Bermuda Hospitals Board

Clinical Services Plan

Project Report

APPROVED BY THE BHB BOARD:
23 January 2018

Bermuda Hospitals Board

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Bermuda Hospitals Board

CEO Remarks

On behalf of the BHB Board, leadership and staff members, I am very pleased to share the BHB Clinical Services Plan (CSP). This document is one of the major deliverables of the BHB Strategic Plan 2016-21, which was published last year. This Plan is a practical navigation tool for us to achieve our vision of '*Exceptional Care. Strong Partnerships. Healthy Community.'* and deliver on the Triple Aim of: improving the patient experience, improving population health and reducing the per capita (per person) cost of care. More importantly, we believe this Clinical Services Plan can serve as both a blueprint and foundation for the Bermuda Health Strategy featured in the Health Platform of our newly-elected Government and the key healthcare priorities advanced in the Speech from the Throne.

Why is our Clinical Services Plan so important? Our population is changing. We are getting older, and many of us on the island are getting sicker. Healthcare costs are rising in parallel, and are becoming increasingly unaffordable. At the same time, the health care landscape is changing. New technologies make care possible in ways that we had not imagined, both inside and outside of the hospital. Health care cost was identified in the Throne Speech as a major expense for the government and private employers. There is a clear impetus to address health care costs and create a better way forward for Bermuda's health care system.

Our Clinical Services Plan aims to better understand these changes and, together with our partners, determine the best role for BHB in addressing them for the benefit of the population of Bermuda. BHB is an essential part of the economic health of the island and must serve the demands of the community in a financially sustainable manner.

It recognizes that an older and less healthy community results in a growing need for hospital services, but also that system-wide changes can help us avoid this current trajectory.

BHB cannot do this alone; any effective path forward requires partnerships. BHB currently works closely with several key components of the health care system, but true partnerships, with shared values and clear objectives centered on providing quality care, are needed to deliver the level of medical care required by our dynamic population. Our Plan therefore recommends what is possible for BHB, our healthcare partners, and Bermuda, as a community, to begin changing course.

So, what can BHB do? The Clinical Services Plan recommends which services BHB is best positioned to offer, or must offer as there is currently no community alternative. Clarity on BHB's role will highlight where the gaps are and how the system can work together to address them. We can collaborate, for example, with our health system partners to both prevent illness and to treat patients across the continuum of care. Across BHB services, we will continue to drive up quality and focus on improving patient flow, reducing unnecessary hospitalizations, and reducing length of stay.

The best plans are made together, and I want to sincerely thank the more than 450 people who participated in the CSP process – including community members, community providers, civil servants, along with our BHB staff, physicians, and leadership. Thank you for shining a light on the challenges, and

for your insightful recommendations on solutions. I look forward to working together with you to deliver it.

As we embark on this together with our partners, I know that Bermuda can improve and grow its capacity to provide the right, quality health care at the right time, in the right place.

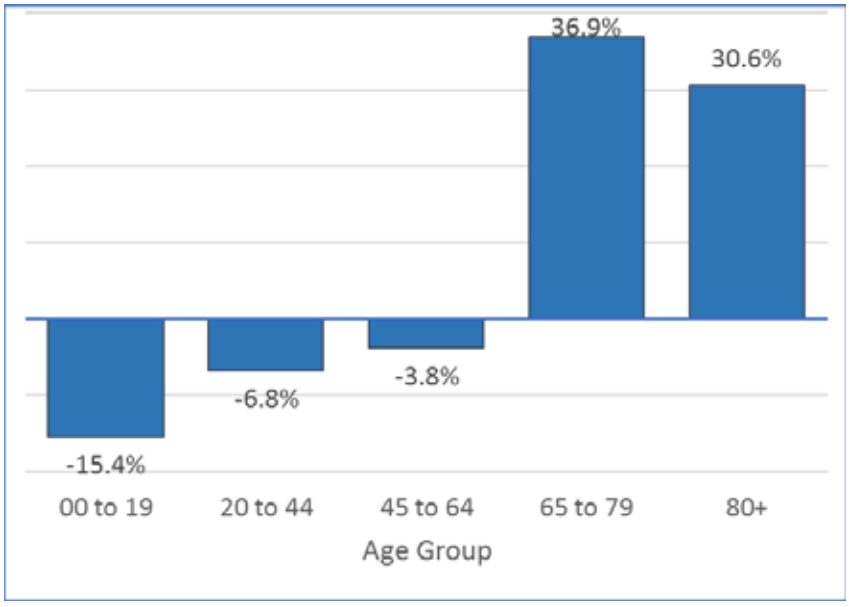
Executive Summary

What Is a Clinical Services Plan (CSP) And Why Do We Need a CSP for BHB?

A Clinical Services Plan (CSP) outlines the services that a health care organization should provide to meet the needs of the population that relies on it for health care. It provides a template for how that organization will need to change, both in terms of what services it will provide, and how much of each service will be required, as the needs of the population change. It also clarifies and confirms the organization's role, specifically what it will do, and what it will not do, so that the population and other health care providers understand what they can expect from the hospital.

All developed countries are experiencing a shift in their demographics, with a higher percent of their population in the senior age groups as 'baby boomers' retire. Coinciding with this change in their employment status and their reduced financial contributions through taxes to the costs of public services, baby boomers are developing the chronic and acute illnesses associated with aging. Bermuda is facing similar trends. While the Bermuda population projections do not predict significant growth by 2025, the population aged over 65 years old will be much larger, and the number of children and young adults is projected to shrink.

Exhibit A: Projected Percent Change in Bermuda Population from 2015 to 2025 by Age Group



This shift in the age composition of the Bermuda population has the potential to greatly increase the cost of health care in Bermuda, and the pressures on BHB to provide services. The high cost of health care for the elderly is not surprising, but when coupled with the projected change in the demographics of the Bermuda population, it highlights the risk of increased health care costs at the same time the

working population decreases, further pushing up the health care cost share of the Bermuda gross domestic product. If the historical pattern of reliance on BHB inpatient beds does not change, and the Bermuda population demographics change as projected, BHB will need to open **75 more beds by 2025** to accommodate the growth in demand from Bermuda's residents.

Knowing this, Bermuda Hospitals Board (BHB) has a responsibility to look at the types of services it provides and understand what it can do to effectively respond to the changing health needs of the Bermuda population. The time is right to develop a CSP that answers questions such as:

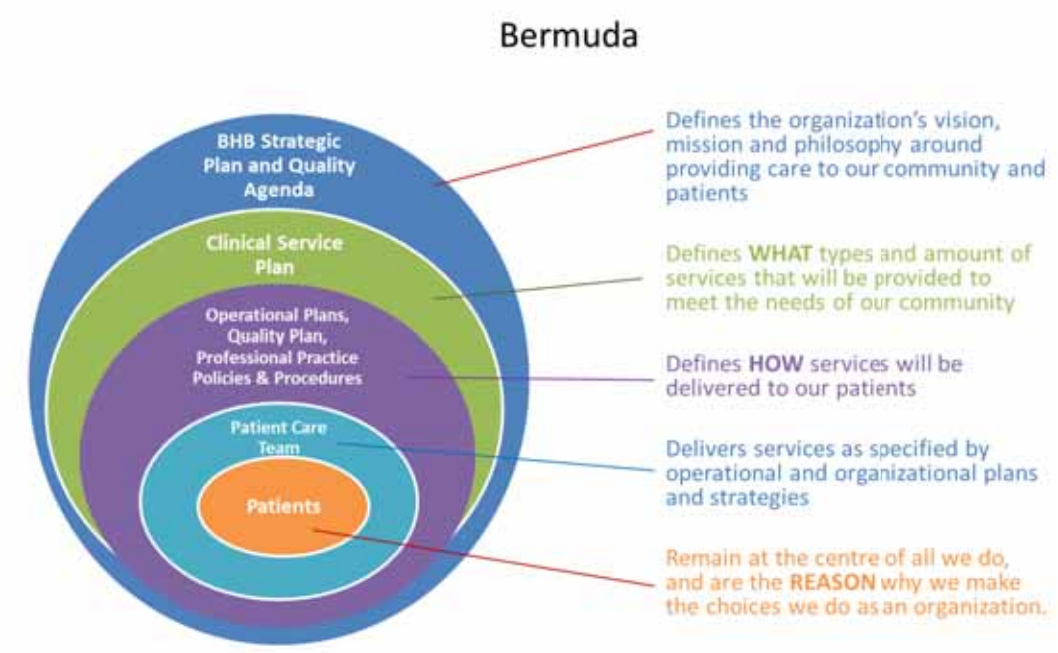
- What type of hospital should we aspire to be (e.g., large community hospital)?
- How can we best meet the needs of the population for high quality hospital care, and can we do this without adding more beds?
- Are there services beyond the traditional role of an acute care hospital (such as long-term care, chronic disease management, or even primary care) that BHB needs to provide, given the unique situation in Bermuda?
- Given cost pressures and the needs of our population, what services can we afford to deliver?

The health system in Bermuda is changing (funding, providers, population). To meet these changes, BHB needed to come together as an organization and work with community partners to examine and define the hospital's clinical service offering through the development of a Clinical Services Plan. The CSP can be a catalyst for change in Bermuda, allowing all healthcare partners to better define and understand mutual roles and expectations

The CSP is a link between BHB's Strategic Plan and the operational plans that guide day-to-day activity, driving operational and capacity changes as well as improvement activities required to ensure that Bermuda's patients receive the best care BHB can possibly provide. The Strategy adopted the Institute for Healthcare Improvement's Triple Aim which guided the development of the CSP:

- Improving the patient experience of care (including quality and satisfaction)
- Improving the health of populations
- Reducing the per capita cost of care

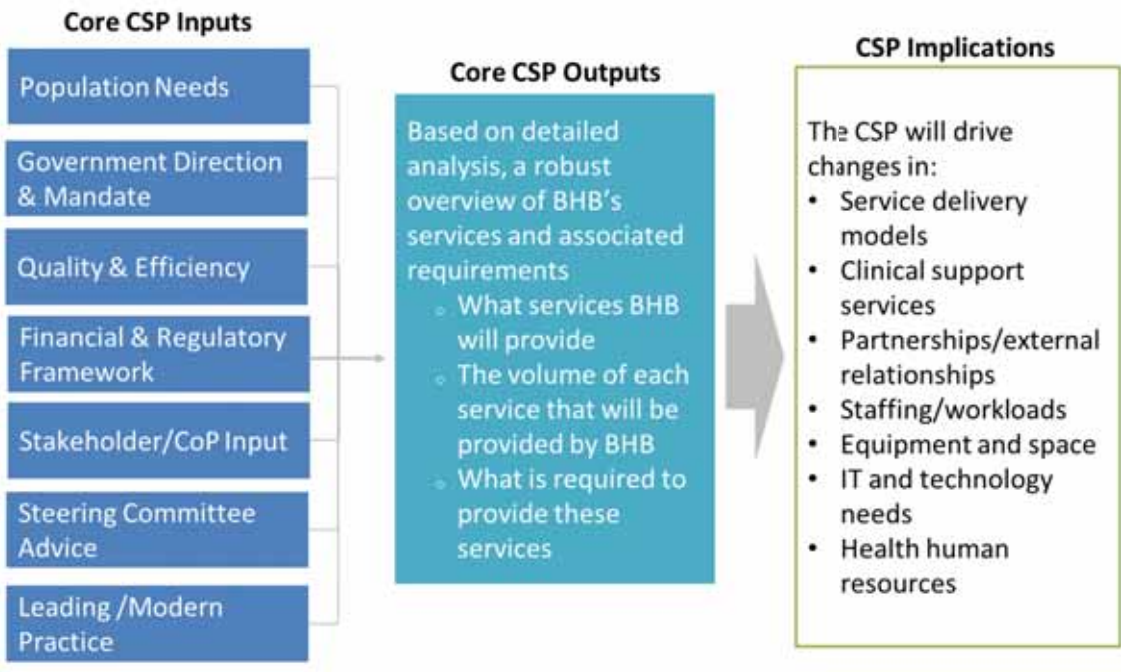
Exhibit B: Relationship between the Patients and Plans at BHB



How Was the Clinical Services Plan Developed?

To develop a comprehensive and fit-for-purpose Clinical Services Plan, a wide range of inputs were needed.

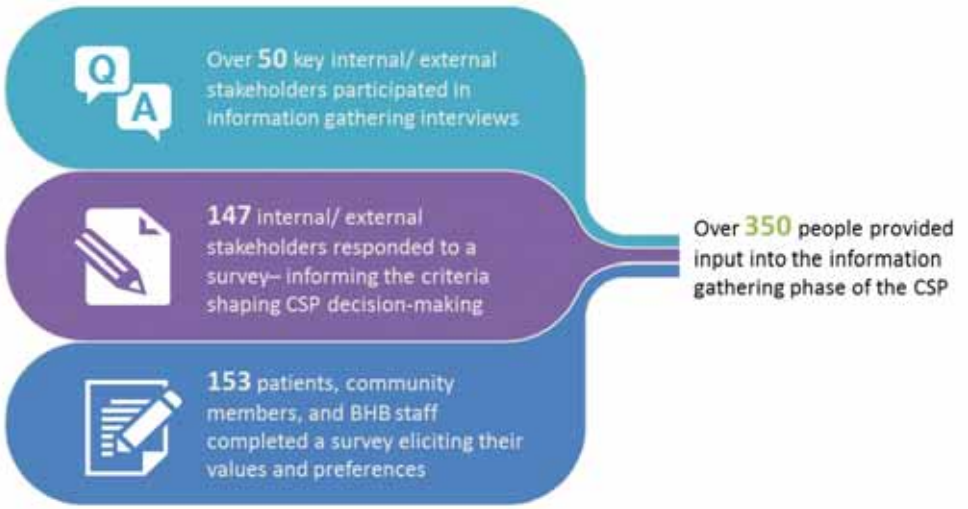
Exhibit C: CSP Inputs, Outputs, and Implications



The CSP project was delivered in five phases described below:

Phase 1: Setting Up for Success – The first phase launched the project governance, and sought initial input from a broad range of stakeholders (more than 50 interviews, and more than 350 individuals). The Steering Committee launched and developed principles and criteria to guide the advice and decision-making processes.

Exhibit D: Sources of Initial Input to the CSP Planning Process



Phase 2: Preparing the Evidence - Phase 2 of the project focused on the collection, collation, and analysis of data describing the Bermuda population, their health status, and their historical use of health services.

Phase 3: Community of Practice Advice –In Phase 3, ten "Communities of Practice" (CoP) were established to support consideration of the role of BHB in the Bermuda health system, and to provide advice about how BHB should approach delivery of care in the future.

Exhibit E: Community of Practice Advisory Groupings

In all, there were approximately 150 CoP participants who shared their knowledge, expertise and advice over a two-month period to inform the development of BHB's CSP.

Phase 4: Prioritization and Decision Making - In Phase 4, Programme and Service advice from each of the CoPs was considered. This culminated in an Advisory Summit held in November 2017. The Advisory Summit was an opportunity for participants to explore and understand the advice of all the CoPs together as a whole and to provide advice to BHB about how implementation of BHB's Clinical Services Plan should be coordinated with the other stakeholders in the Bermuda health system. Attendees included the CSP Steering Committee, the CoP leads, the CSP Executive Committee, and community stakeholders.

The BHB Executive Committee then reviewed the advice from the Advisory Summit, and provided final direction on the service and delivery models to be provided by BHB in 2020 and 2025.

Phase 5: Develop CSP and Implementation Plan - Modeling was used to project the volumes of services that BHB will be required to provide in 2020 to 2025. This report outlines the CSP recommendations, providing a high-level projection of future BHB activity volumes, the steps that BHB must take to achieve its goals, and a clearer definition of what health services BHB will assume responsibility for, either on its own, or in partnership with others.

Key Learnings

In this past year, BHB has experienced inpatient bed shortages that have negatively impacted patient and staff satisfaction. The evidence reviewed in the CSP shows us why we are facing this challenge and, in fact, informs us that without the changes the CSP recommends, we will require additional inpatient beds to provide the same level of service into the future.

While BHB recognizes that there are internal improvements required to meet its quality objectives and address current hospital capacity challenges, it is clear that there is also a need to look across the health system in Bermuda. Unless the system works effectively as a system to provide the right type and quality of services across the continuum of care, BHB will be unable to deliver on expectations to operate efficiently. Without a coordinated and more comprehensive system of care, demands for hospital services will continue to grow, and BHB will be challenged to meet the demands of the population. As well as looking internally for improvements, BHB must continue to advocate for system level solutions to some of the challenges it faces.

Five key learnings resulted from deliberations to inform BHB's CSP:

Exhibit F: Drivers of Change

The table below describes key learnings from the development of the CSP, and provides examples of assumptions made to support the goals of moving towards high quality, timely, cost effective and patient centred care at BHB.

Exhibit G: Clinical Services Plan Over-Arching Considerations and Planning Assumptions

Considerations	Assumptions
Raising Quality Standards	
Improvement in Quality of Care and Coordination of system resources	Implementing strategies and working together as a system to improve the standard of care across Bermuda. Standardizing care according to evidence-based protocols, coordinated capacity planning and improving transitions in care.
Leveraging Information Technology to Improve Quality of Care	Establishing the information infrastructure to measure, monitor, and evaluate care and outcomes. Improving ability to track patient care across continuum, and use information technology to support case management, care coordination and reduce duplicated services.

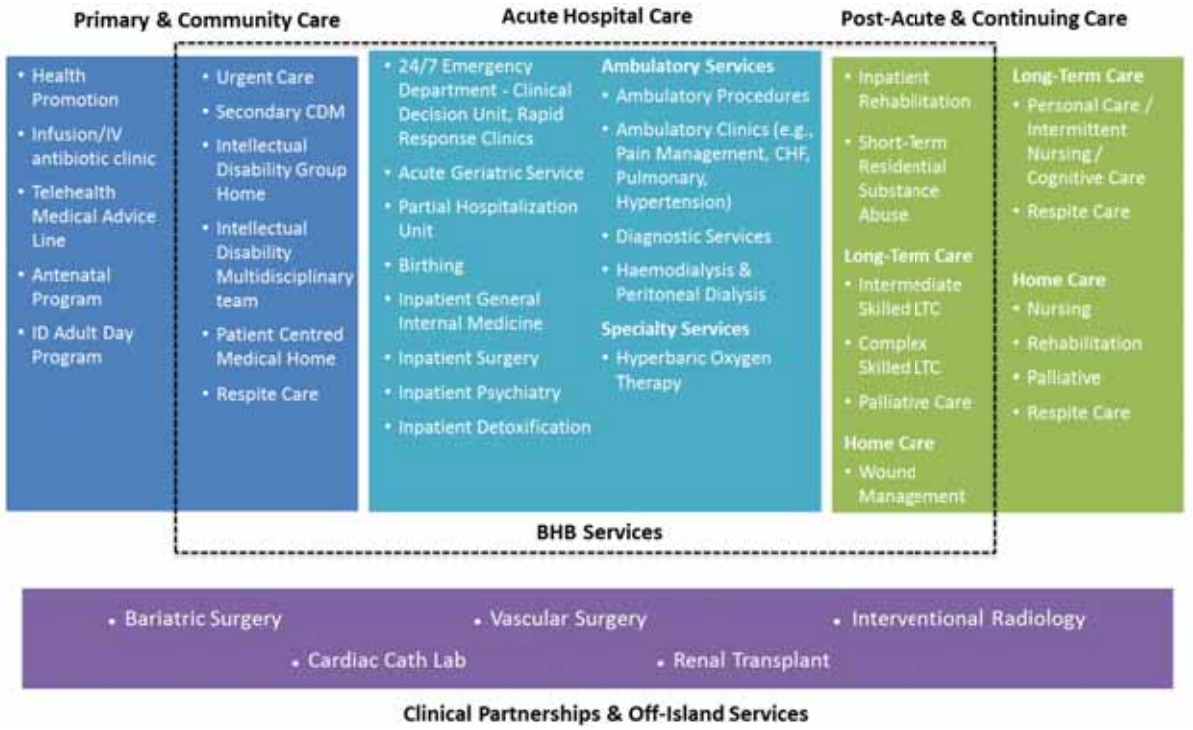
Considerations	Assumptions
Supporting the Bermuda Health Strategy	
Support for Government Health Strategies	Actioning Health Strategies articulated in Bermuda that support capacity and capability along the entire continuum of care, including the Long-Term Care Action Plan and the Mental Health Plan. Clarifying an understanding of BHB's role in the Bermuda health system, and ensuring that BHB's expectations of other partners are clear. Aligning funding models with BHB's role, and recognizing impacts on BHB if other partners do not fulfil their roles.
Optimizing Patient Flow	
Hospital Role in Prevention and Promotion	Agreement that prevention and promotion is not the primary role of BHB, but that BHB can support partners (clinical knowledge, identification of needs, promotion of initiatives, diagnostics, setting of standards, etc.) that do provide prevention and promotion activity. Recognition that appropriate funding and incentives need to be in place so that others will provide critical prevention and promotion services.
Matching Care to Needs	Ensuring the "right care by right provider at right time" in an effort to substitute less invasive care. Including "de-escalating" care to ensure that needs are identified and addressed as early as possible, and in the least intensive setting required. Reorganizing resources and funding incentives, including cohorting patients according to needs, providing services "earlier in the continuum" whenever possible to avoid acute exacerbations of illness. Creating capacity to accommodate growing needs due to population change.
Establishing Partnerships	
Partnerships	Recognizing that development and support of collaborative partnerships is necessary to best meet the health service needs of Bermuda residents. Clarifying roles and coordinating/integrating care, smoothing transitions and communication, and ensuring that quality expectations and standards can be met by all providers in the continuum of care. Considering partnerships among BHB, Specialists, GPs, community providers, government and others, including off shore and visiting physicians through clinical affiliation agreements, with BHB establishing itself as a partner, rather than a competitor.
Aligning Funding/Payment Incentives with Quality	
Aligning Funding/Payment Incentives with Quality	Reforming government and insurer reimbursement/funding to align incentives so that patients are treated in the most appropriate settings, aligning funding models with high value models of care, and recognizing the need to contain cost while promoting high quality and accessible care.

Many of the services/initiatives identified by the Communities of Practice will be supported by cooperation and collaboration with external partners. The Bermuda Health Action Plan (2014 to 2019) emphasizes the importance of partnerships and collaboration among the health system stakeholders. It is very clear that the future scope and scale of services to be provided by BHB will be very dependent on the capacity, capability, and collaboration with BHB's partners, including government and other community providers.

BHB Clinical Services

Given its relatively isolated geographic location, the Bermuda community needs a range of services far broader than would commonly be expected of a hospital serving a similar population base (i.e. 62,000 residents). The graphic below shows the proposed set of health care services that BHB will assume primary responsibility for in the future. There are some Primary and Community Care and Post-Acute and Continuing Care services that BHB will provide in addition to its Acute Hospital Care services.

Exhibit H: BHB Proposed Services



A principle developed by the Steering Committee was that BHB could not divest a service without an alternative provider identified. This constrained the pool of services available for divestment. BHB is considering the potential merger of the BHB adult intellectual disability New Dimensions Day Programme with the Ageing and Disabilities services (MoH), K. Margaret Carter Adult day centre programme, which could result in the potential divestment of the combined service to the Ministry of Health. This is the only potential divestment considered by the CSP.

New BHB services include the Patient Centred Medical Home (currently available as a pilot project), a partial hospitalization unit, ambulatory clinics (e.g. congestive heart failure, pulmonary, hypertension), inpatient rehabilitation, and formally designated intermediate skilled and complex skilled long-term care units. Most of the proposed new services have been identified as supporting "de-escalation of care", by responding to direct patient needs with the highest quality and most cost-effective care. New specialized services (e.g. renal transplant, cardiac catheterization) where there are accepted international critical mass standards, will be first offered off-island to Bermuda's resident through clinical partnerships with off-shore hospitals, with the potential to transition to on-island care as patient volumes and BHB experience with the service increases.

Inpatient Hospital Beds Projections

While hospitals provide many ambulatory services, such as an emergency room, outpatient surgery, and clinics, the most expensive (and unique) role of a hospital is the provision of inpatient care.

The table below shows the overall projected number of hospital beds for BHB in 2020 and 2025. The bed numbers do not include residential group home or assisted living beds for intellectual disability or substance abuse patients. The negative numbers in the final two columns mean that the current BHB bed capacity is more than the projected requirement (i.e. BHB could close some beds), and the positive numbers mean that the projected future requirement is more than the current number of beds provided by BHB for the programme (i.e. more beds will be required).

The 2020 and 2025 bed projections assume successful implementation of the proposed strategies to avoid admission, to reduce length of stay, and to more quickly move patients to levels of care most suited to their needs. Some of the proposed reduction in beds results from application of bed occupancy targets that reflect industry standards, rather than the historical low occupancy rates for BHB's overflow, maternity, neonate, and paediatric beds. The projections also assume increased community capacity for long-term care (as described in the LTC Action Plan) and BHB investment in additional ambulatory service capacity.

Exhibit I: Projected BHB Hospital Beds by Bed Type for 2020 and 2025

Bed Type	Actual 2017	Projected		Change from 2017	
		2020	2025	2020	2025
Adult Acute Medical	90.0	53.4	52.5	(16.6)	(16.3)
Adult Acute Surgical		20.1	21.2		
Intensive Care Unit	8.0	10.8	11.3	2.8	3.3
Maternity	19.0	14.2	13.7	(4.8)	(5.3)
Neonate	12.0	5.9	5.6	(6.1)	(6.4)
Paediatric	17.0	9.7	8.5	(7.3)	(8.5)
Total Acute	**146.0**	**113.9**	**112.9**	**(32.1)**	**(33.1)**
Rehabilitation	-	17.9	19.3	17.9	19.3
Post-Acute	140.0	82.1	89.3	(57.9)	(50.7)
Hospice	8.0	9.1	10.1	1.1	2.1
KEMH Total	**294.0**	**223.1**	**231.6**	**(70.9)**	**(62.4)**

Bed Type	Actual 2017	Projected		Change from 2017	
		2020	2025	2020	2025
Acute Psychiatry	23.0	17.1	17.1	(1.3)	(1.6)
Intensive Care Psychiatry		4.6	4.4		
Child/Adolescent Psych	4.0	1.3	1.2	(2.7)	(2.8)
Psych Rehab	40.0	22.7	20.7	5.0	4.7
Post-Acute Psych.		22.3	24.0		
Addictions	8.0	5.5	5.4	(2.5)	(2.6)
MWI Total	**75.0**	**73.5**	**72.7**	**(1.5)**	**(2.3)**
BHB Total	**369.0**	**296.6**	**304.3**	**(72.4)**	**(64.7)**

The most important steps to be taken by BHB to help it respond to increasing population need for health care without increasing the overall number of hospital beds it operates are:

- Avoid unnecessary admissions to inpatient care through the addition of a **clinical decision unit** (CDU) in the emergency room, expand rapid access to clinics, and allow some surgery patients to return home on their day of surgery rather than staying in an inpatient hospital bed.
- Introduce new procedures and supports for standardization of care, identify patient needs early, and help with transitions of patients from acute care to home or post-acute services.
- Develop a **short-term rehabilitation unit**, where acute care patients with rehabilitative potential can receive focused rehabilitation care to increase their potential to return home after hospitalization.
- Introduce **a partial hospitalization service for psychiatric patients** that will allow them to receive care through a day hospital programme.
- Add a **residential care service for substance abuse patients** to access after their hospital stay, where they can be further supported away from their home environment, and develop the skills and knowledge to help them avoid readmission to hospital.
- **Re-organize inpatient units** so that patients with similar care needs (e.g. complex long-term care) are together, and that the nursing and other care they receive is targeted to the specific needs of that cohort.

With aggressive implementation of the initiatives proposed in the CSP, BHB will be able to provide high quality inpatient care within the current facility capacity at both the KEMH and MWI sites. Because of the emphasis on “de-escalation” of care, the future patients in BHB hospital beds will have greater needs and staffing patterns will need to be modified to reflect this reality. Other investments will also be needed to implement the CSP recommendations.

Other BHB Service Projections

Other services to be provided by BHB in the future include:

- **Emergency Room and Urgent Care Centre** – There will be little change in the overall number of visits, but there will be a shift in BHB emergency room visits from low acuity to high acuity

patients. The proposed CDU will help reduce the number of admissions for lower acuity patients.

- **Dialysis** – There will be growth in need for dialysis services, and BHB will remain the largest provider of haemodialysis on the island. BHB will work with the new providers of community based dialysis (both haemodialysis and peritoneal dialysis) to make sure that everyone who needs this service can expect to receive the same standard of quality.
- **Hospital-Based Ambulatory Clinics** – The CSP identifies new and expanded clinics (e.g. congestive heart failure, hypertension) that BHB will need to have. BHB will also reorganize its ambulatory services to ensure that the range of ambulatory care required by BHB's patients is accessible and coordinated.
- **Residential Intellectual Disability Support** – BHB will continue to operate residential group homes across the island. BHB will work with the Ministry of Health to create the proposed registry of the Bermuda intellectual disability population, and to identify best practice models for support of this population in the future.

Alignment with National Bermuda Health System Plans

The recommended BHB initiatives and service delivery model changes support Bermuda's national health plans, and coordination of BHB activities with the other stakeholders responsible for implementation of these plans.

There was also recognition that appropriate funding and incentives need to be in place so that others in the system will provide critical prevention and promotion services. It is very clear that the future scope and scale of services to be provided by BHB will be very dependent on the capacity, capability, and collaboration with BHB's partners, including government, other on-island providers, and offshore affiliates.

BHB cannot function effectively and efficiently in a system that does not have effective partnerships, or that does not work collaboratively to ensure that people are accessing the care they need in an efficient, cost effective and patient-centred way. BHB is dependent on, and must work collaboratively with, its partners who provide primary care, chronic disease management services, specialized surgical services, and many more. There is a need to move the system towards a clearer understanding of each provider's unique role, with BHB as a partner with other health system stakeholders, rather than being seen as a potential competitor.

BHB stakeholders have advised that BHB has a leadership role to play in supporting the advancement of collaborative partnerships that are necessary to best meet the health service needs of Bermuda's residents. This includes clarifying roles and coordinating/integrating care, smoothing transitions and communication between providers, and ensuring that all providers in the continuum of care can meet quality expectations and standards.

Implementation Considerations

The Clinical Services Plan services/initiatives recommended for BHB are listed below. The items highlighted in **green** are new BHB services or service delivery changes. The items highlighted in **blue** are existing BHB services. The items highlighted in **yellow** are services where implementation will be dependent on support from other partners (including government, other community health care providers, and offshore clinical partners). The services/initiatives are ranked according to the extent that the proposed item supports the principles approved by the CSP Steering Committee to evaluate the CoP advice (note – a higher number indicates greater alignment with principles).

Exhibit J: Implementation Considerations and Major Impacts of Proposed Items in Clinical Services Plan

Service	CoP Advice - Updated	Rank re Principles	New Major BHB Investment?	Major Change in BHB Process(es)?	Major Impacts on Master Estate Plan?	Major Impact on Permanent HR/Staffing?	Major Technology Impact?	Implementation Considerations
Complex Skilled and Intermediate Skilled Long Term Care (LTC)	Establish specific unit(s) for patients who require Complex Skilled or Intermediate Skilled long-term care services. Patients to be stratified by need so that BHB can establish staffing models & care protocols reflecting the needs of the patients. This should lead to both higher quality and more cost-effective care	1	✓	✓	✓	✓		Align staffing (and funding) to each level of care
Short Stay Inpatient (IP) Rehabilitation Care Unit	Establish new unit to support inpatient rehabilitation for those patients with restorative potential who would benefit from rapid access to intensive rehabilitative care. Should result in overall reduction in patient length of stay with improved outcomes	3	✓	✓	✓	✓		Recruitment of Physiatry lead and additional therapy staff

Service	CoP Advice - Updated	Rank re Principles	New Major BHB Investment?	Major Change in BHB Process(es)?	Major Impacts on Master Estate Plan?	Major Impact on Permanent HR/Staffing?	Major Technology Impact?	Implementation Considerations
Clinical Decision Unit	Establish a Clinical Decision Unit (CDU) in Emergency where patients can be cohorted for observational care to allow ongoing assessment and short-term interventions to prevent unnecessary hospital admission	8	✓	✓	✓	✓		Identify space and location
Step Down Mental Health Unit - Partial Hospitalization	Provide new partial hospitalization service or virtual ward to provide support to patients and prevent readmissions	10	✓	✓	✓	✓		Identify and develop appropriate day hospital space at MWI
Acute Geriatric Service	Establish an inpatient, specialized geriatric assessment unit to better identify and support patients at risk for hospital-acquired disability	11	✓	✓	✓	✓	✓	Recruitment of geriatric service professionals
Comprehensive Antenatal Programme	Develop, in partnership with other providers, a standardized approach to antenatal care to improve the patient experience and health outcomes for all pregnant women in Bermuda	12		✓				Work with Dept. of Health to monitor access to antenatal care
Interventional Radiology	Include development and refinement of business case	14	✓	✓	✓	✓	✓	Include in identification of offshore clinical partner
Case Management	Expand case management role, particularly for patients who are elderly and/or have chronic disease(s). Will only be fully effective with increase in community services	16	✓	✓		✓	✓	Coordinate with geriatric assessment and care pathway discharge planning

Service	CoP Advice - Updated	Rank re Principles	New Major BHB Investment?	Major Change in BHB Process(es)?	Major Impacts on Master Estate Plan?	Major Impact on Permanent HR/Staffing?	Major Technology Impact?	Implementation Considerations
Standardized Care Pathways	Develop a hospital-wide, coordinated initiative to acquire/develop, implement, monitor, and enforce adherence to standardized clinical pathways	5	✓	✓			✓	Staged implementation with refinement of pathways used elsewhere
Short Term Residential Treatment for Substance Abuse Patients	Provide shorter term residential treatment options following discharge from the detoxification unit. A 3 month clinically-managed and medically monitored programme would fill an existing service gap	17	✓	✓	✓	✓		Align staffing and funding to provide this service
Cardiology - Hypertension Clinic	Re-establish an out-patient hypertension clinic to reduce the need for inpatient hospital care	20	✓	✓	✓		✓	Consolidation of activity for HTN patients seen in other BHB clinics
Long Stay Physically Disabled Patients	BHB to advocate for more appropriate and cost-effective settings to manage long-term needs of paediatric and/or young adults w/ long-term care needs, but will continue to care for these residents until more appropriate setting exist	23	✓	✓	✓	✓		Include in development of complex and intermediate LTC units
Rapid follow up Clinics	Provide rapid follow up clinics so that patient with the need for urgent follow-up but who do not need hospitalization can access services through a clinic.	24	✓	✓	✓	✓	✓	Review access (availability, frequency, and wait time) to clinics

Service	CoP Advice - Updated	Rank re Principles	New Major BHB Investment?	Major Change in BHB Process(es)?	Major Impacts on Master Estate Plan?	Major Impact on Permanent HR/Staffing?	Major Technology Impact?	Implementation Considerations
Improved Matching of Surgical Modalities w/ Procedure Requirements	Utilize the main OR for only those procedures requiring such a facility. Create an ambulatory surgery stream with a 23-hour service model. Perform procedures not requiring the OR in a procedure room or surgeon's office	25	✓	✓	✓		✓	Promote change in funding model and identify space to move selected procedures out of OR
CHF Clinic	Re-establish an out-patient heart failure clinic with nursing support to provide personalize heart failure management programme and self-management around diet, exercise and medication	27	✓	✓	✓	✓		
Dual Diagnosis Outreach	Provide cross training of current BHB providers in the common elements of mental health and substance abuse.	31	✓	✓				
Gynaecology Minimally Invasive Surgery	Develop an ambulatory gynaecology program that converts appropriate OR surgical procedures to minimally invasive approaches	37	✓		✓	✓	✓	Surgeon training and equipment acquisition
Expanded Respite Care to Support ID Caregivers	Expand BHB service capacity to better support community care givers and allow individuals to be supported longer or permanently in the community	38	✓	✓	✓	✓		Include in staffing model and seek funding support
Acute Pulmonary Service	Pulmonologist available to support inpatient consults at KEMH			✓		✓		May be able to contract with community pulmonologist

Service	CoP Advice - Updated	Rank re Principles	New Major BHB Investment?	Major Change in BHB Process(es)?	Major Impacts on Master Estate Plan?	Major Impact on Permanent HR/Staffing?	Major Technology Impact?	Implementation Considerations
Surgery by Visiting Surgeon	Implement strategies to improve scheduling and smooth workload to prevent unmanageable spikes in surgical bed requirements			✓				Include in identification of offshore clinical partner
Nephrology and Dialysis	Set service standards for dialysis and continue services at the current volume. Accommodate anticipated growth in demand through external partners	4		✓				Confirm community partner capability (re quality standards) and capacity
Patient Centred Medical Home	Following the pilot and based on evidence, continue PCMH to support individuals with one or more chronic disease who are not seeing a GP and who are un or under-insured	7	✓	✓	✓	✓		Formalize programme, subject to pilot evaluation results
Asthma/COPD Chronic Disease Management	Provide a leadership role in coordination of chronic disease management services for respiratory care, in coordination with external partners	20		✓				Include referrals in care pathways
Metabolic and Diabetes CDM	Provide a leadership role in coordination of services for diabetes and related metabolic disease, in coordination with external partners.	20						Include referrals in care pathways
Long Term ID Residential Group Home	Continue to provide at BHB with appropriate funding: candidate for divestiture as not a “hospital” service but no available partners	28						Review service delivery after register of ID population available

Service	CoP Advice - Updated	Rank re Principles	New Major BHB Investment?	Major Change in BHB Process(es)?	Major Impacts on Master Estate Plan?	Major Impact on Permanent HR/Staffing?	Major Technology Impact?	Implementation Considerations
Inpatient Care for Complex Intellectual Disabilities (ID) Patients	Include provisions of complex ID patients in BHB long-term care beds	30		✓	✓	✓		Include in development of complex and intermediate LTC units
Hyperbaric Oxygen Therapy	Continue to provide to support diving tourism	36						Establish and communicate criteria for identification of service candidates
ID Multidisciplinary Team Services	Provide multi-disciplinary team support to ID patients but due to capacity limitations only provide to BHB Group Home and IP clients	39		✓				
National Electronic Health Record	Promote & support national initiative for electronic health record and coordinate so that hospital records are aligned to coordinate with a longitudinal record.	2					✓	Provide alignment with internal BHB information technology planning and implementation
In-Home Care	Assume development outside of BHB of national home care programme by 2025	6		✓				Support LTC Action Plan implementation
Vascular Surgery	Align with interventional radiology development	9	✓	✓	✓	✓	✓	Include in identification of offshore clinical partner
Palliative Care	Continue existing support of palliative care patients, with growth accommodated in external partners	13						Promote development of Bermuda end of life strategic plan

Service	CoP Advice - Updated	Rank re Principles	New Major BHB Investment?	Major Change in BHB Process(es)?	Major Impacts on Master Estate Plan?	Major Impact on Permanent HR/Staffing?	Major Technology Impact?	Implementation Considerations
Pulmonary Service	BHB will work with community pulmonologist and primary care practitioners to increase access	15		✓				Identify community capability and capacity
Care Plan Prompt for Referral to CDM Service	Build in care plans and clinical information systems prompts for referrals of patients with chronic disease to access appropriate CDM services	19		✓			✓	Incorporate in pathways
National Disabilities Register to include Bermuda residents with Intellectual disabilities	Incorporate in Bermuda National EHR and care plans	26					✓	Work with Ministry of Health to establish
Admissions for Drug Coverage	Move services to a clinic or home health care to prevent unnecessary admissions ((i.e. possible external partners)	29						Work with Ministry of Health and insurers to change policy
Injection/Infusion/IV antibiotic clinic	Support external provision for injection/infusion/IV antibiotic treatment to free up capacity in the ED.	33		✓				Promote provision via primary care
Bariatric surgery	Work with external provider to support the continuum of care for patients with bariatric surgery	34					✓	Include in identification of offshore clinical partner
Health Promotion Partnership	Identify and nurture partnerships to support health promotion	41						
Paediatric Asthma Clinic	Do not include as separate service from BHB Dream Centre							Paediatric asthma patients treated in Dream Clinic

Service	CoP Advice - Updated	Rank re Principles	New Major BHB Investment?	Major Change in BHB Process(es)?	Major Impacts on Master Estate Plan?	Major Impact on Permanent HR/Staffing?	Major Technology Impact?	Implementation Considerations
Overarching Advice – BHB Supports Partner CDM Initiatives	Effective Chronic Disease Management must be rooted in a broad-based approach across the education, healthcare, and social service sectors. BHB as central resource to support partners in delivery and to play a quality leadership role							

Health System Implications

The CSP has made assumptions about the future capability and capacity of other health care providers in Bermuda, and has made assumptions about future changes in health system policy and national initiatives. While outside the mandate and control of BHB, there are implications for the broader Bermuda health system associated with implementation of the BHB CSP, and some of these are highlighted here.

Universality of Health Care

Through the CSP development, it became clear that some aspects of the proposed BHB role were considered necessary to meet the needs of the under- and un-insured population (e.g. Patient Centred Medical Home). If universal healthcare were to be introduced in Bermuda[1], and changes were made to support primary care providers to play a comprehensive care management role, then **the BHB role (particularly with respect to the PCMH) and projected bed requirements should be reviewed.**

Health System Performance Measurement and Monitoring

The analysis of patterns of utilization by Bermuda's resident conducted for the CSP project have highlighted some limitations in Bermuda health care data that impact the ability to accurately and comprehensively measure and monitor health system performance. Examples include:

- Inadequate data to determine what hospital services Bermuda residents access overseas

[1] The 2012 Bermuda Ministry of Health National Health Plan: Bermuda Health System Reform Strategy set the first of 11 health sector goals as "Universal access to basic health coverage shall be assured for all residents of Bermuda."

- Electronic and integrated health information systems and databases being in the early stages of development.
- Inadequate standardization of health data to support international health system performance comparisons

Health System Partnerships

As the provider of hospital care in Bermuda, BHB can play a major role in cost control and system integration, and can work to improve patient experience with respect to the services that BHB provides. But the goals of improving population health and reducing the per capita cost of care in Bermuda require cooperation and collaboration among all health system stakeholders.

The proposed limited scope of services in the CSP shows that BHB does not aspire to be the provider of all health care in Bermuda. But much of what BHB does plan to do requires the support of health system partners. While BHB may have been perceived in the past as a competitor by other stakeholders, **a key message of the CSP is that BHB wants, and needs, to partner with other health care providers and government that share the goal of improving the health of Bermuda's residents through the provision of high quality health care services**.

Health Promotion, Illness Prevention, and Chronic Disease Management

While BHB is clearly impacted by the prevalence of chronic disease and the health status of the population it serves, **the CSP does not incorporate significant increased BHB investment and service capacity in support of chronic disease management and health promotion**.

BHB's vision for its role in chronic disease management (CDM) is as a support to grow a more robust solution for CDM in Bermuda. BHB can play a quality leadership role, but will not necessarily be responsible for the direct public interventions required to reduce the incidence of chronic disease. BHB will support public self-management of chronic disease.

BHB recognizes that effective chronic disease management must be rooted in a broad-based approach across the education, healthcare, and social service sectors throughout Bermuda. **BHB recognizes the critical role of primary care providers in healthcare in prevention and management of chronic disease and sees a partnership with the community doctors as essential to the success of CDM.**

Long-Term Care (LTC) Reform

The Bermuda LTC Action Plan describes the Personal Care, Intermittent Skilled Nursing, Cognitive Care levels of care. The Personal Care level of care was identified as being provided in both KEMH and community based care homes. The CSP project has concluded that BHB should not provide the Personal Care, Intermittent Nursing Care, Cognitive Care level of long-term care, either in hospital beds, or in an off-site facility.

Once community based care homes can assume responsibility for patients requiring this level of Personal long-term care, BHB can focus on long-term care patients requiring a level of care that should

be provided in a hospital environment (i.e. Complex Skilled and Intermediate Skilled long-term care). Patients will benefit from having the opportunity to live in a less institutional environment and not be as exposed to the iatrogenic risks of living in a hospital.

The ability of BHB to cease offering this level of care is contingent on the successful implementation of the Bermuda LTC Action Plan, and the increase in capability and capacity of community care homes to assume sole responsibility for this level of care. BHB recommends that legislation may be necessary to facilitate appropriate placement of patients in the appropriate levels of care.

The CSP project has concluded that BHB should not independently assume an expanded role in the provision of in-home care services as part of the Clinical Services Plan. BHB should have a role to play in helping to determine and establishing quality standards for post-acute in-home care, but this should be done within the context of a national plan to establish a Bermuda system of in-home care.

BHB recognizes the value of in-home care, and the potential for an improved system to support patient flow through the hospital system, and to allow BHB to focus on providing hospital care for patients who have a level of need that cannot be met in the community.

Health System Funding Reform

Bermuda's health system funding and payment policies should be supportive of the country's health system goals. CoP participants identified funding and payment policies as barriers to implementation of initiatives intended to improve the quality of care and reduce the overall per capita costs of health care for Bermuda's residents. BHB understands that this is being addressed.

There is no explicit articulation of the goals and principles that should guide development and implementation of funding and payment policies. Such an overarching framework would provide the basis for assessing how funding mechanisms and rates should be established for new services, and would support the evaluation of whether the funding approaches are supporting health system goals.

The Ministry of Health, the Bermuda Health Council, and BHB should jointly develop principles and framework that should be applied for all health services provided for Bermuda's residents.

If Bermuda and BHB accept the Triple Aim framework, there may be situations where increased cost in one sector can contribute to cost reductions in other sectors, and a net reduction in overall system per capita costs. **The funding system needs to be sensitive to overall cost impacts, and support initiatives that may generate savings elsewhere in the system.**

1 Clinical Services Planning at BHB

This chapter describes why BHB embarked on the Clinical Services Planning Project, setting the context with the launch of the Strategic Plan in 2016. It explains what a Clinical Services Plan does and how it relates to the both the Strategic Plan and the Operating Plans.

The BHB Strategic Plan was published in 2016, after engaging with over 350 staff members and external stakeholders. It set the ultimate vision of the organisation – ***Exceptional Care, Strong Partnerships, Healthy Community***. It also committed BHB to the Institute for Healthcare Improvement's Triple Aim:

- Improving the patient experience of care (including quality and satisfaction)
- Improving the health of populations
- Reducing the per capita cost of care

The mission states that BHB will ***deliver safe, high quality, people centred, and compassionate care every day*** in pursuit of that vision.

Exhibit 1: BHB Strategic Plan 2016- 2021

BHB's mandate is set out in the Hospitals Board Act 1970, and requires BHB to remain financially sound while delivering high-quality, cost-effective services. Given the relatively isolated geographic location, the Bermuda community needs a range of services broader than would commonly be expected of a hospital servicing a similar population base in a larger country, with highly specialist services that cannot be provided safely on-island referred overseas.

BHB provides a large variety of services: acute care, chronic care, long-term care, intellectual disability (ID), substance abuse, and mental health services. BHB's services are delivered from the King Edward VII

Memorial Hospital (KEMH), Continuing Care Unit (CCU), Mid-Atlantic Wellness Institute (MWI) and Lamb Foggo Urgent Care Centre (UCC), as well as in various group home and community settings.

Each year, an Annual Plan is collaboratively developed by BHB's leadership that defines the key projects that will navigate BHB closer towards its vision. To consider the services that BHB provides and ensure they are in alignment with the strategy (and support the achievement of the Triple Aim), BHB planned the development of a Clinical Services Plan (CSP), as part of the FY15/16 Annual Plan. The development of the Clinical Services Plan was one of the major initiatives on the FY16/17 Annual Plan.

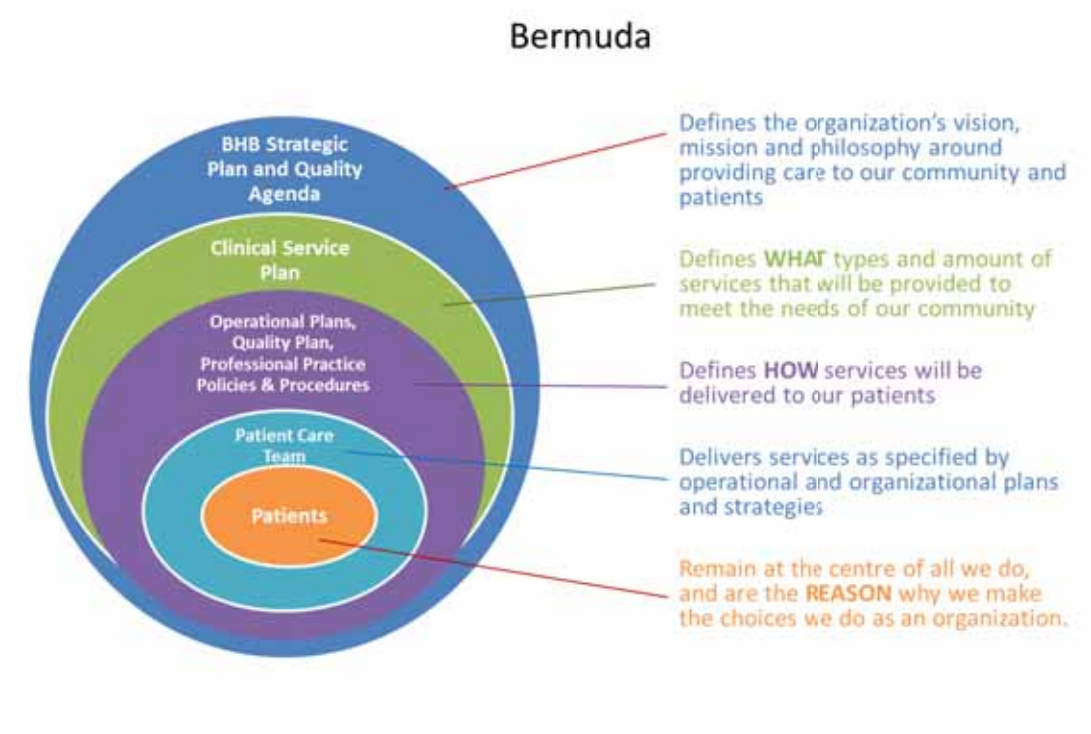
1.1 Expectations and Objectives

BHB developed the CSP to help define the health services needs of the Bermuda population and to define BHB's role in responding to those needs. The CSP clarifies:

- The type and amount of service that will be provided by BHB
- The model of service delivery that should be used to enhance quality of care and improve the patient experience
- The supports (e.g., clinical supports, physical plant, equipment and infrastructure, technology, human resources, etc.) that will be required to provide the services

The CSP is an important link between BHB's Strategic Plan and the operational plans that guide day-to-day activity. While the **Strategic Plan** provides overall direction and articulates the vision, mission and values that will guide BHB's delivery of care, the **CSP** describes ***what*** services BHB will provide to achieve the organizational vision. More specifically, it defines the role of BHB within Bermuda's health system by confirming what services BHB will (and will not) provide. Once the CSP is approved, **Operating Plans** will be developed to support the clinical service priorities identified in the CSP, defining ***how*** BHB health care teams will provide the high quality, cost-effective services we have committed to providing.

Exhibit 2: Relationship between the Patients and Plans at BHB



As the link between strategy and operations, the CSP plays an important role in ensuring that BHB enables two critical strategic commitments: **fiscal and operational excellence, and a commitment to quality**.

The CSP has been developed by a process that supports **fiscal and operational excellence** – directly contributing to BHB's "Performance Pillar" objectives, as outlined in the Strategic Plan:

> *"We will effectively manage our resources to improve decision making, productivity and cost effectiveness, while seeking opportunities to optimise revenues without adding unnecessary costs to the Bermuda healthcare system. We will advance our strategic priorities through appropriate and purposeful use of resources (e.g., information management/technology, estate, equipment). We will seek feedback from the community and our system partners, and actively work to strengthen trust and confidence in our organisation."*[2]

The CSP also ensures that the array of services provided by BHB supports the **quality agenda,** supporting the delivery of care that is:

- **Safe:** Avoiding harm to patients from the care that is intended to help them
- **Effective:** Providing services based on scientific knowledge to all who could benefit and refraining from providing services to those not likely to benefit (avoiding underuse and misuse, respectively)

[2] Bermuda Hospitals Board Strategic Plan 2016- 2021

- **Patient-centred:** Providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions
- **Timely:** Reducing waits and sometimes harmful delays for both those who receive and those who give care
- **Efficient:** Avoiding waste, including waste of equipment, supplies, ideas, and energy
- **Equitable:** Providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status[3]

The next chapter describes how the Clinical Services Plan was developed, including the inputs to the plan, the governance of the planning process, and the five phases of the CSP project.

[3] Institute of Medicine (IOM) Framework for Quality

2 The Planning Process

The BHB CSP project was initiated through a planning and scoping phase, as part of the ***2016/17 Annual Plan***. Significant planning occurred to define all of the required elements of the CSP, and ensure an optimal use of resources during the process. To support this, key planning principles were collaboratively defined, and they shaped CSP development:

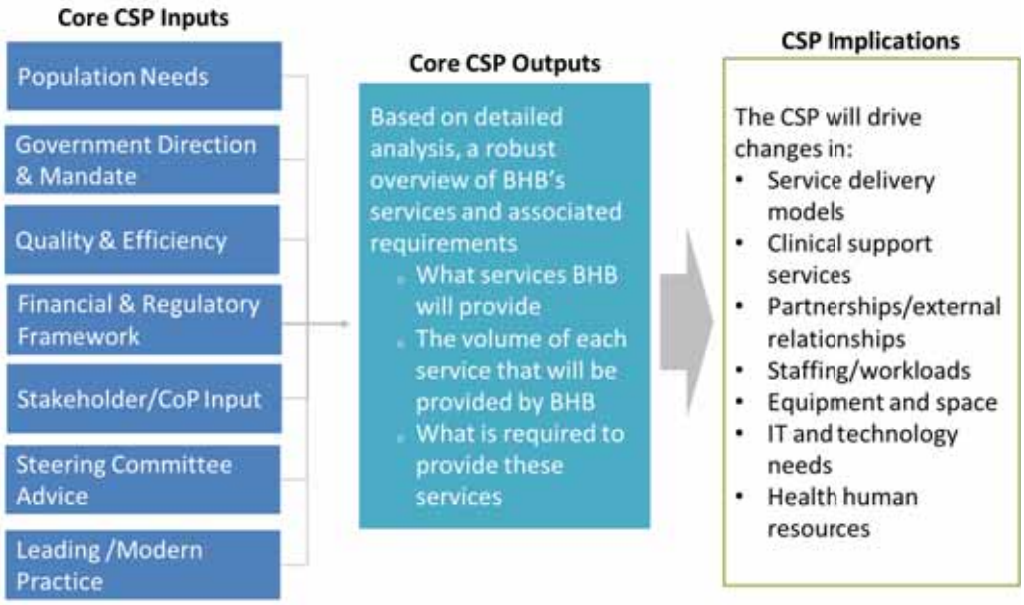
- The plan must be guided by/ support the achievement of the BHB Strategic Plan
- The process must meaningfully engage BHB staff, physicians and community stakeholders in the development and decision-making processes and ensure representative involvement
- The process must involve clinical support services/ non-clinical services/ estates, to ensure the clinical services plan informs their planning efforts must be included
- Patients/families must be at the centre of all our decisions/plans
- Decisions will be informed by data and evidence
- Flexibility will be embedded in the planning process to ensure the sustainability of the plan despite current uncertainties
- Outcome measures will be built into the plan, enabling BHB to measure impact

The objective for the CSP was defined to:

> *Identify **population needs**, and define the **scope and scale** of clinical services offered at BHB (including which should grow, stay the same, or be divested), along with the associated **organizational requirements**, meeting high standards of **quality**, **patient experience** and **value** to best serve the people of Bermuda.*

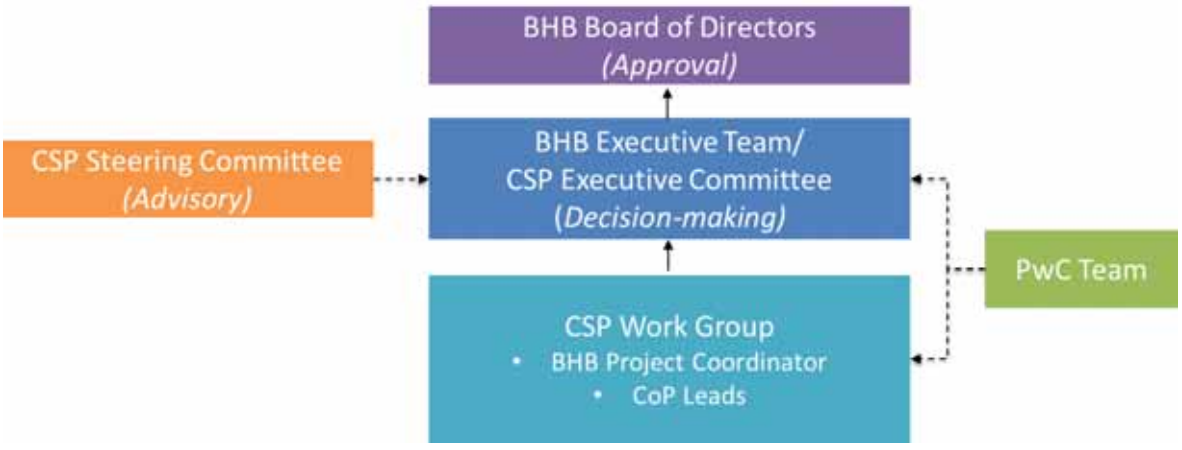
In alignment with principles and to meet the defined objectives, BHB identified that the approach to CSP development must be grounded in data and evidence, and shaped by stakeholder engagement. A wide variety of inputs were considered and analyzed, to identify the implications for service delivery at BHB and partnerships with other providers. **Exhibit 3** summarizes BHB's CSP planning efforts, and the requirements outlined for the Plan.

Exhibit 3: CSP Inputs, Outputs, and Implications



The planning and scoping phase resulted in the development of project terms of reference[4], securing of resources to execute the work of the project, and articulation of the project approach and work plan. Project governance was carefully considered, and is depicted in **Exhibit 4**. BHB's Executive Team was accountable to the Board of Directors for delivery of the CSP, and an Executive Committee was formally assembled to complete this work for the Executive Team. In recognition that planning for BHB should not occur in isolation of clinical or system-level input, a Steering Committee that included both internal and external stakeholder was established to help direct the planning process and provide advice to the Executive Committee on planning outcomes. The Steering Committee membership is listed in the project terms of reference - see **Appendix A**.

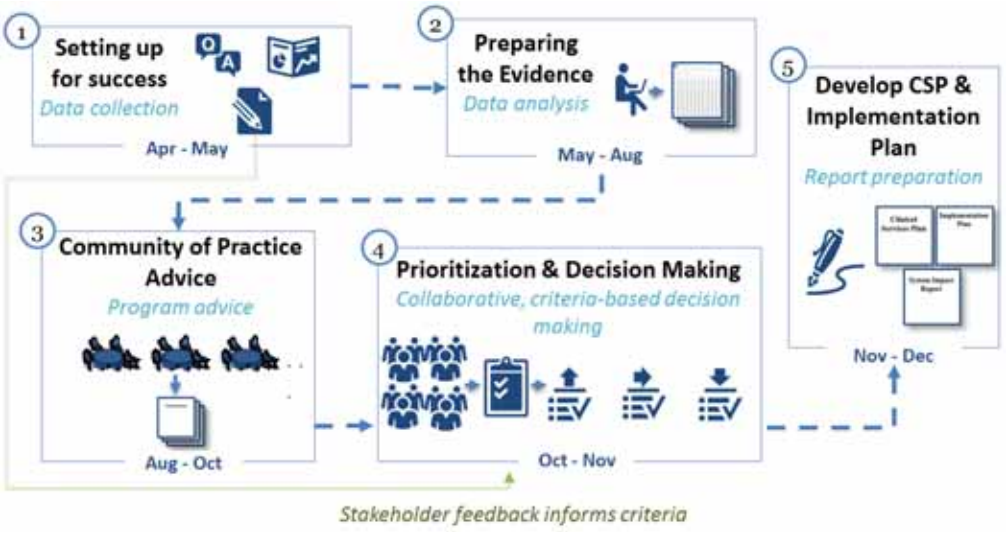
Exhibit 4: Clinical Services Planning Project Governance



[4] **Appendix A**. BHB Clinical Services Planning Activity Terms of Reference.

The development of the CSP was officially launched in the spring of 2017, and consisted of five consecutive project phases, structured over a nine-month period (see **Exhibit 5**). Each phase is described in the following sections.

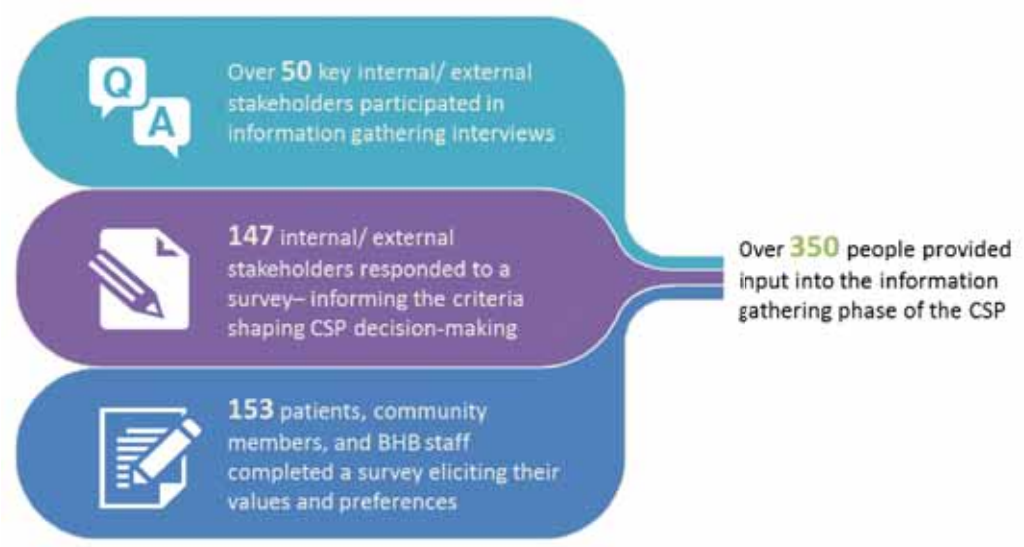
Exhibit 5: BHB Clinical Services Planning Project: Five Phases



2.1.1 Phase 1 – Setting Up for Success

Phase 1 of the CSP project focused on gathering input from BHB stakeholders about the health care needs of Bermuda's residents, BHB's role in the Bermuda health system, and opportunities for BHB to contribute to improving population health. Approximately 350 stakeholders were engaged in Phase 1 to share information about the planning process and to gather input and direction. The input from these stakeholders was used by the Steering Committee to inform the development of a set of planning principles that would be used to evaluate service changes proposed later in the project.

Exhibit 6: CSP Project Phase 1 Information Gathering Activities



2.1.2 Phase 2 – Preparing the Evidence

Phase 2 of the project focused on the collection, collation, and analysis of data describing the Bermuda population, their health status, and their historical use of health services. Data sources for this phase included:

- Prior Bermuda National Health Plans and Health System Reviews (including the Health Action Plan, the Health Disparities Report, Health in Review reports, Well Bermuda Health Survey, and the Long-Term Care Action Plan)
- BHB facility planning reports (2005 Estate Master Plan [Canon Report], 2007/08 Estate Master Plan Review by Johns Hopkins, 2010 Clinical Output Specifications – Acute Care Wing, 2011 KEMH Master Programme)
- Bermuda Department of Statistics Population Estimates and Projections
- BHB Inpatient discharge records for fiscal years 2014/15, 2015/16, 2016/17, and 2017/18 year to date
- BHB ER/UCC visit records for fiscal years 2014/15, 2015/16, 2016/17, and 2017/18 year to date
- BHB Surgical Outpatient Unit (SOPU) case records for fiscal years 2014/15, 2015/16, 2016/17, and 2017/18 year to date
- BHB annual and monthly bed occupancy reports
- BHB Strategic Plan 2016 – 2021
- BHB Mental Health Plan
- BHB Board Statistics and Quality Indicator Dashboard reports
- BHB General Ledger Trial Balance Reports (2014/15 to 2016/17)
- BHB Outpatient Charge report for 2016/17
- Aggregated offshore health care claims data for Bermuda residents (provided by the Bermuda Health Council)
- Aggregated health care claims costs by service, by patient age, and gender for 2013/14, 2014/15, 2015/16, and 2016/17 (provided by the Bermuda Health Council)
- Health care claims cost by patient principal diagnosis for 2015/16 and 2016/17[5] (provided by the Bermuda Health Council)

This data provided the input for Phase 3, projecting BHB service volumes based on past performance modeled using demographic projections.

2.1.3 Phase 3 – Programme and Service Advice

Ten Communities of Practice" (CoPs) were established as part of the CSP advisory process to support consideration of the role of BHB in the Bermuda health system, and to allow Bermuda's clinical experts to provide advice about how BHB should approach delivery of care in the future. Eight of the ten groups were comprised of multi-disciplinary and multi-agency stakeholders involved with the delivery of broad BHB clinical programmes, familiar with historical service delivery approaches, and able to identify strengths, weaknesses, and opportunities for improvement. The two remaining groups were established

[5] A range of diagnoses codes were missing for both years of data, and the 2016/17 data could not be used due to incomplete reporting of data from some insurers.

to consider diagnostic and technical support and allied health services across all BHB clinical programmes, and to provide advice about their role in supporting potential changes in services proposed by the other eight CoPs.

In all, approximately 150 participants shared their knowledge, expertise and advice through this process to inform the development of BHB's CSP.

Exhibit 7: Community of Practice Advisory Groupings

The CoPs met multiple times over a period of seven weeks (collectively, around 75 hours of meetings) to work through a structured process that allowed them to explore evidence assembled about population health needs, service profiles and service delivery outcomes.[6] Participants discussed leading practices, quantitative and qualitative evidence and experience, and opportunities to mitigate increasing demand for services in Bermuda. They proposed potential service models and changes in service delivery and discussed barriers, critical success factors and dependencies that would impact the delivery of these programmes and services in Bermuda.

As they deliberated and formulated their advice, CoP participants were asked to consider the planning principles and criteria that the CSP Project Steering Committee had articulated as critical for evaluating potential services changes. The principles fell into six categories, as shown in **Exhibit 8,** and fully described in **Appendix B**:

[6] Workbooks were provided to Communities of Practice Participants and were used to structure the discussion and advice giving. A sample Table of Contents of the workbooks is included in **Appendix C**.

Exhibit 8: Categories of Principles and Criteria Used to Evaluate Potential Service Changes

2.1.4 Phase 4 – Prioritization and Decision Making

Programme and service advice from each of the ten CoPs was submitted for the consideration of the attendees at the Advisory Summit that was held in November 2017. The Advisory Summit was an opportunity for participants to explore and understand the advice of each CoP together as a whole, to confirm anticipated implications of each proposed service priority, and to provide advice to BHB about how implementation of BHB's Clinical Services Plan should be coordinated with the other stakeholders in the Bermuda health system. The focus was on understanding the service profile that BHB should execute to achieve the CSP goals of promoting high quality, efficient care that meets the needs of Bermuda, and that would be achievable in the planning horizon given the enablers and barriers that had been identified. Attendees included the CSP Steering Committee, the CoP leads, the CSP Executive Committee, and community leaders. The list of attendees is included as **Appendix D**.

The BHB Executive Committee reviewed the advice from the Summit, and provided final direction on the service and delivery models to be provided by BHB in 2020 and 2025.

2.1.5 Phase 5 – Develop CSP and Implementation Plan

The Clinical Services Plan (i.e., this report) outlines the CSP recommendations, providing a high-level projection of future BHB activity volumes (developed using modelling to project the volumes of services that BHB will be required to provide in 2020 to 2025), the steps that BHB must take to achieve its goals, and a clearer definition of what health services BHB will assume responsibility for, either on its own, or in partnership with others, in the future.

Implementation recommendations to support execution of the CSP have been developed based on the advice collected throughout the planning process. The implementation plan in Chapter 8 addresses the relative priority of the service options and the operational planning/ execution that will be required. It also provides advice on critical success factors and risks that need to be mitigated and addressed at the

organization and system level as BHB moves to execute this plan. When BHB's Board of Directors provides approval of this plan, the organization will begin implementation.

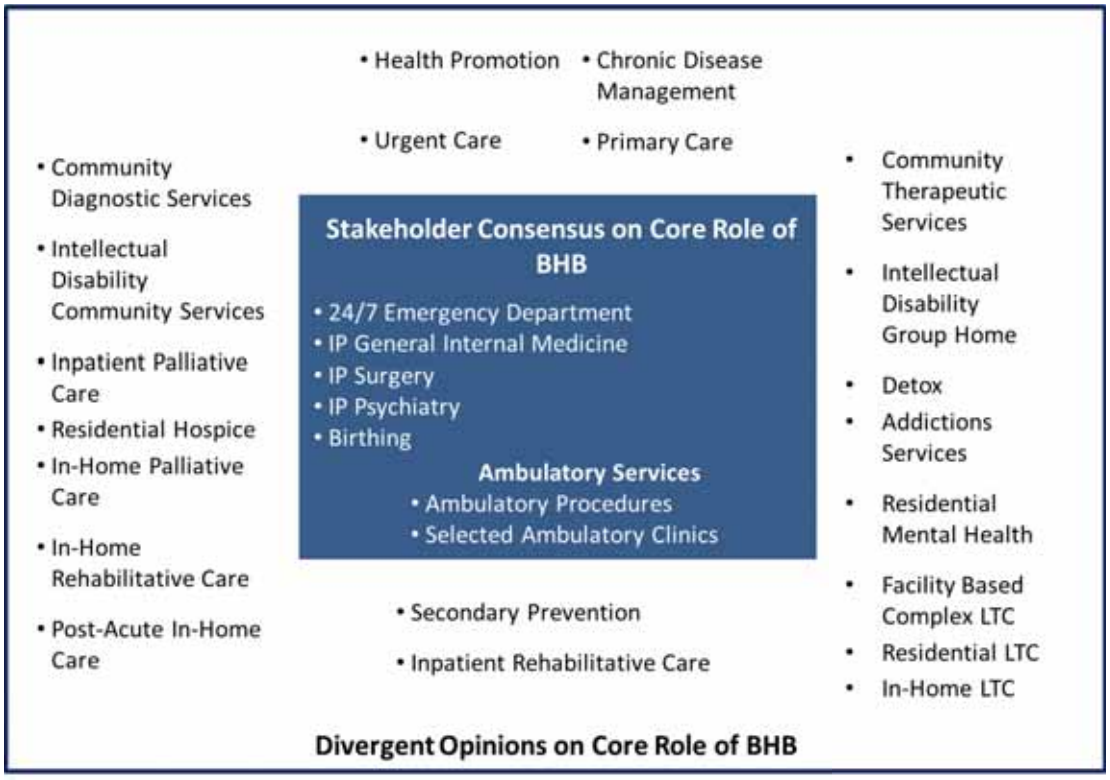
The next chapter of this report describes the current state challenges of the Bermuda health system through an examination of the data available relating to demographics and health care utilization and concludes that there are quality and capacity issues and that solutions to resolve these issues are proposed through the CSP.

3 Current State Challenges

3.1 The Challenge of Role

Given the relatively isolated geographic location, the Bermuda community needs a range of services far broader than would commonly be expected of a hospital serving a similar population base (i.e., 62,000 residents). While it is acknowledged that a wide range of health services is required to meet the current and future needs of the Bermuda population, opinions differ as to which services should be the primary responsibility of BHB. As part of the stakeholder engagement process, there was broad consensus and agreement that BHB should provide the core services of an acute care hospital. Stakeholders expressed a more diverse range of opinions about BHB's role beyond the core services. **Exhibit 9** illustrates the number and type of clinical services that various stakeholders considered for inclusion within BHB:

Exhibit 9: Initial Stakeholder Advice Regarding the Core Role of BHB



BHB currently provides a broad and diverse suite of services, including many of the services identified as "non-core" by stakeholders. During fiscal year 2016/17, BHB operated 369 inpatient beds, and had an overall average occupancy rate of 75.6%.[7]

Exhibit 10: BHB Inpatient Hospital Beds by Site and Programme for Fiscal Year 2016/17[8]

Site	Type of Bed	# of Beds	Patient Days	% Occupancy
KEMH	**Total**	**294**	**79,337**	**73.9%**
	General	79	9,206	25.0%[6]
	Acute Care Wing	90	30,225	92.0%
	Continuing Care	68	21,598	87.0%
	Alternate Level of Care	49	16,010	89.5%
	Hospice	8	2,298	78.7%
MWI	**Total**	**75**	**22,462**	**82.1%**
	Acute	23	6,544	78.0%
	Long-Term/Rehab	40	14,086	96.5%
	Substance Abuse	8	1,522	52.1%
	Child & Adolescent	4	310	21.2%
	Total	**369**	**101,799**	**75.6%**

BHB provides these beds, as well as additional services, at each of the two main delivery sites, including:

King Edward VII Memorial Hospital (KEMH)[9]

-
- Continuing Care
- Diagnostic Imaging
- Emergency Services
- Hospice Care
- Intensive Care Unit
- Maternal-Child
- Oncology Services
- Pharmacy
- Stroke Rehabilitation
- Acute Inpatient Medicine Services
- Clinical Dietetic Services
- Day Hospital
- Dialysis Treatment
- Home Care
- Hyperbaric and Wound Care
- Laboratory and Pathology Services
- Medical Social Work
- Palliative Care
- Rehabilitation Services
- Surgical Services
- Urgent Care

Mid-Atlantic Wellness Institute (MWI)

- Mental Health Programmes
- Chronic Disease Management
- Learning Disability Treatment
- Substance Abuse Treatment
- Community Rehabilitation Services
- Asthma and Diabetes Education
- Recreational Therapy
- Child & Adolescent Services

[7] The reported overall occupancy rate is artificially low because of the inclusion of the General overflow beds in the bed count. These beds (32) are used only when ACW and other General beds are full.
[8] http://bermudahospitals.bm/about-us/news-media/bhb-statistics/
[9] http://bermudahospitals.bm/wp-content/uploads/2016/11/BermudaHospitalsBoardFactsheet.pdf

Appendix E shows BHB activity statistics for both the KEMH and MWI sites for the four most recent fiscal years (2013/14 through 2016/17).

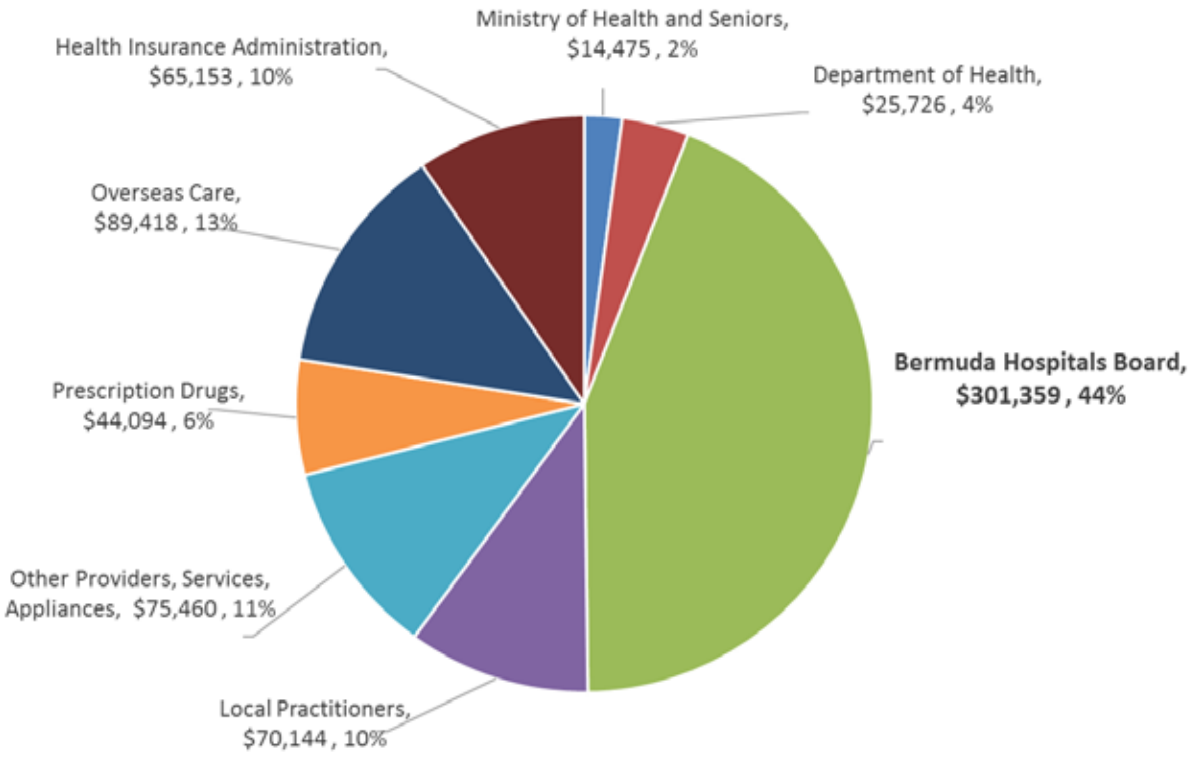
There was broad agreement that a key output of the CSP project would be clear delineation of which of these other, or "non-core" services should be provided by BHB, and which should be left to other providers (either independently, or in partnership with BHB) in Bermuda to provide.

3.2 The Challenge of Increasing Demand and Rising Cost

3.2.1 Bermuda Health Care Costs

Each year, the Bermuda Health Council publishes a "*National Health Accounts Report*" which examines Bermuda's health system costs and compares Bermuda health system cost performance indicators with results from the 35-member countries in the Organisation for Economic Co-operation and Development. The 2016 National Health Accounts report[10] (based on 2014/15 data) showed the distribution of Bermuda health care expenditures by sector, with BHB accounting for 44% of spending.

Exhibit 11: 2014/15 Distribution of Bermuda Health Care Expenditures



The report also showed that the Bermuda health system share of the gross domestic product was 11.5%. Only one Organisation for Economic Co-operation and Development country had a higher percentage (the United States, at 16.9%); the average for all 35 Organization for Economic Co-operation

[10] http://www.bhec.bm/wp-content/uploads/2017/07/2016-NHA-Report-20170208.pdf

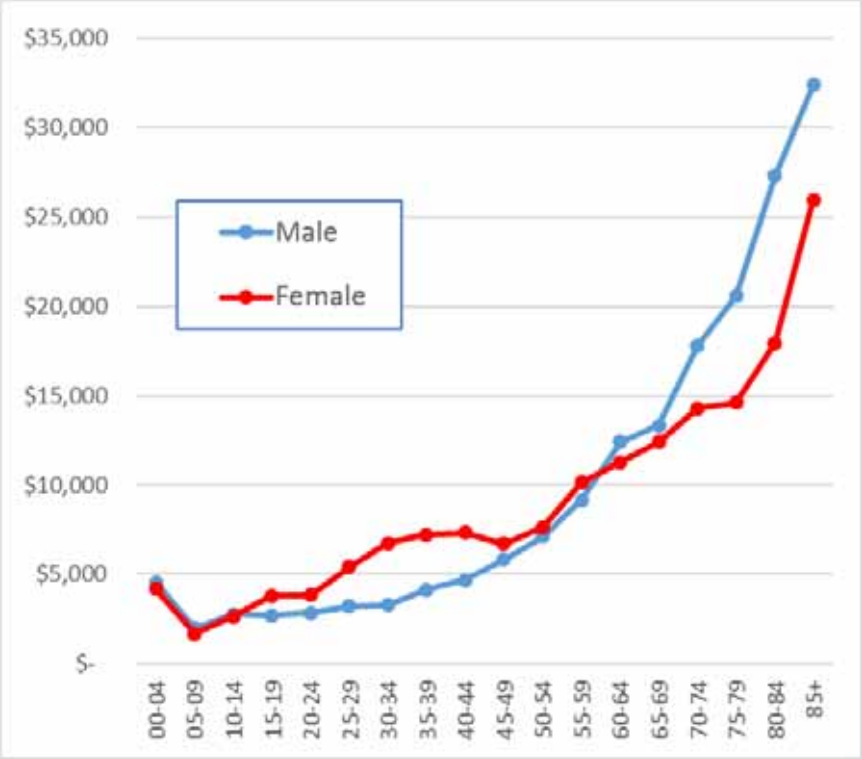
and Development member countries was 8.9%. In 2016, the Bermuda gross domestic product fell by 0.1%, while health system costs rose.[11]

Bermuda's health care costs are becoming increasingly unaffordable (and are high in comparison to other Organisation for Economic Co-operation and Development countries). There is an imperative to optimize where, when, and how services are delivered, to best meet population needs and deliver better value for money.

3.2.2 Bermuda Health Care Costs by Population Age and Gender

The Bermuda Health Council provided health systems claims data by cost category for four fiscal years. For fiscal year 2016/17, the total costs for claims-based expenditures were $486 million, and BHB claims accounted for 56% of this total. Claims for overseas hospital care for Bermuda residentsaccounted for a further 5% of the total. The claims data from the Bermuda Health Council, broken down by patient gender and age cohort, was used with Bermuda Department of Statistics population estimates to show the average claims-based health care expenditure per capita for Bermuda residents by age and gender. While the overall average health care claims cost per Bermuda residents was $7,881 in 2016/17, **per capita claims cost for Bermuda's residents aged 65 and older were much higher, rising from double the average for those 65 to 69, to four times the average for those older than 84**.

Exhibit 12: 2016/17 Average per Capita Bermuda Resident Health Care Claims Cost by Age and Gender



[11] Government of Bermuda, Department of Statistics, 2016 Gross Domestic Product – 2016 Highlights, October 2017. https://www.gov.bm/sites/default/files/GDP-2016-annual-publication.pdf

The high cost of health care for the elderly is not surprising, but when coupled with the projected change in the demographics of the Bermuda population, it highlights the risk of increased health care costs at the same time the working population decreases, further pushing up the health care cost share of the Bermuda gross domestic product.

The Bermuda Digest of Statistics – 2015, published by the Government of Bermuda Cabinet Office, Department of Statistics, shows that the overall Bermuda population decreased in size from 2010 to 2015, and is not expected to grow from 2015 to 2020. While the overall population in 2020 is projected to be 4% smaller than it was in 2010, the percentage of the population aged 65 and older is projected to increase from 13.6% in 2010 to almost 20% in 2020. The number of Bermuda residentsBermuda's residents aged 65 and older is projected to increase by 1,822 people from 2015 to 2020, a 20.9% increase.

If the Department of Statistics population projection trends are extrapolated to 2025,[12] **the percentage of Bermuda residents aged 65 and older will further increase to 22.6%, an increase of 35.4% over just five years.** While the results of the recent 2016 Bermuda census are not yet available, it is unlikely that any new census data will significantly impact population estimates and projections for the elderly, since they are less likely to immigrate/emigrate based on the state of the Bermuda economy and changes in employment.

Exhibit 13: Bermuda Population by Age Group – 2010, 2015, 2020, and 2025

Age Group	Year				Change '15 to '20		Change '15 to '25	
	2010	2015	2020	2025	#	%	#	%
00 to 19	13,889	12,352	11,399	10,450	-953	-7.7%	-1,902	-15.4%
20 to 44	22,167	19,524	18,853	18,204	-671	-3.4%	-1,320	-6.8%
45 to 64	19,357	19,618	19,251	18,878	-367	-1.9%	-740	-3.8%
65 to 79	6,764	7,802	9,247	10,680	1,445	18.5%	2,878	36.9%
80+	1,952	2,439	2,816	3,185	377	15.5%	746	30.6%
Total	**64,129**	**61,735**	**61,566**	**61,396**	**-169**	**-0.3%**	**-339**	**-0.5%**
65+	**13.6%**	**16.6%**	**19.6%**	**22.6%**	**1,822**	**20.9%**	**3,624**	**35.4%**

The disproportionate increase in the elderly has significant implications for the demand for health services needed in Bermuda, and for the services provided by BHB, given the much higher prevalence of chronic disease, and higher rates of health service utilization by the elderly.

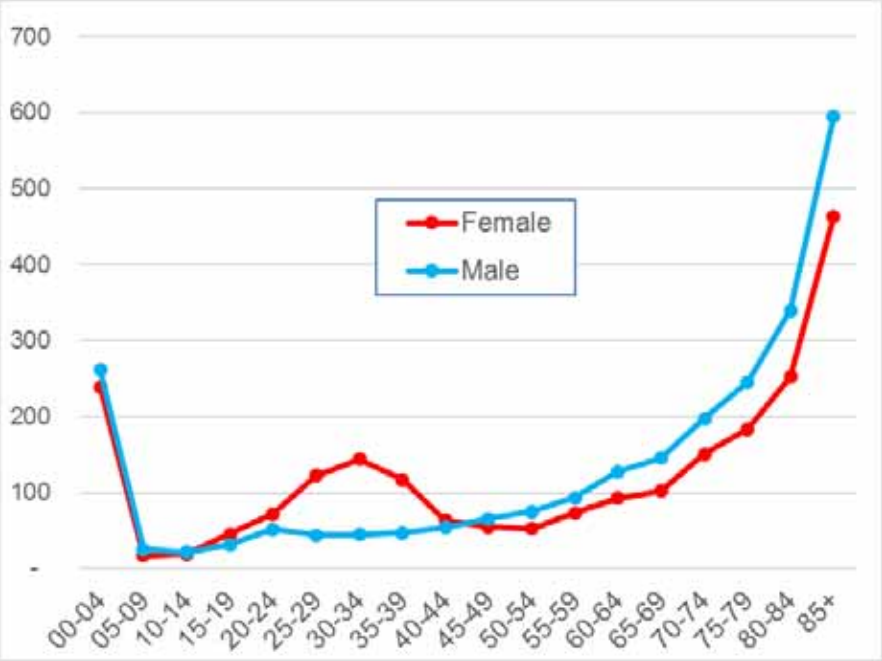
[12] The last full Bermuda census for which results are available was the 2010 census, and the 2015 population estimate, and 2020 population projection are based on analysis of immigration, birth rates, death rates, and other factors. The data collection for the 2016 Bermuda Census of Population and Housing is complete, but the preliminary population measurements are not likely to be available until December 2017. Once this data is released, the estimates of the potential impacts of population change, and the projection of future BHB service requirements can be updated to reflect any new information.

If the current rates of health care claims per population are combined with population projections for 2020 and 2025, the estimated increase in Bermuda claims-based health care costs would be $21.0 million (4.3%) for 2020, and $47.1 million (9.7%) by 2025. The Clinical Services Plan must consider opportunities to help control these anticipated health care cost increases for Bermuda.

3.2.3 Bermuda Inpatient Hospitalization by Population Age and Gender

The likelihood of Bermuda residents to be admitted to a BHB inpatient bed also varies by gender and age. Children are usually born in the hospital, but otherwise have few hospital admissions. Females aged 15 to 39 have higher hospital admission rates than males the same age, primarily because they are admitted for birthing. After age 50, males are more likely to be admitted to a BHB inpatient bed, and the rate of admissions for both males and females increases sharply with increasing age.

Exhibit 14: Bermuda Resident Average BHB Inpatient Admissions per 1,000 Population by Age and Gender



If this historical pattern of reliance on BHB inpatient beds does not change, and the Bermuda population demographics change as projected, BHB will need to open 75 more beds by 2025 to accommodate the growth in demand from Bermuda residents.

The concluding sentence of the Bermuda Health Council 2016 National Health Accounts report was:

> *"It will be a continued challenge for Bermuda to identify opportunities to improve access, quality, and outcomes of care delivery while reducing the comparably high resource expectations and requirements of its system's participants."*

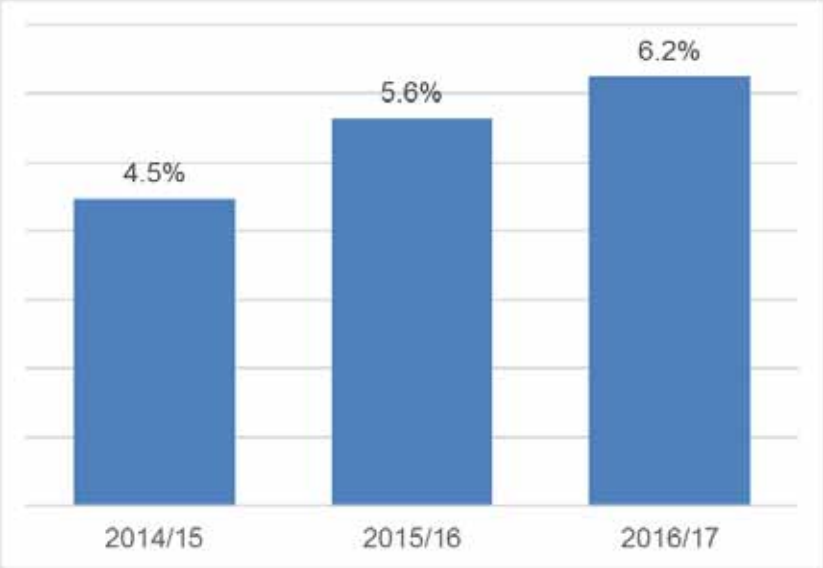
The Clinical Services Plan is an opportunity for BHB to consider how the organization, and the system, can work together to mitigate the impact of the aging demographic, and potentially avoid the need to add 75 additional beds in the next eight years.

3.3 The Quality and Patient Experience Challenge

Providing high quality care is an ongoing objective of any health care service and system. BHB has a commitment to quality in its Strategic Plan, as articulated in its mission and its support of Triple Aim.

An example of a quality improvement strategy at BHB is the implementation of approaches to reduce readmissions. As a first step, BHB is focusing on more comprehensive documentation of readmission status and is standardizing definitions (e.g., to assess whether a subsequent admission is for a "similar" diagnosis). BHB is also refining risk adjustment methods to support comparison of readmission rates with hospitals in other jurisdictions. The short-term impact of this attention to readmission is that reported readmission rates for KEMH acute medical/surgical patients have increased from 4.5% of patients in fiscal year 2014/15 to 6.2% of patients in fiscal year 2016/17.[13]

Exhibit 15: KEMH Acute Medical/Surgical Patient % Readmission Trend – Readmissions within 1 Month with a Similar Diagnosis



While BHB recognizes that there are internal improvements that are needed to meet its quality objectives, there is also a need to look at quality across the system in Bermuda. Unless the system works effectively together, and the right type and quality of services are available across the continuum of care, BHB will be unable to deliver on expectations to operate efficiently. Without a coordinated and more comprehensive system of care, demands for hospital services will continue to grow, and BHB will

[13] However, it is not clear whether this represents a true change in readmission rates or a change in documentation and coding. It is not unusual to find an "increase" such as this when implementing a more robust methodology for tracking a specific metric. With a more accurate baseline BHB is now better positioned to monitor this metric in the coming years.

be challenged to meet the service needs of the population. As well as looking internally for improvements, BHB must continue to advocate for system level solutions to many of the challenges it faces.

An example of an internal quality issue that requires system level solutions is patient flow. The ability of the hospital to use its resources effectively and to provide top quality care is illustrated by a key flow "bottleneck," the ability to move patients from acute care to long-term care facilities when the acute phase of their care is completed.

In 2016/17, there were 199 patients discharged from a KEMH inpatient bed to "SNF/LTC" (i.e., skilled nursing facility or long-term care). The average length of stay for these patients in the KEMH bed was 83.3 days. More than 70% of these stays was time spent waiting for discharge after these patients no longer required acute care (i.e., as "alternate level of care" or ALC).

Exhibit 16: 2016/17 Discharge of KEMH Inpatients (excluding Birthing) by Discharge Disposition

Discharge Disposition	Cases	Days	Avg. LOS	ALC Days	% ALC Days	ALC Beds @ 95%
Home, Self-Care	3,869	59,492	15.4	2,250	3.8%	6.5
SNF/LTC	***199***	***16,570***	***83.3***	***11,738***	***70.8%***	***33.9***
Expired	209	14,588	69.8	2,315	15.9%	6.7
Home Health Care	42	1,471	35.0	654	44.5%	1.9
Hospice	74	1,237	16.7	10	0.8%	0.0
Acute - Abroad	170	1,085	6.4	-	0.0%	-
All Others	46	409	8.9	2	0.5%	0.0
Grand Total	**4,609**	**94,852**	**20.6**	**16,969**	**17.9%**	**48.9**

As a group, these patients used the equivalent of **33.9 KEMH beds** while ALC. As a result, these beds were not available for use by patients who required acute care.

Unavailable inpatient beds contributed to delays for the patients in the emergency room who required inpatient admission for acute care, and contributed to ongoing "bed crises" at KEMH. This challenge is becoming worse, with longer times before transfer to a bed at BHB being seen year over year.[14] BHB recognizes this is not the quality of care or patient experience that should be provided to patients in the emergency room. However, while BHB can make efforts to improve flow internally, without sufficient long-term care capacity outside of BHB, this bottleneck will continue to exist. Without increases in long-term care capacity in the system, BHB may be at risk of eventually filling with so many alternate level of care patients that it will have difficulty serving acute care patients, especially those requiring elective care. The solutions to this flow problem are, to a large degree, outside of BHB's direct control.

Additionally, this is not the quality of care BHB wants to provide for their admitted patients. Patients who no longer need acute care should move to the right next level of care in a timely way. Evidence

[14] For ER patients admitted to KEMH inpatient beds, their average LOS in the ER before being admitted has been increasing every year. For the first three months of the 2017/18 fiscal year, patients waited an average of 689 minutes (11 hours and 29 minutes), almost three hours longer than they did in 2014/15, impeding patient flow and diminishing the patient experience.

shows that patients who spend longer than they need to in a hospital bed, risk iatrogenic injury (e.g., infection, delirium) and may decompensate and experience "hospital acquired disability/ functional decline" that reduces the likelihood that they can be rehabilitated to their greatest potential level of function.

And similar to other challenges identified, this quality issue is also getting worse with time. Over three years, the percent of inpatient stay reported as alternate level of care (ALC) has increased dramatically, from 5.4% to 25.0%.

Exhibit 17: KEMH Acute Inpatient Activity and ALC Days by Fiscal Year

Discharge Fiscal Year	Cases	Total Days	Avg. LOS	ALC Days	Avg. ALC LOS	% ALC
2014/15	5,705	44,444	7.8	2,399	0.4	5.4%
2015/16	5,954	46,352	7.8	6,652	1.1	14.4%
2016/17	6,027	67,795	11.2	16,966	2.8	25.0%

The Clinical Services Plan is an opportunity for BHB to examine quality issues (e.g., challenges with patient flow) and to propose how they, and the system, should be planning to find viable solutions for the people of Bermuda.

The next chapter describes the six drivers of the CSP and how each of these provides direction as to the role of BHB in meeting the healthcare needs in Bermuda.

4 CSP Drivers

A number of common themes were identified throughout the CoP discussions, and these became principles that guided the identification and prioritization of service changes recommendations for the CSP. The following is a synthesis of the key considerations**,** assumptions or enablers identified by the CoPs – the CSP drivers. They are grouped into five broad categories:

Exhibit 18: Drivers for the Clinical Services Plan

4.1 The Opportunity to Raise Quality Standards

As CSP discussions occurred, it became clear that there are opportunities to improve the quality of care and coordination of system resources in Bermuda. BHB must be responsible for ensuring that the services it provides are of the highest quality. But there is also an opportunity for BHB, through the execution of the CSP, to positively influence the quality of care that occurs outside of the hospital, to satisfy the "Triple Aim" objectives of its Strategic Plan, and in so doing, to help "raise the quality bar" for Bermuda.

4.1.1 Assuring High Quality BHB Provided Services

BHB has a commitment to providing the highest quality care, and is focusing on:

- Reducing Avoidable Deaths
- Enhancing Chronic Disease Management
- Improving Patient Experience
- Reducing Patient Harm
- Reducing Length of Stay
- Improving Access to Care

BHB is relentlessly committed to quality. It is the right thing to do for its patients and there are quality strategies that may help mitigate some of the future demand for services resulting from changing demographics, and that contribute to cost control. BHB must do things differently and better, to avoid cost and the need for additional beds over the short term.

Planning discussions highlighted opportunities to better measure, monitor, and improve the quality of care provided by BHB. It was recommended that BHB commit to improving quality of care through initiatives such as:

- Development and implementation of standardized care pathways throughout the hospital
- Implementation of a specialized geriatric assessment service
- Improved matching of surgical modalities with procedure requirements
- Expansion of dual diagnosis outreach for mental health patients
- Expanded case management for acute medical patients

4.1.2 Driving Systems Quality

As the largest provider of health care services in Bermuda, BHB will continue to improve quality standards for its own care, and will work with partners to ensure that they can offer services outside the hospital that meet these standards and contribute to the overall quality improvement goals.

It became clear during the CSP deliberations that there is both a need and a willingness to implement strategies and work together as a system to improve the standard of care across Bermuda. This might include standardizing care according to evidence-based protocols, coordinated capacity planning and improving transitions in care. BHB may be considered a leader or catalyst, for the system in executing these types of strategic improvements.

It also became clear that there are opportunities to better leverage information technology to improve the quality of care in Bermuda. There is a need to establish and incent the use of the information infrastructure to measure, monitor, and evaluate care and outcomes. There are identified opportunities to improve the ability to track patient care across continuum, and use information technology to support case management, care coordination, and to reduce duplication of services. BHB plans to participate and/or lead these types of activities, and to improve those areas, such as Laboratory and Diagnostic Imaging communication, that it has individual control over.

4.2 Support for Bermuda's National Health Plans

Bermuda has many important national strategies in place to reform health care services and service delivery. These national initiatives include:

- The Long-Term Care Action Plan (2017)
- Bermuda Health Strategy: Priorities for Bermuda's Health System Reform 2014-2019
- Steps to a Well Bermuda (2014)
- Bermuda Hospitals Board Mental Health Plan (2009)

Stakeholders were clear that there are many opportunities for BHB's CSP to support initiatives currently underway in Bermuda.

The recommended BHB initiatives and service delivery model changes support Bermuda's national health plans, and coordination of BHB activities with the other stakeholders responsible for action plan implementation will be mutually beneficial.

4.3 Optimizing Patient Flow and Enhancing Patient Experience

A key outcome of the CSP deliberations was the identification of opportunities to optimize patient flow and enhance the patient experience.

There is a clear need to more effectively utilize available hospital capacity, so that beds are being provided to meet the needs of patients who require care that can only be provided in a hospital. This requires both internal and external strategies at BHB: improvements in how patients move through the hospital to reduce and eliminate delays or unnecessary extensions of a hospital stay, and the development of alternate "places" in the continuum of care for patients who no longer have acute care needs but who still require services.

Currently there are multiple barriers to flow at BHB, and beds are often filled with people who would be better served in another setting. Many of BHB's stakeholders recognized the need to "de-escalate" care within the system. In other words, too often in Bermuda people receive a "higher or more acute level" of care than they really need (for example, rehab or long-term care patients who are accommodated in acute care beds because of a lack of appropriate, alternative resources).

4.3.1 Improving Flow in Hospital

During CSP deliberations, it was clear that, while gains have been made, there continue to be opportunities to standardize and improve care delivery to improve patient flow at BHB. Stakeholders recommended that the CSP, and subsequent operating plans developed at BHB, includes consideration of quality improvement initiatives that will help patients utilize and move through the resources provided at BHB in the most timely and efficient way possible. This should include continued efforts to reduce lengths of stays and improve the effectiveness of discharge planning (through strategies such as discharge appointments early in the day, more timely referrals, and increased family involvement in decision making). Efforts to standardize care pathways and modifications to current operating procedures that allow BHB to provide care for patients in more effective and appropriate ways (for example, the use of a Clinical Decision Unit (i.e., CDU, for short-term observation of patients to confirm whether admission to an inpatient bed is necessary) in the Emergency Room, and changes to admission practices from the ER should be pursued.

4.3.2 De-Escalating Care and Improving Systems Flow

In addition to opportunities to improve flow at BHB, system-wide opportunities need to be promoted and pursued to improve the patient care experience, quality of care and system efficiency in Bermuda. There is a need to ensure "the right care, by the right provider, at the right time." This includes "de-escalating" care to ensure that needs are identified and addressed as early as possible, and in the least

intensive setting required. The CSP process identified a need to reorganize resources and funding incentives, and the opportunity to pursue strategies such as "cohorting" patients according to needs and providing services "earlier in the continuum" whenever possible to avoid acute exacerbations of illness. Opportunities such as admission avoidance strategies (the use of a Clinical Decision Unit in the ER and allied health staffing in the ER), development of an acute rehabilitation unit, and development of capacity to meet the specialized needs of geriatric patients will be critical to accommodate growing needs due to population change. Developing capacity outside of acute care, such as additional and appropriate long-term care, home care and mental health and addictions services, will also be crucial "de-escalation" strategies.

Additionally, the CSP process identified that there is a need for agreement that prevention and promotion and chronic disease management (CDM) services are an essential component of care. However, while there was agreement that this is a critical element of the system, with the potential to reduce demand for hospital and health care services, there was strong consensus that prevention and promotion is not the primary responsibility of BHB. There was a recognition that BHB needs to support partners who provide prevention and promotion and CDM activity through the sharing of clinical knowledge, identification of service needs, promotion of initiatives, supporting diagnostics, and ensuring quality by setting of standards, etc. (For example, BHB might participate in organizing and standardizing the approach to ante-natal services in Bermuda so that they are appropriate, predictable and highest quality possible.) There was also recognition that appropriate funding and incentives need to be in place so that others in the system will be willing and able to provide critical prevention and promotion services.

4.4 Establishing Partnerships

Partnership and collaboration was a key theme in all the Clinical Services Planning discussions.

Many of the services/ initiatives identified by the Communities of Practice will be supported by cooperation and collaboration with external partners. The Bermuda Health Action Plan (2014 to 2019) emphasizes the importance of partnerships and collaboration among the health system stakeholders:

> *"Our vision is "healthy people in healthy communities". As such, we recognize that health system demands are great and varied. They require the **collaboration of many institutions and multilevel strategies which are coordinated** towards achieving the following three action plan goals reflecting the priorities noted:*
>
> 1. *Effective disease control and prevention (chronic non-communicable diseases)*
> 2. *Human resource development (capacity building)*
> 3. *Infrastructure and technology development (health system strengthening)"*

Stakeholders at the Advisory Summit further reinforced the importance of partnerships. The following "word cloud" was created during a discussion about required elements for Bermuda's health system; partnerships was the most prominent element:

Exhibit 19: Advisory Summit Word Map

It is very clear that the future scope and scale of services to be provided by BHB will be very dependent on the capacity, capability, and collaboration with BHB's partners, including government, other on-island providers, and offshore affiliates. BHB cannot function effectively and efficiently in a system that does not have effective partnerships, or that does not work collaboratively to ensure that people are accessing the care they need in an efficient, cost effective and patient-centred way. BHB is dependent on, and must work collaboratively with, its partners who provide primary care, chronic disease management services, specialized surgical services, and many more. There is a need to move the system towards a clearer understanding of each provider's unique role in providing services, and to reinforce BHB as a partner with other health system stakeholders, rather than being seen as a potential competitor.

BHB stakeholders have advised that BHB has a leadership role to play in supporting the advancement of collaborative partnerships that are necessary to best meet the health service needs of Bermuda residents. This includes clarifying roles and coordinating/integrating care, smoothing transitions and communication between providers, and ensuring that all providers in the continuum of care can meet quality expectations and standards.

4.5 Aligning Funding/Payment Incentives with Quality

During CSP activities, it was identified that there are areas where funding systems may not be optimally aligned with, or supportive of, the most clinically appropriate approaches to providing care. These included things such as:

- Insufficient physician reimbursement for chronic disease management and health promotion initiatives
- Disconnect between reimbursement for inpatient versus outpatient care
- Lack of insurer coverage for procedures that could be safely performed in a physician office, requiring these procedures to be unnecessarily performed in hospital

- Lack of sensitivity of per diem payments to the true cost of providing high quality care (e.g., same per diem for intensive care days as for convalescence days)

Through the CSP process, it became apparent that reforms in government and insurer reimbursement/ funding will be required to align incentives to ensure that patients are treated in the most appropriate settings. Further, there is a need to better align funding models with high value models of care, which will help to contain cost while promoting high quality and accessible care.

The recommendations include changing funding approaches as prerequisites for successful implementation of four specific services: Patient-Centred Medical Home, Surgery, Inpatient Rehab, and Long-Term Care. These are "high impact" service changes that will support the quality, value and patient experience objectives of the CSP, but that require changes to existing funding arrangements to be successful.

4.5.1 The Patient Centred Medical Home

The Patient Centred Medical Home (PCMH) initiative is a pilot project, being tested in conjunction with the enhanced primary care pilot project. There is emerging evidence that the PCMH has resulted in improved care for un/underinsured individuals who had been frequent users of other services. As a service believed to de-escalate care from the ER, the PCMH and or the enhanced primary care model will require investment and a funding model that rewards providers for reducing use of services, rather than a traditional fee-for-service model.

4.5.2 Alignment of Surgical Modalities

There is a need to better match surgical modalities with procedure requirements at BHB. This realignment is intended to shift surgical cases that are now admitted to inpatient care to day surgery, and avoid hospital admission. It will also shift procedures that are currently performed in the main operating room, but do not require a full operating room, to a medical procedure room, or potentially out of the hospital to a physician's office.

Currently the reimbursement rates for inpatient cases (even when admitted for just a few hours) are much higher than the reimbursement for outpatient procedures. Shifting these cases to ambulatory surgery would be better care, but under current payment models, would result in a significant loss of inpatient revenue for BHB. Shifting some minor procedures out of the hospital will sometimes be hindered by insurer policies to only cover procedures done in the hospital.

4.5.3 Inpatient Rehabilitation

Introduction of a short stay inpatient rehabilitation unit, and establishment of dedicated units for complex skilled and intermediate skilled LTC are identified as key service strategies at BHB that will promote "right care in the right place." However, it will require new payment models to be sustainable and to promote best outcomes. A generic LTC per diem will not be sufficient to support the intensity of rehabilitation therapy required for the proposed rehabilitation unit. A case-based payment approach, rather than a per diem approach, would provide incentives to reduce rehab length of stay. This could incorporate measurement of functional status change and discharge to home, so that the hospital would

be financially rewarded for providing higher quality care resulting in improved patient outcome and supporting patients in their return to home.

4.5.4 Long-term Care

A key strategy to improve care and efficiency is to recognize and organize long-term or continuing care by level of patient need. The three levels of bedded long-term care in the LTC Action Plan have different requirements for medical, nursing, and therapy support. As such, they should also have different per diem charges, reflecting the actual costs of providing that level of care. This will require a significant change from how this care is reimbursed at present, as well as the implementation of a resident assessment instrument to confirm the level of care required.

The following chapter describes the service level advice of the CSP. It includes a description of BHB's existing and proposed services and shows the analysis behind the sizing and capacity requirements of the hospital.

5 BHB's Future Role and Projected Services

5.1 Service Opportunities

In addition to the key themes and opportunities described in the previous chapters, service level advice was provided. This section documents services that the Communities of Practice discussed, and provides a summary of advice provided to BHB for the Clinical Services Plan.

The table on the following page presents a consolidated summary of the advice provided by all of the Communities of Practice. More detailed deliberations and a summary of discussions, including evidence considered for each of these service recommendations, are included in **Appendix F**. Each of the 53 service/ process change considered by the CoPs are colour coded to reflect the advice of the CoP as follows:

Exhibit 20: Colour Coding of Community of Practice Advice

	Assume new service for BHB in CSP.
	Assume BHB continues to provide in CSP.
	Include in CSP, as BHB support for partner initiative.
	Do not include as BHB service.
	No further advice required (in progress).

Service changes proposed for BHB involve relatively few additions of new services or discontinuance/ divestment of existing services. Most focus on changes to how the delivery of the core community hospital services of BHB can be modified to better respond to changes in population needs and enhance quality of care, within the financial, facility, and other constraints Bermuda faces.

Exhibit 21: Summary of Service Level Recommendations

BHB Community of Practice	Service	CoP Advice	Raising Quality Standards	Supporting the Bermuda health Strategy	Optimizing Patient Flow & Experience	Establishing Partnerships	Aligning Funding Payment w/ Quality Incentives
Emergency	Clinical Decision Unit	Establish a Clinical Decision Unit (CDU) in Emergency where patients can be cohorted for observational care to allow ongoing assessment and short-term interventions to prevent unnecessary hospital admission	✓	✓	✓		✓
	Rapid follow up Clinics	Provide rapid follow up clinics so that patient with the need for urgent follow-up but who do not need hospitalization can access services through a clinic.	✓	✓	✓		✓
	Standardized Care Pathways	Develop a hospital-wide, coordinated initiative to acquire/develop, implement, monitor, and enforce adherence to standardized clinical pathways	✓	✓	✓	✓	
	Hyperbaric Oxygen Therapy	Continue to provide to support diving tourism	✓		✓		
	Injection/Infusion/IV antibiotic clinic	Support external provision for injection/infusion/IV antibiotic treatment to free up capacity in the ED.			✓	✓	
	Telehealth Medical Advice Line	Do not include as BHB service		✓	✓	✓	
Medicine	CHF Clinic	Re-establish an out-patient heart failure clinic with nursing support to provide personalize heart failure management programme and self-management around diet, exercise and medication	✓	✓	✓		
	Acute Geriatric Service	Establish an inpatient, specialized geriatric assessment unit to better identify and support patients at risk for hospital-acquired disability	✓	✓	✓		
	Patient Centred Medical Home	Following the pilot and based on evidence, continue PCMH to support individuals with one or more chronic disease who are not seeing a GP and who are un or under-insured	✓	✓	✓	✓	✓
	Revised ICU Model of Care	In progress, no further input required	✓		✓		
	Telehealth Remote Specialists Consults	In progress, no further input required	✓		✓	✓	✓

BHB Community of Practice	Service	CoP Advice	Raising Quality Standards	Supporting the Bermuda health Strategy	Optimizing Patient Flow & Experience	Establishing Partnerships	Aligning Funding Payment w/ Quality Incentives
	Acute Pulmonary Service	Pulmonologist available to support inpatient consults at KEMH	✓		✓	✓	
	Pulmonary Service	BHB will work with community pulmonologist and primary care practitioners to increase access	✓		✓	✓	
	Cardiac Catheterization Laboratory	Do not include as BHB service	✓		✓	✓	
Surgery	Improved Matching of Surgical Modalities w/ Procedure Requirements	Utilize the main OR for only those procedures requiring such a facility. Create an ambulatory surgery stream with a 23-hour service model. Perform procedures not requiring the OR in a procedure room or surgeon's office	✓	✓	✓		✓
	Surgery by Visiting Surgeon	Implement strategies to improve scheduling and smooth workload to prevent unmanageable spikes in surgical bed requirements	✓		✓	✓	
	Bariatric surgery	Work with external provider to support the continuum of care for patients with bariatric surgery	✓		✓	✓	
	Vascular Surgery	Align with interventional radiology development	✓		✓	✓	
	Pain Management Clinic	In progress, no further input required			✓	✓	
	Integrated patient scheduling system	In progress, no further input required	✓		✓		
	Hip Surgery by Resident Surgeon	Do not plan to shift hip surgery activity to resident surgeon. May consider in future	✓	✓	✓		
	Renal Transplant Programme	Do not include as BHB service	✓	✓	✓	✓	
Maternal Child	Comprehensive Antenatal Programme	Develop, in partnership with other providers, a standardized approach to antenatal care to improve the patient experience and health outcomes for all pregnant women in Bermuda	✓	✓	✓	✓	
	Gynaecology Minimally Invasive Surgery	Develop an ambulatory gynaecology program that converts appropriate OR surgical procedures to minimally invasive approaches	✓		✓		

BHB Community of Practice	Service	CoP Advice	Raising Quality Standards	Supporting the Bermuda health Strategy	Optimizing Patient Flow & Experience	Establishing Partnerships	Aligning Funding Payment w/ Quality Incentives
	Long Stay Physically Disabled Patients	BHB to advocate for more appropriate and cost-effective settings to manage long-term needs of paediatric and/or young adults w/ long-term care needs, but will continue to care for these residents until more appropriate setting exist	✓	✓	✓		
	Paediatric Asthma Clinic	Do not include as separate service from BHB Dream Centre	✓	✓	✓		
	Admissions for Drug Coverage	Move services to a clinic or home health care to prevent unnecessary admissions ((i.e. possible external partners)	✓		✓		✓
Mental Health and Addictions	Dual Diagnosis Outreach	Provide cross training of current BHB providers in the common elements of mental health and substance abuse.	✓		✓		
	Step Down Mental Health Unit - Partial Hospitalization	Provide new partial hospitalization service or virtual ward to provide support to patients and prevent readmissions	✓		✓		✓
	Short Term Residential Treatment for Substance Abuse Patients	Provide shorter term residential treatment options following discharge from the detoxification unit. A 3 month clinically-managed and medically monitored programme would fill an existing service gap	✓		✓		✓
	Cross-stream Substance Abuse Intervention Team	In progress, no further input required	✓		✓		
Intellectual Disabilities	Expanded Respite Care to Support ID Caregivers	Expand BHB service capacity to better support community care givers and allow individuals to be supported longer or permanently in the community	✓		✓		
	Long Term ID Residential Group Home	Continue to provide at BHB with appropriate funding: candidate for divestiture as not a "hospital" service but no available partners	✓		✓	✓	✓
	Inpatient Care for Complex ID Patients	Include provisions of complex ID patients in BHB long-term care beds	✓		✓		
	ID Multidisciplinary Team Services	Provide multi-disciplinary team support to ID patients but due to capacity limitations only provide to BHB Group Home and IP clients	✓		✓		

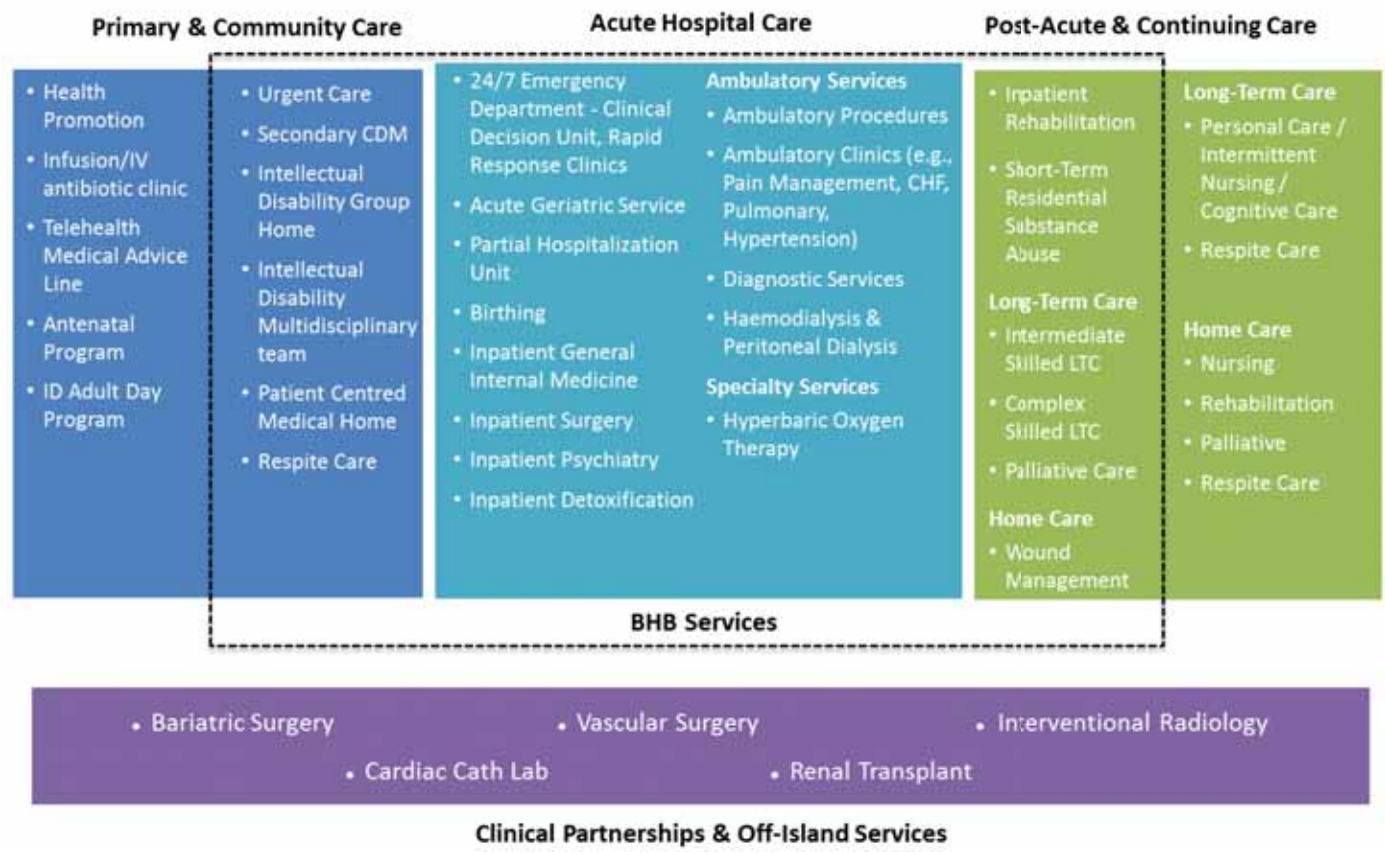
BHB Community of Practice	Service	CoP Advice	Raising Quality Standards	Supporting the Bermuda health Strategy	Optimizing Patient Flow & Experience	Establishing Partnerships	Aligning Funding Payment w/ Quality Incentives
	National Disabilities Register to include Bermuda residents w/ Intellectual Disabilities (ID)	Incorporate in Bermuda National EHR and care plans	✓			✓	
	ID Day Programme	Do not include as BHB service. Merge with DoH programme and divest	✓			✓	
Post-Acute Care	Short Stay IP Rehabilitation Care Unit	Establish new unit to support inpatient rehabilitation for those patients with restorative potential who would benefit from rapid access to intensive rehabilitative care. Should result in overall reduction in patient length of stay with improved outcomes	✓	✓	✓		✓
	Complex Skilled and Intermediate Skilled LTC	Establish specific unit(s) for patients who require Complex Skilled or Intermediate Skilled long-term care services. Patients to be stratified by need so that BHB can establish staffing models & care protocols reflecting the needs of the patients. This should lead to both higher quality and more cost-effective care	✓	✓	✓		✓
	Case Management	Expand case management role, particularly for patients who are elderly and/or have chronic disease(s). Will only be fully effective with increase in community services	✓		✓		
	In-Home Care	Assume development outside of BHB of national home care programme by 2025	✓	✓	✓	✓	
	Palliative Care	Continue existing support of palliative care patients, with growth accommodated in external partners	✓	✓	✓		
	Personal Care, Intermittent Skilled Nursing, Cognitive Care	Do not include as BHB service. Important, but not BHB role	✓	✓	✓	✓	
Chronic Disease	Cardiology - Hypertension Clinic	Re-establish an out-patient hypertension clinic to reduce the need for inpatient hospital care	✓		✓		

BHB Community of Practice	Service	CoP Advice	Raising Quality Standards	Supporting the Bermuda health Strategy	Optimizing Patient Flow & Experience	Establishing Partnerships	Aligning Funding Payment w/ Quality Incentives
Management	Asthma/COPD Chronic Disease Management	Provide a leadership role in coordination of chronic disease management services for respiratory care, in coordination with external partners	✓	✓	✓		
	Metabolic and Diabetes CDM	Provide a leadership role in coordination of services for diabetes and related metabolic disease, in coordination with external partners.	✓	✓	✓		
	Nephrology and Dialysis	Set service standards for dialysis and continue services at the current volume. Accommodate anticipated growth in demand through external partners	✓	✓	✓	✓	
	Overarching Advice – BHB Supports Partner CDM Initiatives	Effective Chronic Disease Management must be rooted in a broad-based approach across the education, healthcare, and social service sectors. BHB as central resource to support partners in delivery and to play a quality leadership role	✓	✓	✓	✓	
	Health Promotion Partnership	Identify and nurture partnerships to support health promotion	✓	✓	✓	✓	
	National Electronic Health Record	Promote & support national initiative for electronic health record and coordinate so that hospital records are aligned to coordinate with a longitudinal record.	✓	✓	✓	✓	
	Care Plan Prompt for Referral to CDM Service	Build in care plans and clinical information systems prompts for referrals of patients with chronic disease to access appropriate CDM services	✓		✓	✓	
Diagnostic and Allied Health	Interventional Radiology	Include development and refinement of business case	✓		✓	✓	
	Cardiac Diagnostics	In progress, no further input required. Include PAD screening	✓		✓		

5.2 Future Role

Exhibit 22 shows the proposed services to be directly provided by BHB and included in the CSP. In the next five to eight years, BHB's role will continue to be broad, and reach beyond "core" hospital services.

Exhibit 22: BHB Proposed Services



Proposed service changes for BHB involve relatively few additions of new services or discontinuance/ divestment of existing services. Most focus on changes to how the delivery of the core community hospital services of BHB can be modified to better respond to changes in population needs and enhance quality of care, within the financial, facility, and other constraints Bermuda faces.

One principle that guided the consideration of divestment of services was "*Existing BHB services, that are needed by residents or visitors should not be discontinued or diminished unless there is an identified partner willing and able to assume responsibility for the service, or access can be achieved through alternative cost-effective means*." While there may be services offered by BHB that would not normally be integral to the operation of a hospital, the absence of a willing and capable partner to assume responsibility prevents BHB from planning for divestment.

BHB is considering the potential of merging the BHB adult intellectual disability New Dimensions Day Programme with the Ageing and Disabilities Services (MoH) K. Margaret Carter Adult day centre programme, and subsequent potential divestment of the combined service to the Ministry of Health. This is the only potential divestment considered by the CSP.

New BHB services include the Patient Centred Medical Home (currently operating as a pilot project), a partial hospitalization unit, ambulatory clinics (e.g., CHF, pulmonary, hypertension), inpatient rehabilitation, and formally designated intermediate skilled and complex skilled long-term care units.

Most of the proposed new services have been identified as supporting "de-escalation of care" by responding to direct patient needs with the highest quality and most cost-effective care.

A principle that guided the consideration of additional services was "*Where accepted international standards exist, the service will be provided by BHB in accordance with these standards, including critical mass of activity*". The current scope of hospital services provided by BHB is greater than what (in North America) would normally be offered by a community general hospital serving a catchment population of about 60,000. The isolation of BHB and challenges of transferring patients with immediate need for specialized care not available at BHB prompted the consideration of some of these specialized services (e.g., vascular surgery, interventional radiology, cardiac catheterization, bariatric surgery) for inclusion in the Clinical Services Plan. For most of these specialized services, the anticipated demand from the Bermuda population would not be great enough to meet the accepted critical mass standards. BHB will address this conflict between local need and critical mass standards by partnering with high quality, high volume offshore providers of specialized care to enhance population access to these services. This will most likely be initially via transfer of Bermuda residents to a preferred North American (or other) provider, but with the goal of eventually bringing the service to Bermuda.

5.3 Acute Care Beds

BHB's medical/ surgical acute care beds operate at high occupancy levels, primarily due to challenges in discharging patients who no longer require acute care, but for whom post-acute care services are not immediately available. The projection of required beds for 2020 and 2025 assumes that BHB will prioritize implementation of initiatives to improve patient flow, including admission avoidance, acute length of stay reduction, and increased access to post-acute services.

5.3.1 Admission Avoidance

The projections of acute care bed requirements incorporate population projections, and future admission avoidance of patients who historically have been admitted to inpatient care. The strategies that will support this admission avoidance include implementing a clinical decision unit (CDU), providing rapid access clinics, and shifting inpatient surgical cases to outpatient surgery (SOPU).

The types of admissions that could be avoided (and 2016/17 BHB avoidable cases) are listed below, first for medical cases, and then for surgical cases. The estimates of avoidable cases are very conservative, since only cases with a very short inpatient stay (i.e., single day, or overnight only) were considered to be avoidable. **While avoiding these 233 medical and surgical admissions would not significantly reduce inpatient days of care, they do mean that the residual average length of stay for admitted cases would be longer, and more comparable with the U.S. length of stay benchmarks.**

Exhibit 23: Diagnoses for Medical Inpatient Admissions Identified as Avoidable in the Future

	Primary Diagnosis	Cases
49392	Asthma, Unspecified, Wit	15
5589	Noninf Gastroenterit NEC	7
46619	Ac Bronchiolitis/Oth Org	6
07989	Other Specified Viral Inf	5

	Primary Diagnosis	Cases
07999	Unspec Viral Infection	5
56211	Diverticuli Colon No Hem	4
0088	Viral Enteritis Nos	4
41071	Subendo AMI/1St Episode	3
33818	Acute Postop Pain NEC	3
63590	Legal Abort Uncompl-Unsp	3
41051	Ami Lat Wall/1St Episode	2
5303	Esophageal Stricture	2
632	Missed Abortion	2
78900	Abdominal Pain, Unspecified	2
41081	Ami Other Site/1St Epis	2
46611	Acute Bronchiolitis /RSV	2
53081	Esophageal Reflux	2
Other Diagnoses		22
Total Avoided Medical Admissions		91

Exhibit 24: Procedures for Surgical Inpatient Admissions Identified as Avoidable in the Future

	Principal Procedure	Cases
282	Tonsillectomy	32
5123	Laparoscopic Cholecystectomy	25
2188	Septoplasty NEC	9
4701	Laparoscopic Appendectomy	9
0309	Spinal Canal Explor NEC	8
7932	Op Red-Int Fix Rad/Ulna	7
2001	Myringotomy W Intubation	7
8145	Cruciate Lig Repair NEC	6
283	Tonsillectomy/Adenoidectomy	6
4709	Other Appendectomy	4
8051	Iv Disc Excision	3
8363	Rotator Cuff Repair	3
4946	Haemorrhoidectomy	3
2161	Diather/Cryo Turbinectom	2
286	Adenoidectomy	2
215	Submuc Nasal Sept Resect	2
7962	Debrid Open Fx-Radius/Uln	2
Other Procedures		12
Total Avoided Surgical Admissions		142

5.3.2 Acute LOS

Future targets for the average KEMH acute length of stay (LOS) are based on U.S. Center for Medicare and Medicaid Services (CMS) annual calculations of average arithmetic LOS by DRG, for non-outlier cases. This is the same source of the DRG relative cost weights used for the BHB DRG-based hospital fees for patients with LOS of less than 16 days.

BHB average LOS by DRG (for cases with LOS below 16 days) has been very similar to the CMS average LOS for birthing and surgical cases, but about 25% longer for medicine cases. For 2020 and 2025 acute care activity projections, the CMS average LOS by DRG has been used as the target LOS for birthing and surgery cases. **For medicine cases, the projections assume that BHB will have an average LOS 20% higher than the CMS LOS targets in 2020, but this will be reduced to 10% above the CMS targets for 2025.** Implementation of standardized care plans for common medicine DRGs will assist with future acute care LOS reduction.

The table below shows the 2016/17 average acute LOS (after application of admission avoidance targets), the CMS average LOS, and the 2020 and 2025 LOS targets, for some of the highest volume medicine and surgery DRGs. For DRG 292, Heart Failure and Shock w CC (a medicine DRG), the 2020 LOS target is 5.2 days (i.e., 20% above the CMS LOS of 4.3 days), and the 2025 LOS target is 4.7 days (i.e., 10% above the CMS LOS). For DRG 470, Major Joint Replacement or Reattachment of Lower Extremity w/o MCC (a surgical DRG), the LOS target for both 2020 and 2025 is the CMS average LOS of 2.9 days, 0.7 days shorter than the 2016/17 BHB LOS for these cases.

Exhibit 25: Examples of BHB Acute Length of Stay Targets for High Volume Medical/Surgical DRGs

	Diagnosis Related Group	2016/17 Avg. LOS	Target LOS (Days)			2016/17 Days Over Target LOS		
			CMS Avg. LOS	2020 Target	2025 Target	CMS Avg.	2020 Target	2025 Target
292	Heart Failure & Shock w CC	6.2	4.3	5.2	4.7	1.9	1.0	1.5
470	Major Joint Replacement or Reattachment of Lower Extremity w/o MCC	3.6	2.9	2.9	2.9	0.6	0.6	0.6
291	Heart Failure & Shock w MCC	6.8	5.8	7.0	6.4	1.0	-0.1	0.5
392	Esophagitis, Gastroent & Misc. Digest Disorders w/o MCC	3.8	3.3	4.0	3.6	0.5	-0.2	0.1
194	Simple Pneumonia & Pleurisy w CC	5.3	4.3	5.1	4.7	1.0	0.1	0.6
871	Septicemia or Severe Sepsis w/o MV 96+ Hours w MCC	6.9	6.4	7.7	7.1	0.5	-0.8	-0.1
690	Kidney & Urinary Tract Infections w/o MCC	5.7	3.7	4.4	4.0	2.0	1.3	1.6
65	Intracranial Hemorrhage or Cerebral Infarction w CC or tPA in 24 Hrs	7.5	4.0	4.8	4.4	3.5	2.7	3.1
330	Major Small & Large Bowel Procedures w CC	7.9	7.9	7.9	7.9	-0.1	-0.1	-0.1

Where a negative value is shown in the last three columns, it means that the 2016/17 actual BHB average length of stay for the DRG was already lower than the calculated target. For example, for Heart Failure and Shock with MCC, the BHB average LOS in 2016/17 was 6.8 days. The 2020 target LOS (i.e. 20% above the CMS average LOS) was 7.0 days, longer than the BHB actual LOS. But by 2025, the target

LOS for that DRG drops to 6.4 days (i.e. 10% above the CMS average LOS), shorter than the BHB actual 2016/17 LOS.

5.3.3 Alternate Level of Care

The projection of length of stay for long stay cases (i.e., beyond the 15 day "trim" LOS used for the BHB DRG-based hospital fee schedule) is based on:

- the transfer of patients requiring inpatient rehabilitation to a rehab unit after an acute LOS equal to the CMS target LOS; and
- reduction of "alternate level of care" (ALC) days for 2020 and 2025 because of proposed investments in initiatives such as acute geriatric, case management, and LTC action plan implementation

The activity projection model assumes that 2016/17 ALC day rates will be reduced by 10% by 2020 and 20% by 2025. The impact of the ALC day reduction is relatively small, compared to the impact of moving patients to inpatient rehabilitation, since many of the patients identified as candidates for inpatient rehabilitation had large numbers of ALC days, and the reduction in LOS has been attributed to the introduction of inpatient rehabilitation, rather than ALC day reduction.

Exhibit 26: Examples of Proposed ALC Day Reduction by Year

Diagnosis Related Group		ALC Day Reduction	
		2020	2025
309	Cardiac Arrhythmia & Conduction Disorders w CC	125	292
470	Major Joint Replacement or Reattachment of Lower Extremity w/o MCC	86	197
41	Periph/Cranial Nerve & Other Nerv Syst Proc w CC or Periph Neurostim	83	180
689	Kidney & Urinary Tract Infections w MCC	63	146
871	Septicemia or Severe Sepsis w/o MV 96+ Hours w MCC	58	140
177	Respiratory Infections & Inflammations w MCC	61	134
690	Kidney & Urinary Tract Infections w/o MCC	52	121
57	Degenerative Nervous System Disorders w/o MCC	52	101
469	Major Joint Replacement or Reattachment of Lower Extremity w MCC	41	98
64	Intracranial Hemorrhage or Cerebral Infarction w MCC	32	73
All Other DRGs		**357**	**772**
Grand Total		**1,010**	**2,253**

5.3.4 Critical Care

The projections of acute care beds include targets for LOS reduction, but none of the LOS reduction is applied to days in the ICU. This reflects the assumption that as BHB 'de-escalates' care, the residual acute care patient days will be higher care days, since it will be the patients requiring lower levels of care for whom admission is avoided and LOS is reduced. The result will be acute care units occupied by patients with greater needs, and requiring higher nurse to patient ratios.

The table below shows the projected change in ICU cases and days from 2016/17 to 2025 for the DRGs most dependent on access to critical care. **The estimated ICU bed requirement increases from 7.5 beds in 2016/17 (at 60% target occupancy) to 11.3 beds by 2025.**

Exhibit 27: Projected Change in Critical Care Activity from 2016/17 Actual to 2025 by DRG

	Diagnosis Related Group	2016/17 Actual				2025 Projection			
		Cases	Acute Days	ICU Days	% ICU Days	Cases	Acute Days	ICU Days	% ICU Days
871	Septicemia or Severe Sepsis w/o Mv 96+ Hours w MCC	100	1,404	121	9%	147	1,034	169	16%
329	Major Small & Large Bowel Procedures w MCC	25	645	88	14%	33	454	127	28%
853	Infectious & Parasitic Diseases w O.R. Procedure w MCC	22	868	77	9%	27	360	92	26%
326	Stomach, Esophageal & Duodenal Proc w MCC	8	518	59	11%	11	161	118	74%
280	Acute Myocardial Infarction, Discharged Alive w MCC	39	405	56	14%	63	394	90	23%
4	Trach w Mv 96+ Hrs or Pdx Exc Face/Mouth/Neck w/o Maj OR.	4	153	51	33%	6	145	59	41%
974	HIV w Major Related Condition w MCC	8	184	50	27%	9	92	47	51%
637	Diabetes w MCC	12	244	38	16%	17	96	60	62%
291	Heart Failure & Shock w MCC	81	786	38	5%	118	756	66	9%
64	Intracranial Hemorrhage or Cerebral Infarction w MCC	45	2,720	38	1%	61	409	49	12%
208	Respiratory System Diagnosis w Ventilator Support <96 Hrs	11	134	36	27%	18	136	56	41%
964	Other Multiple Significant Trauma w CC	8	113	33	29%	9	50	36	71%
958	Other O.R. Proc. for Multiple Significant Trauma w CC	8	103	32	31%	9	80	57	71%
189	Pulmonary Oedema & Respiratory Failure	8	76	30	39%	12	67	50	74%
790	Extreme Immaturity or Respiratory Distress Syndrome, Neonate	12	242	30	12%	14	298	40	13%
65	Intracranial Hemorrhage or Cerebral Infarction w CC or tPA in 24 Hrs	94	2,063	27	1%	135	591	38	7%
328	Stomach, Esophageal & Duodenal Proc w/o CC/MCC	13	120	24	20%	16	51	37	73%
330	Major Small & Large Bowel Procedures w CC	41	548	23	4%	54	430	29	7%
956	Limb Reattachment, Hip & Femur Proc for Multiple	9	154	21	14%	10	83	36	43%

	Diagnosis Related Group	2016/17 Actual				2025 Projection			
		Cases	Acute Days	ICU Days	% ICU Days	Cases	Acute Days	ICU Days	% ICU Days
	Significant Trauma								
981	Extensive O.R. Procedure Unrelated to Principal Diagnosis w MCC	5	144	21	15%	8	104	37	35%
856	Postoperative or Post-Traumatic Infections w O.R. Proc w MCC	1	20	20	100%	2	32	20	63%
All Other DRGs		**5,473**	**39,185**	**730**	**2%**	**6,302**	**26,994**	**1,168**	**4%**
Grand Total		**6,027**	**50,829**	**1,643**	**3%**	**7,083**	**32,817**	**2,482**	**8%**
	ICU Beds @ 60%			**7.5**				**11.3**	

5.3.5 Resulting Acute Care Bed Requirements

The projected number of acute care beds assumes that the beds will be restricted to acute care patients (i.e., LOS< 16 days), and that patients requiring longer stays will be transferred to inpatient rehabilitation, hospice, or post-acute (i.e., sub-acute or long-term care) beds. The target occupancy for each programme reflects industry targets intended to maximize the use of available beds, while accommodating daily fluctuations in census. For some programmes, the target occupancy is much higher than the historical BHB bed occupancy (e.g., target of 60% for Paediatric beds, versus BHB average occupancy of 26.2%). The projected beds are based on the combination of the projected inpatient days and the target occupancy.

Exhibit 28: Overall Acute Care Bed Projections

Programme	Projected IP Days		Target % Occ.	Projected Beds		2016/17 Actual	
	2020	2025		2020	2025	Beds	% Occ.
Medicine	17,923	17,622	92%	53.4	52.5	90	94.3%
Surgery	6,371	6,735	87%	20.1	21.2		
Paediatric	2,116	1,862	60%	9.7	8.5	17	26.2%
Maternity	3,103	3,007	60%	14.2	13.7	19	41.5%
Neonatal	1,297	1,226	60%	5.9	5.6	12	32.1%
Critical Care	2,354	2,482	60%	10.8	11.3	8	61.3%
Total	**33,165**	**32,934**	**80%**	***113.9***	***112.9***	**146**	**72.6%**

5.4 Hospice Care

The projected number of KEMH hospice care beds will be subject to the impacts of any parallel end-of-life policy development in Bermuda, and the establishment of other non-acute palliative care services. Many developed countries have developed overarching end of life care strategies, [15] [16] [17] based on an

[15] "End of Life Care Strategy: promoting high quality care for adults at the end of their life", U.K. Department of Health. Published:16 July 2008. https://www.gov.uk/government/publications/end-of-life-care-strategy-promoting-high-quality-care-for-adults-at-the-end-of-their-life

[16] "Canadian Strategy on Palliative and End-of-Life Care: Final Report". Health Canada 2007. https://www.canada.ca/en/health-canada/services/publications/health-system-services/canadian-strategy-palliative-end-life-care-final-report.html

understanding of their population's expectations and wishes for health system support for death and dying. Bermuda should also develop a Bermuda end of life care strategy that reflects the country's unique culture and needs.

If home care implementation includes palliative home care, then BHB could assume that current Agape capacity could accommodate future demands, but if not, another two beds would be required.

Exhibit 29: Projected Hospice Bed Requirement by Diagnosis Related Group

	Diagnosis Related Group	2016/17	2025
375	Digestive Malignancy w CC	272	369
57	Degenerative Nervous System Disorders w/o MCC	139	204
723	Malignancy, Male Reproductive System w CC	142	195
65	Intracranial Hemorrhage or Cerebral Infarction w CC or tPA in 24 Hrs	134	184
54	Nervous System Neoplasms w MCC	179	175
181	Respiratory Neoplasms w CC	100	141
180	Respiratory Neoplasms w MCC	105	134
755	Malignancy, Female Reproductive System w CC	117	121
871	Septicemia or Severe Sepsis w/o MV 96+ Hours w MCC	72	103
724	Malignancy, Male Reproductive System w/o CC/MCC	60	95
948	Signs & Symptoms w/o MCC	74	87
432	Cirrhosis & Alcoholic Hepatitis w MCC	68	86
182	Respiratory Neoplasms w/o CC/MCC	54	86
687	Kidney & Urinary Tract Neoplasms w CC	70	85
178	Respiratory Infections & Inflammations w CC	53	84
683	Renal Failure w CC	62	80
436	Malignancy of Hepatobiliary System or Pancreas w CC	60	73
598	Malignant Breast Disorders w CC	62	61
940	O.R. Proc w Diagnoses of Other Contact w Health Services w CC	51	60
542	Pathological Fractures & Musculoskeletal & Conn Tiss Malig w MCC	44	52
All Other DRGs		**383**	**479**
Grand Total		**2,302**	**2,954**
Beds @ 80% Occupancy		***7.9***	***10.1***

5.5 Inpatient Rehabilitation

The Ministry of Health's Long-Term Care Action Plan includes a "Short Stay Rehab or Restorative Care" level of care, and identifies KEMH has the location for provision of this service in Bermuda.

Level of Care	Definition	Setting
Short Stay Rehab or Restorative Care	RN on duty 24/7, post-acute recovery period where more than 2 therapeutic services such as PT, OT, speech, respiratory, nutritional 5 days/week or more, and skilled nursing treatments, health education / monitoring needed up to 100 days. Access to mental health services.	KEMH

[17] "Statewide strategy for end-of-life care 2015". Published by the State of Queensland (Queensland Health), May 2015. https://www.health.qld.gov.au/__data/assets/pdf_file/0022/441616/end-of-life-strategy-full.pdf

Establishment of a dedicated inpatient rehabilitation unit will support provision of focused rehabilitation programming, following a rehabilitation philosophy (i.e., as opposed to an acute medical model of care) for the subset of BHB patients with restorative potential who would benefit from rapid access to intensive rehabilitative care. Benefits to patients should include reducing the long-term loss of function and greater opportunity to return to independent living. Benefits to BHB should include reduction in overall patient length of stay in the hospital, and greater ability to separately monitor length of stay and outcomes for acute care and post-acute bedded rehabilitation care.

This initiative will have significant facility, equipment, and staffing (both allied health and medical) implications for BHB. Introduction of a rehabilitation unit will also require a change in the funding model to acknowledge the distinction between acute and rehabilitation care, and to incorporate appropriate incentives for cost-effective care (i.e., maximum improvement in patient function, as quickly as possible).

To estimate the future size of a BHB inpatient rehabilitation unit, 2016/17 BHB neurological, musculoskeletal, spinal cord, brain injury, and amputee inpatient activity was used as a proxy measure of potential inpatient rehabilitation demand.[18] Only cases with a length of stay longer than the CMS average LOS for the DRG were considered as potential rehabilitation cases. Deaths, and transfers to hospice or overseas care were not included as potential rehabilitation cases.

Fifty percent of the eligible cases in the proxy DRGs were assumed to go to inpatient rehabilitation (i.e., 3.6% of all acute care discharges). The modelling assumed that 70% of patients receiving an average 23-day course of inpatient rehabilitation would be able to be discharged home, but 30% would be transferred to a LTC bed for further institutional inpatient long-term care.

Exhibit 30: Examples of DRGs Identified as Inpatient Rehabilitation Candidates for Modelling of Future Requirements

DRG	DRG Description	Rehab Cases	Total Cases	% to IP Rehab
65	Intracranial Hemorrhage or Cerebral Infarction w CC or tPA in 24 Hrs	32	94	34.0%
101	Seizures w/o MCC	23	60	38.3%
66	Intracranial Hemorrhage or Cerebral Infarction w/o CC/MCC	21	41	51.2%
69	Transient Ischemia	14	30	46.7%
470	Major Joint Replacement or Reattachment of Lower Extremity w/o MCC	14	203	6.9%
64	Intracranial Hemorrhage or Cerebral Infarction w MCC	13	48	27.1%
57	Degenerative Nervous System Disorders w/o MCC	9	30	30.0%
74	Cranial & Peripheral Nerve Disorders w/o MCC	7	13	53.8%
482	Hip & Femur Procedures Except Major Joint w/o CC/MCC	6	22	27.3%
240	Amputation for Circ Sys Disorders Exc Upper Limb & Toe w CC	5	8	62.5%
462	Bilateral or Multiple Major Joint Procs of Lower Extremity w/o MCC	5	9	55.6%
41	Periph/Cranial Nerve & Other Nerv Syst Proc w CC or Periph Neurostim	4	9	44.4%
469	Major Joint Replacement or Reattachment of Lower Extremity w MCC	4	8	50.0%

[18] While these are not the only potential patient groups that could benefit from access to inpatient rehabilitation, in other jurisdictions approximately 65% of rehab beds are occupied by these patients.

DRG	DRG Description	Rehab Cases	Total Cases	% to IP Rehab
56	Degenerative Nervous System Disorders w MCC	3	11	27.3%
71	Nonspecific Cerebrovascular Disorders w CC	3	6	50.0%
Other DRGs		**55**	**5,480**	**1.0%**
Grand Total		**218**	**6,072**	**3.6%**

The resulting projection of inpatient rehabilitation beds is 17.9 for 2020 and 19.3 for 2025.

Exhibit 31: Projected Inpatient Rehabilitation Beds

	2020	2025
Cases	256	276
Days	5,894	6,355
Tgt. % Occ.	90%	90%
Beds	**17.9**	**19.3**

5.6 Inpatient Psychiatry and Addictions and Substance Abuse

Application of population projections and target occupancy percentages to MWI 2016/17 data generated the following projection of psychiatric and addictions and substance abuse beds. **The total projected number of beds (73) is just under the current overall bed allocation of 75, but higher occupancy targets than the 2016/17 actual were used for the child and adolescent and detoxification beds.**

Exhibit 32: Projected Psychiatry and Addictions and Substance Abuse Beds

Programme	Projected IP Days		Target %	Projected Beds		2016/17 Actual	
	2020	2025	Occup.	2020	2025	Beds	% Occup.
Acute Psych	5,320	5,295	85%	17.1	17.1	23	77%
Intensive Care	1,246	1,192	75%	4.6	4.4		
Child/Adolescent	276	254	60%	1.3	1.2	4	21%
Psych Rehab	6,630	6,039	80%	22.7	20.7	40	96%
Post-Acute	7,746	8,335	95%	22.3	24.0		
Detox	1,494	1,471	75%	5.5	5.4	8	52%
Grand Total	22,712	22,585	85%	**73.5**	**73.1**	75	81.5%

5.6.1 Partial Hospitalization

In 2016/17, more than one third of MWI inpatient psychiatry patients were readmissions within three months of their prior discharge (most were more than one month after their previous discharge). The proposed partial hospitalization programme is intended to reduce the frequency of readmission and to expand access to psychiatric services for patients who do not require inpatient admission.

Exhibit 33: Readmission of MWI Inpatient Psychiatry Patients by Fiscal Year

Readmission Category	2014/15	2015/16	2016/17
New Admission	64	55	60
Readmission within 1 Week	-	-	-

Readmission Category	2014/15	2015/16	2016/17
Readmission within 1 Month	3	2	2
Readmission within 3 Months	74	68	90
Readmission within 6 Months	33	34	32
Readmission within 1 Year	84	77	76
Readmission over 1 Year	8	10	4
Total IP Discharges	**266**	**246**	**264**
New Admission	24%	22%	23%
Readmission within 1 Week	0%	0%	0%
Readmission within 1 Month	1%	1%	1%
Readmission within 3 Months	28%	28%	34%
Readmission within 6 Months	12%	14%	12%
Readmission within 1 Year	32%	31%	29%
Readmission over 1 Year	3%	4%	2%
Total IP Discharges	**100%**	**100%**	**100%**

A survey of 23 Canadian acute care hospitals with inpatient acute psychiatric beds and partial hospitalization programmes found that the average annual visit volume to the partial hospitalization unit was 5,678 visits, and the median visit volume was 3,740 visits. In the United States, CMS Medicare and Medicaid outpatient payment policies require that patients in partial hospitalization programmes require at least 20 hours of care per week, usually via programme attendance five days per week.

BHB should plan to establish a partial hospitalization unit with the capacity for 15 patients, operating four hours per day, Monday to Friday, with flexibility for weekend support. The impact of the implementation of the partial hospitalization unit on inpatient psychiatry admission volumes and readmission rates should be monitored, and inpatient bed allocations adjusted as necessary to reflect programme impacts.

5.6.2 Short Term Residential Treatment for Substance Abuse Patients

BHB should provide a residential facility to provide a short-term (i.e., three-month average length of stay) alternative to returning home for substance abuse patients for whom their home environment has contributed to their negative behaviour. A period in a residential facility is intended as a return to the community, but not to the precise environment where substance abuse was a problem.

The tables below show the number of discharges of BHB inpatients with substance abuse diagnoses in 2016/17. 80% of these patients were repeat admissions.

Exhibit 34: KEMH Acute and MWI 2016/17 Discharges of Patients Categorized in "Alcohol/Drug Use or Induced Mental Disorders" MDC by Discharge Unit

Discharge Unit	Cases	Days	Avg. LOS
Detox IP	111	1,506	13.6
Somers Ward - Acute Psych,	17	157	9.2
Ascendant - Partner Re	5	41	8.2
Catlin - Lindo	4	27	6.8

Discharge Unit	Cases	Days	Avg. LOS
Somer's Annex - Intensive Care	2	3	1.5
Ace - Barber	2	12	6.0
Child and Adolescent	1	15	15.0
Grand Total	**142**	**1,761**	**12.4**

Exhibit 35: KEMH Acute and MWI 2016/17 Discharges of Patients Categorized in "Alcohol/Drug Use or Induced Mental Disorders" MDC by Readmission Status

Readmission Status	Cases	Days	Avg. LOS
New Admission	28	342	12.2
Readmit within 3 Months	42	573	13.6
Readmit within 6 Months	21	260	12.4
Readmit within 1 Year	41	505	12.3
Readmit after more than a Year	10	81	8.1
Grand Total	142	1,761	12.4
All Readmissions	**114**	**1,419**	**12.4**
% Readmissions	**80%**	**81%**	

If 10% of MWI substance abuse discharges are referred to the proposed short-term residential treatment program, then approximately four beds (in a transitional housing/group home facility) would be required. Benefits to BHB are anticipated to be a reduction in readmissions to the detoxification unit and potentially shorter detoxification lengths of stay.

5.7 Post-Acute Beds

The Bermuda LTC Action Plan describes the Complex Skilled and Intermediate Skilled levels of care. The only setting identified in the Action Plan for these levels of care was KEMH.

Exhibit 36: Extract from Bermuda LTC Action Plan Complex and Intermediate LTC Level of Care Definitions (full list of definitions in the LTC Action Plan can be found at www.gov.bm)

Level of Care	Definition	Setting
Complex Skilled	RN on duty 24/7, MD on call 24/7, includes health assessments, skin and wound care, artificial feedings, ostomy care, IV, oxygen, airway, chronic ventilator management, psycho-behavioural moderate-severe dementia, and care planning and coordination. 65% of residents have 3 or more ADL limitations. Average total nursing care hours **4hr/day/pt**. includes RN 1.6hr/day/pt. Access to rehabilitation/therapeutic services. Access to mental health services.	KEMH
Intermediate Skilled	RN on duty 24/7, MD on call 24/7, includes health assessments, artificial feedings, ostomy care, IV, oxygen, airway, chronic ventilator management, psycho-behavioural moderate/severe dementia, and care planning and coordination. Average total nursing care hours **2.5hr /day/pt**. Access to rehabilitation/therapeutic services. Access to mental health services.	KEMH

BHB will designate a subset of LTC beds (or unit(s)) for which Complex Skilled and Intermediate Skilled care will be provided. Reimbursement rates for patients in these beds would reflect the cost of providing the designated level of care for the unit.

Stratification of patients according to need would allow BHB to establish staffing models and care protocols that reflect the needs of the patients. This should lead to higher quality care and reduced cost by ensuring that, for example, patients who require Intermediate Skilled care, receive that level of care, rather than being placed on a combined unit with patients who required Complex Skilled care, where the default staffing model reflects the needs of the more complex patients.

The CoP participants advised that the complex and skilled LTC unit should be designed to accommodate specific specialized populations (e.g., intellectually disabled/behavioural challenges/paediatrics). Staff training will also need to be considered in planning for this unit. **The development of this capacity, combined with the aging of the population, and the proposed expanded acute geriatric service, will necessitate the recruitment of at least a second Geriatrician.**

BHB will not provide the Personal Care, Intermittent Nursing Care, Cognitive Care level of long-term care, either in hospital beds, or in an off-site facility. However, the small number of patients currently in the BHB long-term care beds who require this level of care, should be assumed to remain in BHB until the capacity and capability of the community based care homes are enhanced and able to take these patients. These patients should be assumed to still require BHB beds in 2020, but by 2025, they should be accommodated in community based care homes. The November 2017 assessment of current BHB LTC patients showed 59% requiring Intermediate level care, and only three (i.e., 3%) in the lowest (Personal) level of care.

Exhibit 37: BHB November 2017 Distribution of LTC Patients by Assessed Level of Care

Level of Care	Patients	%
Intermediate	57	59%
Complex	37	38%
Personal	3	3%
Total	**97**	**100%**

The CSP assumes that BHB acute care beds will be restricted to patients with a length of stay less than 16 days. Any patients in these beds who require a stay of more than 15 days will be transferred, either to the rehabilitation unit, or to a BHB post-acute bed. The post-acute beds will include the Complex and Intermediate levels of LTC, and (until community LTC capacity is expanded) some Personal level of care patients. In addition to rehabilitation and LTC patients, there will be some patients who do not require multi-discipline, intensive rehabilitation, and who are expected to be discharged either home or to community LTC. These "sub-acute" patients require short term nursing reactivation support, but not continuing hospital inpatient care.

With enhanced acute geriatric services, increased case management, standardized care plans, a BHB rehabilitation unit, and expanded community LTC capability and capacity (i.e., via implementation of the LTC Action Plan), **BHB should be able to accommodate the need for bedded LTC and short-term sub-acute care with approximately 82 beds in 2020, increasing to 89 in 2025.**

Exhibit 38: Projected BHB Post-Acute Beds for 2020 and 2025

	2020	2025
Days	28,481	30,974
Tgt. % Occ.	95%	95%
Beds	**82.1**	**89.3**

The adequacy of this projected post-acute bed capacity will be very dependent on the successful implementation of the community-based components of the LTC Action Plan. As the Long-Term Care Assessment tool is more broadly implemented, both within, and outside BHB, the required mix of LTC and sub-acute beds should be periodically re-evaluated.

5.8 Total Hospital Beds

The table below shows the overall projected number of hospital beds for BHB for 2020 and 2025. The bed numbers do not include residential group home or assisted living beds for intellectual disability or substance abuse patients. The negative numbers (shown in brackets) in the final two columns mean that the current BHB bed capacity is greater than the projected requirement (i.e., the bed capacity could be reduced if the initiatives identified in the CSP are successfully implemented). The positive numbers mean that the projected future requirement is greater than the current number of beds provided by BHB.

Exhibit 39: Projected BHB Hospital Beds by Bed Type for 2020 and 2025

Bed Type	Actual 2017	Projected		Change from 2017	
		2020	2025	2020	2025
Adult Acute Medical	90.0	53.4	52.5	(16.6)	(16.3)
Adult Acute Surgical		20.1	21.2		
Intensive Care Unit	8.0	10.8	11.3	2.8	3.3
Maternity	19.0	14.2	13.7	(4.8)	(5.3)
Neonate	12.0	5.9	5.6	(6.1)	(6.4)
Paediatric	17.0	9.7	8.5	(7.3)	(8.5)
Total Acute	**146.0**	**113.9**	**112.9**	**(32.1)**	**(33.1)**
Rehabilitation	-	17.9	19.3	17.9	19.3
Post-Acute	140.0	82.1	89.3	(57.9)	(50.7)
Hospice	8.0	9.1	10.1	1.1	2.1
KEMH Total	**294.0**	**223.1**	**231.6**	**(70.9)**	**(62.4)**
Acute Psychiatry	23.0	17.1	17.1	(1.3)	(1.6)
Intensive Care Psychiatry		4.6	4.4		
Child/Adolescent Psych	4.0	1.3	1.2	(2.7)	(2.8)
Psych Rehab	40.0	22.7	20.7	5.0	4.7
Post-Acute Psych.		22.3	24.0		
Addictions	8.0	5.5	5.4	(2.5)	(2.6)
MWI Total	**75.0**	**73.5**	**72.7**	**(1.5)**	**(2.3)**
BHB Total	**369.0**	**296.6**	**304.3**	**(72.4)**	**(64.7)**

The 2020 and 2025 projections assume successful implementation of strategies identified to avoid admission, reduce length of stay, and more quickly move patients to levels of care most suited to their needs. Some of the proposed reduction in beds results from application of bed occupancy targets that reflect industry standards, rather than the historical low occupancy rates for BHB's overflow, maternity, neonate, and paediatric beds. The projections also assume increased community capacity for long-term care (i.e., as planned in the LTC Action Plan) and BHB investment in additional ambulatory service capacity.

With aggressive implementation of the initiatives proposed in the CSP, BHB will be able to provide high quality inpatient care within the current facility capacity at both the KEMH and MWI sites (i.e., no additional beds are required). Because of the emphasis on "de-escalation" of care, the future patients in BHB hospital beds will have greater needs than they do at present, and staffing patterns will need to be modified to reflect this reality.

5.9 Residential Intellectual Disability Support

There are 13 group homes across the length of Bermuda. Each home supports between four and nine people, with a total of 68 residents across all the group homes. The homes are staffed by community support workers, who are supported by two clinical managers and members of the multidisciplinary team.

Two of the group homes have been adapted to enable people who use wheelchairs to be supported with dignity while maximising their independence. One of the properties belongs to BHB, and the other homes are rented on the open market or from Project 100, a charitable organisation established to purchase and adapt suitable houses.

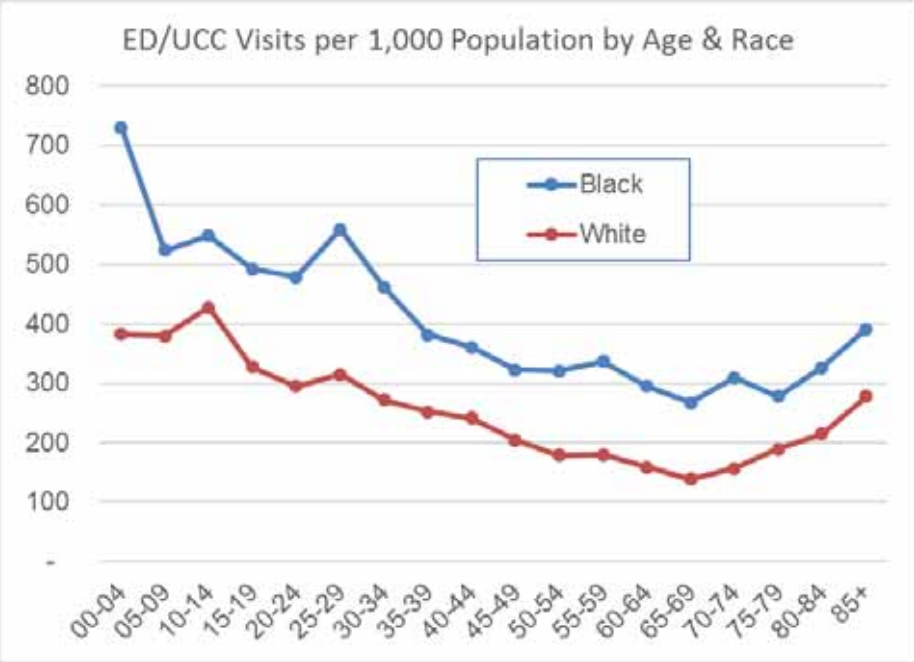
A small number of service users in group homes are supported into sheltered employment. Up to 25 service users attend the New Dimensions Programme each day, while others are engaged in different community-based activities from the homes. Several of the homes have their own cars/ minibuses or can access transportation on a regular basis.

There is a dearth of information about the demographics of this population and the prevalence of ID in the community. The proposed registry of the Bermuda ID population would fill in these blanks and create a stronger foundation for planning for these services. **The current projection for BHB is to continue with the current residential care capacity, divest day programming to the Department of Health, and work with government and other stakeholders to identify best practice models once there is a clearer picture of the overall population needs and future trends.**

5.10 Emergency/UCC Visits

The Emergency CoP reviewed data showing the rates of visits of Bermuda residents to the BHB ER/UCC by population age. These data included comparisons of utilization by gender and by race. In 2016/17 the rates of use of ER/UCC was significantly higher for the Black population than for the White population.

Exhibit 40: 2016/17 ER Visits per 1,000 Bermuda Population by Age and Race



The discussion at the Emergency CoP meetings considered that the differences in ER/UCC utilization reflected differences in insurance status, and that a higher proportion of the Black population were un/under-insured, leading to their reliance more on the ER/UCC for care that could otherwise be provided in primary care. The projections of future BHB ER/UCC activity will be impacted by any future changes in insurance coverage (e.g., introduction of universal health insurance benefits) in Bermuda.

The Emergency CoP also reviewed the results of analysis of actual inpatient admissions of ER patients versus expected admissions, based on admission benchmarks derived from six million Canadian ER visits.

Exhibit 41: Comparison of BHB Admissions of ER Patients with Expected Admissions by Fiscal Year

Fiscal Year	Visits	Admissions to IP		"Excess" Admissions	Admission Rate		Ratio of Actual to Expected
		Expected	Actual		Expected	Actual	
14/15	31,867	2,436	3,619	1,183	7.6%	11.4%	149%
15/16	31,508	2,509	3,756	1,247	8.0%	11.9%	150%
16/17	30,926	2,686	3,994	1,308	8.7%	12.9%	149%
17/18	7,669	688	1,014	326	9.0%	13.2%	147%
Grand Total	**101,970**	**8,318**	**12,383**	**4,065**	**8.2%**	**12.1%**	**149%**

Compared to the Canadian benchmark performance, BHB admits approximately 50% more patients from the ER than would be expected. A comparison of 2016/17 actual versus expected admissions from the ER for the most frequent ER visit diagnosis groups is shown below:

Exhibit 42: 2016/17 BHB Actual versus Expected Inpatient Admissions from the ER for Highest Volume ER Visit Diagnosis Groups

Diagnosis Group	Visits	Admissions to IP		"Excess" Admissions	Admission Rate	
		Expected	Actual		Expected	Actual
Asthma	1,381	38	71	33	2.7%	5.1%
Chest Pain	1,040	26	47	21	2.5%	4.5%
Acute Upper Respiratory Infections	984	4	10	6	0.4%	1.0%
Injuries to Knee and Lower Leg	829	4	13	9	0.5%	1.6%
Abdominal Pain	770	32	66	34	4.2%	8.6%
Syncope/Dizziness	726	68	87	19	9.4%	12.0%
Injuries to Wrist and Hand	588	1	10	9	0.2%	1.7%
Urinary Tract Infection	533	48	88	40	9.1%	16.5%
Open Wound of Head	513	4	10	6	0.7%	1.9%
Other Injuries to The Head	495	10	18	8	1.9%	3.6%

The CSP includes initiatives to support reduction of inpatient admission of ER patients, most notably through the introduction of a Clinical Decision Unit (CDU). **The modelling of CDU patient volumes and associated admission avoidance projected that approximately 5% of ER patients should be referred to the CDU (1,630 patients per year), and this would result in 124 annual fewer admissions to inpatient care.**

Exhibit 43: Projected ER Visits Referred to CDU and Resulting Avoided Admissions for Highest Volume CDU Diagnosis Groups

Diagnosis	Total ER Visits	CDU Cases	% Cases to CDU	Avoided Admits
Anaemias	291	130	45%	21
Other Forms of Heart Disease	176	19	11%	9
Diverticular Dis. Of Intestine	107	19	17%	8
Pneumonia	384	20	5%	7
Other Diseases of Intestines	214	22	10%	6
Congestive Heart Failure	303	32	11%	5
Cholelithiasis	94	15	15%	5
Injuries to Hip and Thigh	330	13	4%	4
Abdominal Pain	770	80	10%	4
Fracture of Lower Leg/Knee	222	10	4%	4
Transient Cerebral Ischaemic Attack	70	8	11%	3
Chest Pain	1,040	107	10%	3
Syncope/Dizziness	728	57	8%	3
Appendicitis	69	12	17%	3
Urinary Tract Infection	534	24	4%	3
Stroke and Other Cerebrovascular Disease	164	11	7%	3

Diagnosis	Total ER Visits	CDU Cases	% Cases to CDU	Avoided Admits
Atrial Fibrillation and Flutter	96	13	13%	2
Fracture of Skull and Facial Bones	104	7	7%	2
Gastrointestinal Haemorrhage NOS	73	7	10%	2
Type 2 Diabetes Mellitus no Acidosis	186	15	8%	2
Other Infections of Skin & Subcutaneous Tissue	289	8	3%	2
Symptoms/Signs Involv. Cognition, Perception, Behav.	46	5	10%	2
Haematuria	60	6	11%	2
Nausea and/or Vomiting	393	39	10%	2
Epilepsy	132	12	9%	2
Other Cardiac Arrhythmias	55	5	9%	1
All Other Diagnoses	24,047	933	4%	16
Total	**30,977**	**1,630**	**5%**	**124**

The projected BHB ER/UCC visits by triage acuity level are shown below. Because of the changes in the age composition of the Bermuda population, **the 2025 projection shows a 6.6% increase in high acuity visits, and a 2.5% reduction in low acuity visits.**

Exhibit 44: Projected BHB ER/UCC Visits for 2020 and 2025 by Triage Acuity Level

Triage Acuity	2016/17 Actual	Projected Visits		Change 16/17 to 2025	
		2020	2025	#	%
ESI Level 1	101	107	114	13	12.9%
ESI Level 2	607	629	658	51	8.3%
ESI Level 3	14,553	14,975	15,492	939	6.4%
ESI Level 4	18,603	18,404	18,147	-456	-2.4%
ESI Level 5	1,015	999	981	-34	-3.4%
Unknown	654	643	630	-24	-3.7%
Grand Total	**35,533**	**35,758**	**36,021**	**488**	**1.4%**
High Acuity (1, 2, 3)	**15,261**	**15,711**	**16,263**	**1,002**	**6.6%**
Low Acuity (4, 5)	**19,618**	**19,404**	**19,128**	**-490**	**-2.5%**

The ER/UCC diagnosis groups with the largest projected increases in visit volume are listed below. Most of the listed diagnoses are those associated with the elderly, and many are conditions amenable to chronic disease management.

Exhibit 45: BHB ER/UCC Visit Diagnosis Groups with Greatest Projected Increased Visit Volume by 2025

Diagnosis Group	2016/17 Actual	Projected Visits		Change 16/17 to 2025	
		2020	2025	#	%
Grand Total	**35,533**	**35,758**	**36,021**	**488**	**1.4%**
Syncope/Dizziness	760	808	867	107	14.0%

Diagnosis Group	2016/17 Actual	Projected Visits		Change 16/17 to 2025	
		2020	2025	#	%
Congestive Heart Failure	306	347	397	91	29.9%
Urinary Tract Infection	639	665	696	57	9.0%
COPD	236	260	289	53	22.5%
Pneumonia	390	409	432	42	10.8%
Other Arthropathies	391	409	432	41	10.5%
Stroke and Other Cerebrovascular Disease	165	182	203	38	22.9%
Chest Pain	1,107	1,123	1,143	36	3.3%
Other Forms of Heart Disease	177	193	213	36	20.3%
Other Diseases of Intestines	218	231	248	30	13.6%
Type 2 Diabetes Mellitus no Acidosis	190	203	219	29	15.1%
Retention of Urine	83	95	110	27	32.4%
AMI	98	109	123	25	25.4%
Hypertensive Diseases	145	156	169	24	16.8%
Complications of Surgical & Medical Care	212	223	236	24	11.3%
Constipation	284	294	307	23	8.0%
Malaise and Fatigue	130	140	152	22	16.8%
Atrial Fibrillation and Flutter	96	105	117	21	21.6%
Abnormalities of Breathing	455	464	475	20	4.3%
Follow-Up Care	363	372	383	20	5.4%

5.11 Dialysis

When the Bermuda population projections are applied to the 2016/17 BHB haemodialysis treatment volumes, the results project an 18% increase in treatments by 2025, or approximately 4,300 more treatments per year. This is equivalent to an increase of 16 more haemodialysis patients by 2020, and a further 12 by 2025 (i.e., 28 more patients than in 2016/17).

Exhibit 46: Application of Projected Population to Annual BHB Haemodialysis Treatment Volumes by Patient Age Cohort

Age Cohort	2016/17	2020	2025	% Growth
20-24	26	25	24	-10%
25-29	335	356	370	10%
30-34	271	262	256	-5%
35-39	550	533	525	-5%
40-44	936	829	762	-19%
45-49	1,211	1,103	997	-18%
50-54	1,077	926	762	-29%
55-59	3,551	3,681	3,800	7%
60-64	3,368	3,874	4,286	27%
65-69	2,901	3,346	3,689	27%
70-74	3,389	4,113	4,517	33%
75-79	2,725	3,294	3,893	43%
80-84	2,197	2,352	2,336	6%

Age Cohort	2016/17	2020	2025	% Growth
85+	1,180	1,517	1,821	54%
Grand Total	**23,717**	**26,211**	**28,036**	**18%**

Based on the 2016/17 actual BHB continuous ambulatory peritoneal dialysis patient volumes, the change in population demographics would generate a 9% increase in demand by 2025.

Exhibit 47: Application of Projected Population to Annual BHB Monthly CAPD Patients by Age Cohort

Age Cohort	2016/17	2020	2025	% Growth
30-34	19	18	18	-5%
35-39	3	3	3	-6%
40-44	3	3	2	-19%
50-54	21	18	15	-28%
55-59	15	16	16	9%
60-64	11	13	15	36%
65-69	5	6	6	27%
70-74	17	20	23	33%
75-79	14	17	19	39%
80-84	7	7	8	10%
Grand Total	**115**	**121**	**126**	**9%**

Exhibit 48: Estimate of New Dialysis Patients Due to Change in Population Demographics

Dialysis Type	2016/17	2020	2025
Dialysis CAPD per month	115	121	126
ESRD -haemodialysis session	23,717	26,211	28,036
Grand Total	**23,832**	**26,333**	**28,162**
Increase in CAPD Monthly		6	5
Projected New BHB CAPD Patients		1	1
Increase in Haemodialysis Sessions		2,494	1,825
Projected New Haemodialysis Patients		16	12
Total New Dialysis Patients		**17**	**13**

The projected increase in new dialysis patients (both haemodialysis and peritoneal dialysis) of 17 by 2020, and a further 13 by 2025, can be accommodated through increases in community based dialysis, i.e., home based peritoneal dialysis, or satellite haemodialysis. BHB should not plan for expanded capacity of hospital-based dialysis service.

5.12 Hospital Outpatient Visits

BHB outpatient service volume is incompletely and inconsistently tracked. The volumes in the table below are based on analysis of 2016/17 charge data for both hospital and physician charges. Individual charges are not consistently coded by "service code," with some charges assigned to the diagnostic or therapeutic cost centre providing the service, and others assigned to the BHB clinic or attending physician service.

In 2016/17, there were 22,025 Bermuda residents who used at least one of the BHB outpatient services listed below. 36% of all Bermuda residents visited BHB for an outpatient service (not including ER/UCC).

Exhibit 49: Actual and Projected BHB Outpatient Visits by Service

Service	Patients	Avg. Visits per Pat.	2016/17 Actual and Future Projected Visits			% Growth 16/17 to 2025
			2016/17	2020	2025	
Renal Dialysis	186	123.4	22,960	25,377	27,145	18%
Physiotherapy	1,254	5.7	7,188	7,419	7,575	5%
X-Ray	7,315	1.2	8,568	8,915	9,140	7%
Cardiology	3,713	1.6	6,098	6,780	7,295	20%
Fracture Clinic	2,782	2.0	5,674	5,724	5,740	1%
Surgical Outpatients Unit	5,188	1.1	5,952	6,145	6,258	5%
Chemotherapy	330	9.6	3,181	3,525	3,788	19%
Wound Care	372	12.3	4,576	5,095	5,494	20%
CT	2,245	1.2	2,780	2,985	3,130	13%
Ultrasound	2,995	1.2	3,696	3,802	3,872	5%
Home Care Programme	159	26.5	4,216	4,721	5,118	21%
Diabetes Centre	707	2.8	1,968	2,100	2,197	12%
Mammogram	1,567	1.1	1,754	1,840	1,891	8%
Day Hospital	314	7.3	2,295	2,496	2,638	15%
MRI	2,384	1.1	2,600	2,650	2,676	3%
Oncology	1,108	2.7	3,040	3,361	3,591	18%
Pain Management	677	2.3	1,565	1,657	1,720	10%
Endocrinology	824	2.6	2,175	2,244	2,288	5%
Cardiac Rehabilitation Services	142	8.2	1,159	1,318	1,436	24%
Psychiatry	555	3.4	1,864	1,881	1,890	1%
Occupational Therapy	254	4.3	1,082	1,080	1,072	-1%
Pre-Op Exam	1,157	1.1	1,242	1,327	1,387	12%
Brace Clinic	295	2.1	625	666	696	11%
Interventional Radiology	359	1.4	496	534	562	13%
Maternity	401	2.5	987	959	943	-4%
Nuclear Medicine	582	1.1	625	693	743	19%
Paediatrics	92	3.7	339	318	299	-12%
HBOT	13	13.4	174	189	197	13%
Infectious Disease	260	2.5	654	679	696	6%
Colposcopy	509	1.1	562	546	532	-5%
Nephrology	200	2.7	549	610	654	19%
Internal Medicine	279	1.6	433	439	441	2%
Medical Nutrition Therapy	160	2.4	389	402	411	6%
Palliative	97	3.6	348	396	434	25%
Lung Function Test	328	1.1	346	360	369	7%
Neurology	308	1.1	332	358	376	13%
Radiology	283	1.0	285	317	339	19%
Bone Density	274	1.0	275	303	323	17%

Service	Patients	Avg. Visits per Pat.	2016/17 Actual and Future Projected Visits			% Growth 16/17 to 2025
			2016/17	2020	2025	
Vascular Surgery	174	1.5	258	279	294	14%
Asthma Management	133	1.3	168	175	180	7%
PCMH	41	3.8	154	170	180	17%
Urology	79	1.4	111	127	139	25%
Speech Therapy	44	2.6	116	120	124	6%
Peritoneal Dialysis	16	7.0	112	118	123	9%
Laboratory	74	1.1	83	84	84	1%
Employee Health Services	8	1.0	8	8	8	4%
Grand Total	**22,025**	**4.7**	**102,591**	**110,461**	**116,147**	**13%**

The ambulatory services with the greatest percent increase in projected volumes from 2016/17 to 2025 include Cardiac Rehabilitation (24% increase), Palliative Care (25%), Cardiology (20%), and Wound Care (20%).

An early CSP implementation activity should be for BHB to improve the internal capability and capacity to measure and monitor outpatient clinical activity and performance. Planning for significant changes in ambulatory clinic services should be deferred until there is a better baseline picture of the current services and types of patients served in each area.

Examples include the proposed re-introduced congestive heart failure clinic and hypertension clinic. Many patients with these diagnoses are already receiving outpatient care but it is spread across the services listed in the **Exhibit 49**. Some of the activity for these clinics may come from a reorganization of existing ambulatory services, by creating a "one stop" clinic based on patient diagnosis. Other activity may come from new visits by patients who have not historically accessed BHB outpatient services.

6 Implementation Planning

BHB's Clinical Services Plan outlines BHB's future state role – defining what services will be provided, along with recommended initiatives to optimize delivery. This will enable BHB to meet the high standards of quality, patient experience and value needed to best serve the people of Bermuda. The changes are significant, and will require thoughtful planning, and diligent implementation over many years. It will be an iterative process: lessons will be learned, and changes will occur in the environment that will require the Plan to be refined as conditions and information changes. To support the transition from planning to action, the following section outlines critical success factors for implementation, implementation considerations, suggested timing, and risks/ mitigation strategies.

6.1 Critical Success Factors

6.1.1 Critical Success Factor #1- A Time for Action:

Throughout the CSP development process, it was extraordinarily clear the time for action is immediate. Many of the recommendations in this report have been considered and debated for some time, and the system has been waiting for change. BHB needs to leverage the momentum generated through the CSP process and begin to implement the recommendations.

Therefore, it will be important for BHB to:

- Communicate its plan in a timely manner to stakeholders
- Demonstrate progress against the Plan within the fiscal year, and define the priority actions in the FY18/19 Annual Plan
- Expand community engagement efforts to continue to secure and ensure continued support for the Plan

6.1.2 Critical Success Factor #2 – Visible and Meaningful Leadership:

Embarking on the changes outlined in the CSP is a significant undertaking, and BHB will only be successful with a unified and steadfast commitment from the full Executive Team. This commitment is critical to provide the necessary direction and support to staff and stakeholders during the period of change. To support this, the full BHB Executive Team should:

- Provide inspirational and visionary leadership to staff, system partners and the community
- Create methods to keep staff engaged and enable their participation
- Foster a culture that stresses the importance of continued collaboration with health system partners and ongoing communication

6.1.3 Critical Success Factor #3 –Strategy to guide the implementation planning:

The Implementation Strategy takes the Plan and puts it into action. The Plan, at this stage, requires collaboration and decision-making, to confirm the implementation approach and priorities. To support this, BHB should:

- Review/ finalize the prioritized actions for the next few years

- Consider which changes should be piloted in advance of complete roll out
- Create a detailed implementation plan, clearly defining accountabilities
- Identify interdependencies (especially with other major initiatives), and develop strategies to manage them effectively

6.1.4 Critical Success Factor #4 – Governance and Resourcing:

A project of this magnitude and complexity will require BHB, with respect to both governance and management, to:

- Determine the go-forward role for the CSP Steering Committee, and its role (if any) in supporting implementation
- Define the Accountable Executive (Executive Sponsor) for the implementation of the Plan. This person will have ultimate accountability for the successful implementation of the Plan. The executive(s) will need to drive it forward (building on current momentum), maintain organizational focus, manage emerging issues, etc. This role should be supported by a dedicated Activity Lead, to coordinate, manage, and support the change process
- Secure resources to provide project management/ execution support – and ensure sufficient capacity to manage all implementation requirements
- Identify and leverage change champions and advocates (including those already engaged in the process) to provide enhanced resources to support planning and implementation
- Establish forums to continue to partner and collaborate with external stakeholders engaged as part of the CSP development process

6.1.5 Critical Success Factor #5 – Tracking and Reporting Performance

Driving and sustaining the required changes will require BHB to:

- Determine the project governance/ reporting structure for the implementation of the CSP (e.g., leverage existing forums/ processes or establish new ones that will feed into the existing processes/ structures – i.e., accountability mechanisms in support of the Annual Plan – score cards and snapshots)
- For each major change implemented, use data to monitor progress, track impact, and make adjustments as required
- Develop a plan (either leveraging or supplementing existing structures) to communicate results to both internal and external stakeholders

6.1.6 Critical Success Factor #6 – Communication and Engagement

The CSP outlines significant and system-wide changes that will require coordinated change efforts to drive the Bermuda-wide transformation required. Achieving the changes required will necessitate buy-in, commitment, and partnership from physicians, staff, and health system partners. To achieve this, BHB must:

- Ensure regular and meaningful engagement of each of the stakeholder groups – both communicating information and seeking input. Important groups to note are:

- Medical staff –they are critical to achieving the desired changes and can support the proactive identification and resolution of potential issues
- BHB Staff - to support and deliver aspects of the CSP and associated developments.
- The community – their engagement and support with the changes will build trust and confidence in BHB

6.1.7 Critical Success Factor #7 – Maintain the Financial Sustainability of BHB

Working with the Ministry and the Bermuda Health Council, BHB will need to secure appropriate financing to ensure its financial health and sustainability.

The Office of the Auditor General has indicated that the Bermuda Hospitals Act 1970 requires BHB to "*break-even taking one year with another*". This is interpreted to mean that any deficit delivered in the current year must be offset in subsequent years by an equal surplus. The Auditor General has requested the BHB produce a Financial Recovery Plan (FRP) to show how it will comply with this requirement.

The BHB FRP will focus on cost reductions and revenue maximization. However, while financial sustainability is a prerequisite to BHB consistently providing high quality care, improving quality of care is not the primary goal of the FRP. BHB leadership and management will be implementing both the CSP and FRP simultaneously, which will stretch analytical, change management, and programme management office resources. BHB will need to ensure that implementation of short term initiatives of the FRP does not hinder longer term implementation of CSP initiatives, and vice versa.

6.2 Implementation Considerations

The Clinical Services Plan services/ initiatives recommended for BHB are listed below. The items highlighted in green are new BHB services or service delivery changes. The items highlighted in blue are existing BHB services. The items highlighted in yellow are services where implementation will be dependent on support from other partners (including government, other community health care providers, and offshore clinical partners). Within each colour coded section, the services/initiatives are ranked according to the extent that the proposed item supports the principles approved by the CSP Steering Committee to evaluate the CoP advice (see **Appendix B**, Principles and Criteria to Support Evaluation of CoP Advice).

Exhibit 50: Implementation Considerations and Major Impacts of Proposed Items in CSP

Service	CoP Advice	Rank re Principles	New Major BHB Investment?	Major Change in BHB Process(es)?	Major Impacts on Master Estate Plan?	Major Impact on Permanent HR/Staffing?	Major Technology Impact?	Implementation Considerations
Complex Skilled and Intermediate Skilled LTC	Include designated units	1	✓	✓	✓	✓		Align staffing (and funding) to each level of care
Short Stay IP Rehabilitation Care Unit	Include new designated unit	3	✓	✓	✓	✓		Recruitment of physiatry lead and additional therapy staff
Clinical Decision Unit	Include	8	✓	✓	✓	✓		Identify space and location
Step Down Mental Health Unit - Partial Hospitalization	Include new designated unit	10	✓	✓	✓	✓		Identify and develop appropriate day hospital space at MWI, which could be existing space or a 'virtual unit'
Acute Geriatric Service	Include	11	✓	✓	✓	✓	✓	Recruitment of geriatric service professionals
Comprehensive Antenatal Programme	Continue to provide, in partnership w/ other providers	12		✓				Work with Dept. of Health to monitor access to antenatal care
Interventional Radiology	Include development and refinement of business case	14	✓	✓	✓	✓	✓	Include in identification of offshore clinical partner
Case Management	Include expanded service	16	✓	✓		✓	✓	Coordinate with geriatric assessment and care pathway discharge planning
Standardized Care Pathways	Assume will be implemented across BHB	5	✓	✓			✓	Staged implementation with refinement of pathways used elsewhere
Short Term Residential Treatment for Substance Abuse Patients	Include	17	✓	✓	✓	✓		Align staffing and funding to provide this service

Service	CoP Advice	Rank re Principles	New Major BHB Investment?	Major Change in BHB Process(es)?	Major Impacts on Master Estate Plan?	Major Impact on Permanent HR/Staffing?	Major Technology Impact?	Implementation Considerations
Cardiology - Hypertension Clinic	Include and support external partners	20	✓	✓	✓		✓	Consolidation of activity for HTN patients seen in other BHB clinics
Long Stay Physically Disabled Patients	Include re BHB long-term care	23	✓	✓	✓	✓		Include in development of complex and intermediate LTC units
Rapid follow up Clinics	Include	24	✓	✓	✓	✓	✓	Review access (availability, frequency, and wait time) to clinics
Improved Matching of Surgical Modalities w/ Procedure Requirements	Include	25	✓	✓	✓		✓	Promote change in funding model and identify space to move selected procedures out of OR
CHF Clinic	CSP will assume re-establishment of clinic	27	✓	✓	✓	✓		
Dual Diagnosis Outreach	Cross train current BHB providers	31	✓	✓				
Gynaecology Minimally Invasive Surgery	Include	37	✓		✓	✓	✓	Surgeon training and equipment acquisition
Expanded Respite Care to Support ID Caregivers	Expand BHB service capacity	38	✓	✓	✓	✓		Include in staffing model and seek funding support
Acute Pulmonary Service	Ensure access to pulmonologist consults for KEMH inpatients			✓		✓		May be able to contract with community pulmonologist
Surgery by Visiting Surgeon	Implement strategies to smooth workload			✓				Include in identification of offshore clinical partner
Nephrology and Dialysis	Continue, with growth accommodated in external partners	4		✓				Confirm community partner capability (re quality standards) and capacity

Service	CoP Advice	Rank re Principles	New Major BHB Investment?	Major Change in BHB Process(es)?	Major Impacts on Master Estate Plan?	Major Impact on Permanent HR/Staffing?	Major Technology Impact?	Implementation Considerations
Patient Centred Medical Home	Include	7	✓	✓	✓	✓		Formalize programme, subject to pilot evaluation results
Asthma/COPD Chronic Disease Management	Continue, and support external partners	20		✓				Include referrals in care pathways
Metabolic and Diabetes CDM	Continue, and support external partners	20						Include referrals in care pathways
Long Term ID Residential Group Home	Continue to provide (no available partners) w/ funding	28						Review service delivery after register of ID population available
Inpatient Care for Complex ID Patients	Include re BHB long-term care	30		✓	✓	✓		Include in development of complex and intermediate LTC units
Hyperbaric Oxygen Therapy	Continue to provide	36						Establish and communicate criteria for identification of service candidates
ID Multidisciplinary Team Services	Restrict to Group Home and Inpatient clients	39		✓				
National Electronic Health Record	Promote & support national initiative	2					✓	Provide alignment with internal BHB information technology planning and implementation
In-Home Care	Assume development of national home care programme by 2025	6		✓				Support LTC Action Plan implementation
Vascular Surgery	Align with interventional radiology development	9	✓	✓	✓	✓	✓	Include in identification of offshore clinical partner
Palliative Care	Continue, with growth accommodated in external partners	13						Promote development of Bermuda end of life strategic plan
Pulmonary Service	BHB will work with partners to increase access	15		✓				Identify community capability and capacity

Service	CoP Advice	Rank re Principles	New Major BHB Investment?	Major Change in BHB Process(es)?	Major Impacts on Master Estate Plan?	Major Impact on Permanent HR/Staffing?	Major Technology Impact?	Implementation Considerations
Care Plan Prompt for Referral to CDM Service	Incorporate in Bermuda National EHR and care plans	19		✓			✓	Incorporate in pathways
National Disabilities Register to include Bermuda residents with Intellectual Disabilities	Incorporate in Bermuda National EHR	26					✓	Work with Ministry of Health to establish
Admissions for Drug Coverage	Assume avoided via clinic or home health care (i.e. possible external partners)	29						Work with Ministry of Health and insurers to change policy
Injection/Infusion/IV antibiotic clinic	Assume diversion from ER, but not necessarily BHB clinic	33		✓				Promote provision via primary care
Bariatric surgery	Work with external provider to develop	34					✓	Include in identification of offshore clinical partner
Health Promotion Partnership	Support external partners health promotion initiatives	41						
Paediatric Asthma Clinic	Do not include as BHB service							Paediatric asthma patients treated in Dream Clinic
Overarching Advice – BHB Supports Partner CDM Initiatives	BHB as central resource to support partners in delivery of CDM							

6.3 Risk & Mitigation Strategies

To support effective implementation of the Clinical Services Plan, it is important to be aware of the potential "risks" or areas where implementation may be impacted by internal or external factors. A broad overview of potential risks and corresponding mitigation strategies is provided below.

Risk #1: Introducing change in a politically charged environment

BHB will be implementing this Plan during a time of significant financial pressures, political change with the formation of the new government, and competing economic interests.

Mitigation Strategies:

- Clear communication regarding the intent and direction of the Plan to improve the health of the population, the quality of care available, and deliver better value for money
- Establish sound intelligence gathering tactics at the local level to enhance BHB's readiness to respond to the unknown
- Ensure those charged with speaking publicly about the Plan are well prepared to respond to both its supporters and resistors
- Identify local spokespeople to speak to the Plan and its benefits (e.g., Steering Committee members, CoP participants)

Risk #2: Public Expectations

Bermuda residents are very aware of health care challenges within BHB. Awareness and sensitivities exist with respect to quality issues, patient flow, and bed capacity. The public has voiced its expectation that there be positive change and clear direction.

Mitigation Strategies:

- Frequent and transparent communication that is sensitive to health literacy levels and embraces both traditional as well as social media concepts
- Sound intelligence gathering tactics at the local level to enhance the BHB's readiness to respond to the unknown
- Simple, clear and consistent messaging from BHB spokespeople and BHB staff and Board members

Risk #3: Quality

Improvements in quality will result in improvements in the patient experience and value for money. The impact of not achieving improvements in quality and patient outcomes, is that Bermuda residents may seek to obtain their care from offshore providers or from local entrepreneurs able to "cherry pick" those services that they will provide.

Mitigation Strategies:

- Clear communication from the BHB to the public and providers pertaining to the quality agenda
- Regular reporting of BHB initiatives such as standardized care pathway development and addition of acute geriatric services
- Partnership and cooperation with other providers who share BHB's quality standards

Risk #4: Physician Engagement

The importance of physician engagement and support cannot be understated. The Plan places a high degree of emphasis on working with providers. This is a new environment and the CSP will not be successful unless physicians (both within and outside BHB) are fully and thoughtfully engaged.

Mitigation Strategies:

- Identify “quick win” examples that will respond to challenges currently facing physicians
- Communicate in a manner that is respectful of the contribution they can make as well as their patient care demands
- Demonstrate improvements to the patient care experience and address frustrations related to care management

Risk #5: Labour and Labour Relations

Bermuda does not have all of the skilled resources required to implement the Clinical Services Plan. As well, there will be changes to the workforce that will be needed to meet the objectives of the CSP to provide the necessary hospital services within the physical capacity of BHB. The health care workforce is heavily unionized and changes to the Collective Bargaining Agreements require time and cooperation.

Mitigation Strategies:

- Establish mechanisms to identify and address where labour issues may impact the plan
- Examine all options for providing the resources required, including clinical affiliation, recruiting, training, and contracting

Risk #6: Another Plan to Plan

BHB will need to message that they are prepared to act and to act in a timely manner with respect to the CSP. Many of the CSP’s initiatives have been proposed before, but were not successfully implemented.

Mitigation Strategies:

- Identify “quick wins” for 2018/19 and for each successive year
- Communicate actions and involve a wider group of providers and public in the various working groups needed to implement the CSP

Risk #7: Gaining Consensus across the Continuum of Care

Bermuda’s healthcare provision is not based on an integrated health system which could limit BHB’s ability to deliver on the CSP.

Mitigation Strategies:

- Communicate actions and involve the broader Bermuda health system in the various working groups needed to implement the CSP
- Work with the government to support the implementation of the CSP.

7 Health System Implications

The Clinical Services Plan outlines the services, and service volumes that BHB will provide to achieve its organizational vision, and clarifies the role of BHB within Bermuda's health system. BHB's expenditures represent 44% of all Bermuda health care expenditures, more than all other providers of direct health care for Bermuda residents combined.[19]

The CSP has made assumptions about the future capability and capacity of other health care providers in Bermuda, and has made assumptions about future changes in health system policy and national initiatives. While outside the mandate and control of BHB, there are implications for the broader Bermuda health system associated with implementation of the BHB CSP, and some of these are highlighted here.

7.1 Universality of Health Care

The Bermuda Minister of Health recently made a statement[20] that:

> *"Mr Speaker, The Ministry of Health is committed to progressing toward the goal of universal healthcare, where every person has access to the basic health services they need without suffering financial hardship."*

Through the CSP development, it became clear that some aspects of the proposed BHB role were considered necessary to meet the needs of the under- and un-insured population (e.g., PCMH). **If universal healthcare were to be introduced in Bermuda, and changes were made to support primary care providers to play a comprehensive care management role, then the BHB role (particularly with respect to the PCMH) and projected bed requirements should be reviewed.**

Currently, BHB already plays a large role in the care of the under- and un-insured population. In 2016/17 indigent discharges from KEMH acute care beds had an average length of stay more than three times as long as the average KEMH acute LOS, and spent more than one third of their time in hospital waiting for discharge.

Exhibit 51: 2016/17 KEMH Acute Care Discharge Length of Stay by Subsidy Category

Subsidy Category	Cases	Average LOS	% ALC Days
Indigent	***256***	***34.4***	***34%***
Age	2,167	17.8	32%
None	2,695	6.5	9%
Youth	909	3.3	0%
Total	**6,027**	**11.2**	**25%**

[19] Bermuda Health Council (2017) National Health Accounts Report 2016: Bermuda health system finance and expenditure for fiscal year 2015-2015. Bermuda Health Council.
[20] Ministerial Statement by the Minister of Health, The Hon. Kim N. Wilson, JP, MP Friday, October 6, 2017

7.2 Health System Performance Measurement and Monitoring

The analysis of patterns of utilization by Bermuda residents conducted for the CSP project have highlighted some limitations in Bermuda health care data that impact the ability to accurately and comprehensively measure and monitor health system performance. Some examples of these limitations are listed in the following sections.

7.2.1 Off-Island Care for Bermuda residents

The 2007 Johns Hopkins Medical International Estate Master Plan Phase 1 Report examined opportunities to expand the scope of services provided by BHB. When they looked at records of off-island care, they found that:

> *"The information obtained from the insurers did not allow for reliable quantitative analysis of the number of off-island cases due to incomplete diagnosis code information. As such, the predominantly qualitative conclusions that were made are limited to trends and to the proportion of off-island care, relative to the care provided at KEMH at the specialty level."*
>
> *"Although substantial efforts were made to gather appropriate data from insurers, the type, completeness, and detail-level of the information provided allowed a limited analysis, and therefore, conclusions were limited to trends and to the proportion of off-island care relative to the care provided by BHB at the specialty level. Reliable quantitative analysis of the number of off-island patients (or cases) versus BHB patients by specialty, disease, or procedure was not possible."*

Ten years later, the data is no better; it is still not possible to definitively identify the number of Bermuda residents who travel overseas for specific hospital services that could be provided by BHB, or to determine the real potential to "repatriate" this care.

The Bermuda Health Council has recently published a report on use of overseas health care by Bermuda residents.[21] The Health Council warned about coding system inconsistencies (since data comes from multiple external sources), but the magnitude of the problem only became clear once the dataset was provided. The procedure data reported on claims includes:

- Free text service descriptions
- U.S. CPT procedure codes
- Hospital Revenue Codes
- ICD-9-CM procedure Codes
- Dental Procedure Codes

The total overseas charges reflected in the 2015/16 fiscal year data set provided by the Bermuda Health Council were $65.7 million. There were 4,615 distinct procedure codes recorded in the dataset, but only 31 codes (including "No Code") accounted for 60% of all charges.

[21] Bermuda Health Council (2017). "Overseas Care: A Synopsis of Trends for the Islands of Bermuda". Bermuda Health Council: Bermuda.

Exhibit 52: Off Island Claims Data 2015/16[22] by Procedure Code by Descending Charges

Procedure Name/Code (as reported in dataset)	Sum of Cost	% of Total	Cumul. %
No Code	$11,522,833	17.5%	17.5%
Room and Board	$8,193,492	12.5%	30.0%
General	$6,488,960	9.9%	39.9%
Office/outpatient visit est	$972,346	1.5%	41.4%
Intensity modulated rad tx dlvr simple	$901,703	1.4%	42.8%
Intensity modulated rad tx dlvr complex	$808,547	1.2%	44.0%
Medical/Surgical/Gynaecology	$788,271	1.2%	45.2%
Radiation treatment delivery	$745,786	1.1%	46.3%
999999999	$717,433	1.1%	47.4%
Fixed wing air transport	$697,560	1.1%	48.5%
AAMB	$687,075	1.0%	49.5%
RX	$677,355	1.0%	50.6%
HOTEL	$497,784	0.8%	51.3%
Emergency department visit	$485,510	0.7%	52.0%
Chemo IV infusion 1 hr	$465,670	0.7%	52.8%
T0006	$417,866	0.6%	53.4%
Subsequent hospital care	$377,312	0.6%	54.0%
Office/outpatient visit new	$376,116	0.6%	54.5%
PET image w/CT skull-thigh	$365,052	0.6%	55.1%
SNF	$353,622	0.5%	55.6%
HOTELP	$344,371	0.5%	56.2%
VST	$330,670	0.5%	56.7%
Tissue exam by pathologist	$297,569	0.5%	57.1%
MRI brain stem w/o & w/dye	$283,993	0.4%	57.5%
RXGEN	$251,518	0.4%	57.9%
Office consultation	$246,304	0.4%	58.3%
Guidance for radiaj tx dlvr	$244,862	0.4%	58.7%
Intermediate ICU	$240,091	0.4%	59.0%
Ipilimumab injection	$236,094	0.4%	59.4%
Other Implants	$235,717	0.4%	59.8%
Neck spine fuse & removal below c2	$229,735	0.3%	60.1%

The variability and lack of specificity in procedure reporting on the claims limits their utility for analysis of overseas health services. The Bermuda Health Insurance Claims Regulations[23] define the data to be submitted with a claim, and this includes *"#12: Relevant current diagnostic and procedural code*".

[22] Provided by the Bermuda Health Council.
[23] HEALTH INSURANCE (HEALTH SERVICE PROVIDERS AND INSURERS) (CLAIMS) REGULATIONS 2012 - SCHEDULE 1 (paragraph 4(1)(b))

The Bermuda Health Council should review the diagnostic and procedural coded data provided to it on health service claims, and provide insurers with more specific guidelines for reporting of such data, so as to improve the specificity and comparability of the data elements across providers. The Bermuda Health Council has a legislated responsibility to provide information to the public on the incidence of illness, and greater standardization of diagnostic (and procedure) coding would assist them (and BHB) in fulfilling their obligations.

7.2.2 Importance of National Electronic Health Record

Community of Practice participants provided many examples of where transitions of patients between providers or referral of patients for primary or community care were hindered by limitations in ability to share clinical information or advise providers of the services their patients have received elsewhere in the health system. There were also areas where planning to respond to population needs for services has been hindered by lack of understanding of the prevalence of Bermuda residents with certain conditions (e.g., people with intellectual disabilities, people with chronic diseases).

The Bermuda Health Strategy: Priorities for Bermuda's Health System Reform 2014-2019 provides 14 goals for health system reform. Two of these goals were:

- An integrated health IT system shall be established throughout the health sector to improve efficiency and quality

Other developed countries have made development of national health care databases a priority, as reported in a recent Organisation for Economic Co-operation and Development (OECD) publication.[24] The OECD surveyed its members and found that:

> *"Countries are moving forward to develop databases from electronic health records for monitoring and research. Twenty-two of twenty-five countries report a national plan or policy to implement electronic health records and 20 countries report starting its implementation. Eighteen national plans include the secondary use of the data. Thirteen countries are using data from electronic record systems to monitor public health, eleven countries to conduct health research and nine countries to monitor patient safety. Barriers to creating and analysing databases from electronic health records reported by countries include concerns with current legislative frameworks, particularly as they apply to data privacy protection (16 countries); problems with the quality of data within EHRs (14 countries); and resource constraints to database creation (nine countries) and to the de-identification of data to protect privacy (seven countries). Data quality concerns include a lack of clinical terminology standards; improper coding; missing data; and variable quality across health care providers*."

In support of the integrated health information system goal, the National Health Plan (2012) stated that:

> *"Bermuda's healthcare sector requires improved communication and coordination between stakeholders, to which an integrated health IT system can contribute significantly. In particular,*

[24] OECD. "Strengthening Health Information Infrastructure for Health Care Quality Governance - Good Practices, New Opportunities and Data Privacy Protection Challenges". 15 May 2013

any system introduced must provide sufficient access and support to primary care physicians, and tie in laboratories and diagnostic facilities; as this will make it possible to improve quality of care, and reduce costs to the system. Collaboration between providers and payors will be required to build on current electronic data interface capability, and extend it further to include integrated electronic health records."

The authors estimated that it would take five years to develop and implement a system that would cover 75% of the health sector.

The "Bermuda Health Action Plan: Priorities for Bermuda's Health System Reform 2014-2019" included "*identify essential data elements in population health information system and implement unique patient identifier*" as one of the 20 health priority areas. The Bermuda Health Council has been leading a collaborative project to develop a Unique Patient Identifier (UPI) for each resident in Bermuda, and has emphasized this as a necessary step to support the eventual introduction of an integrated electronic health system.

The size and influence of BHB in the Bermuda health system is such that it would make sense for planning for both standardization of data elements and technology be done for both BHB and Bermuda at the same time. **Coordinated implementation of the BHB electronic medical record and data element standards with the integrated electronic health system would support national measurement of disease prevalence, communication of clinical data across all health care sectors, and improved patient experience through reduction in duplicative services and delays waiting for transfer of information between providers.**

7.2.3 Standardization of Data for International Comparisons

As a small country, Bermuda is dependent on comparisons with other international health systems to help guide identification of opportunities for health system improvement. BHB also must look overseas for benchmarks and planning guidelines to support performance improvement, since there are no in country peer hospitals.

The recent Health in Review, 2nd Edition[25], includes valuable comparisons of Bermuda with OECD countries using a standard set of indicators developed for performance comparisons among OECD countries. The report highlights areas where the Bermuda performance on indicators is an outlier compared to most other countries. Because of the small size of Bermuda, there can be instability in measurement results from year to year, and it becomes necessary to pool data over a longer period (e.g., five years) to have a reliable rate. This complicates direct comparisons of indicators.

Some of these apparent outliers likely reflect differences in collection and categorization of Bermuda data, compared to the OECD standards:

- Bermuda is reported to have one of the lowest average lengths of stay in hospital following AMI. AMI is the highest volume diagnosis where patients are admitted via the ER, stabilized, and then

[25] Ministry of Health (2017). Health in Review: An International Comparative Analysis of Bermuda Health System Indicators, 2nd Edition. Ministry of Health: Bermuda

transferred overseas for care. The apparent short Bermuda LOS is because many of these short inpatient stabilization stays are included in the calculation of the average.

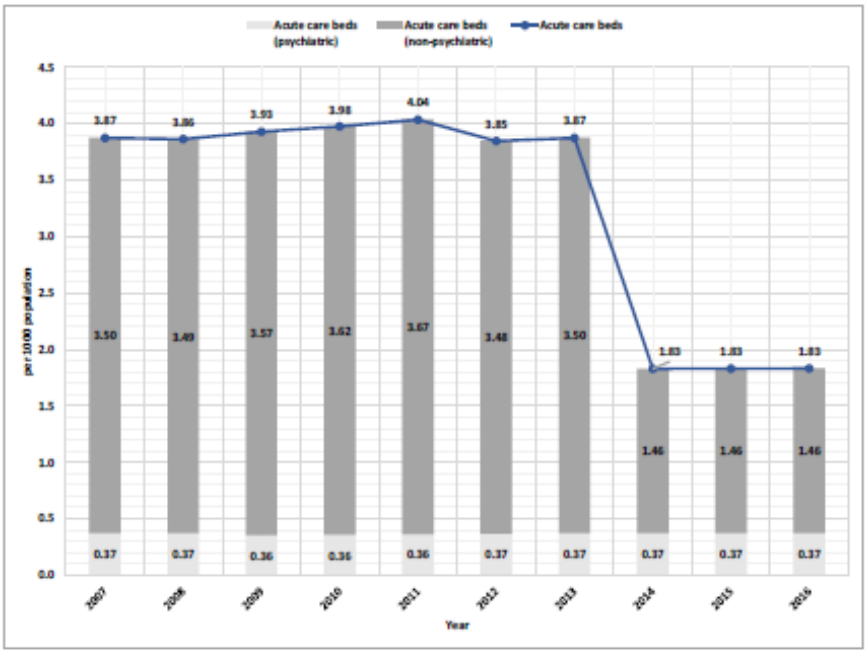
- Bermuda is reported to have the second lowest rate of COPD (Chronic Obstructive Pulmonary Disease) admission per population among the OECD countries. Bermuda is one of the few countries to still use ICD-9 for diagnostic coding. The newer ICD-10 system allows more specific categorization of COPD diagnoses. Under ICD-9 COPD patients are assigned to diagnoses also used for asthma patients, leading to over reporting of asthma prevalence and under reporting of COPD prevalence.
- The five-year rate of diabetes related major lower amputation is the fourth highest among the countries included in the comparison. But the five-year trend for Bermuda includes 2012 when there were virtually no amputations reported, 2013 when rates were equal to the highest in the world, and 2014 and 2015 when rates followed the OECD average. The instability in this measure suggests that there may be inconsistencies from year to year in coding of whether amputations were diabetes related, and calls in to question the validity of the comparisons.
- Based on five years of data, the Bermuda in-hospital AMI case fatality rate is the second lowest among the countries in the comparison. But looking at just the 2015 results, the Bermuda rate is the fifth highest, and more than three times higher than it was in 2013.
- The comparison of acute care (curative) discharges per population suggests that Bermuda has the lowest ratio of discharges per population among all the countries, and the lowest acute care (curative) bed days per capita. However, only the beds in the BHB Acute Care Wing were categorized as acute care (curative) beds. This excludes discharges from overflow, maternity, psychiatry, and paediatric beds, contrary to the OECD guidelines for bed categorization.[26] Even within BHB, there is inconsistency in what units are considered to be acute care units.

The change in BHB bed categorization is obvious in the bed per population trend chart included in the Health in Review Report. The big drop in the reported beds per population in 2014 (i.e., corresponding to the opening of the ACW) should raise flags about comparability of the Bermuda data over time, and comparability with the data from other OECD countries, particularly where Bermuda appears to be an outlier.

[26] The discrepancy in bed categorization has been reported, and will be corrected in the revised Health in Review report.

Exhibit 53: Excerpted Table of Bermuda Acute Care Bed per Population Trend in Health in Review Report

Figure 5.2.3 Curative (acute) care beds per 1000 population, Bermuda 2007-2016



SOURCE: Bermuda Hospitals Board

If Bermuda (and BHB) health system performance compared to international peers is to be used to help guide quality improvement and establishment of policy priorities, it will be necessary to establish consistency and comparability of the data used to support the analyses of performance.

7.3 Health System Partnerships

BHB has adopted the IHI Triple Aim framework with the goals of:

- Improving the patient experience of care (including quality and satisfaction);
- Improving the health of populations; and
- Reducing the per capita cost of health care.

While the Bermuda Ministry of Health and other key health system stakeholders have not explicitly adopted the Triple Aim framework, CSP project Steering Committee members and other informants expressed support for the Triple Aim framework.

IHI has described five components of a health system that would meet the Triple Aim goals[27]:

- Focus on individuals and families
- Redesign of primary care services and structures
- Population health management

[27] IHI Triple Aim Concept Design. http://www.ihi.org/Engage/Initiatives/TripleAim/Documents/ConceptDesign.pdf

- Cost control platform
- System integration and execution

As the provider of hospital care in Bermuda, BHB can play a major role in cost control and system integration, and can work to improve patient experience with respect to the services that BHB provides. But the goals of improving population health and reducing the per capita cost of care in Bermuda require cooperation and collaboration among all health system stakeholders.

The proposed limited scope of services in the CSP shows that BHB does not aspire to be the provider of all health care in Bermuda. But much of what BHB does plan to do requires the support of health system partners. While BHB may have been perceived in the past as viewing other stakeholders as competitors, **a key message of the CSP is that BHB wants, and needs, to partner with other health care providers and government that share the goal of improving the health of Bermuda residents through the provision of high quality health care services**.

The table below summarizes alignment of some of the strategic initiatives underway in Bermuda, and shows recommendations for programme and service initiatives that are included in BHB's CSP that would support achievement of these strategies.

Exhibit 54: Ministry of Health and Seniors Roadmap 2017 – 2019: Mapping of Ministry Initiatives 2014 to 2019

Bermuda Health Reform Strategy 2014-2019	Bermuda Health Action Plan 2014-2019	Long-Term Care (LTC) Action Plan 2017	BHB CSP Supporting Initiative
1. Access to basic health **insurance coverage shall be assured for all residents** of Bermuda to ensure access to essential healthcare and protection from financial risk	16. Develop health financing reform model toward increasing national capacity for achieving coverage for all residents and increased access to mental health and primary care (BHeC)		Ongoing operation of the Patient Centred Medical Home to support un- and under-insured Bermuda residentss
2. Encourage and expand the **use of outpatient facilities and preventive care** to allow the hospital to focus on acute care	15. Introduce HIP and FutureCare benefits to promote wellness, encourage self-management of health, enable ageing in place, better manage chronic disease and direct care to cost-effective settings (HID)	D9. Review insurance benefits to improve value of home care services such as personal home care and palliative care (BHeC/HID)	Establishment of clinical decision unit and rapid follow up clinics (including CHF and hypertension) to divert ER patients from inpatient admission. Shift IP surgery to ambulatory, and medical procedures out of main OR

Bermuda Health Reform Strategy 2014-2019	Bermuda Health Action Plan 2014-2019	Long-Term Care (LTC) Action Plan 2017	BHB CSP Supporting Initiative
4. **Streamline use of overseas care** to efficiently meet the medical needs of the population and contain healthcare costs	14. Increase access to cost effective, high quality, specialty medical care via clinical affiliation agreements with local and overseas providers (BHB)		Establish clinical partnership with North American or other hospital(s) to support access to specialized care, and transition to on-island service
5. **Mechanisms to pay healthcare providers** shall assure optimal quality to patients and maximum efficiency to the health system to contain costs and improve health outcomes	6. Develop post-acute care programme to provide rehabilitative and long-term care in a more appropriate and cost-effective setting (HID)	D10. Redesign reimbursement rates for hospital long term stays, for utilization and cost control to ensure system sustainability and to enact post-acute care initiative (MOHS/BHB)	Proposed development of funding/ reimbursement principles and re-design of payment methods to optimize adherence to principle
6. An integrated **electronic health system** shall be established throughout the health sector to improve quality of care and efficiency of the health system	20. Identify essential data elements in population health information system and implement unique patient identifier (BHeC)		Promote and support national electronic health record initiative. Implement ICD-10. Support national registries of Bermuda's residents with chronic diseases and intellectual disabilities
7. Implement strategies to meet the **long-term healthcare** needs of seniors and persons with chronic illnesses, and physical, cognitive or mental disabilities to better provide for the needs of vulnerable populations and manage costs	4. Increase number of available beds in the community and identify ways to decrease the cost of care without compromising quality (BHB) 5. Enable the capacity in the community to deliver interventions for older adults to maintain an independent life (ADS)	A1. Identify the gaps, challenges and priorities to providing quality LTC services, in accordance with the Residential Care Home and Nursing Home Act &proposed standards (ADS) C5. Amend the Residential Care Home and Nursing Home Act, regulations and create standards (ADS) C8. Create a 3 to 5-year Long Term Care Strategy and Action Plan (ADS) C6. Address community treatment orders and consider mental capacity & receivership requirements, as part of the Mental Health Act Review (BHB)	Implement short stay inpatient rehabilitation unit. Establish complex skilled and intermediate skilled LTC units. Implement specialized geriatric assessment service. Expand case management services. Support development of national home care programme by 2025

Bermuda Health Reform Strategy 2014-2019	Bermuda Health Action Plan 2014-2019	Long-Term Care (LTC) Action Plan 2017	BHB CSP Supporting Initiative
8. Regulate **standards of clinical care** for all healthcare facilities and providers that are equivalent to best practice models	13. Enhance regulation of health service providers through licensing and registration (BHeC) 17. Improve consistency in appropriate evidence based screening, testing and treatment across the system to increase focus on neglected areas and reduce medically unnecessary interventions (BHeC)	A2. Create long-term care accreditation standards (Age Concern) C7. Strengthen Senior Abuse Register operational procedures to improve enforcement (ADS)	Develop and implement standardized care pathways. Support development of quality standards for community providers (e.g. dialysis, antenatal care, diagnostic imaging)
9. Bermuda's health system shall be **financed through the most cost-effective means** available to reduce complexity and duplication and improve efficiency	16. Develop health financing reform model toward increasing national capacity for achieving coverage for all residents and increased access to mental health and primary care (BHeC)	D11. Compile available data on existing LTC financing and expenditure across ministries for improved financial planning (MOHS)	Proposed development of funding/ reimbursement principles and re-design of payment methods to optimize adherence to principle
10. Update **health and insurance regulation** to reflect current technologies and pricing and utilization of services	18. Identify and regulate "outliers", health service providers whose diagnostic ordering patterns are significantly beyond the norm (BHeC) 19. Improve access to and rational use of safe, effective, and quality medicines, medical products and health technologies via implementation of Health Technology Reviews (BHeC)		Identification of critical mass standards for specialized services and establishment of clinical partnership(s) with North American (or other) hospital(s) to support provision on care on island

Bermuda Health Reform Strategy 2014-2019	Bermuda Health Action Plan 2014-2019	Long-Term Care (LTC) Action Plan 2017	BHB CSP Supporting Initiative
11. Implement a comprehensive approach to **health promotion** which encourages healthy lifestyles and involves health professionals and organizations to ensure the Well Bermuda population goals can be achieved	3. Halt the rise in obesity and diabetes in Bermuda with rates in adults no higher than 34.4% and 12.2% respectively (DOH) 8. Focus on reducing NCD risk factors (obesity, overweight, blood pressure, alcohol, tobacco, cardiovascular disease, asthma, COPD) (DOH/ OCMO) 10. Reduce risk factors associated with violence and injuries with a focus on road safety, preventing child injuries, and violence against children, women, and youth (DOH)	E13. Implement a public awareness campaign to increase community knowledge of the available resources to assist persons with LTC needs (ADS)	Support community and government partners in health promotion initiatives. Provide selected CDM and secondary prevention clinics (e.g. Asthma/ COPD, Metabolic and Diabetes)
12. **Partner with physicians and the broader healthcare community** to achieve health reform goals and improve the coordination of healthcare delivery to ensure the best outcomes possible for patients and efficient use of healthcare resources	11. Develop guidance document for medical workforce planning that would meet the future health needs of the population (OCMO) 12. Develop policies and procedures for complaints handling and registration requirements for statutory professional bodies (Medical Council and Dental Board) (OCMO)	B3. Identify an agency that will provide formal LTC workers with a variety of opportunities to extend and build on their knowledge and skills (ADS) B4. Identify agencies/partners that will support caregivers by providing families and volunteers with access to LTC workshops and other forms of informal training (DAC)	Development and implementation of evidence-based standardized care plans, including post-acute care. Monitoring and reporting of adherence to care protocols to all physicians

7.4 Health Promotion, Illness Prevention, and Chronic Disease Management

A focus of the emphasis on illness prevention and health promotion is better management and avoidance of chronic disease. Over the past three years, BHB has had a 9.3% increase in reported secondary diagnoses, with large increases for hypertensive diseases, diabetes, heart disease, CHF, and other high prevalence chronic diseases.

Exhibit 55: BHB Acute Care Secondary Diagnoses by Fiscal Year

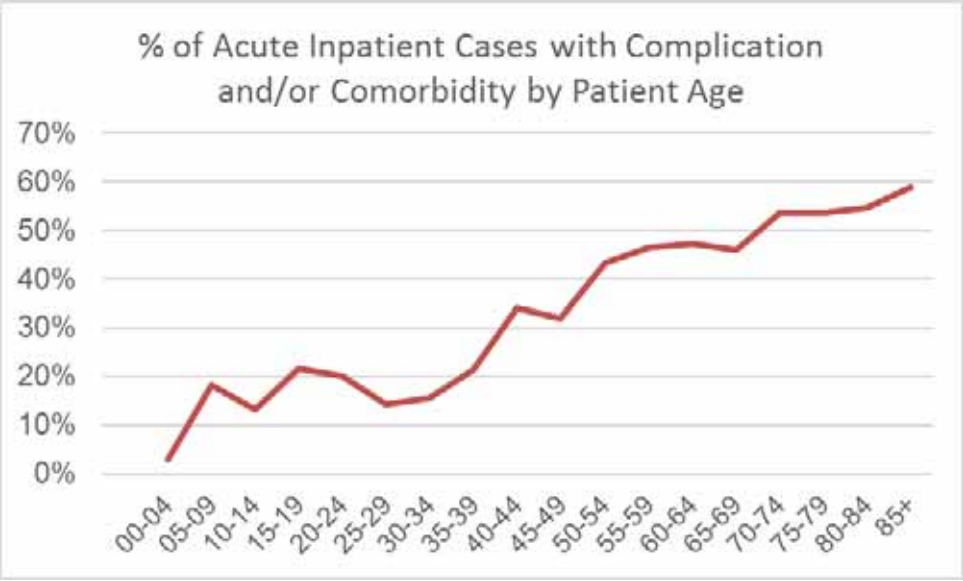
Secondary Diagnoses	2014/15	2015/16	2016/17	Increase 14/15 to 16/17	
				Dx	%
Grand Total	**22,061**	**24,114**	**24,102**	**2,041**	**9.3%**
Hypertensive Diseases	***2,145***	***2,247***	***2,457***	***312***	***14.5%***
Diabetes	***1,150***	***1,230***	***1,288***	***138***	***12.0%***
Renal Failure	1,061	1,075	1,027	- 34	-3.2%
Electrolyte and Acid Base Disorders	789	858	866	77	9.8%
Other Forms of Heart Disease	***710***	***814***	***824***	***114***	***16.1%***
Congestive Heart Failure	***533***	***585***	***666***	***133***	***25.0%***
Atrial Fibrillation and Flutter	551	572	610	59	10.7%
Other Mental & Behavioural	568	694	602	34	6.0%
Anaemias	578	560	528	- 50	-8.7%
Other Dermatologic Conditions	367	454	468	101	27.5%
Asthma	***433***	***522***	***431***	***- 2***	***-0.5%***
Malignant Neoplasm	402	339	385	- 17	-4.2%
Urinary Tract Infection	321	351	367	46	14.3%
Other Disorders of The Nervous System	330	278	342	12	3.6%
Coagulation Defects & Other Haem. Conditions	261	293	324	63	24.1%
Other Diseases of The Respiratory System	317	312	317	-	0.0%
Disorders of Thyroid Gland	255	271	312	57	22.4%
Pneumonia	289	288	308	19	6.6%
Dementia	***238***	***240***	***300***	***62***	***26.1%***
Sepsis	206	218	262	56	27.2%
Other Cardiac Arrhythmias	218	248	262	44	20.2%
AMI	244	219	262	18	7.4%

Bermuda categorizes acute care discharges using the U.S. Diagnosis Related Group (DRG) system, which subdivides cases by presence or absence of "complications or comorbidities" (CC). Cases with CC's have longer lengths of stay and higher costs of care. The table and graph below show that the percent of discharges with CC's increases with age, with more than half of patients age 70 and older having complications or comorbidities. The overall average BHB LOS for patients with CC's or major CC's (MCC's) was 21.2 days, more than three times as long as the average LOS patients without CC's or MCC's.

Exhibit 56: BHB 2016/17 Acute Care Discharges by Age Cohort - % with Complications or Comorbidities (CC) or Major Complications or Comorbidities (MCC)

Age Cohort	Cases	% with CC or MCC	Average LOS	
			Without CC or MCC	With CC or MCC
00-04	733	3.0%	3.4	3.5
05-09	66	18.2%	2.0	2.7
10-14	53	13.2%	2.8	7.0
15-19	88	21.6%	3.0	7.7
20-24	159	20.1%	3.2	5.8
25-29	274	14.2%	3.2	5.8
30-34	348	15.5%	2.9	4.8
35-39	329	21.3%	3.4	9.8
40-44	212	34.0%	3.1	8.3
45-49	251	31.9%	4.4	22.5
50-54	307	43.3%	4.6	9.1
55-59	409	46.5%	5.6	18.3
60-64	485	47.2%	5.3	20.5
65-69	454	46.0%	5.4	14.0
70-74	471	***53.5%***	10.1	33.4
75-79	393	***53.7%***	7.2	23.8
80-84	437	***54.7%***	13.8	27.9
85+	558	***58.8%***	14.7	30.6
Total	**6,027**	***36.5%***	**5.6**	**21.2**

Exhibit 57: 2016/17 KEMH Acute Discharges - % of Patients with Complication/Comorbidity by Patient Age



With an aging population, if rates of chronic disease continue to be high, then this is likely to further increase pressure on the BHB bed capacity.

While BHB is clearly impacted by the prevalence of chronic disease and the health status of the population it serves, **the CSP does not incorporate significant increased BHB investment and service capacity in support of chronic disease management and health promotion**.

BHB's vision for its role in chronic disease management (CDM) is as a support to grow a more robust solution for CDM in Bermuda. BHB can play a quality leadership role, but will not necessarily be responsible for the direct public interventions required to reduce the incidence of chronic disease. BHB will support public self-management of chronic disease.

BHB will provide leading practice models and establish quality standards for CDM. As the acute care facility for the island and with the largest cohort of skilled healthcare practitioners, **BHB is in the best position to facilitate coordinated assessment and referral of patients to partners who are best able to impact population health status.**

There will be situations, particularly for the un- and under-insured, where there may be gaps in availability of community-based CDM services, and where BHB will be required to play a direct service role. As well, during development and refinement of services, BHB may need to temporarily assume direct service roles as gaps are identified and partner organizations transition fully to fill the gaps. BHB will work with and support partners such as primary care physicians, the Department of Health, and community-based health and social service agencies, to implement a coordinated national approach to CDM. But BHB's priority will always be to identify and support partners in their provision of direct CDM service to the public, where partners who are willing and able to meet quality standards are available.

BHB recognizes that effective chronic disease management must be rooted in a broad-based approach across the education, healthcare, and social service sectors throughout Bermuda. **BHB recognizes the critical role of primary care providers in prevention and management of chronic diseases and views partnerships with community doctors as essential to the success of CDM.**

BHB strongly supports the recent announcement of the Ministry of Health to establish a registry of patients with Chronic Diseases in Bermuda.

7.5 Long-Term Care (LTC) Reform

The Bermuda LTC Action Plan describes the Complex Skilled and Intermediate Skilled levels of care. A description of the needs of patients for each level of LTC is shown in the assessment form, listed in **Appendix G**. The only setting identified in the Action Plan for Complex Skilled Care was KEMH, however, Intermediate skilled levels of care are provided at KEMH, Lefroy House, Sylvia Richardson Home and Westmeath. The projected inpatient hospital beds for BHB include beds for these ALC levels of care.

The Bermuda LTC Action Plan also describes the Personal Care, Intermittent Skilled Nursing, Cognitive Care level of care. This level of care was identified as being provided in both KEMH and Community Based Care Homes.

Exhibit 58: LTC Action Plan Definition of Personal Care Level of Care

Level of Care	Definition	Setting
Personal Care, Intermittent Nursing Care, Cognitive Care	Shared housing, group home, assisted living for meals, accommodation, and self-care including mobility, supervision for safety, medications, Mild-moderate dementia care. Access to rehabilitation/therapeutic services. Access to mental health services	KEMH and Community Based Care Home

The CSP project has concluded that BHB should not provide the Personal Care, Intermittent Nursing Care, Cognitive Care level of long-term care, either in hospital beds, or in an off-site facility. However, the small number of patients currently in the BHB long-term care beds who require this level of care should be assumed to remain in BHB until the capacity and capability of the community based care homes are enhanced and able to take these patients. These patients should be assumed to still require BHB beds in 2020, but by 2025 they should be accommodated in community based care homes.

Once community based care homes can assume responsibility for patients requiring this level of care, BHB can focus on long-term care patients requiring a level of care that should be provided in a hospital environment (i.e., Complex Skilled and Intermediate Skilled long-term care). Patients will benefit from having the opportunity to live in a less institutional environment and not be as exposed to the iatrogenic risks of living in a hospital.

The ability of BHB to cease offering this level of care is contingent on the successful implementation of the Bermuda LTC Action Plan, and the increase in capability and capacity of community care homes to assume sole responsibility for this level of care. Enabling legislation may also be required to facilitate appropriate placement of patients in the appropriate levels of care.

The Bermuda Long-Term Care Action Plan defines a single level of home care:

Exhibit 59: LTC Action Plan Definition of Home Care Level of Care

Level of Care	Definition	Setting
Home Care	Personal care and / or homemaking assist, episodic skilled nursing visit / consult, cognitive care for safety, adult day care	Private Home

The Post-Acute Care CoP discussed three types of in-home care:

- **Post-Acute** – Immediate, time limited, post-discharge in-home care, focused on meeting the nursing needs of acute care patients
- **Long-Term** – Continuing in-home care, intended to support individuals to remain living independently in the community, primarily provided by non-professionals
- **Rehabilitation** – Time limited, post-discharge, in-home rehabilitation care, coordinated by professional therapist staff, intended to enhance patient function

The CSP project has concluded that BHB should not independently assume an expanded role in the provision of in-home care services as part of the Clinical Services Plan. BHB should have a role to play

in helping to determine and establish quality standards for post-acute in-home care, but this should be done within the context of a national plan to establish a Bermuda system of in-home care.

The Clinical Services Plan does not assume that any expanded capability or capacity of in-home care will exist by 2020, but does anticipate that in-home care will be more widely accessible by 2025, and that this can contribute to reduced length of stay in hospital. An enhanced in-home care system will support Bermuda residents in their ability to return to independent living, and allow community care home and hospital beds to be used for patients who require institutional levels of care.

The Post-Acute Care CoP members recognize the value of in-home care, and the potential for an improved system to support patient flow through the hospital system, and to allow BHB to focus on providing hospital care for patients who have a level of need that cannot be met in the community.

7.6 Health System Funding Reform

Bermuda's health system funding and payment policies should be supportive of the country's health system goals. CoP participants identified funding and payment policies as barriers to implementation of initiatives intended to improve the quality of care and reduce the overall per capita costs of health care for Bermuda residents.

Examples of specific instances where payment policies were perceived to hinder BHB quality improvement were presented in section 4.5. There is no explicit articulation of the goals and principles that should guide development and implementation of funding and payment policies. Such an overarching framework would provide the basis for assessing how funding mechanisms and rates should be established for new services, and would support the evaluation of whether the funding approaches are supporting health system goals.

The Ministry of Health, the Bermuda Health Council, and BHB should jointly develop principles and framework that should be applied for all health services provided for Bermuda residents. An example of this is the development of Activity Based Funding (ABF) Principles[28] in Australia that were used to guide the development of specific funding methodologies:

- **Timely–quality care**: ABF should support timely access to quality health services.
- **Efficiency**: ABF should improve the value of the public investment in hospital care and ensure a sustainable and efficient network of hospital services.
- **Fairness**: ABF payments should be fair and equitable.
- **Maintaining agreed roles and responsibilities of governments**: ABF design should recognise the complementary responsibilities of each level of government in funding health services.
- **Transparency**: all steps in the ABF process should be clear and transparent.
- **Administrative ease**: ABF should not unduly increase the administrative burden on hospitals.
- **Stability**: the payment relativities are consistent over time.

[28] Australia Independent Hospital Pricing Authority (IHPA) Discussion Paper, Activity based funding for Australian public hospitals: Towards a Pricing Framework, available at: http://www.ihpa.gov.au/internet/ihpa/publishing.nsf/Content/publications.

- **Evidence based**: ABF should be based on best available information.
- **Supporting innovation**: ABF pricing should respond in a timely-way to introduction of evidence based, effective new technology and innovation.
- **Price harmonisation**: Pricing should facilitate best practice provision of appropriate site of care.
- **Minimising undesirable and inadvertent consequences**: ABF design should minimise susceptibility to gaming, inappropriate rewards and perverse incentives.
- **ABF pre-eminence**: ABF should be used for funding wherever practicable.
- **Single unit of measure and price equivalence**: ABF pricing should support dynamic efficiency and changes to models of care with the ready transferability of funding between different care types and service streams through a single unit of measure and relative weights.
- **Patient-based**: Adjustments to the standard price should be, as far as is practicable, based on patient related rather than provider-related characteristics.
- **Public-private neutrality**: ABF pricing should not disrupt current incentives for a person to elect to be treated as a private or a public patient in a public hospital.

If Bermuda and BHB accept the Triple Aim framework, there may be situations where increased cost in one sector can contribute to cost reductions in other sectors, and a net reduction in overall system per capita costs. **The funding system needs to be sensitive to overall cost impacts, and support initiatives that may generate savings elsewhere in the system.**

The American Hospital Association has considered how payment systems should be designed to support Triple Aim.[29] One of their recommendations is that there should be bridge payment models to help hospitals shift to value-based payment mechanisms.

Short-term Policy Recommendations

- Develop time-limited, bridge payment models to assist hospitals transitioning to value-based payment mechanisms. Hospitals and care systems will need assistance as they move between payment models that may have differing incentives
- Increase access to actionable information related to care, payment and cost. Ensuring open access to information from public and private payers will allow health care organizations to make more informed decisions regarding their care delivery
- Dedicate funding that supports critical access hospitals and small/rural hospitals. These types of hospitals will need additional support due to funding and infrastructure limitations
- Consider upfront infrastructure development costs. Aligning new care delivery services to adjust to different payment mechanisms and community needs will require infrastructure assistance
- Establish better, more streamlined quality measures. Metrics such as those outlined in the National Academy of Medicine's (Institute of Medicine's) "Vital Signs" could be used for quality measures applied throughout the U.S. health care system

[29] American Hospital Association, Committee on Research and Committee on Performance Improvement. (2016, January). Care and Payment Models to Achieve the Triple Aim. Chicago, IL: American Hospital Association. Accessible at: http://www.aha.org/about/org/cpi.shtml and http://www.aha.org/research/cor/index.shtml

- Provide additional incentives for joining ACOs and bundled payment pilots. Incentivizing hospitals and health care systems to join these transformational payment models could accelerate a move toward population health for U.S. hospitals

Long-term Policy Recommendations

- Ensure appropriate blending of different payment models. Hospitals and health care systems will need more guidance on how to properly blend different payment models
- Set better payment rates for bundled payments and global budgets. As more hospitals move to bundled- and population-based payment models, it will require setting better payment rates that are reflective of historical performance, not historical performance minus a discount. Additionally, new clinical delivery models and evidenced-based practices will be needed. Payment models will become more complex and thus require more investment in ensuring accuracy of payments
- Establish better risk adjustments for payment models. More precise and detailed risk adjustments will be needed as focus on value in health care becomes more in-depth
- Identify payment policies for high-cost/high-risk utilizers. Because a high-cost segment of the patient population will always exist, hospitals and health care systems will need additional clarification on how reimbursements are dispersed
- Offer incentives for healthy patients. Providing incentives for hospitals and health care systems to keep healthy patients healthy will lead to long-term, positive health outcomes”

8 Glossary of Acronyms

Acronym	Definition
ABF	Activity based funding
ABI	Acquired brain injury
ACHE	American College of Health Executives
ACOs	U.S. Accountable Care Organizations
ACW	KEMH Acute Care Wing
ADLs	Activities of daily living
ADS	Bermuda - Ageing and Disability Services
AHA	American Hospital Association
ALC	Alternative level of care
ALC LOS	Alternative level of care, length of stay
AMI	Acute myocardial infarction
BMDA	Bermuda Medical Doctor's Association
BHB	Bermuda Hospitals Board
BHeC	Bermuda Health Council
CAPD	Continuous ambulatory peritoneal dialysis
CC	Complications and/or co-morbidities
CCU	Continuing care unit
CDM	Chronic disease management
CDU	Clinical Decision Unit
CHF	Congestive heart failure
CMS	U.S. Center for Medicare and Medicaid Services
CoP	Community of practice
COPD	Chronic obstructive pulmonary disorder
CPT Codes	American Medical Association's medical codes: current procedural terminology
CSP	Clinical Services Plan
CT	Computed tomography scan
DAC	Bermuda - Disability Advisory Council
DI	Diagnostic imaging
DOH	Bermuda's Department of Health
DRG	U.S. medical coding; diagnosis related group
E.H.R.	Electronic health record
EMR	Electronic medical record
ER	Emergency Room
ESRD	End stage renal disease
FIM	Functional independence measure
FRP	BHB - Financial Recovery Plan
FTE	Full-time equivalent
GDP	Gross domestic product
GPs	General practitioners
HBOT	Hyperbaric oxygen therapy

Acronym	Definition
HF	Heart failure
HID	Bermuda - Hospital Insurance Department
HIMS	BHB - Health Information Management Department
HIP	Bermuda - Health Insurance Plan
HR	Human resource
IADLs	Instrumental activities of daily living
ICD-10	World Health Organization International Classification of Diseases - Version 10
ICD-9	World Health Organization International Classification of Diseases - Version 9
ICD-9-CM	World Health Organization International Classification of Diseases - Version 9, U.S. clinical modification
ICU	Intensive Care Unit
ID	Intellectual disability (previously referred to as learning disability)
IHI	U.S. Institute for Healthcare Improvement
IHPA	Australia - Independent Hospital Pricing Authority
IOM	U.S. Institute of Medicine
IP	Inpatient
IV	Intravenous
KEMH	King Edward Memorial Hospital
LACE	Index to identify patients at risk for readmission or death within 30 days of discharge.
LD	Learning disability (now referred to as intellectual disability)
LOS	Length of stay
LT	Long term
LTC	Long-term care
MCC	Major complication and/or co-morbidity
MD	Medical doctor
MDT	Multidisciplinary team
MOHS	Bermuda - Ministry of Health and Seniors
MRI	Magnetic resonance imaging
MV	Mechanical ventilation
MWI	Mid-Atlantic Wellness Institute
NCDs	Non-communicable diseases
OCMO	Bermuda - Office of the Chief Medical Officer
OECD	Organisation for Economic Co-operation and Development
OR	Operating room
OT	Occupational therapy
PAD	Peripheral arterial disease
PAHO	Pan American Health Organization
PCMH	Patient centered medical home
PDSA	Plan, Do, Study, Act (framework)
PT	Physiotherapy
RCA	Canada - Rehabilitative Care Alliance
RN	Registered nurse

Acronym	Definition
SCI	Spinal cord injury
SNF	Skilled nursing facility
SOPU	Surgical Outpatient Unit
tPA	Tissue plasminogen activator
TPN	Total parenteral nutrition
UCC	Urgent Care Center
UPI	Unique patient identifier
WHO	World Health Organization

Appendix A – Steering Committee Terms of Reference

02 June 2017 v 2.0

Bermuda Hospitals Board

Clinical Services Planning Activity
Terms of Reference

1. BACKGROUND

Bermuda Hospitals Board (BHB) is committed to delivering safe, high quality, patient centred, compassionate care every day. BHB will do this within the context of the Triple Aim: our commitment to improving the patient experience of care, the health of our population, and the need to reduce the per capita cost of care.

Given these objectives, and the challenges, demands and opportunities in the system that BHB is part of, the need to define the services that the hospital will (and can afford to) provide to meet the needs of the population is critical. For this reason, Clinical Services Planning was identified as a priority activity in BHB's 2017/18 Annual Plan. BHB is undertaking a comprehensive nine month project to develop a Clinical Services Plan to ensure it is offering the clinical services needed to best meet the needs of the people of Bermuda. The Clinical Services Plan will also serve as a key input to the Clinical Affiliation Agreement, another priority initiative on the FY17/18 Annual Plan.

1.1 Activity Goal:

BHB will have a Clinical Services Plan that identifies population needs, and defines the scope and scale of clinical services offered at BHB (including which should grow, stay the same, or be divested), along with the associated organizational requirements, to best serve the people of Bermuda.

1.2 Activity Objectives:

BHB has established four objectives for the Clinical Services Planning activity:

- To understand the health service needs of the population
- To determine what services BHB should provide, and how we should provide them to meet population needs and financial realities
- To identify the requirements for clinical support services/ non-clinical services/ estates, to support the optimal delivery of clinical services
- To identify the implications/ requirements for the Ministry and health system – to enable BHB to optimally fulfil its role.

1.3 Activity Deliverables:

The deliverable will be a comprehensive Clinical Services Plan (CSP) for BHB. The plan will:

- Define the health services needs of our population
- Describe BHB's role in responding to these service needs:
  - Type/amount of service that will be provided
  - Model of service delivery
  - Supports (e.g. clinical supports, physical plant, equipment and infrastructure, technology, human resources, etc.) required to provide the services
- Provide a high level implementation plan for moving from current state to recommended state
- Provide sufficient detail to act as an input to other required plans (e.g. Estate Master Plan, Clinical Program Plans)
- Suggest implications for the system, including necessary amendments to existing Ministry contracts, Acts, etc.

1.4 Activity Approach:

Q3 and Q4 of 2016/17 were used to consider the scope and approach to clinical services planning that would best help us to achieve our objectives. Because of the capability, capacity and expertise required to complete this work, it was determined that external support was required to assist BHB with this activity. A project approach has been established and will be executed by external consultants from PricewaterhouseCoopers (PwC) under the direction of the CSP Steering Committee (SC) and an Executive Project Committee of the CSP SC.

The CSP SC should ensure that the approach to develop the CSP, delivered by the external consultants, is at all times consistent with the following desired principles, identified as priorities by BHB:

- Never lose sight that patients/families are at the centre of our decisions/plans
- Meaningfully engage BHB staff, physicians and community stakeholders in the development of the plan and decision-making
- Ensure involvement of clinical support services/ non-clinical services/ estates, to ensure the clinical services plan informs their planning efforts
- Ensure decisions are driven by data and evidence, but that we balance quantitative evidence with qualitative advice
- Embed flexibility to ensures the sustainability of the plan despite current uncertainties
- Ensure we are developing a user-friendly and useful plan that adds value and has impact

1.5 Activity Risk Assessment:

The following risks should be discussed and mitigated by the CSP SC over the duration of the project:

- Timely and complete availability of information needed to inform the plan, including data and analytics
- Availability and commitment of staff and key stakeholders, given competing priorities and Bermuda based events in the summer months
- Continued commitment to the project for the duration (9 months), risk of loss of focus, delayed decision making and delayed completion
- Public and/or staff perception that this is an exercise to cut services will need to be managed with careful communications
- Inability to come to consensus as an organization
- Difficulty developing viable solutions and/or making decisions given:
  - Ambiguous funding and legal context, and/or
  - Uncertainty about willingness to fund/shift/support the delivery of community based services

2. ACTIVITY STRUCTURE, PURPOSE AND SCOPE

A CSP Steering Committee (CSP SC) is in place to ensure that the goals and objectives of this activity are completed with the best possible outcome. The CSP SC's role will be advisory in nature, directing the work of the project activity and providing the balanced perspective, expertise and advice needed to inform the outcomes of the Clinical Services Plan. Judy Richardson, the Accountable Executive for this activity, will be the Chair of the CSP SC.

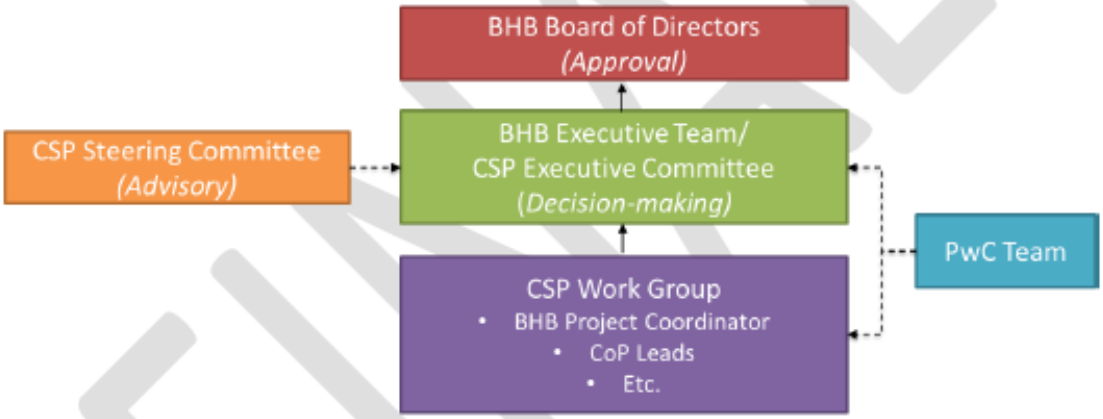
A CSP Executive Committee (EC), made up of a portion of the broader CSP SC, is also in place. This committee will contain BHB representatives only, and will provide ongoing oversight and management of project activity. The CSP EC will both monitor and direct the project to ensure the approach is consistent with expectations, that risks are being mitigated and that timelines are being managed in such a way as to ensure completion. The EC will have the authority to make day to day project management decisions on behalf of the broader CSP SC, and will ensure the CSP SC is kept up to date on any decisions and directions

taken by the CSP EC, and that the CSP SC is informed of the status of the workplan on an ongoing basis. The CSP EC will share project findings, hypotheses and potential recommendations with the CSP Project Work Group (defined below), and will seek the advice and input of the CSP SC on an ongoing basis in order to help direct the project work to the best outcome possible. The CSP EC will be accountable to the Accountable Executive, and will be led by the BHB Project Lead, Judy Richardson.

A Project Work Group (PWG), consisting of the consulting group engaged for this activity and a BHB appointed Project Manager, will be responsible for carrying out the activities detailed in the project work plan, with the goal of completing the deliverables within the time and resources allotted. The BHB Project Manager will be accountable to the Project Lead. The PWG will share information with, report to and facilitate discussion and decision making at CSP SC meetings as requested by the CSP EC.

3. GOVERNANCE

The Accountable Executive and Chair of the CSP SC and will oversee this annual plan activity on behalf of the Executive Team.
The CSP Executive Committee will be a subcommittee of the CSP SC, and will provide ongoing oversight and direction to the Project Work Group, which will execute the day to day project activities.



4. DUTIES AND RESPONSIBILITIES

4.1 Duties and responsibilities of the Clinical Services Plan Steering Committee:

- Provide overall direction to guide the project approach, ensuring a balanced approach to addressing issues and that stakeholder perspectives are considered in the development of the plan
- Provide overall direction in project activity and outcomes
- Facilitate access to resources and information, including external resources, required to complete this deliverable
- Participate in meetings, workshops, and forums to provide advice to support decision-making events planned for this activity
- Review findings, reports and recommendations, and provide advice to ensure that a balanced, comprehensive and viable plan is developed by BHB.

4.2 Duties and responsibilities of the Clinical Services Plan Executive Committee:

- Participate as members of the CSP SC
- Provide day to day project management direction and oversight to the PWG on behalf of the Steering Committee to ensure delivery of this project occurs in a way that is consistent with expectations
- Review, guide and direct the major deliverables produced by the PWG prior to presentation to the

CSP SC

- Facilitate access to BHB resources and information required to complete this deliverable
- Is led by the BHB CSP Project Lead, who is responsible for liaising with the PWG and supervising the BHB Project Manager on a day to day basis; the Project Lead reports to the Accountable Executive/Steering Committee Chair for this activity

5. MEMBERSHIP

5.1 Clinical Services Plan Steering Committee:

Given the advisory responsibilities of the CSP SC, and the desire to develop a plan that is realistic, effective and viable, the Steering Committee will have a balance of representation that includes BHB leadership, system leadership, and clinical program representation from within and outside of the organization. Members of the CSP SC will include:

Organization	Name
BHB CEO and Accountable Executive	Venetta Symonds
Chief of Nursing and Activity Lead	Judy Richardson, SC Chairman
BHB VP Quality and Acting ED MWI	Preston Swan
BHB Chief of Staff	Dr. Keith Chiappa
BHB Chief Financial Officer	Bill Shields
BHB Chief Operating Officer	Scott Pearman
BHB Chief of Psychiatry	Dr. Chantelle Simmons
BHB Chief of Medicine	Dr. Michael Ashton
BHB Chief of Surgery	Dr. Wesley Miller
BHB Chief of Geriatrics, Rehab and Palliative Care	Dr. Htay Myint
BHB Chief of Family Medicine	Dr. Nicola Terceira
BHB VP Communications	Anna Nowak
BHB Board Member	Dr. George Shaw
Bermuda Health Council	Tawanna Wedderburn
Ministry of Health, Seniors and Environment	Dr. Jennifer Attride-Stirling
Ministry of Health, Seniors and Environment	David Kendell
Ministry of Finance	Anthony Manders
Bermuda Healthcare Advocacy Group	Mark Selley
Argus	Michelle Jackson
Bermuda Hospitals Charitable Trust	Lisa Sheppard/ Ralph Richardson
Bermuda Public Services Union	Edward Ball Jr.

5.2 The Executive Committee, a subset of the Steering Committee responsible for ongoing project oversight and direction on behalf of the broader steering committee will require:

- BHB Accountable Executive and CEO – Venetta Symonds
- BHB Activity Lead and Chief Nursing Officer - Judy Richardson, EC and SC Chair,

and may include participation from BHB Executive Team Members as appropriate:

- BHB Chief of Staff - Dr. Keith Chiappa
- BHB CFO – Bill Shields
- BHB VP Public Relations – Anna Nowak
- BHB VP Quality and Risk - Preston Swan
- BHB COO – Scott Pearman

- BHB CSP Project Coordinator – Jane Chapman (non-voting member)

5.3 Term of Membership

This activity is anticipated to begin in April 2017 and end in December 2017. Term may be extended as required.

5.4 Meetings

Steering Committee:

The Steering Committee will meet at least monthly at the call of the Chair in order to direct the outcomes of this project. Some months will require more input than others from the Steering Committee, and more frequent meetings or participation in workshops will be required. All attempts to make efficient and effective use of the Steering Committee's time will be made. Meetings over the summer months and America's Cup will likely be less frequent.

While participation in Steering Committee activities is expected, because of the advisory nature of this committee, no quorum is required. Where a CSP SC member is unable to attend a meeting, an appropriate delegate must be sent in their place. Note the CSP SC member is responsible for keeping any named delegate updated and informed about the project and the meeting. A list of delegates will be maintained by the CSP Project Coordinator.

Steering Committee Meetings will be attended by the BHB Project Manager. Members of the PWG may be invited to participate, present and facilitate at these meetings as required.

The SC Chair will be accountable for meeting agenda and materials, with the BHB CSP Project Coordinator responsible for developing and distributing materials by email in advance of each meeting. All attempts to make materials available a week before each meeting will be made, however, because of aggressive project timelines, this will not always be possible.

CSP Executive Committee:

The CSP EC will meet on a regular basis to monitor and direct project progress. It is anticipated that at minimum, weekly meetings will be required during the most active phases of this project. Ad hoc meetings will be called as required.

Participation in CSP EC meetings is requested, and while no quorum is required, decisions will be made by consensus. Decisions will have the participation of either the Accountable Executive or the Project Lead, if not both.

CSP EC meetings will be attended by the BHB Project Manager and a representative from the PwC consulting team completing the work.

The agenda and materials for these meetings will be developed collaboratively by the BHB CSP Project Lead and the PwC Consulting Team, with assistance of the BHB Project Manager.

Appendix B – CSP Planning Principles & Criteria

The CSP Project steering committee approved a set of principles and associated criteria to support the evaluation of proposed services/initiatives by the communities of practice. The Project Team applied the criteria to each service/initiative recommended by the CoPs, assigning a score (1 for minimally supports principle, 5 for maximally supports principle) in order to establish a ranking of items according to overall level of support for the principles.

Category	Principle	Criteria
Population Needs	BHB should prioritize the services that best respond to projected population health service needs	Epidemiologic evidence shows high and/or increasing prevalence of the conditions for which the service is provided.
		Demographic projections predict increasing prevalence of the conditions for which the service is provided.
		Service is expected to contribute to reduction in premature mortality of Bermuda residents.
	The service will support the Bermuda Health Plan goal that "Bermuda's health system will provide universal coverage, solidarity in financing, and equal access to basic and essential healthcare" and infrastructure.	Service is included within health care services covered within the basic health benefit.
	BHB should be prepared to provide services to respond to population needs in the case of disaster.	Service is important component of BHB disaster response planning.
Access	All Bermuda residents will have equal access to the health care service	Access to the service does not differ based on socio-economic, racial, geographic, or another characteristic.
	Where hospital services can be provided safely and cost-effectively on the island, BHB should provide local access to the service.	Service can be safely and cost-effectively be provided by BHB.
	BHB will provide hospital services where transfer of patients to other centres on an urgent or regular basis is impractical.	Lack of local access to service could lead to increased avoidable morbidity and/or mortality.
Quality of Care	Where accepted international standards exist, the service will be provided by BHB in accordance with these standards, including critical mass of activity	Projected annual volume of activity will exceed accepted critical mass requirements
		BHB will be able to support the range of health disciplines recommended for high quality service
	BHB should offer services that have become standard/ accepted elements of modern hospital care	Services considered by international health system planners to be core hospital services should be available at BHB.
	Provision of the service is necessary to support BHB achievement of quality and cost-effectiveness for basic hospital care	Providing the service will allow BHB to optimize use of resources and infrastructure required to support basic hospital care
		The service will improve patient flow within BHB and reduce cost per discharge by more than the cost of the service
Revenue and Cost Efficiency	For all BHB services, there must be an identified revenue stream that will cover the anticipated cost of the services	The BHB revenue for the service is proportionate to the activity volume and cost of the service

Category	Principle	Criteria
	The overall set of programmes and services offered by BHB must be able to allow BHB to achieve the financial surplus targets identified in the financial recovery plan.	Projected revenue for package of BHB services exceeds costs by X%.
	Provision of the service by BHB is expected to contribute to a reduced per capita cost of the overall health system in Bermuda.	Access to the BHB service is expected to reduce or avoid Bermuda health care costs by an amount greater than the cost of the service.
	BHB may "compete" to provide services not required to support the goal of basic and essential health care where it can generate a profit to help subsidize other required services	The projected revenue from the service is expected to exceed the BHB costs of providing the service
		Provision of the service is not likely to distract BHB from provision of basic and essential health care.
Cost and Quality	BHB should provide "safety net" services, beyond basic hospital care, where there is a need unlikely to be met by other providers, and where lack of these services would hinder achievement of cost and quality goals for basic hospital care	There are no other providers currently or likely to offer the service
		The cost of BHB providing the service is less than the anticipated BHB cost savings or cost avoidance.
		There are no other providers currently or likely to offer the service at an acceptable level of quality
Divestment	Existing BHB services, that are needed by residents or visitors should not be discontinued or diminished unless there is an identified partner willing and able to assume responsibility for the service, or access can be achieved through alternative cost-effective means	There is no identified partner (on or off the island) ready and able to provide the service.
		There are not, and are unlikely to be, financial incentives for other providers to provide the service
		Other providers cannot provide the service at a level of quality equal or greater than BHB.

Bermuda Hospitals Board

Appendix C – Sample CoP Workbook Table of Contents

Clinical Service Plan Workbook Table of Contents

Appendix D – List of Advisory Summit Attendees

Name	Title
Dr. Michael Ashton	Chief of Medicine, BHB
Dr. Jennifer Attride-Stirling	Permanent Secretary, Health, Bermuda Government
Lynnette Bean	Clinical Director, Critical Care Services, BHB
Ja-Mae Burgess	Acting Coordinator for Seniors & Disabilities, Bermuda Government
Dr. Alick Bush	Clinical Psychologist, BHB
Jane Chapman	Clinical Services Redesign Coordinator, BHB
Dr. Keith Chiappa	Neurologist, BHB
Stephen Gift (Anthony Manders)	Deputy Financial Secretary, Bermuda Government
Debra Goins-Francis	BHB General Counsel, BHB
Dr. Richard Hammond	Chief of Anaesthesia, BHB
Dr. Margot Harvey	General Practitioner, Bermuda
Gaynell Hayward	Chief Nursing Officer, Department of Health, Bermuda
Sita Ingram	Clinical Director, Allied Health Services, BHB
Michelle Jackson	Executive Vice President, Argus Insurance Bermuda
Debbie Jones	Chair of Bermuda Diabetes Association
Diana Liacos	Clinical Care Manager Consultant, HID Bermuda Government
Dr. Wesley Miller	Chief of Surgery, BHB
Dr. Htay Myint	Chief of Geriatrics, Rehab & Palliative Care
Anna Nowak	Vice-President Public Relations, BHB
Lucille Parker-Swan	Chair of Bermuda Hospitals Board, BHB
Scott Pearman	Chief Operating Officer, BHB
Dr. Cheryl Peek-Ball	Chief Medical Officer, BHB
Judy Richardson	Chief of Nursing, BHB
Dr. Michael Richmond	Chief of Staff, BHB
Granville Russell	Clinical Director, Continuing Care/Maternal/Child, BHB
Loretta Santucci	Clinical Director, Surgical/Perioperative Services, BHB
Dr. Edward Schultz	Chief of Emergency, Wound Care, Hyperbaric Med, BHB
Lisa Sheppard	Executive Director of Bermuda Hospitals Charitable Trust
Bill Shields	Chief Financial Officer, BHB
Dr. Chantelle Simmons	Chief of Psychiatry, BHB
Norma Smith	Clinical Director, Medical/Surgical Services, BHB
Dr. TerryLynn Emery	Chief of Obstetrics/Gynaecology, BHB
Dr. Daniel Stovell	Chief of Radiology, BHB
Preston Swan	VP Quality & Risk, BHB
Venetta Symonds	CEO & President, BHB
Dr. Nicola Terceira	General Practitioner, Bermuda
George Thomas, Jr.	Bermuda Wellness Foundation
Tawanna Wedderburn	CEO of Bermuda Health Council

Regrets:

Edward Ball	General Secretary, BPSU
David Kendell	Director, Department of Health
Mark Selley	Bermuda Health Advocacy Group
Andrea Smith	Bermuda Health Advocacy Group

Appendix E – BHB Annual Activity Statistics

The table below shows a summary of the statistics compiled for the BHB annual report for the prior three complete fiscal years. This table focuses on clinical activity at the KEMH (and Lamb Foggo UCC) site, and shows the changes associated with opening of the new ACW in September 2014.

Exhibit 1: King Edward VII Memorial Hospital Annual Statistics[30]

Indicator	2013/14	2014/15	2015/16	2016/17
INPATIENT – GENERAL WING				
Beds	217	196	79	79
Patient Days	52,027	36,365	7,464	9,206
Discharges (incl. deaths)	6,030	3,694	1,955	1,953
Length of Stay	8.6	9.8	2.5	3.1
Births	617	573	584	558
Percentage of Occupancy	67%	51%	26%	25%
INPATIENT – ACUTE CARE WING Opened 14 September 2014				
Beds	–	90	90	90
Patient Days	–	15,608	28,551	30,225
Discharges (incl. deaths)	–	2,042	3,926	3,967
Length of Stay	–	6.9	6.7	6.7
Percentage of Occupancy	–	87%	87%	92%
CONTINUING CARE – COOPER & PERRY WARDS Moved April 2015*				
Beds	121	121	68	68
Patient Days	37,515	28,011	21,643	21,598
Discharges	71	42	27	45
Length of Stay	528.4	666.9	216	431.9
Percentage of Occupancy	85%	63%	89%	87%
ALTERNATE LEVEL OF CARE (ALC) – GORDON WARD & GORDON EXTENSION Opened 14 September 2014				
Beds	–	49	49	49
Patient Days	–	15,078	16,272	16,010
Discharges	–	89	79	111
Length of Stay	–	169.4	118.7	106
Percentage of Occupancy	–	95%	91%	90%
HOSPICE				
Beds	9	9	8	8
Patient Days	1,991	2,054	2,071	2,298
Discharges	105	145	112	103
Length of Stay	19	13.6	18.3	22.1
Percentage of Occupancy	68%	63%	71%	79%
ALL PATIENTS				
Emergency Dept. Visits – KEMH	32,538	31,968	31,594	30,982

[30] BHB Website – BHB Statistics http://bermudahospitals.bm/about-us/news-media/bhb-statistics/

Indicator	2013/14	2014/15	2015/16	2016/17
Lamb Foggo Urgent Care Centre Visits	4,617	4,560	4,880	4,588
Operations (Inpatients & SDA)	1,762	1,745	994	1,861
Operations (Outpatients)	5,882	6,275	6,339	6,305
Physiotherapy (units) (Inpatients)	28,963	22,602	11,517	10,340
Physiotherapy (units) (Outpatients)	17,390	20,628	17,063	12,120
Physiotherapy (units) (CCU)	1,289	674	238	248
X-Ray (exams) (In & Out)	29,753	28,158	29,571	30,276
Laboratory (Thousand Units) (In & Out)	3,311,405	3,103,340	3,111,707	3,441,850
Cardiac Investigations (ECG/EEG) (In & Out)	10,678	9,220	9,865	10,377
Ultrasound Exams (In & Out)	6,681	5,997	6,966	7,110
Nuclear Medicine (In & Out)	773	664	692	754
Chemotherapy Treatments (Outpatients)	2,494	2,198	2,940	3,260
Cat Scans (In & Out)	9,972	9,783	10,969	12,788
MRI Scans (In & Out)	3,496	3,019	3,520	3,585
Occupational Therapy (units) (Inpatients)	9,182	6,779	5,066	9,431
Occupational Therapy (units) (Outpatients)	3,380	2,985	3,570	3,749
Occupational Therapy (units) (CCU)	2,492	660	91	256
Speech/Language Pathology (Inpatients)	7,668	6,339	7,001	6,428
Speech/Language Pathology (Outpatients)	1,330	797	1,122	676
Speech/Language Pathology (CCU)	470	798	3,552	1,946
Hyperbarics Patients	22	19	26	26
Hyperbarics Treatments	157	146	212	228
Wound Care Patients	2,155	1,987	2,008	2,064
Wound Care Treatments	7,300	6,496	6,379	6,476
Rehab Day Hospital – New Patients	226	239	219	222
Rehab Day Hospital – # of Clients	733	733	869	1,050
Rehab Day Hospital – # of Discharges	126	184	199	187
Home Care Visits	4,066	5,038	3,749	4,293
Blood Donations	1,769	1,716	1,711	2,006
* Old Continuing Care Units closed April 2015. CCU Cooper Ward opened 7 April 2015. CCU Perry Ward opened 14 April 2015.				

Exhibit 2: Mid-Atlantic Wellness Institute Annual Statistics[31]

Indicator	2013/14	2014/15	2015/16	2016/17
INPATIENT – ACUTE CARE				
Beds	23	23	23	23
Discharges (including deaths)	219	211	191	207
Length of Stay	13	14	15	14
Admissions	218	217	199	219
Percentage of Occupancy	63%	69%	73%	77%
Patient Days	5,320	5,795	6,213	6,544
LONG TERM & REHABILITATION				

[31] BHB Website – BHB Statistics http://bermudahospitals.bm/about-us/news-media/bhb-statistics/

Indicator	2013/14	2014/15	2015/16	2016/17
Beds	58	41	40	40
Discharges (excl. deaths)	54	39	43	36
Patient Days (excl. respite)	13,004	12,994	13,789	14,086
Length of Stay	269	334	321	391
Deaths	0	1	3	3
Transfer from Acute	N/A	N/A	N/A	N/A
Percentage of Occupancy	62%	87%	88%	96%
Average Length of Stay of Deaths (days)	0	409	412	631
TURNING POINT (SUBSTANCE ABUSE – DETOX UNIT)				
Beds	8	8	8	8
Discharges	91	89	111	113
Patient Days	1,145	1,024	1,239	1,522
Length of Stay	13	12	11	13
Admissions	91	89	110	113
Percentage of Occupancy	39%	39%	42%	52%
CHILD & ADOLESCENT SERVICES				
Beds	4	4	4	4
Discharges	12	16	12	21
Patient Days	148	249	198	310
Length of Stay	12	14	16	14
Admissions	13	15	11	20
Percentage of Occupancy	10%	17%	14%	21%
OUTPATIENTS (Child & Adolescent/ Mental Health/ Substance Abuse/ Learning Disability)				
Total New Admissions / Referrals	312	308	463	326
Total Re-admissions / Referrals	111	101	159	126
Total Follow-up Appointments	5,042	4,562	4,799	4,687
Total Day Patients Visits	13,208	11,683	13,217	12,576
Total Walk-in / Unscheduled Visits	11,088	10,054	10,982	12,293
Total DNA to Scheduled Appointments	1,474	1,324	1,535	1,596
Total TOPs	122	138	24	17
Total Home Visits	6,729	6,411	6,682	7,467

Appendix F – Community of Practice Advice

The advice from each Community of Practice generated at the three sessions has been consolidated and confirmed by each Lead. The advice is presented in this document in the following format:

Community of Practice Advice: What was the CoP advice with respect to whether the project should proceed with considering a change in services/processes as part of the CSP.

Anticipated Benefits: Why would following through on the advice would be a good thing for either the population or BHB. How would making the proposed change help BHB achieve its goals?

Other Considerations: Other advice or cautions about why/how to implement the change. E.g. what would be expected from other partners, and how BHB could best engage both internal and external stakeholders in supporting, and successfully implementing the change.

Preceding the boxed summary, each service/process includes the background information that constituted the working document for each service/process in each CoP:

Relevant Communities of Practice:

Lists the CoPs (at least one and sometimes additional CoPs) that discussed the service/initiative

Description of Service/Initiative:

Brief Description of the service/initiative

Relevant Background Data:

Includes additional information, often specific to Bermuda's unique attributes.

Related Research Evidence or Clinical Standards:

Summarizes articles containing research/evidence relevant to the service/initiative

Input/Advice from CoP Discussions:

Captures the broad discussion from the CoP meetings, often directly quoting the participants

Emergency

Clinical Decision Unit

Relevant Communities of Practice: Emergency, Medicine

Description of Service/Initiative:

Clinical area in the ED or hospital where patients are "cohorted" for observational care. The area may be 'real" (i.e. 4-6 segregated beds) or "virtual" (patients designated as CDU but scattered in the department). The period for observation is longer than an emergency visit, but shorter than an admission to the hospital. Patients are most often treated using a clinical pathway or algorithm and are under the care of an EM physician. There should be an explicit understanding on the part of admitting services that if the patient is not sufficiently improved in 23 hours they will promptly take over the care and arrange admission. In general patients are placed in the CDU only if there is a reasonable expectation that their clinical condition will improve sufficiently in the next 23 hours. Both children and adults can be treated in a CDU. The CDU supports a specific, defined set of clinically appropriate services, which include ongoing assessment and reassessment and short-term treatment. The additional period allows the clinician to decide whether patients require admission, discharge, or transfer.

Relevant Background Data:

High rate of admission of KEMH ED patients, compared with Ontario, Canada experience. High occupancy of KEMH medical beds.

Input/Advice from CoP Discussions:

Implement a 23 Hour Observation Unit. Could serve multiple patient needs across the age spectrum (e.g. chest pain, asthma, croup, abdominal pain NYD, TIAs). Make use of standardized protocols (e.g. chest pain).

A CDU can improve overall flow of the hospital (for appropriately avoided admissions). It would be helpful for mental health patient population (evidence of success of this model at other organizations) – and would target needs of specific patients.

Challenge with proposed solution: space/ staffing to do this (easier to admit patients to areas in the hospital with better staffing coverage). Shouldn't sacrifice staffing in ED to support CDU.

Related Research Evidence or Clinical Standards:

Health Aff (Millwood). 2013 Dec;32(12):2149-56. doi: 10.1377/hlthaff.2013.0662.

Protocol-driven emergency department observation units offer savings, shorter stays, and reduced admissions.

Ross MA, Hockenberry JM, Mutter R, Barrett M, Wheatley M, Pitts SR.

Many patients who seek emergency department (ED) treatment are not well enough for immediate discharge but are not clearly sick enough to warrant full inpatient admission. These patients are increasingly treated as outpatients using observation services. Hospitals employ four basic approaches to observation services, which can be categorized by the presence or absence of a dedicated observation unit and of defined protocols. To understand which approach might have the greatest impact, we compared 2010 data from three sources: a case study of observation units in Atlanta, Georgia; statewide discharge data for Georgia; and national survey and discharge data. Compared to patients receiving observation services elsewhere in the hospital, patients cared for in "type 1" observation units-dedicated units with defined protocols-have a 23-38 percent shorter length-of-stay, a 17-44 percent lower probability of subsequent inpatient admission, and $950 million in potential national cost savings each year. Furthermore, we estimate that 11.7 percent of short-stay inpatients nationwide could be treated in a type 1 unit, with possible savings of $5.5-$8.5 billion annually. Policy makers should have hospitals report the setting in which observation services are provided and consider payment incentives for care in a type 1 unit.

Barriers and facilitators to the implementation of Ontario's emergency department clinical decision unit pilot program: a qualitative study

Salkeld E, Leaver CA, Guttmann A, Vermeulen MJ, Rowe BH, Sales A, Schull MJ. CJEM. 2011; 13(6):363-71.

In Ontario, clinical decision units (CDUs) were implemented as a pilot project in 2008 by the Ministry of Health and Long-Term Care as part of its strategy to reduce emergency department (ED) waiting times. Our objective was to describe general characteristics of the program at each of the participating sites and to examine barriers and facilitators to integrating CDUs into practice.

The qualitative analysis identified 10 key themes related to integrating CDUs into EDs: shift in clinical and operational practice; administrative aspects of implementation; team building and stakeholder involvement; use of clinical care protocols; physical or virtual model of care; responsive ancillary services; involvement of specialist services; coordination with hospital and community supports; appropriate use of the CDU; and ongoing evaluation and monitoring. Each theme represents an important insight from the perspective of clinical and administrative staff at participating sites. The implementation of CDUs is a complex process, with no single preferred clinical care or operational model. This study identifies many key considerations relevant to the future implementation of CDUs.

Health Aff (Millwood). 2012 Oct;31(10):2314-23. doi: 10.1377/hlthaff.2011.0926. Epub 2012 Sep 26.

Making greater use of dedicated hospital observation units for many short-stay patients could save $3.1 billion a year.

Baugh CW, Venkatesh AK, Hilton JA, Samuel PA, Schuur JD, Bohan JS.

Using observation units in hospitals to provide care to certain patients can be more efficient than admitting them to the hospital and can result in shorter lengths-of-stay and lower costs. However, such

units are present in only about one-third of US hospitals. We estimated national cost savings that would result from increasing the prevalence and use of observation units for patients whose stay there would be shorter than twenty-four hours. Using a systematic literature review, national survey data, and a simulation model, we estimated that if hospitals without observation units had them in place, the average cost savings per patient would be $1,572, annual hospital savings would be $4.6 million, and national cost savings would be $3.1 billion. Future policies intended to increase the cost-efficiency of hospital care should include support for observation unit care as an alternative to short-stay inpatient admission.

Community of Practice Advice:

The BHB Clinical Services Plan should incorporate the establishment of a Clinical Decision Unit (CDU).

Anticipated Benefits:

The CDU should support reduction in admissions to inpatient care, and reduce pressure on acute care (particularly medical) beds.

Other Considerations:

Establishment of a CDU will require careful space planning and consideration of required staffing levels. Successful implementation will require changes in outpatient vs. inpatient funding models to reduce any incentive to admit patients to support BHB's revenue requirements.

Rapid follow up Clinics

Relevant Communities of Practice: Emergency, Chronic Disease Management

Description of Service/Initiative:

Consider the creation of rapid follow clinics in which patients with issues that need urgent follow-up can access services through a clinic as an alternative to admission (e.g. chest pain). In addition, patients with longer LOS can be shortened if they can be referred to these clinics to support ongoing evaluation/assessment in an outpatient setting.

Relevant Background Data:

Used in many North American hospitals. May be opportunity to coordinate with PCMH to provide comprehensive care. May help with frequent users.

Input/Advice from CoP Discussions:

Seen as potentially valuable, particularly as way to allow hospitalists to discharge patients earlier and to support ED admission avoidance. Potential overlap with the PCMH (and opportunity to coordinate with PCMH services) needs to be further investigated.

BHB should establish a Rapid Response Team. It needs to cover at least 16 hours a day (or patients will still present to ED).

The patient population should be higher acuity patients who need follow up, who require timely access to diagnostic services, and for whom it may be a challenge to see a GP in a 24 to 48-hour window.

These clinics should offer sufficient time for visits, and there could be an NP staffing model, with some patients seen by on-call physicians.

Liability concerns for admission avoidance? It can enhance the safety net (ensure urgent follow-up), and close the loop to ensure patients who require follow-up get it

There will need to be a robust referral network, link patients with most appropriate providers (strong collaboration). Need to be careful about usurping role of primary care physicians. Referral to follow up clinic shouldn't be routine alternative to ensuring that ED patient returns to their primary care physician. BHB should be seen supporting primary care, rather than trying to create alternative hospital-based system of primary care and chronic disease management.

Related Research Evidence or Clinical Standards:

For many patients, admissions can be avoided if there is assurance of timely follow up in the community post-discharge from the ED. Although not a new concept, ED follow up clinics play an important role in managing an acute episode in the community post discharge. When patients referred by the ED are seen soon after discharge (within 24 hours to 5 days depending on the nature of the referral) the risk of readmission or returns to the ED/inpatient setting can be greatly managed.

- Kaiser Permanente's Newborn Early Discharge Follow up Program significantly decreased the utilization of urgent care clinics. Before the program was implemented 58% of newborn parents used the urgent care clinic prior to their 2-3-week newborn checkup compared to just 28% of newborn parents who participated in the program[32].
- At Evergreen Hospital Medical centre, identifying and referring high risk patients to a Cardiac Enhancement centre within 3 days of discharge reduced the hospital re-admission rate from 14% to 6%[33].

Various studies, however, have shown that patient compliance with referrals to follow up clinics/testing is greatly enhanced if appointments are made *for* the patient prior to discharge and that the responsibility of making an appointment is not left to the patient[34,35,36].

[32] Nelson, V.R. (1999) The Effect of Newborn Early Discharge Follow-up Program on Pediatric Urgent Care Utilization. Journal of Pediatric Health Care Vol. 13(2).

[33] http://www.ama-assn.org/amednews/2011/02/07/prsa0207.htm

- Murray's study based on 503 appointments made for follow up appointments at various clinics at Victoria General Hospital in British Columbia revealed that 81.7% of appointments were kept; a much higher percentage than found in similar American hospitals. Authors of the study attributed the high compliance rate to bookings being made prior to discharge, a print out of the appointments being given to the patient and the fact that patients did not have to pay for these follow out-patient clinics.
- Kyriacou's study based out of Northwestern Memorial Hospital (an urban teaching hospital) also revealed statistically significant higher follow-up rates for those who had their appointments made for them (59%) compared to those in the control group (37%).
- Richard's study that focussed on compliance for stress tests for low-risk chest pain patients discharged from 3 academic EDs in Hamilton also found significantly higher compliance rates for patients who had their stress tests scheduled for them prior to discharge (72.5%) compared to those in the control group (56.1%).

Community of Practice Advice:

The BHB Clinical Services Plan should incorporate the establishment of Rapid Response Clinics to support admission avoidance of patients who require further specialized follow up, that can be provided on an ambulatory basis, thereby avoiding inpatient admission.

Anticipated Benefits:

Rapid Response Clinics should support reduction in admissions to inpatient care, and reduce pressure on acute care (particularly medical) beds.

Other Considerations:

Successful implementation will require changes in outpatient vs. inpatient funding models to reduce any incentive to admit patients to maximize BHB revenue. Further planning will be required to identify priority clinics for implementation, and the relationship of this service with the PCMH. BHB should not be seen to be competing with primary care providers, and should facilitate re-connection of clinic patients with their primary care physicians.

Hyperbaric Oxygen Therapy

Relevant Communities of Practice: Emergency

[34] Murray, M. & LeBlanc, C. (1996) Clinic Follow-up From the Emergency Department: Do Patients Show Up? Annals of Emergency Medicine Vol. 27(1).

[35] Kyiacou, D., Handel, D. et al. (2005) Brief Report; Factors Affecting Outpatient follow up compliance of Emergency Department Patients. Journal of General Internal Medicine Vol. 20(10).

[36] Richards, D., Meshkat, N. et al. (2007) Emergency Department Patient compliance with Follow-up for Outpatient Exercise Stress Testing: a randomized Controlled Trial. Canadian Journal of Emergency Medicine Vol. 9(6).

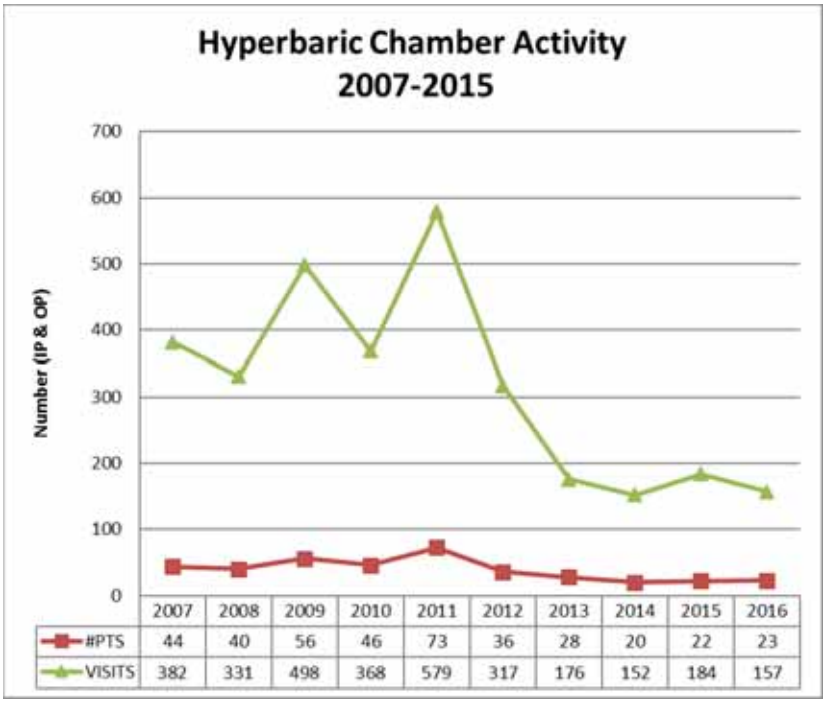
Description of Service/Initiative:

Hyperbaric Oxygen Therapy (HBOT) treats patients in a pressurised chamber where their entire body is exposed to 100% oxygen. This super-oxygenates the bloodstream to promote the growth of new small blood cells and support tissue re-growth.

HBOT is a life-saving treatment for medical emergencies such as carbon monoxide poisoning and gas gangrene, and is adjunctive therapy in the treatment of many types of non-healing wounds. HBOT was originally developed to treat underwater divers suffering from "the bends" (decompression sickness).

Relevant Background Data:

Functional programme work for ACW projected ~ 500 visits per year.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
#PTS	44	40	56	46	73	36	28	20	22	23
VISITS	382	331	498	368	579	317	176	152	184	157

Input/Advice from CoP Discussions:

If there was a diving accident – access to this therapy is critical. While diving accidents are on the decline, need for hyperbaric services could increase (due to radiation therapy). It was built by money from the government to support diving related tourism – is a requirement for diving tourism.

Strategy has been to offer with a high-volume wound care service to subsidize low volume hyperbaric services. Variability in practice amongst surgeons. Many of the surgeons don't believe in hyperbarics and don't send their patients; some send their patients for the service overseas.

It is an expensive modality, so physicians can be reluctant to admit (especially if the patients are un/under-insured).

Incorporate use of hyperbarics for a patient population into care pathways (if it doesn't fit into a pathway – it shouldn't be used – i.e., promote consistent use). Potential patient populations (14 different indications for use) include:

- Vascular patients
- Radiation patients
- Diving accidents
- Wound care
- Necrotising Fasciitis
- Plastics

This service could offer a medical tourism opportunity.

Current staffing: 2 people (hyperbaric safety officer and hyperbaric technician) – served by on-call physician. Send physicians overseas to keep current.

Multi-place vs. Mono-place hyperbaric therapy (current) vs. multi-place (newer approach) could impact cost to run.

Related Research Evidence or Clinical Standards:

Cochrane Database Syst Rev. 2004;(2):CD004123.

Hyperbaric oxygen therapy for chronic wounds.

Kranke P, Bennett M, Roeckl-Wiedmann I, Debus S.

Update in Cochrane Database Syst Rev. 2012;4:CD004123.

REVIEWERS' CONCLUSIONS: In people with foot ulcers due to diabetes, HBOT significantly reduced the risk of major amputation and may improve the chance of healing at 1 year. The application of HBOT to these patients may be justified where HBOT facilities are available, however economic evaluations should be undertaken. In view of the modest number of patients, methodological shortcomings and poor reporting, this result should be interpreted cautiously however, and an appropriately powered trial of high methodological rigour is justified to verify this finding and further define those patients who can be expected to derive most benefit from HBOT. Regarding the effect of HBOT on chronic wounds associated with other pathologies, any benefit from HBOT will need to be examined in further, rigorous randomised trials. The routine management of such wounds with HBOT is not justified by the evidence in this review.

2012 Update:

AUTHORS' CONCLUSIONS:

In people with foot ulcers due to diabetes, HBOT significantly improved the ulcers healed in the short term but not the long term and the trials had various flaws in design and/or reporting that means we are

not confident in the results. More trials are needed to properly evaluate HBOT in people with chronic wounds; these trials must be adequately powered and designed to minimise all kinds of bias.

Ont Health Technol Assess Ser. 2005;5(11):1-28. Epub 2005 Sep 1.

Hyperbaric oxygen therapy for non-healing ulcers in diabetes mellitus: an evidence-based analysis.

Health Quality Ontario.

CONCLUSIONS:

The quality of the evidence assessing the effectiveness of HBOT as an adjunct to standard therapy for people with non-healing diabetic foot ulcers is low, and the results are inconsistent. The results of a recent meta-analysis that found benefit of HBOT to prevent amputation are therefore uncertain. Future well-conducted studies may change the currently published estimates of effectiveness for wound healing and prevention of amputation using HBOT in the treatment of non-healing diabetic foot ulcers.

Community of Practice Advice:

The BHB Clinical Services Plan should include continued availability of Hyperbaric Oxygen Therapy (HBOT), which is required to support diving tourism in Bermuda.

Anticipated Benefits:

HBOT can be a life-saving therapy for diving accidents.

Other Considerations:

There may be opportunities to increase surgeon awareness and acceptance of the potential uses of HBOT, and to increase the volume of treatments, and thereby decrease the average BHB cost of treatments.

Injection/Infusion/IV antibiotic clinic

Relevant Communities of Practice: Emergency

Description of Service/Initiative:

Seek opportunities to decant IV infusions conducted electively from the emergency department

Relevant Background Data:

The table below shows the highest volume procedures reported for ED patients in each of the last 3 fiscal years. In 2016/17, there were almost 7,000 ED patients who received an "Injection/Infusion Not Elsewhere Classified" (an increase of almost 1,000 from prior years).

BHB Procedures for ED/UCC Patients by Fiscal Year

ED Procedures	14/15	15/16	16/17
Inject/Infuse NEC	***6,019***	***6,033***	***6,992***
Nebulizer Therapy	2,762	2,949	2,476
Inject Antibiotic	1,077	1,225	1,849
Skin Suture NEC	957	883	937
Application of Splint	954	811	728
Diphtheria Toxoid Admin	579	615	985
Inject Anticoagulant	204	272	304
Insert Indwelling Cath	282	208	99
Inject Steroid	132	150	249
Other Skin & Subq I & D	187	161	109
Immobiliz/Wound Attn NEC	89	119	53
Inject Insulin	58	73	67
Linear Rep Lid Lacer	46	71	69
Suture of Lip Laceration	76	58	35
Replace Indwelling Cath	42	59	49
Packed Cell Transfusion	50	54	28

Input/Advice from CoP Discussions:

Infusions/ Transfusions/ IV antibiotic clinics

- Establish a clinic, so these cases don't need to be treated in the ED

- Establish an Infusion Clinic

	Blood Transfusion/ Antibiotic Clinic
Decision	**ED should divest scheduled transfusions/ infusions in the ED (but need to ensure access elsewhere for all patients)**
Questions	- Need more information: why are these patients coming to ED? o There is a home care service that should be offering this
Does it need to be BHB?	- No – if a community provider can do it for the same/better quality (and in a timely way), does not need to be at BHB o Two infusion clinics opening on the island – can refer to them o Challenge = under/ un-insured patients (likely won't be treated in private practice – will need to determine solution for these patients) Options to provide this service (need to balance quality and cost-

	Blood Transfusion/ Antibiotic Clinic
	effectiveness) - Could it be the PCMH? - Could it be part of the Rapid Referral Clinic - Could BHB or DOH subsidize the cost of uninsured patients being treated by private providers?

Related Research Evidence or Clinical Standards:

The Community IntraVenous Antibiotic Study (CIVAS): a mixed-methods evaluation of patient preferences for and cost-effectiveness of different service models for delivering outpatient parenteral antimicrobial therapy.

Minton J et al.

Southampton (UK): NIHR Journals Library; 2017 Feb. Health Services and Delivery Research.

OBJECTIVES: The aims of this research were to (1) establish the extent of OPAT service models in England and identify their development; (2) evaluate patients' preferences for different OPAT service delivery models; (3) assess the cost-effectiveness of different OPAT service delivery models; and (4) convene a consensus panel to consider our evidence and make recommendations.

METHODS: This mixed-methods study included seven centres providing OPAT using four main service models: (1**) hospital outpatient (HO)** attendance; (2) **specialist nurse (SN) visiting at home**; (3) general nurse (GN) visiting at home; and (4) self-administration (SA) or carer administration. Health-care providers were surveyed and interviewed to explore the implementation of OPAT services in England. OPAT patients were interviewed to determine key service attributes to develop a discrete choice experiment (DCE). This was used to perform a quantitative analysis of their preferences and attitudes. Anonymised OPAT case data were used to model cost-effectiveness with both Markov and simulation modelling methods. An expert panel reviewed the evidence and made recommendations for future service provision and further research.

RESULTS: The systematic review revealed limited robust literature but **suggested that HO is least effective, and SN is most effective**. Qualitative study participants felt that different models of care were suited to different types of patient and they also identified key service attributes. The DCE indicated that type of service was the most important factor, with SN being strongly preferred to HO and SA. Preferences were influenced by attitudes to health care. The results from both Markov and simulation models suggest that a SN model is the optimal service for short treatment courses (up to 7 days). Net monetary benefit (NMB) values for HO, GN and SN services were £2493, £2547 and £2655, respectively. For longer treatment, SA appears to be optimal, although SNs provide slightly higher benefits at increased cost. NMB values for HO, GN, SN and SA services were £8240, £9550, £10,388 and £10,644, respectively. The simulation model provided useful information for planning OPAT services. The expert panel requested more guidance for service providers and commissioners. Overall, they agreed that mixed service models were preferable.

LIMITATIONS: Recruitment to the qualitative study was suboptimal in the very elderly and ethnic minorities, so the preferences of patients from these groups might not be represented. The study recruited from Yorkshire, so the findings may not be applicable nationally.

CONCLUSIONS: The quantitative preference analysis and economic modelling favoured a SN model, although there are differences between sociodemographic groups. SA provides cost savings for long-term treatment but is not appropriate for all.

FUTURE WORK: Further research is necessary to replicate our results in other regions and populations and to evaluate mixed service models. The simulation modelling and DCE methods used here may be applicable in other health-care settings.

J Antimicrob Chemother. 2017 Aug 1;72(8):2392-2400. doi: 10.1093/jac/dkx123.

Cost-effectiveness of outpatient parenteral antibiotic therapy: a simulation modelling approach.

Vargas-Palacios A et al.

Objectives: In the UK, patients who require intravenous antimicrobial (IVA) treatment may receive this in the community through outpatient parenteral antimicrobial therapy (OPAT) services. Services include: IVA administration at a hospital outpatient clinic (HO); IVA administration at home by a general nurse (GN) or a specialist nurse (SN); or patient self-administered (SA) IVA administration following training. There is uncertainty regarding which OPAT services represent value for money; this study aimed to estimate their cost-effectiveness.

Methods: A cost-effectiveness decision-analytic model was developed using a simulation technique utilizing data from hospital records and a systematic review of the literature. The model estimates cost per QALY gained from the National Health Service (NHS) perspective for short- and long-term treatment of infections and service combinations across these.

Results: **In short-term treatments, HO was estimated as the most effective (0.7239 QALYs), but at the highest cost (£973).** SN was the least costly (£710), producing 0.7228 QALYs. The combination between SN and HO was estimated to produce 0.7235 QALYs at a cost of £841. For long-term treatments, SN was the most effective (0.677 QALYs), costing £2379, while SA was the least costly at £1883, producing 0.666 QALYs. A combination of SA and SN was estimated to produce 0.672 QALYs at a cost of £2128.

Conclusions: SN and SA are cost-effective for short- and long-term treatment of infections, while combining services may represent the second-best alternative for OPAT in the UK.

Community of Practice Advice:

The projections of future ED visit volumes for the BHB Clinical Services Plan should assume that patients requiring only non-emergent injections/infusions will be diverted from the ED. But the plan should not necessarily assume that BHB will establish an injection/infusion clinic, since there may be opportunities to support expanded access to these services in the community.

Anticipated Benefits:

Will reduce ED workload for non-urgent visits.

Other Considerations:

If community partners cannot be supported to provide this service, may be necessary for BHB to consider establishment of medical procedures clinic to divert these patients from the ED.

Telehealth Medical Advice Line

Relevant Communities of Practice: Emergency

Description of Service/Initiative:

Telephone line staffed with health care professionals to provide real time advice as alternative to ED or FP visits

Relevant Background Data:

High volume of triage level 4 (less urgent) visits to ED/UCC, particularly for under and uninsured patients.

Input/Advice from CoP Discussions:

In partnership with BHB, GPs, and DOH – establish a number for patients to get 24/7 health advice. Had been looked at previously, but not pursued due to legal concerns.

Do not think it would divert visits, but it could divert "second opinions". Health literacy is not high enough for something like this to work.

Some GPs offer this (but it is variable). Some GPs would see this as helpful, but some would see it as competitive. Better if Island GPs to collaborate and provide this service (in partnership with government and support from BHB).

Related Research Evidence or Clinical Standards:

Telehealth (including telemonitoring) is defined as using nurse practitioners or other qualified health professionals as case managers to remotely monitor specifically targeted (i.e. heart failure) chronically ill patients using evidence-based clinical care protocols[37]. There has also been success in predicting/preventing the likelihood of readmission for recently discharged heart failure patients who

[37] Piedmont Hospital in Atlanta: http://www.innovativecaremodels. com/care_models/15 and http://www.healthleadersmedia.com/content/ 90114/topic/WS_HLM2_HOM/How-Piedmont-Hospital-Cut-Heart-Failure- Patient-Readmissions-by-75-Percent.html ; Presbyterian Home Healthcare in New Mexico Patient Available at: http://www.innovativecaremodels.com/ care_models/18

are remotely monitored through various telemedicine technologies[38,39]. Most evidence about the impact of telecare/monitoring and impact on readmissions has focussed on people with heart failure, asthma and diabetes. Remote intervention strategies vary, however, by inclusion of other elements of enhanced team management, degree of patient education/self-management and follow up telephone contacts and follow up telephone contacts. As such, it is often difficult to assess the causal relationship between remote monitoring and hospitalization rates. The IHI's 2009 publication on Effective Interventions to Reduce Hospitalizations[40], noted that in the 8 articles that were included for review, the effect of remote monitoring (most often for patients with heart failure) on reducing hospitalizations ranged from a low of14% to a high of 80%. Other studies reviewed in this paper (e.g., those for asthma patients) showed a trend towards reducing hospital re-admissions but did not reach clinical significance. An overall review of the literature would conclude that evidence about the impact of providing information and support over the phone or remote monitoring of patients is inconsistent[41,42].

A 2011 Cochrane publication[43] that included 25 studies in a review of structured telephone support or telemonitoring programmes for patients with chronic heart failure found that telemonitoring reduced all-cause mortality (non-significant positive effect for structured telephone support). Both structured telephone support and telemonitoring reduced CHF-related hospitalizations as improvements in quality of life. Reduced healthcare costs were noted in several studies. Overall, the authors concluded that structured telephone support and telemonitoring were effective in reducing the risk of all-cause mortality and CHF-related hospitalisations, improving quality of life, reducing costs, and increasing evidence-based prescribing.

THE TEXT BELOW DESCRIBES THE TELEHEALTH ONTARIO SERVICES

Call Telehealth for medical advice

Telehealth Ontario is a free, confidential service you can call to get health advice or information. A Registered Nurse will take your call 24 hours a day, seven days a week.

- Toll-free: 1-866-797-0000
- Toll-free TTY: 1-866-797-0007

[38] Whellan DJ, Ousdigian KT et al. (2010) Combined heart failure device diagnostics identify patients at higher risk of subsequent heart failure hospitalizations: results from PARTNERS HF (Program to Access and Review Trending Information and Evaluate Correlation to Symptoms in Patients With Heart Failure) study. JACC 55:1803:10

[39] Boehmer JP, Saxon LA et al. (2009) Active Remote Management and Device Monitoring in Patients with HF Results in Frequent Interventions: Results from the RAPID-RF Registry. HRS Annual Scientific Sessions. Abstract 6367

[40] IHI (2009) Effective Interventions to Reduce Hospitalizations. A Survey of Published Evidence http://www.ihi.org/offerings/Initiatives/STAAR/ Documents/STAAR_A_Survey_of_the_Published_Evidence.pdf

[41] University of Birmingham (2006) Reducing Unplanned Hospital Admissions: What Does the Literature Tell Us? http://www.birmingham.ac.uk/Documents/ college-social-sciences/social-policy/HSMC/publications/2006/Reducing-unplanned-hospital-admissions.pdf

[42] OHTAC is currently reviewing the evidence regarding the effectiveness of telemonitoring

[43] Inglis SC, Clark RA, McAlister FA, Ball J, Lewinter C, Cullington D, Stewart S, Cleland JGF. Structured telephone support or telemonitoring programmes for patients with chronic heart failure. Cochrane Database of Systematic Reviews 2010, Issue 8. Art. No.: CD007228. DOI: 10.1002/14651858.CD007228.pub2

Telehealth Ontario is only offered over the phone. Email advice is not available.

How it works: When you call, a Registered Nurse will ask you to answer questions, so they can assess your health problem and give you advice.

Telehealth Ontario nurses will not diagnose your illness or give you medicine. They will direct you to the most appropriate level of care or may put you in contact with a health professional who can advise you on your next steps.

The nurse will help you decide whether to:

- handle a problem yourself
- visit your doctor or nurse practitioner
- go to a clinic
- contact a community service
- go to a hospital emergency room

Who can call: Anyone can call Telehealth Ontario to ask a health-related question. This service is:

- confidential – you may be asked to provide your health card number, but it is not required
- provided in both English and French, with translation support for some other languages
- free for all users

What you can ask: You can contact Telehealth Ontario when you have health-related questions or concerns about:

- illness or injury that may need medical care
- illnesses that don't go away or keep coming back
- food and healthy living
- teen health and issues
- depression, suicide or other mental health concerns
- medications and drug interactions
- breastfeeding

Community of Practice Advice:

A Telehealth Medical Advice Line should not be pursued as a BHB hospital-based strategy.

Standardized Care Pathways

Relevant Communities of Practice: All

Description of Service/Initiative:

Use of care maps to provide standardization of care and to support adherence to best/evidence based practice. Care maps also increase timeliness of care and increased efficiency in all of ED, Medicine, Surgery, Paediatrics, and Maternity.

Care pathways, also known as clinical pathways, critical pathways, care paths, integrated care pathways, case management plans, clinical care pathways, or care maps, are used to systematically plan and follow up a focused patient or client care programme.[44]

Care pathways are a way of setting out a process of best practice to be followed in the treatment of a patient or client with a condition or with particular needs. They are a distillation of the best available expert opinion on the care process and should be evidence based. Care pathways, which map out the care journey an individual can expect, should be multi-professional, crossing organisational boundaries; and can act as a prompt for care.

Clinical pathways, predictive algorithms or acuity algorithms support clinical decision making by providing a link between the best available evidence and clinical practice, and provide recommendations, processes and time-frames for the management of specific medical conditions or interventions. They can assist in understanding the proper level of care needed, determining whether to admit a patient to the hospital, determining the appropriate length of stay for admitted patients or flagging patients at risk for readmission.

Relevant Background Data:

Prior initiatives at BHB to develop care pathways.

Input/Advice from CoP Discussions:

The need for care maps was acknowledged and supported by all communities of practice. Care maps – should be mandatory/ standardized, with end point in mind

Historical care map work was put on pause until implementation of EMR. Opportunities to improve the use of care maps include:

- Update medical care pathways to include triggers for assessment/ referral for chronic disease
- Optimize resources, to support deliver of care maps (e.g., heart failure order sets exist, but not resourced to enact them)
- Improve MDT collaboration (including co-management of surgical and medical patients) for implementation of care maps (adherence needs to be enforced)

No pathways are currently in use for medical patients. Stroke pathway was developed, but not implemented (historic challenges with time and resources to implement them, and implementation efforts were put on hold until the EMR is implemented).

[44] European Pathway Association, http://www.e-p-a.org/clinical---care-pathways/index.html

Pathways are in place for surgery, which outline care for pre-op through to recovery. They are started in pre-assessment, but use often breaks down on the wards. Pathways currently in place include:

- Gynae surgery
- Cholecystectomies
- Total knee
- Total hip
- Hip fractures
- Hysterectomy
- C-Sections
- Tonsillectomies

Challenges with current use:

- They were not fully rolled out hospital-wide
- Utility varies widely between pathways
- Adherence is not monitored or enforced.
- Current staffing model (especially shortages in allied health) – can prevent optimal adherence.

Introduction, active use, and monitoring of adherence to clinical pathways would help to reduce acute care lengths of stay at BHB.

Prior work to develop pathways have been "siloed". Dr. Patton, as part of "Optimize ED" initiative – has initiated work. The Quality Council to be the body to oversee work.

BHB should use existing pathways from other organizations (platform to build) and implement one pathway at a time, ensuring that mandatory compliance is enforced.

Related Research Evidence or Clinical Standards:

The use of care pathways has been associated with reduced in-hospital complications and strong positive effects on safety and quality of care.

- Lee's study[45] that included a random sample of 12,591 patients presenting to one of 86 Hospital EDs in Ontario from 2004 to 2007 focussed on deriving and validating a model for acute heart failure mortality applicable in the ED. Their research has resulted in the development of the Emergency Heart Failure Mortality Risk Grade (EHMRG) that focuses on 10 predictors to assess the relative impact on the risk of death in the week following presentation to the ED.
- Goldman's study[46] focused on developing an algorithm to identify/screen for stroke patients who have unjustifiable hospital stays thereby assisting in clinical decision making. Of the 177 patients that were included in this study from an acute care teaching hospital in Wisconsin, 68% of patients

[45] Lee, D.S., Stitte, A. et al. (2012) Prediction of Heart Failure Mortality in Emergent Care: A Cohort Study. Annals of Internal Medicine, Vol. 156(11).

[46] Goldman, R. Hartz, A. et al. (1996) Results of a Computerized Screening of Stroke Patients for Unjustified Hospital Stay. Stroke Vol. 27.

had some unjustified hospital days and 41% of all hospital days were unjustified. Algorithms such as the one developed/used in this study can support clinical decision making and efficiencies.

- A 2010 Cochrane review[47] of 27 studies including over 11,000 patients compared the outcomes of patients who received care as per a clinical pathway and those who received usual care. For 20 of the studies where studies compared stand-alone clinical pathways with usual care, patients who were on a clinical pathway had a reduction in in-hospital complications, improved documentation and decreases in overall hospital costs. Most studies also found significant reductions in length of stay. There was no evidence, however, of decreases in in-hospital mortality or readmission rates. The other 7 studies included in the Cochrane reviewed included studies that included clinical pathways as part of a multifaceted intervention with usual care. No evidence of differences was found in these groups. The Authors' concluded that: "Clinical pathways are associated with reduced in-hospital complications and improved documentation without negatively impacting on length of stay and hospital costs."
- Grunier's study[48] that reviewed administrative data to identify 26,045 adult medical patients discharged alive from 6 hospitals in Toronto in 2007 used the LACE index to flag high risk readmissions (LACE score greater than or equal to 10) found that 12.6% of patients were re-admitted to hospital within 30 days of discharge. Interestingly, while high risk patients accounted for only 34% of the sample but 51.7% of patients were readmitted. The authors concluded that algorithms such as the one used in this study could help identify patients at high risk for readmission and who may benefit from improved post-discharge care and interventions.
- At Intermountain Healthcare concerted efforts have been made to improve patient outcomes and reduce costs by developing and implementing integrated care delivery protocols in 10 clinical areas. These clinical areas included cardiovascular, neuro-musculoskeletal, surgical specialties, women and newborns, intensive medicine, intensive paediatrics, intensive behavioural, oncology, preventive and health maintenance, and primary care. Working in small teams comprised of clinical leaders and researchers, Care Process Models (CPM) were developed for approximately 60 routine clinical processes. CPMs were adopted and integrated into care delivered across the organization with the use of supporting resources and tools and corresponding performance metrics. One relevant example is the organization's adoption of a community-acquired pneumonia CPM that established an evidence-based care pathway for patients and standardized criteria for their admission to hospital. Among the many benefits of its implementation was the 7.2% reduction in the hospital admission rate among pneumonia patients. A formal cost analysis revealed that the adoption of CPMs resulted in improved clinical performance and netted approximately $100 million in savings for the organization on an annual basis[49].

See Centre for Policy and Ageing (May 2014 issue) for a summary of additional evidence included in their rapid review http://www.ageuk.org.uk/Documents/EN-GB/For-professionals/Research/CPA-Effectiveness_of_care_pathways.pdf?dtrk=true

[47] Rotter T, Kinsman L, James EL, Machotta A, Gothe H, Willis J, Snow P, Kugler J. Clinical pathways: effects on professional practice, patient outcomes, length of stay and hospital costs. Cochrane Database of Systematic Reviews 2010, Issue 3. Art.No.:CD006632. DOI: 10.1002/14651858.CD006632.pub2.

[48] Gruneir, A. Dhalla, I. et al (2011) Unplanned Readmissions After Hospital Discharge Among Patients identified as Being at High Risk for Readmission Using a Validated Predictive Algorithm. Open Medicine Vol. 5(2).

[49] Bohmer, R. (2008). Clinical Change at Intermountain Healthcare. Harvard Business Review 9-607-023.

Van Herck et al found that 65.5% of the included studies reported a positive effect on clinical outcomes, while 32% reported no effect and 2.4% a negative effect.

Bandolier reported on improved clinical outcomes for hip and knee replacements, fractured neck of femur, inpatient asthma management, community acquired pneumonia, heart failure, community acquired lower respiratory tract infections, bronchiolitis, and caesarean section. Hindle, Dowdeswell and Yasbeck list earlier studies that describe positive effects on quality of care and patient outcomes for geriatric patients with depression, patients undergoing regional anaesthesia for outpatient orthopaedic surgery, pain management, neonatal intensive care, peri-operative settings, amputation, elective infrarenal aortic reconstructions, urology patients, inpatient asthma care and hip and knee arthroplasty.

In the review by Van Herck et al 82.5% of the studies reported a positive effect on reducing costs, while 13.5% described no effect and 4% a negative effect. A 2013 study of the introduction of a clinical pathway in postoperative clinical care following major head and neck surgery found a 27% reduction in costs per patient and several other studies have identified reduced length of stay following pathway introduction.

Community of Practice Advice:

BHB should support a hospital-wide, coordinated initiative to develop, implement, monitor, and enforce adherence to standardized clinical pathways (starting with existing pathways from other hospitals).

Anticipated Benefits:

Implementation of these pathways will contribute to both admission avoidance and length of stay reduction, and reduction in variability of care provided by BHB.

Other Considerations:

Build on work already done elsewhere; no need to start from scratch. Implement one pathway at a time, and enforce use to demonstrate BHB support.

Medicine

Patient Centred Medical Home

Relevant Communities of Practice: Medicine, Chronic Disease Management

Description of Service/Initiative:

Patient-Centred Medical Home programme offers outpatient referral services for individuals with chronic diseases such as diabetes who are not seeing a GP and who are uninsured or underinsured.

Relevant Background Data:

Patients covered by HID (HIP, FutureCare) have longer than expected stay for non-outlier cases, highest % of outlier cases, and highest % of days in outlier cases. Self-pay patients include patients without any insurance and patients with the resources to pay directly for care.

2016/17 KEMH Acute Inpatient Cases by Insurer

Insurer	Non-Outlier Cases					Outlier Cases			% Outlier Cases	% Outlier Days
	Disch.	Actual Days	Avg. LOS	CMS Expect. Days	% Over CMS	Disch.	Actual Days	Avg. LOS		
Private	2,309	9,053	3.9	8,668	4%	147	9,535	64.9	6.0%	51.3%
HID	***1,264***	***7,216***	***5.7***	***5,572***	***30%***	***258***	***22,125***	***85.8***	***17.0%***	***75.4%***
Self-Pay	1,260	3,941	3.1	4,670	-16%	77	8,784	114.1	5.8%	69.0%
GEHI	642	2,959	4.6	2,491	19%	57	4,066	71.3	8.2%	57.9%
Dept. of Corrections	10	58	5.8	44	31%	2	49	24.5	16.7%	45.8%
Other	1	9	9.0	4	105%	-	-		0.0%	0.0%
Grand Total	5,486	23,236	4.2	21,449	8%	541	44,559	82.4	9.0%	65.7%

HID patients have highest rate of readmission within 1 year for a similar diagnosis.

2016/17 KEMH Acute Inpatient Readmissions for Related Diagnosis within 1 Year

Insurance Status	Discharges	Readmit. Similar Dx w/in 1 Yr.
Private	2,456	12.8%
HID	***1,522***	***21.0%***
Self-Pay	1,337	8.6%
GEHI	699	15.6%
Dept. of Corrections	12	25.0%
Other	1	0.0%
Grand Total	6,027	14.3%

Patients covered by HID have highest % of stay in acute care as ALC (40.7% of days).

2016/17 KEMH Acute Discharge ALC Days by Insurance Status

Insurance Status	Total Days	ALC Days	% ALC Days
HID	***29,341***	***11,946***	***40.7%***
Private	18,588	1,571	8.5%
Self-Pay	12,725	3,007	23.6%
GEHI	7,025	442	6.3%
Dept. of Corrections	107	-	0.0%
Other	9	-	0.0%
Grand Total	67,795	16,966	25.0%

PCMH implementation in other jurisdictions has focused on modification of incentives in primary care to support multi-disciplinary coordination of care. BHB's model focuses on the un- and under-insured population and offers the PCMH supports via an acute care provider.

Input/Advice from CoP Discussions:

Strengthen/ Expand the PCMH

There are 3 criteria for admission:

- No GP
- At least one chronic condition
- Under-insured

Now at 11 months of an 18-month project – after 12 months slated to deliver report on results to submit to the Ministry. 50 super users have been tracked and there is preliminary evidence of a 42% decrease in ED use. The number one referral source is from the GP.

In our current fragmented system, with BHB's safety net role – it is critical BHB continues to offer the PCMH, but the model should be adapted: hours should be extended (and extend what is offered in the community), enhanced allied health support – especially the addition of a social worker (meet all needs of the patient population).

There are mixed views from GPs on whether BHB should be running the PCMH (acknowledged benefit for this service as a "safety net" for uninsured, under insured patients). Is there a role that BHB could/should play to support primary care for under-insured and un-insured patients that would not be perceived as being in "competition" with community providers?

There is a parallel pilot project of enhanced primary care, with similar timing of implementation and evaluation.

Related Research Evidence or Clinical Standards:

J Gen Intern Med. 2016 Nov;31(11):1382-1388. Epub 2016 Jul 29.

The CareFirst Patient-Centered Medical Home Program: Cost and Utilization Effects in Its First Three Years.

Cuellar A, Helmchen LA, Gimm G, Want J, Burla S, Kells BJ, Kicinger I, Nichols LM.

BACKGROUND: Enhanced primary care models have diffused slowly and shown uneven results. Because their structural features are costly and challenging for small practices to implement, they offer modest rewards for improved performance, and improvement takes time.

OBJECTIVE: To test whether a patient-centered medical home (PCMH) model that significantly rewarded cost savings and accommodated small primary care practices was associated with lower spending, fewer hospital admissions, and fewer emergency room visits.

DESIGN: We compared medical care expenditures and utilization among adults who participated in the PCMH programme to adults who did not participate. We computed difference-in-difference estimates using two-part multivariate generalized linear models for expenditures and negative binomial models for utilization. Control variables included patient demographics, county, chronic condition indicators, and illness severity.

PARTICIPANTS: A total of 1,433,297 adults aged 18-64 years, residing in Maryland, Virginia, and the District of Columbia, and insured by CareFirst for at least 3 consecutive months between 2010 and 2013.

INTERVENTION: CareFirst implemented enhanced fee-for-service payments to the practices, offered a large retrospective bonus if annual cost and quality targets were exceeded, and provided information and care coordination support.

MEASURES: Outcomes were quarterly claims expenditures per member for all covered services, inpatient care, emergency care, and prescription drugs, and quarterly inpatient admissions and emergency room visits.

RESULTS: By the third intervention year, annual adjusted total claims payments were $109 per participating member (95 % CI: -$192, -$27), or 2.8 % lower than before the programme and compared to those who did not participate. Forty-two percent of the overall decline in spending was explained by lower inpatient care, emergency care, and prescription drug spending. Much of the reduction in inpatient and emergency spending was explained by lower utilization of services.

CONCLUSIONS: A PCMH model that does not require practices to make infrastructure investments and that rewards cost savings can reduce spending and utilization.

Community of Practice Advice:

The CoP felt strongly that the PCMH has resulted in improved care for un/underinsured individuals who had been frequent users of other services. It was believed that this would be demonstrated when the formal evaluations of the PCMH and the enhanced primary care pilot project are completed in 6 months. On the strength of this belief, the CoP felt that the BHB CSP should plan for the expansion of the PCMH model. The CSP should assume that there will be a reduction in ED visits and hospital admissions by non-/under-insured “super users” in the future, because of either a BHB PCMH service, an enhanced primary care model, or a combination of both.

Anticipated Benefits:

Reduction in ED visits by “super users”, reduced admissions, and reduced length of stay through better management of chronic conditions and case management.

Other Considerations:

Any BHB PCMH model should be seen as supportive of primary care providers, rather than competitive. As a service believed to de-escalate care from the ED, the PCMH and / or the enhanced primary care model will require investment; there needs to be a more robust funding model.

Cardiac Catheterization Laboratory

Relevant Communities of Practice: Medicine

Description of Service/Initiative:

The **Mary & David Barber Cardiac Diagnostic Unit** at BHB provides tests to help evaluate the cardiac function of adults and, to a limited extent, children. The following tests are available in the unit:

- Electrocardiogram (ECG)
- Echocardiogram (echo)
- Ultrasound
- Exercise (treadmill) stress tests (with and without echocardiogram)
- Holter monitoring
- 24-hour automated blood pressure monitoring

Other devices, such as pacemakers, defibrillators and reveal recorders, even those not installed by the hospital, are monitored within the Cardiac Diagnostic Unit.

Cardiac Rehabilitation Services are offered to patients and their families following a heart attack, heart surgery or coronary angioplasty/stents and heart failure. The main goal of this service is to assist patients in developing a healthy lifestyle plan that includes physical activity, education, stress management, and nutrition counselling.

It has been suggested that a cardiac catheterization laboratory may be a useful addition to the cardiac services provided by BHB. Procedures performed in a cath lab include diagnostic (coronary angiography) and several percutaneous coronary interventions, (PCIs) such as coronary angioplasty, stenting, electrophysiology studies, and catheter ablations.

Relevant Background Data:

Cardiac Related ED Visits

ED Dx Group	14/15	15/16	16/17
AMI	66	95	98
Angina	11	6	6
Atrial Fibrillation and Flutter	124	134	96
Chest Pain	1,019	1,201	1,107

ED Dx Group	14/15	15/16	16/17
Congestive Heart Failure	278	283	306
Hypertensive Diseases	201	212	145
Other Cardiac Arrhythmias	70	58	56
Other Forms of Heart Disease	170	161	177
Syncope/Dizziness	639	697	760
Tachycardia	22	24	21
Grand Total	**2,600**	**2,871**	**2,772**

BHB KEMH Discharges Assigned to AMI DRG

Diagnosis Related Group	2014/15	2015/16	2016/17
Acute Myocardial Infarction, Discharged Alive w CC	23	20	23
Acute Myocardial Infarction, Discharged Alive w MCC	32	34	39
Acute Myocardial Infarction, Discharged Alive w/o CC/MCC	43	48	44
Acute Myocardial Infarction, Expired w CC	7	2	4
Acute Myocardial Infarction, Expired w MCC	8	6	6
Acute Myocardial Infarction, Expired w/o CC/MCC	-	1	-
Grand Total	113	111	116
% Expired	13%	8%	9%

Input/Advice from CoP Discussions:

Not discussed during Session 1 and 2; was included in prior Johns Hopkins review, and has been raised outside of the CoP discussions.

At Session 3, Dr. Mir presented the case for establishment of the service at BHB, including:

- Should have built an interventional radiology suite -- 100 MI's year another 200 acute angina creates a critical mass of patients who would benefit from the service.
- With the projected aging of the Bermuda population the need for cardiac services will increase
- For ST elevation MI, time is an issue; cardiac catheterization within 90 minutes of presentation in ED.
- You could save the system millions of dollars, sending two patients a week overseas. Could do ICDs and pacemakers as well with the same investment, as well as vascular procedures for exertional angina
- Historical requirements for local access to cardiac surgery back up are no longer applicable, and the risk of need for surgical back up should be balanced against the risk of having no local access to interventional cardiac procedures

Could visiting cardiologist support for this service be part of the clinical affiliation agreement? Would it be appropriate to have a single cardiologist to do PCIs? Can we find out another island that does this?

Cayman Island - 61,000 people – Provides adult and paediatric cardiac surgery and cardiology. Offers lifesaving emergency and scheduled cardiac procedures including cardiothoracic surgery, paediatric

cardiac surgery, congenital heart surgery, heart valve surgery, and the complex repair of abdominal and thoracic aortic aneurysms. Programme established as medical tourism initiative as well as resource for Caribbean population.

Barbados – 270,000 people – adult cardiac surgery started with North Shore Hospital New York, provides surgery for adults from elsewhere in the Caribbean

Iceland – 360,000 people – PCIs and cardiac surgery in one centre

Maldives – 329,000 people – hospital part of large Indian chain, may offer cardiology (not clear)

Seychelles – 87,000 people – no apparent PCI or cardiac surgery

In Pacific Islands of Samoa and Fiji, cardiac surgery is provided via volunteer cardiac surgeon visits to islands. Samoa has 190,000 people; Fiji has 900,000.

ANZ J Surg. 2011 Dec;81(12):871-5. doi: 10.1111/j.1445-2197.2011.05899.x. **Cardiac surgery in the Pacific Islands.** Davis PJ1, Wainer Z, O'Keefe M, Nand P.

Related Research Evidence or Clinical Standards:

Several factors have contributed to a decline in PCI volumes over the last several years in the US including a greater emphasis on medical therapy for the treatment of stable coronary artery disease, enhanced primary and secondary prevention efforts, a reduction in restenosis by drug-eluting stents, a reduction in the incidence of ST-segment elevation myocardial infarction (STEMI), and the development and application of appropriate use criteria.

Cardiac surgery will not be available in Bermuda and establishing a cardiac catheterization laboratory without the availability of surgical back-up has not been generally recommended. Across the US, however, PCI without on-site surgery has increased since 2007; currently, 45 states allow both primary and elective PCI without on-site surgery, 4 states allow only primary PCI without on-site surgery, and 1 state prohibits PCI without on-site surgery. PCI without on-site surgery is regulated by the State Department of Health in 34 states but is unregulated in the remaining 16 states. Elective PCI without on-site surgery was allowed at selected facilities in 9 states but only as part of statewide demonstration projects or to allow participation in the Cardiovascular Patient Outcomes Research Team (CPORT) Nonprimary PCI (CPORT-E) trial.

A limitation of programs performing PCI without on-site surgery is the lack of on-site access to a cardiac surgeon for consultation about revascularization options. This makes the concept of a Heart Team consultation more difficult to achieve and could necessitate performing only diagnostic catheterization until a case review with a cardiac surgeon can be performed. The application of telemedicine consultations with a heart surgeon could facilitate these interactions. Many of the nonemergency patients who merit discussion by a Heart Team are not optimal candidates for PCI at facilities without on-site cardiac surgery. It is important to emphasize that the role of the cardiac surgeon is not confined

to the treatment of PCI complications but includes the participation in decisions about revascularization options.

The 2011 ACCF/AHA/SCAI PCI Guidelines state that "desires for personal or institutional financial gain, prestige, market share, or other similar motives are not appropriate considerations for initiation of PCI programs without on-site cardiac surgery" and suggests that new programs offering PCI without on-site surgery are inappropriate unless they clearly serve geographically isolated populations. However, a recent meta-analysis suggests that there are few differences in outcomes between centres with and without onsite surgical backup.

Circulation. 2015 Aug 4;132(5):388-401. doi: 10.1161/CIRCULATIONAHA.115.016137. Epub 2015 Jul 7.

Percutaneous Coronary Intervention at Centers with and Without On-Site Surgical Backup: An Updated Meta-Analysis of 23 Studies.

Lee JM, Hwang D, Park J, Kim KJ, Ahn C, Koo BK.

BACKGROUND:

Emergency coronary artery bypass grafting for unsuccessful percutaneous coronary intervention (PCI) is now rare. We aimed to evaluate the current safety and outcomes of primary PCI and nonprimary PCI at centers with and without on-site surgical backup.

METHODS AND RESULTS:

We performed an updated systematic review and meta-analysis by using mixed-effects models. We included 23 high-quality studies that compared clinical outcomes and complication rates of 1 101 123 patients after PCI at centers with or without on-site surgery. For primary PCI for ST-segment-elevation myocardial infarction (133 574 patients), all-cause mortality (without on-site surgery versus with on-site surgery: observed rates, 4.8% versus 7.2%; pooled odds ratio [OR], 0.99; 95% confidence interval, 0.91-1.07; P=0.729; I(2)=3.4%) or emergency coronary artery bypass grafting rates (observed rates, 1.5% versus 2.4%; pooled OR, 0.76; 95% confidence interval, 0.56-1.01; P=0.062; I(2)=42.5%) did not differ by presence of on-site surgery. For nonprimary PCI (967 549 patients), all-cause mortality (observed rates, 1.6% versus 2.1%; pooled OR, 1.15; 95% confidence interval, 0.94-1.41; P=0.172; I(2)=67.5%) and emergency coronary artery bypass grafting rates (observed rates, 0.5% versus 0.8%; pooled OR, 1.14; 95% confidence interval, 0.62-2.13; P=0.669; I(2)=81.7%) were not significantly different. PCI complication rates (cardiogenic shock, stroke, aortic dissection, tamponade, recurrent infarction) also did not differ by on-site surgical capability. Cumulative meta-analysis of nonprimary PCI showed a temporal decrease of the effect size (OR) for all-cause mortality after 2007.

CONCLUSIONS:

Clinical outcomes and complication rates of PCI at centers without on-site surgery did not differ from those with on-site surgery, for both primary and nonprimary PCI. Temporal trends indicated improving clinical outcomes in nonprimary PCI at centers without on-site surgery.

Little is known about recent trends in the incidence rates of the two major types of AMI; ST-segment elevation acute myocardial infarction (STEMI) and non-ST-segment acute myocardial infarction (NSTEMI). A recent article in the United States did identify incidence rates of STEMI to be 77 per 100,000 population, whereas the incidence rates of NSTEMI was measured at 132 per 100,000 population. These rates applied to the Bermuda population (65,331) translate to approximately 50 STEMIs and 86 NSTEMIs annually; for a total of 136.

The ACCF/AHA/SCAI 2013 Update of the Clinical Competence Statement on Coronary Artery Interventional Procedures states that:

An institutional volume threshold <200 PCIs/annually appears to be consistently associated with worse outcomes, but above this level there was no relationship between even higher annual volumes and improved outcomes. Accordingly, the writing committee recommends a minimum **institutional volume** threshold of 200 PCIs per year. There is less evidence to support a threshold for individual operator volume for both elective and primary PCI. It is the writing committee's recommendation that interventional cardiologists perform a minimum of 50 PCI procedures per year (averaged over a 2–year period) to maintain competency.

Harold JG, Bass TA, Bashore TM, Brindis RG, Brush JE Jr, Burke JA, Dehmer GJ, Deychak YA, Jneid H, Jollis JG, Landzberg JS, Levine GN, McClurken JB, Messenger JC, Moussa ID, Muhlestein JB, Pomerantz RM, Sanborn TA, Sivaram CA, White CJ, Williams ES.

ACCF/AHA/SCAI 2013 update of the clinical competence statement on coronary artery interventional procedures: a report of the American College of Cardiology Foundation/American Heart Association/American College of Physicians Task Force on Clinical Competence and Training (Writing Committee to Revise the 2007 Clinical Competence Statement on Cardiac Interventional Procedures). Circulation. 2013;128:436-472.

Dehmer GJ, Blankenship JC, Cilingiroglu M, Dwyer JG, Feldman DN, Gardner TJ, Grines CL, Singh M. **SCAI/ACC/AHA expert consensus document: 2014 update on percutaneous coronary intervention without on-site surgical backup.** Circulation. 2014;129:2610–2626.

David D. McManus, Joel Gore, Jorge Yarzebski, Frederick Spencer, Darleen Lessard, Robert J. Goldberg. ***Recent Trends in the Incidence, Treatment, and Outcomes of Patients with ST and Non-ST-Segment Acute Myocardial Infarction***. Am J Med. 2011 Jan; 124(1): 40–47.

Community of Practice Advice:

Given the potential cardiac catheterization volumes, the CoP felt that the CSP should not include the development of a cardiac catheterization laboratory.

There was, however, not unanimity among the members of the Medicine CoP. With demands associated with interventional radiology (that require similar equipment), changes in recommendations regarding the need for on-site cardiac surgery backup that may support cardiac intervention in

Bermuda, and a number of developments that suggest that volumes would be insufficient to maintain a service (a decline in PCI volumes over the last several years attributed to a greater emphasis on medical therapy for the treatment of stable coronary artery disease, enhanced primary and secondary prevention efforts, a reduction in restenosis by drug-eluting stents, a reduction in the incidence of ST-segment elevation myocardial infarction (STEMI), and the development and application of appropriate use criteria), it was felt that the decision should be re-evaluated in the future.

Other Considerations:

Recent research suggests that lack of on-site access to back up cardiac surgery should no longer be considered an over-riding barrier to provision of an interventional cardiac catheterization laboratory particularly in geographically isolated areas.

Evidence of a volume/outcome relationship, at both the individual provider, and institutional level continues to be found in recent research reports. Based on population-based utilization rates in other countries, the Bermuda population is unlikely to generate the volume of procedures that would exceed the recommended minimum institutional volumes by 2025.

CHF Clinic

Relevant Communities of Practice: Medicine

Description of Service/Initiative:

Heart Failure clinic with nursing support to provide personalized heart failure management program, and self-management around diet, exercise, and medication.

Relevant Background Data:

2016/17 CHF Diagnosis Related Group Discharges and Length of Stay

Diagnosis Related Group	Cases	Days	Avg. LOS	% ALC Days
Heart Failure & Shock w CC	131	943	7.2	0%
Heart Failure & Shock w MCC	81	880	10.9	11%
Heart Failure & Shock w/o CC/MCC	23	131	5.7	0%
Grand Total	235	1,954	8.3	5%

The BHB cases assigned to the heart failure DRGs had among the highest rates of readmission for a similar diagnosis within 1 year.

2016/17 CHF Diagnosis Related Group Readmission within 1 Year with Related Diagnosis

Diagnosis Related Group	Cases	Readmit w/in Yr. w/Similar Dx	% Readmit
Heart Failure & Shock w CC	131	47	36%
Heart Failure & Shock w MCC	81	27	33%
Heart Failure & Shock w/o CC/MCC	23	5	22%
Grand Total	235	79	34%

Input/Advice from CoP Discussions:

BHB previously had an outpatient Heart Failure Clinic which was associated with a reduction in readmissions from double digits to single digit. The clinic was discontinued because the Nurse Practitioner for the clinic moved to support the PCMH. Referral to the clinic was based on a care map initiated in the ED.

In the absence of the availability of this service in another environment (e.g. in the community), the onus should be on BHB to provide the service, since BHB will face the consequences (in terms of readmissions) if the service is not available. However, BHB must also ensure that there is a revenue stream identified to cover the costs of the service.

BHB should re-establish this clinic. BHB should consider increasing the complement of Nurse Practitioners (including a Health Failure Nurse Practitioner promote daily rounding of HF clinic).

This model could be used by Hospitalists and geriatricians for diabetes, asthma, hypertension, and COPD, as well as CHF. BHB nurse practitioners or advanced practice nurses should staff the clinics and participate in inpatient rounds as well as their outpatient role.

However, the surgical reimbursement model (i.e. where the surgeons are not BHB employees) does not support the NP payment model.

Related Research Evidence or Clinical Standards:

JAAPA. 1999 Oct;12(10):24-6, 29, 32 passim.

A CHF clinic. How aggressive outpatient care can offset hospitalization.

Branch RD Jr.

Congestive heart failure (CHF) is a serious problem, responsible for one of the highest rates of hospitalization in the United States for any medical condition. This study evaluated the effectiveness of a multidisciplinary, outpatient CHF clinic in decreasing the number of hospitalizations that CHF patients required. The clinic combines intensive patient and family education with aggressive follow-up. A major aspect of the research project was developing a computerized database for maintaining the large volume of information generated by the CHF clinic. Once that database was established, records of 20 clinic patients were examined for a 6-month period surrounding each patient's date of enrollment.

Characteristics of each patient during the 3-month preclinic period were compared with those of the 3-month postclinic period, including all admissions, all days in the hospital, admissions due to CHF, and days in the hospital due to CHF. There was a mean reduction of 0.733 admissions of all types and a mean reduction of 5.2 inpatient days for all admissions. There was a mean reduction of 0.8 admissions for CHF and a mean reduction of 4.067 inpatient days for CHF. All four reductions were statistically significant (P < .05). Results suggest that the CHF clinic was effective in reducing the number of, and length of stay during, hospitalizations.

Int J Cardiol. 2015 Dec 15;201:368-75. doi: 10.1016/j.ijcard.2015.08.066. Epub 2015 Aug 8.

Cost-effectiveness of home versus clinic-based management of chronic heart failure: Extended follow-up of a pragmatic, multicentre randomized trial cohort - The WHICH? study (Which Heart Failure Intervention Is Most Cost-Effective & Consumer Friendly in Reducing Hospital Care).

Maru S, Byrnes J, Carrington MJ, Chan YK, Thompson DR, Stewart S, Scuffham PA; WHICH? Trial Investigators.

OBJECTIVE: To assess the long-term cost-effectiveness of two multidisciplinary management programs for elderly patients hospitalized with chronic heart failure (CHF) and how it is influenced by patient characteristics.

METHODS: A trial-based analysis was conducted alongside a randomized controlled trial of 280 elderly patients with CHF discharged to home from three Australian tertiary hospitals. Two interventions were compared: home-based intervention (HBI) that involved home visiting with community-based care versus specialized clinic-based intervention (CBI). Bootstrapped incremental cost-utility ratios were computed based on quality-adjusted life-years (QALYs) and total healthcare costs. Cost-effectiveness acceptability curves were constructed based on incremental net monetary benefit (NMB). We performed multiple linear regression to explore which patient characteristics may impact patient-level NMB.

RESULTS: During median follow-up of 3.2 years, HBI was associated with slightly higher QALYs (+0.26 years per person; p=0.078) and lower total healthcare costs (AU$ -13,100 per person; p=0.025) mainly driven by significantly reduced duration of all-cause hospital stay (-10 days; p=0.006). At a willingness-to-pay threshold of AU$ 50,000 per additional QALY, the probability of HBI being better-valued was 96% and the incremental NMB of HBI was AU$ 24,342 (discounted, 5%). The variables associated with increased NMB were HBI (vs. CBI), lower Charlson Comorbidity Index, no hyponatremia, fewer months of HF, fewer prior HF admissions <1 year and a higher patient's self-care confidence. HBI's net benefit further increased in those with fewer comorbidities, a lower self-care confidence or no hyponatremia.

CONCLUSIONS: Compared with CBI, HBI is likely to be cost-effective in elderly CHF patients with significant comorbidity.

Community of Practice Advice:

The BHB Clinical Services Plan should include re-establishment of an outpatient CHF service (both inpatient and outpatient).

Anticipated Benefits:

Availability of a nurse practitioner or enhanced practice nurse staffed CHF clinic will improve patient and family education and self-management. This will reduce the current high readmission rate for BHB patients with CHF.

Other Considerations:

The CHF clinic provides a model of a BHB chronic disease management clinic. The clinical staff of the clinic should also participate in inpatient rounds.

Pulmonary Service

Relevant Communities of Practice: Medicine

Description of Service/Initiative:

Establishment of a pulmonary service within BHB. The service would provide a complete evaluation of the respiratory system to identify the severity of pulmonary impairment. Testing would include patient history, physical examinations, chest x-ray examinations, arterial blood gas analysis, and tests of pulmonary function.

Relevant Background Data:

There is currently no service in the hospital. There is a community-based facility that is open intermittently when a visiting Respirologist is in the country (apparently for 1-2 weeks per month)

BHB has many ED visits and admissions for asthma and acute exacerbations of COPD. The optimal management of these patients can and should include some PF testing both acutely and during their inpatient stay. Such testing could be conducted by a respiratory therapist and interpreted by a Respirologist but there is no RT in the hospital.

Input/Advice from CoP Discussions:

Identified by cardiology as beneficial addition to BHB services.

There is a new community pulmonologist on the Island who will be providing spirometry testing.

There is a need for a core service on the island, and BHB has a responsibility for providing care to patients who are un-/under-insured and will not be able to access a private community service. Indigent patients with COPD or asthma are forced to make a choice between food or medications.

But BHB should work in partnership, not competition, with the community pulmonologist, and primary care providers, to ensure that Bermuda residents have access to lung function testing.

Coverage of lung function testing under the SHB will be an important consideration.

Related Research Evidence or Clinical Standards:

General considerations for lung function testing

M. R. Miller, R. Crapo, J. Hankinson, V. Brusasco, F. Burgos, R. Casaburi, A. Coates, P. Enright, C. P. M van der Grinten, P. Gustafsson, R. Jensen, D. C. Johnson, N. MacIntyre, R. McKay, D. Navajas, O. F. Pedersen, R. Pellegrino, G. Viegi, J. Wanger

European Respiratory Journal 2005 26: 153-161; DOI: 10.1183/09031936.05.00034505

BACKGROUND

In preparing the joint statements on lung function testing for the American Thoracic Society (ATS) and the European Respiratory Society (ERS), it was agreed by the working party that the format of the statements should be modified so that they were easier to use by both technical and clinical staff. This statement contains details about procedures that are common for many methods of lung function testing and, hence, are presented on their own.

PATIENT CONSIDERATIONS - Contraindications

Performing lung function tests can be physically demanding for a minority of patients. It is recommended that patients should not be tested within 1 month of a myocardial infarction. Patients with any of the conditions listed in table 1 (in original paper) are unlikely to achieve optimal or repeatable results.

PERSONNEL QUALIFICATIONS AND TECHNICIAN'S ROLE IN QUALITY CONTROL - Personnel qualifications

Previously, the ATS has published recommendations for laboratory personnel conducting pulmonary function tests. Minimum requirements include sufficient education and training to assure that the technician understands the fundamentals of the tests, the common signs of pulmonary diseases and the management of the acquired pulmonary function data. The ATS also recommended that medical directors should have appropriate training and be responsible for all pulmonary function testing. Since these initial recommendations, pulmonary function testing equipment and procedures have become considerably more complex. The use of computers has reduced the need for routine manual measurement; however, new and more complex training issues have evolved. Many providers of pulmonary function training programmes have expanded the scope and length of training to accommodate these new needs.

The current guidelines suggest that completion of secondary education and at least 2 yrs. of college education would be required to understand and fulfil the complete range of tasks undertaken by a pulmonary function technician.

For pulmonary function testing, an emphasis on health-related sciences (nursing, medical assistant, respiratory therapy, etc.) is desirable. Formal classroom-style training alone does not, however, establish competency in pulmonary function testing. Technicians who conduct pulmonary function testing need to be familiar with the theory and practical aspects of all commonly applied techniques, measurements, calibrations, hygiene, quality control, and other aspects of testing, as well as having a basic background knowledge in lung physiology and pathology. In the USA, the National Institute for Occupational Safety and Health (NIOSH) has developed a model programme, and reviews and approves spirometry training courses. These 2- and 3-day courses include the fundamentals of spirometry standards and hands-on training. The workshop experience provides hands-on instruction in a small group setting with an experienced instructor. Students are expected to demonstrate their ability to properly prepare and administer a spirometric test, and demonstrate competency in other areas, such as calibration, recognition of unacceptable manoeuvres, etc.

Spirometry refresher training is also recommended. Refresher training helps to ensure that testing technicians are informed of changes in spirometry standards and learn new skills. It also provides a mechanism for technicians to obtain answers to questions not foreseen during initial training. The need for refresher training has been recognised by several organisations, including the Lung Health Study, the National Health and Nutrition Examination Survey and the American College of Occupational and Environmental Medicine. The frequency of refresher training is dependent on many factors that differ among individuals. A recommended frequency of every 3–5 yrs. is recommended, or shortly after changes to lung function standards are published. While in-house training may achieve the desired goals, laboratory directors should strongly consider the benefits of formal training programmes from outside providers.

Perhaps the most important component in successful pulmonary function testing is a well-motivated, enthusiastic technician. The importance of a quality-control programme with feedback to technicians in obtaining adequate spirometry results has been documented. A quality-control programme that continuously monitors technician performance is critical to the collection of high-quality data. Feedback to the technicians concerning their performance should be provided on a routine basis, which should include, at a minimum: 1) information concerning the nature and extent of unacceptable manoeuvres and nonreproducible tests; 2) corrective action that the technician can take to improve the quality and number of acceptable manoeuvres; 3) positive feedback to technicians for good performance; and 4) comments regarding system set-up and reporting results.

Respirology. 2012 May;17(4):611-9. doi: 10.1111/j.1440-1843.2012.02149.x.

Clinical applications of lung function tests: a revisit.

Liang BM, Lam DC, Feng YL.

The development and clinical application of lung function tests have a long history, and the various components of lung function tests provide very important tools for the clinical evaluation of respiratory health and disease. Spirometry, measurement of the diffusion factor, bronchial provocation tests and forced oscillation techniques have found diverse clinical applications in the diagnosis and monitoring of

respiratory diseases, such as chronic obstructive pulmonary disease, interstitial lung diseases and asthma. However, there are some practical issues to be resolved, including the establishment of reference values for individual test parameters and the roles of these tests in preoperative risk assessment and pulmonary rehabilitation. Novel measurements, including negative expiratory pressure, the fraction of exhaled nitric oxide and analysis of exhaled breath condensate, may provide new insights into physiological abnormalities or airway inflammation in respiratory diseases, but their clinical applications need to be further evaluated. The clinical application of lung function tests continues to face challenges, which may be overcome by further improvement of conventional techniques for lung function testing and further specification of new testing techniques.

Community of Practice Advice:

There should be greater availability, and access to, a pulmonary service in Bermuda that would provide a complete evaluation of the respiratory system to identify the severity of pulmonary impairment. Testing would include patient history, physical examinations, chest x-ray examinations, arterial blood gas analysis, and tests of pulmonary function.

BHB should work in partnership with the new community pulmonologist, an appropriately trained respiratory technician and primary care practitioners, to ensure that there is appropriate access to a pulmonary service and pulmonary function testing, but this does not necessarily mean that BHB will expand its direct provision of this service. The BHB Clinical Services Plan will assume that along with improved chronic disease management for respiratory diseases, there can be a small reduction in ED visits and inpatient admissions for patients with these conditions.

Anticipated Benefits:

Better identification of patients who require support with chronic disease management, which will reduce ED visits and inpatient admissions for acute exacerbation of their disease.

Other Considerations:

BHB should promote partnership with other providers, rather than competition.

Revised ICU Model of Care

Relevant Communities of Practice: Medicine, Surgery

Description of Service/Initiative:

Shift low acuity/unnecessary admits out of ICU and/or if retained ensure nursing model matches actual patient need (i.e. consider 1:2, 1:3 or 1:4 nursing).

Relevant Background Data:

Patients admitted to ICU include all those having abdominal surgery late at night, patients with epidurals in place.

Input/Advice from CoP Discussions:

Participants concurred that admission to ICU was not "necessary;" however, admissions to ICU reflected clinician concerns/confidence in nursing care on regular units.

In ICU we know we keep patients longer than we need whenever we can because we can provide therapy there and we don't want them to "bounce back" to ICU if they don't get therapy on the unit.

We discharge medical patients home directly from ICU (because we can't find beds for them except in overflow). We do see vented patients, but a low percentage of these. ICU Staffing depends on occupancy and type of patient… 1:1 for vented patients, but most are 2:1. ICU very unpredictable, and stressful on Fridays. Also, we report 8 ICU beds…we have only 7 beds. 9th bed is paediatric bed, 8th is dialysis bed. Bipap patients are always in ICU. Increase in LOS attributable to inability to move to somewhere. And we are reimbursed by diagnosis not bed type, so this is very costly. LOS is somewhat related to occupancy in the end because we keep them if we can/if the bed is not needed.

BHB has been implementing a semi-closed unit, and may need to consider a step-down unit in the future. Reduced occupancy of ward beds will facilitate transfer of patients from the ICU back to the ward when patient needs are such that they no longer require the level of care available only on the critical care unit.

Run into issues with access to telemetry already. Critical care is not capacity constrained. The staffing model needs flexibility to manage acuity.

Related Research Evidence or Clinical Standards:

The intensive care unit (ICU) provides critical care to severely ill patients. The average daily cost of an ICU stay is estimated to be as high as 3 times the average cost of a day's stay on a general ward, as ICU stays are more resource intensive — from personnel to equipment and medication. For these reasons, it is important to better understand the use of this constrained resource with respect to operating patterns, patient flow, trends in admissions, patient populations and process of care for those treated in ICU[50].

There are various resources that identify the appropriateness of admission to critical care units including the resources identified below:

The Institute of Health Information has published guidelines on Admission and Discharge Criteria for Critical Care Services Admission and Discharge Criteria: Critical Care Services
http://www.ihi.org/resources/Pages/Tools/AdmissionDischargeCriteriaCriticalCareSvcs.aspx

[50] Canadian Institute of Health Information. (2016) *Care in Canadian ICUs.* P. 4

Guidelines for intensive care unit admission, discharge, and triage. Task Force of the American College of Critical Care Medicine, Society of Critical Care Medicine. *Critical Care Medicine* (March 1999)

ABC of Intensive Care: Criteria for Admission *British Medical Journal* (June 1999) https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1115908/

Admission and discharge guidelines for the pediatric patient requiring intermediate care. *Critical Care Medicine* (2004, Vol 22.) http://www.learnicu.org/Docs/Guidelines/AdmissionDischargePediatric.pdf

Criteria for intensive care unit admission and severity of illness *Surgery (Oxford)* April 2015 Volume 33

Final Report of The Ontario Critical Care Steering Committee 2005 Bell Et Al - document attesting to appropriate physician staffing by level of care offered in the ICU

Community of Practice Advice:

There are already changes to the BHB critical care model of care, and the BHB Clinical Services Plan will model reduced discharge of critical care patients directly to the community and reduced average critical care until length of stay.

Anticipated Benefits:

BHB is already taking steps to better match patient needs with available levels of care, and increased flexibility in critical care staffing levels, and return of patients to ward care when they no longer require critical care, will support reduction in critical care unit length of stay. This will allow BHB to accommodate increasing needs for critical care (due to population change) within the current physical capacity.

Other Considerations:

There is not the critical mass to support a step-down unit, but this should be monitored, and considered as a potential future initiative, as demand increases. The unit needs to be as flexible in staffing as possible to deal with fluctuating demands for care at any given time while facilitating de-escalation of care.

Telehealth Remote Specialists Consults

Relevant Communities of Practice: Medicine

Description of Service/Initiative:

Telehealth is the use of information and telecommunications technology in health care delivery for a specific patient involving a provider across distance or time. Proposal is to consider including telehealth as part of our model of care.

Relevant Background Data:

The equipment and space necessary to support telehealth remote consultations was included in the planning for ACW. The BHB schedule of outpatient fees includes a charge code for remote consultation.

Input/Advice from CoP Discussions:

The ACW at BHB included telehealth technology in the functional specifications, but currently this technology is not utilized. Because this is a technology that has been adopted in multiple jurisdictions, including jurisdictions that are remote, isolated or underserviced, BHB should consider if and how to use this technology.

Telehealth may be useful for remote consultation and care management, and may be facilitate providing care in Bermuda that was typically offered oversees. It may be a way of bringing patients back to Bermuda earlier, building our local capacity to offer care and/or may facilitate the involvement of an increased number of specialists.

Prior BHB experience was that the service was not cost effective. We used it in oncology – unless there is a person in the room who can do the work it wasn't a complete consultation. You had to prep so much for it.

Telehealth/medicine has been done on an ad hoc basis, where there was already an existing relationship between the BHB provider and the remote specialist. With a clinical affiliation agreement, this can be expanded so that it's a routine arrangement.

We had a telemedicine robot here – the impression was that it set the patient's mind greatly at rest. The patient "forgot' that the physician wasn't actually there.

There needs to be a way to compensate the "consulting" physician. The "remote consultation fee" will reimburse the local physician, but not necessarily the remote physician.

Related Research Evidence or Clinical Standards:

There is significant evidence of the benefits of telehealth. Much of this evidence is specific to particular types of service (such as mental health, chronic disease management, etc.).

A useful resource is a systematic review completed in 2016 by Totten et al. (Telehealth: Mapping the Evidence for Patient Outcomes from Systematic Reviews) which identified 1,494 citations about telehealth, from which 58 systematic reviews met the inclusion criteria. A large volume of research reported that telehealth interventions produce positive outcomes when used for remote patient monitoring, broadly defined, for several chronic conditions and for psychotherapy as part of behavioral health. The most consistent benefit has been reported when telehealth is used for communication and counseling or remote monitoring in chronic conditions such as cardiovascular and respiratory disease, with improvements in outcomes such as mortality, quality of life, and reductions in hospital admissions. www.ncbi.nlm.nih.gov/pubmed/27536752

Community of Practice Advice:

The facility and equipment to support the service is available at BHB. The BHB Clinical Services Plan should not assume any significant opportunity to repatriate overseas patients due to increased use of this service.

Other Considerations:

There may be opportunities through the development of a clinical affiliation agreement to expand and formalize the use of this service. This should be encouraged.

Acute Geriatric Service

Relevant Communities of Practice: Emergency, Medicine, Surgery, Post-Acute Care

Description of Service/Initiative:

Geriatric Assessment Services allow for the specialized needs of the elderly to be addressed while in hospital. This specialized care program was originally created to offer to the frail elderly hospitalized with acute conditions, global and integrated health care in an adapted physical environment, and to ensure a comprehensive assessment and intervention by a multi-professional team. In Acute Geriatric Assessment Units, the geriatric team works collaboratively with specialists and patients are co-located in a senior friendly environment. Some organizations offer a Geriatric Assessment program, rather than a specific Unit, and/or have adopted a senior friendly approach to care and environment.

Proposal is to develop an Acute Geriatric service at BHB.

Relevant Background Data:

Bermuda's population is aging. Patients over the age of 65 are the most rapidly increasing cohort of the population as well as being "disproportionate" users of the acute care system. Many seniors decompensate or decondition once admitted to hospital leading to prolonged hospital stays or difficulties with discharge.

There are opportunities to reduce the length of stay for all patients at BHB, but the geriatric patient may be one of our greatest opportunities. Patients over 65 years old have the longest acute LOS compared to U.S. benchmarks, and the highest percent of cases and days for outliers.

BHB 2014/15 to 2016/17 KEMH Inpatient Cases by Outlier Status and Patient Age Group

Patient Age	Non-Outlier Cases					Outlier Cases			% Outlier Cases	% Outlier Days
	Disch.	Actual Days	Avg. LOS	CMS Expect. Days	% Over CMS	Disch.	Actual Days	Avg. LOS		
00-04	2,328	5,806	2.5	8,496	-32%	65	1,774	27.3	2.7%	23.4%
05-09	206	416	2.0	655	-37%	-	-		0.0%	0.0%

Patient Age	Non-Outlier Cases					Outlier Cases			% Outlier Cases	% Outlier Days
	Disch.	Actual Days	Avg. LOS	CMS Expect. Days	% Over CMS	Disch.	Actual Days	Avg. LOS		
10-14	167	395	2.4	551	-28%	4	82	20.5	2.3%	17.2%
15-19	291	835	2.9	1,040	-20%	7	244	34.9	2.3%	22.6%
20-24	499	1,480	3.0	1,734	-15%	11	484	44.0	2.2%	24.6%
25-29	813	2,536	3.1	2,722	-7%	15	1,339	89.3	1.8%	34.6%
30-34	1,134	3,455	3.0	3,672	-6%	15	373	24.9	1.3%	9.7%
35-39	946	3,097	3.3	3,177	-3%	25	1,052	42.1	2.6%	25.4%
40-44	694	2,459	3.5	2,569	-4%	31	1,021	32.9	4.3%	29.3%
45-49	724	3,004	4.1	2,748	9%	56	2,952	52.7	7.2%	49.6%
50-54	869	3,617	4.2	3,496	3%	59	2,065	35.0	6.4%	36.3%
55-59	1,091	4,773	4.4	4,461	7%	99	5,872	59.3	8.3%	55.2%
60-64	1,135	5,288	4.7	4,782	11%	116	6,815	58.8	9.3%	56.3%
65-69	***1,095***	***5,056***	***4.6***	***4,588***	***10%***	***121***	***6,977***	***57.7***	***10.0%***	***58.0%***
70-74	***1,124***	***5,656***	***5.0***	***4,774***	***18%***	***174***	***14,269***	***82.0***	***13.4%***	***71.6%***
75-79	***978***	***5,027***	***5.1***	***4,205***	***20%***	***160***	***12,229***	***76.4***	***14.1%***	***70.9%***
80-84	***943***	***5,441***	***5.8***	***4,033***	***35%***	***210***	***14,107***	***67.2***	***18.2%***	***72.2%***
85+	***1,187***	***7,444***	***6.3***	***5,271***	***41%***	***294***	***21,151***	***71.9***	***19.9%***	***74.0%***
Grand Total	16,224	65,785	4.1	62,974	4%	1,462	92,806	63.5	8.3%	58.5%

Input/Advice from CoP Discussions:

There is likely the need to adopt a more senior friendly approach with BHB hospital users. This means more than just environment, but means recognizing that all elderly patients by virtue of being geriatric have special management needs and may be particularly vulnerable for functional decline while in hospital.

BHB has geriatric service, but it is not routine that a geriatrician consults with and helps to manage the care of acute inpatients. We may be able to better manage our geriatric clients with a change in approach that allows for them to achieve better outcomes and for BHB to achieve some efficiency. There may be a subset of patients (outliers, those with more comorbidities or assessed to be frail or higher risk of discharge delays) that could be cohorted in a GAU.

If this service is provided at the beginning of a patient stay, there may be opportunity to reduce the number of geriatric patients who end up requiring hospital based long-term care, for which the hospital is not adequately funded. Currently the average length of stay for "overflow" patients is 60 days, and the services of a acute geriatric service could reduce hospital acquired disability and delirium among geriatric patients, leading to reduced length of stay in hospital.

Related Research Evidence or Clinical Standards:

There has been significant evaluation of Geriatric Assessment to determine effectiveness and cost. In general, the literature suggests that this approach to care can produce improved outcomes for elderly

patients without increasing costs. There is some evidence to suggest that ward based assessment units have better results than geriatric assessment programs, but results are mixed and may be attributed to how programs are executed.

A meta-analysis of randomized controlled trials of comprehensive geriatric assessment for older adults completed be Ellis et al in 2011 concluded that comprehensive geriatric assessment increases patients' likelihood of being alive and in their own homes after an emergency admission to hospital. This seems to be especially true for trials of wards designated for comprehensive geriatric assessment and is associated with a potential cost reduction compared with general medical care. Twenty-two trials evaluating 10,315 participants in six countries. For the primary outcome "living at home," patients who underwent comprehensive geriatric assessment were more likely to be alive and in their own homes at the end of scheduled follow-up (6 and 12 months). In addition, patients were less likely to be living in residential care. Subgroup interaction suggested differences between the subgroups "wards" and "teams" in favour of wards. Patients were also less likely to die or experience deterioration and were more likely to experience improved cognition in the comprehensive geriatric assessment group. http://www.bmj.com/content/343/bmj.d6553

A literature review of effectiveness and costs of these interventions by Darryl Weiland (2003) demonstrated that evidence supports the proposition that geriatric interventions can be effective (although results are not uniform and outcome variability is related to identifiable program design parameters). For frail elderly, an interdisciplinary team structure with clinical control of care and long-term follow-up tends to be associated with effective programs. Answers to cost-effectiveness questions also varied although with some exceptions, existing evidence suggests that geriatrics interventions can be effective without raising total costs of care. http://www.croh-online.com/article/S1040-8428(03)00212-9/fulltext

In a study of frail elderly inpatients with a high probability of nursing-home placement, it was found that those assigned to a geriatric evaluation unit intended to provide improved diagnostic assessment, therapy, rehabilitation, and placement had much lower mortality than controls (23.8 vs. 48.3 per cent, P less than 0.005) and were less likely to have initially been discharged to a nursing home (12.7 vs. 30.0 per cent, P less than 0.05) or to have spent any time in nursing home during a one year follow-up period (26.9 vs. 46.7 per cent, P less than 0.05). Those treated on a regular unit had substantially more acute-care hospital days, nursing-home days, and acute-care hospital readmissions. Patients in the geriatric unit were significantly more likely to have improvement in functional status and morale than controls (P less than 0.05). Direct costs for institutional care were lower for the experimental group, especially after adjustment for survival. We conclude that geriatric evaluation units can provide substantial benefits at minimal cost for appropriate groups of elderly patients, over and above the benefits of traditional hospital approaches.
Effectiveness of a Geriatric Evaluation Unit. Available from: https://www.researchgate.net/publication/16806505_Effectiveness_of_a_Geriatric_Evaluation_Unit [accessed Oct 06 2017].

In a study in Quebec Canada, where short term GAUs have been implemented in every acute care hospital, they found that the units were used for mixed purposes. Overall, GAU programs admitted 9% of all patients aged 65 years and older in the surveyed year. GAU patients presented one or more geriatric syndromes, including dementia. Based on their clientele, three distinct clinical care profiles of GAU were identified. Only 19% of GAU were focused on geriatric assessment and acute care management; 23% mainly offered rehabilitation care, and the others offered a mix of both types. Thus, there was a significant heterogeneity in GAU's operation. They concluded that given the scarcity of these resources, it would be appropriate to better target the clientele that may benefit from them. Standardizing and promoting GAU's primary role in acute care must be reinforced. To meet the needs of the frail elderly not admitted in GAU, alternative care models centered on prevention of functional decline must be applied throughout all hospital wards. Reference: **Short-term geriatric assessment units: 30 years later**: Judith Latour, Paule Lebel, Bernard-Simon Leclerc, Nicole Leduc, Katherine Berg, Aline Bolduc and Marie-Jeanne Kergoa BMC Geriatrics201010:41

J Am Geriatr Soc. 2004 Sep;52(9):1417-23.

A randomized, controlled trial of comprehensive geriatric assessment and multidisciplinary intervention after discharge of elderly from the emergency department--the DEED II study.

Caplan GA, Williams AJ, Daly B, Abraham K.

OBJECTIVES: To study the effects of comprehensive geriatric assessment (CGA) and multidisciplinary intervention on elderly patients sent home from the emergency department (ED).

DESIGN: Prospective, randomized, controlled trial with 18 months of follow-up.

SETTING: Large medical school-affiliated public hospital in an urban setting in Sydney, Australia.

PARTICIPANTS: A total of 739 patients aged 75 and older discharged home from the ED were randomized into two groups.

INTERVENTION: Patients randomized to the treatment group underwent initial CGA and were followed at home for up to 28 days by a hospital-based multidisciplinary outreach team. The team implemented or coordinated recommendations. The control group received usual care.

MEASUREMENTS: The primary outcome measure was all admissions, to the hospital within 30 days of the initial ED visit. Secondary outcome measures were elective and emergency admissions, and nursing home admissions and mortality. Additional outcomes included physical function (Barthel Index (total possible score=20) and instrumental activities of daily living (/12) and cognitive function (mental status questionnaire (/10)).

RESULTS: Intervention patients had a lower rate of all admissions to the hospital during the first 30 days after the initial ED visit (16.5% vs 22.2%; P=.048), a lower rate of emergency admissions during the 18-month follow-up (44.4% vs 54.3%; P=.007), and longer time to first emergency admission (382 vs 348 days; P=.011). There was no difference in admission to nursing homes or mortality. Patients randomized

to the intervention group maintained a greater degree of physical and mental function (Barthel Index change from baseline at 6 months: -0.25 vs -0.75; P<.001; mental status questionnaire change from baseline at 12 months: -0.21 vs -0.64; P<.001).

CONCLUSION: CGA and multidisciplinary intervention can improve health outcomes of older people at risk of deteriorating health and admission to hospital. Patients aged 75 and older should be referred for CGA after an ED visit.

Comprehensive geriatric assessment in the emergency department

Graham Ellis, Trudi Marshall, and Claire Ritchi2

Changing global demography is resulting in older people presenting to emergency departments (EDs) in greater numbers than ever before. They present with greater urgency and are more likely to be admitted to hospital or re-attend and utilize greater resources. They experience longer waits for care and are less likely to be satisfied with their experiences. Not only that, but older people suffer poorer health outcomes after ED attendance, with higher mortality rates and greater dependence in activities of daily living or rates of admission to nursing homes. Older people's assessment and management in the ED can be complex, time consuming, and require specialist skills. The interplay of multiple comorbidities and functional decline result in the complex state of frailty that can predispose to poor health outcomes and greater care needs. Older people with frailty may present to services in an atypical fashion requiring detailed, multidimensional, and increasingly multidisciplinary care to provide the correct diagnosis and management as well as appropriate placement for ongoing care or admission avoidance. Specific challenges such as delirium, functional decline, or carer strain need to be screened for and managed appropriately. Identifying patients with specific frailty syndromes can be critical to identifying those at highest risk of poor outcomes and most likely to benefit from further specialist interventions. Models of care are evolving that aim to deliver multidimensional assessment and management by multidisciplinary specialist care teams (comprehensive geriatric assessment). Increasingly, these models are demonstrating improved outcomes, including admission avoidance or reduced death and dependence. Delivering this in the ED is an evolving area of practice that adapts the principles of geriatric medicine for the urgent-care environment.

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Can consultant geriatrician led comprehensive geriatric assessment in the emergency department reduce hospital admission rates? A systematic review

Samuel Jay, Paula Whittaker, Jerome Mcintosh, Nicholas Hadden

Objective - Economic and demographic pressures are driving a need to reassess the way in which we care for older patients presenting to emergency departments (EDs). This systematic review seeks to assess the extent to which performing comprehensive geriatric assessment (CGA) in the ED can reduce admission rates.

Design - Systematic search of both published and unpublished literature to identify studies reporting admission rates following the introduction of consultant geriatrician led teams performing CGA in the ED. Changes in inpatient length of stay and subsequent readmission rates were identified as secondary outcome measures.

Results - Five studies with a total of 28,434 participants were included. All of the studies reported statistically significant reductions in admission rates (ranging between 2.6 and 19.7%). However, variation in the degree of changes leads to uncertainty as to the financial viability of the intervention. No studies have yet examined the clinical effects of performing CGA within the ED. The results were far more varied with regards to inpatient length of stay and readmission rates, indicating that complex local factors, such as the design of community support services, may play an important role.

Conclusion - Consultant geriatrician led teams performing CGA within the ED can reduce admissions rates among older patients. It is unclear as to what impact such interventions have upon readmission rates or inpatient length of stay. Future research is needed to assess the clinical outcomes and financial viability of such admissions avoidance teams.

Community of Practice Advice:

The BHB Clinical Services Plan should incorporate the establishment of an Acute Geriatric Service.

Anticipated Benefits:

Availability of an Acute Geriatric Service will better identify and support inpatient management of patients at risk for hospital-acquired disability and delirium, leading to reduced inpatient stays, and reductions in the number of patients who end up requiring hospital-based long-term care.

Other Considerations:

Implementation of this service, along with increased geriatric assessment in the ED, will require increased BHB geriatric staffing resources (both medical and non-medical) and strong linkages with community providers.

Surgery

Bariatric surgery

Relevant Communities of Practice: Surgery

Description of Service/Initiative:

Create Bariatric Surgery programme.

Relevant Background Data:

Obesity is epidemic in Bermuda (greater than 50% of the population have an elevated BMI) and currently patients are referred to the mainland for surgery. There are a variety of surgical treatments described in the literature all of which have associated significant complications and potential for long term morbidity. Of note, bariatric surgery requires not only a group of surgeons with specific training but also a programmatic approach including the involvement of appropriately trained dietitians, nutritionists, pharmacists, nursing, anaesthesia, and ICU staff. Many patients require ICU care post op. There is a significant requirement for a critical mass (120 cases per year done by 3 surgeons) for the maintenance of quality.

Input/Advice from CoP Discussions:

Bermuda insurers cover bariatric surgery but not in Bermuda. Patients come back from bariatric surgery abroad with complications that BHB must manage. We might be able to develop as a centre for excellence of Bariatrics in Bermuda. We don't know what the demand is, but sense that more people would access it if it was local. There are programs bariatric in the community.

General surgeons can do bariatric surgery, and there is appropriate equipment in the hospital, so this is potentially a service that could be offered on island, but would need to offer as part of a full multidisciplinary programme and have right equipment …is it sustainable?

We don't know the numbers of patients that are accessing bariatric surgery, but we know we aren't in the ballpark for critical mass.

We could do better at integrating our care with off island providers and on island providers. Any bariatric surgical programme would require critical information to underpin its development. In the first instance, it would also require a framework to deliver safe care. This might be best delivered through a visiting surgeon programme.

Related Research Evidence or Clinical Standards:

British Obesity and Metabolic Surgery Society (BOMSS) Service Standards & Commissioning Guidance Working Party - Standards 2012 - PROVIDING BARIATRIC SURGERY

1. SIZE & SCOPE OF SERVICE - Services within the NHS for NHS patients,

BOMSS proposes that, by analogy to cancer services, NHS provision should recognise Bariatric Units and Bariatric Centres. Any Bariatric Unit will have a network relationship to a Centre. These relationships will constitute a Bariatric Network.

Bariatric Units - Volume

As a minimum a Unit will comprise **3 consultant bariatric surgeons** with sufficient anaesthetic cover, supported by 3 half-time equivalent specialist dietitians and 3 half-time equivalent specialist nurses. **Each surgeon shall on average operate on at least 40 cases per annum (1 a week).**

As a matter of aspiration and development support, a new Unit, supported within a Network, may have a lower service volume at the outset. The service specification should require (and commissioning volume should support) that this minimum volume be achieved by the end of an agreed period – usually the second or third year of service (reflected in agreed projections for years 3&4).

BOMSS regards a Unit of this size as the minimum sustainable in the long term, but considers that an established Unit should aim to comprise **4 consultant bariatric surgeons**, supported by at least 2 FTE nurses (distributed so as to ensure continuous cover, usually 3 individuals) and 2 FTE dietitians (likewise).

Such a Unit is the minimum to provide continuous consultant bariatric surgeon on-call availability, which may otherwise have to be provided by explicit networking arrangements.

Bariatric Units – Scope

An established Bariatric Unit cannot provide a single treatment modality in the long term. All established units should be competent to provide treatment by gastric banding, gastric bypass and sleeve gastrectomy as primary procedures.

Patients will be suitable for treatment at Units if they are below a BMI / weight limit agreed within the Network for the Unit and if they are below thresholds levels of co-morbidity and physiological risk likewise agreed.

Units will need to ensure the competence of their personnel and the adequacy of their facilities (as set out in Core considerations above) to provide this service.

Only minor revisions to gastric bands should be undertaken at Bariatric Units. The level of emergency surgery provided should be agreed within the network.

Bariatric Centres - Volume

At a Bariatric Centre there should be at least 5 operations a week. Each consultant bariatric surgeon will undertake at least 2 full bariatric operations a week. These figures should be regarded flexibly and will depend on the experience of each surgeon, but overall it is clear that higher quality should be expected at a service volume of 300 cases a year than at 100.

With the caveats set out above, the world literature suggests that an establishment of 4 surgeons will deliver high quality with a volume of 400 a year. This ideal may take several years to achieve, but should be the aspiration supported by commissioning plans.

The provision of specialist nurses and dietitians together with expert anaesthetic cover and availability of internal medicine and psychiatry / psychology will be scaled to this volume.

Bariatric Centres - Scope

In addition to the work undertaken at Units, a Centre will provide primary surgery for more complex patients, patients of weight / BMI limited only by prudence and patients requiring less common procedures.

Overtly mal-adsorptive surgery, surgery for patients with complex physiological needs (e.g. renal or cardiopulmonary failure) and all complex revision surgery should only be undertaken at Centres.

Centres will therefore need to demonstrate all the Facility and Personnel provision set out above as Core Requirements.

Over time, Units may wish and be able to develop into Centres and should set a time frame for that development. Commissioning should support that development, so that new Units can be supported around them.

Also See American College of Surgeons Standards Manual for Bariatric Surgery

Community of Practice Advice:

The BHB Clinical Services Plan should only plan for the provision of on island bariatric surgery if in association with an existing credible programme which can demonstrate high quality outcomes.

Other Considerations:

Any developments in this area should be associated with the development of an obesity programme that would include support for patients coming back to Bermuda following surgery abroad; as the field of bariatric surgery evolves and develops, BHB will reconsider population needs and the possibility of bariatric surgery services at BHB.

Vascular Surgery

Relevant Communities of Practice: Surgery

Description of Service/Initiative:

Create Vascular Surgery Programme.

Relevant Background Data:

Bermuda has been reported (although there is some confusion regarding the classification system) as having an inordinately high rate of amputations (mostly of toes) primarily as a complication of long standing and sub optimally treated diabetes. A variety of vascular procedures are reported in the literature as a means of avoiding the ultimate amputation by "by passing" the obstructed arteries.

Input/Advice from CoP Discussions:

Vascular Surgery (due to patient population, have a higher need for this service than other geographies).

Vascular disease is increasingly being treated collaboratively by radiologist/ vascular surgeon. There is a limited supply of vascular surgeons. Overseas, this is increasingly becoming a tertiary centre procedure. Introducing this programme would require an increase in ICU capacity, and it would be an expensive programme (equipment, space, etc.).

There is also an intermittent need to treat vascular emergencies that arise because of trauma (e.g. profound knee injuries) or a ruptured aneurysm. Most of the vascular procedures currently conducted are the creation of fistulas to facilitate dialysis therapy.

Need to retain capacity to do vascular procedures when necessary… we have general surgeons who can do this (concern that general surgeons entering profession will not be able to do vascular surgery). BHB receives service from 4 vascular surgeons from Lahey Clinic who visit here several times per month… they provide very high-quality care. It is intermittent, but we have capacity when needed for emergencies.

Could look at recruiting general surgeons who train in rural/ remote medicine (more broadly trained and could cover multiple need).

Related Research Evidence or Clinical Standards:

Vascular surgery is a subspecialty in flux. A significant percentage of the surgical procedures formerly conducted to bypass obstructed vessels are now treated by the insertion of stents or other synthetic grafts. These procedures are most often done using a team based approach (surgeons isolating the vessel and radiologists inserting the graft) although in some cases they are performed by either a radiologist or surgeon working alone. The capital equipment requirements are significant. A specially equipped operating room (including image intensifier) or imaging suite (less preferred) is necessary as is an inventory of stents designed for specific bypass procedures. It is suggested that a minimum of 40 cases per year per operator are required for the maintenance of competence.

Community of Practice Advice:

The BHB Clinical Services Plan should only include the planning for a limited vascular surgery program, in alignment with consideration of interventional radiology developments.

Other Considerations:

Other Communities of Practice have discussed the developing need for Interventional Radiology at BHB; the development of such a service would contribute to establishing a vascular service at BHB.

Hyperthermic Intraperitoneal Chemotherapy

Relevant Communities of Practice: Surgery

Description of Service/Initiative:

The MD Anderson Cancer Center provides the following description for Hyperthermic intraperitoneal chemotherapy (HIPEC)[51]. It is a cancer treatment that involves filling the abdominal cavity with chemotherapy drugs that have been heated. Also known as "hot chemotherapy," HIPEC is performed after the surgeon removes tumors or lesions from the abdominal area.

After all visible tumors are removed, cisplatin, a chemotherapy drug, is heated to 103 degrees Fahrenheit (42 degrees Celsius) and pumped through the abdominal cavity. The patient lies on a special cooling blanket to keep their body temperature at safe levels. Surgeons physically rock the patient back and forth on the operating table for about 2 hours to ensure that the drug reaches all areas of the abdomen, killing any cancer cells that remain after surgery and reducing the risk for cancer recurrence.

HIPEC has several advantages over standard chemotherapy:

- It is a single treatment done in the operating room, instead of multiple treatments over several weeks;
- 90% of the drug stays within the abdominal cavity, decreasing toxic effects on the rest of the body;
- It allows for a more intense dose of chemotherapy;
- Heated chemotherapy is used on both adult and paediatric patients to treat soft tissue sarcomas, appendix cancer, Wilms' tumor, desmoplastic small round cell tumors (DSRCT) and other cancers in the abdominal cavity.

Input/Advice from CoP Discussions:

Identified by Dr. Miller as potential new service.

This is new and growing practice in Europe, but is being introduced slowly in North America. There is evidence that it may be beneficial to provide, but with a low number of patients (estimated at only 1 or 2 patients per year). It would not be expensive to introduce, and there is an interest among the medical staff in making this available, and it could potentially be revenue generating by offering it to North American patients.

[51] https://www.mdanderson.org/treatment-options/hyperthermic-intraperitoneal-chemotherapy.html

New equipment would be required (new pump) but there would be no major impact on facilities. A reimbursement model would need to be established since it is not represented in the MS-DRG system. There may be a German trained surgeon in Bermuda who could provide the service.

Related Research Evidence or Clinical Standards:

Hyperthermic intraperitoneal chemotherapy: Rationale and technique. World J Gastrointest Oncol. 2010 Feb 15; 2(2): 68–75.

Santiago González-Moreno, Luis A González-Bayón, and Gloria Ortega-Pérez

The combination of complete cytoreductive surgery and perioperative intraperitoneal chemotherapy provides the only chance for long-term survival for selected patients diagnosed with a variety of peritoneal neoplasms, either primary or secondary to digestive or gynaecologic malignancy. Hyperthermic intraperitoneal chemotherapy (HIPEC) delivered in the operating room once the cytoreductive surgical procedure is finalized, constitutes the most common form of administration of perioperative intraperitoneal chemotherapy. This may be complemented in some instances with early postoperative intraperitoneal chemotherapy (EPIC). HIPEC combines the pharmacokinetic advantage inherent to the intracavitary delivery of certain cytotoxic drugs, which results in regional dose intensification, with the direct cytotoxic effect of hyperthermia. Hyperthermia exhibits a selective cell-killing effect in malignant cells by itself, potentiates the cytotoxic effect of certain chemotherapy agents and enhances the tissue penetration of the administered drug. The chemotherapeutic agents employed in HIPEC need to have a cell cycle nonspecific mechanism of action and should ideally show a heat-synergistic cytotoxic effect.

Peritoneal dissemination of gastrointestinal (GI) or gynaecologic cancers or primary peritoneal neoplasms constitute a difficult challenge for the practicing oncologist given the dismal prognosis associated with these entities and the debilitating effect that they exert on those patients who suffer them. Cytoreductive surgery combined with perioperative intraperitoneal chemotherapy is currently a valid treatment option for selected cases diagnosed with these diseases. Extensive clinical and pharmacological research studies have been conducted and unprecedented therapeutic results have been reported, bringing peritoneal surface oncology to the forefront of clinical oncology practice and research. Moreover, peritoneal surface malignancy treatment centers have been established around the world.

In this article, the rationale that supports its use and the methodology employed for the delivery of HIPEC are discussed. Additionally, safety precautions to be observed during the procedure are reviewed.

Curr Oncol. 2016 Jun;23(3):e266-75. doi: 10.3747/co.23.2831. Epub 2016 Jun 9.

Treatment of peritoneal surface malignancies with hyperthermic intraperitoneal chemotherapy-current perspectives.

Spiliotis J, Halkia E, de Bree E.

Peritoneal carcinomatosis (PTC) represents advanced malignant disease and has generally been associated with a grim prognosis. Peritoneal surface malignancy is often the major source of morbidity and mortality; it is of major concern in cancer management. Although PTC is categorized as metastatic disease, it represents a special disease pattern considered to be a locoregional disease limited to the abdominal cavity. The combination of cytoreductive surgery (CRS) and intraoperative hyperthermic intraperitoneal chemotherapy (HIPEC) has successfully been used as locoregional treatment for selected patients with PTC from gastric, colorectal, and ovarian cancer; with mesothelioma; and with pseudo myxoma peritonei. In the prophylactic setting, hipec can also be used to prevent PTC in high-risk patients, and the first results of the "second-look" approach are promising. Patient selection-in which the risks of perioperative morbidity and mortality, which are analogous to those for any other major gastrointestinal surgery, are assessed-is of utmost importance. Those risks have to be weighed against the anticipated survival benefit, which depends mainly on tumour biology, extent of disease, and probability of achieving complete CRS. The present review discusses the principles of CRS and HIPEC, the most significant recent clinical data, and current perspectives concerning the application of this treatment modality in various malignancies. Ongoing trials and future directions are noted. **It appears that the combination of CRS and HIPEC is an indispensable tool in the oncologist's armamentarium.**

Community of Practice Advice:

The BHB Clinical Services Plan should include the availability of HIPIC at BHB.

Anticipated Benefits:

Allows for higher doses of chemotherapy, while minimizing the rest of the body's exposure to the chemotherapy. Reduces some chemotherapy side effects, and may offer a survival benefit.

Other Considerations:

The current MS-DRG system used for BHB inpatient reimbursement do not include a DRG for HIPIC or include estimates of the cost of the service. There would need to be development of a revised reimbursement approach for this service.

Hip Surgery OR Utilization Smoothing

Relevant Communities of Practice: Surgery

Description of Service/Initiative:

When visiting surgeons perform Hip surgery, procedures are booked for up to 5 per day for a full week. This may result in cancellation of other elective procedures and an overcrowding of surgical beds while overwhelming surgical unit staff, particularly post-surgical rehabilitation support. These procedures need to be scheduled in a manner that spreads them more evenly. Switching from reliance on visiting surgeons for hip surgery procedures to local surgeons is one approach to achieving this end.

Relevant Background Data:

There is an increasing volume of hip procedures performed at BHB (includes surgery by local surgeons in addition to Dr. Treacy). Volumes have almost doubled from 2014/15 (81) to 2016/17 (144).

PROC CODE	PRINCIPAL PROCEDURE	2014/15	2015/16	2016/17
0070	REV HIP REPL-BOTH COMP	3	5	4
0071	REV HIP REPL-ACETAB COMP	1	1	
0072	REV HIP REPL-FEM COMP		1	
0073	REV HIP REPL-LINER/HEAD	1		2
0085	HIP RESURFACING-TOTAL	34	26	34
0151	TOTAL HIP RPLCMNT		1	
7975	CL REDUC DISLOC-HIP		2	5
8005	RMVL PROSTH HIP INC		1	
8015	OTH ARTHROTOMY-HIP		1	5
8035	HIP JOINT BIOPSY	1		
8085	DESTRUCT-HIP LESION NEC		1	1
8095	EXCISION OF HIP NEC		1	
8151	TOTAL HIP RPLCMNT	28	50	67
8152	PARTIAL HIP REPLACEMENT	13	13	26
Total		**81**	**103**	**144**

237 cases in prior 3 fiscal years by visiting surgeon

Principal Procedure		On Island	Treacy
8151	TOTAL HIP RPLCMNT	16	129
0085	HIP RESURFACING-TOTAL	6	88
0070	REV HIP REPL-BOTH COMP	3	9
0073	REV HIP REPL-LINER/HEAD	1	2
7865	REMOVE INT FIX DEV-FEMUR	6	2
0071	REV HIP REPL-ACETAB COMP	1	1
0072	REV HIP REPL-FEM COMP	-	1
0080	REV KNEE REPL-TOTAL	2	1
0151	TOTAL HIP RPLCMNT	-	1
8005	RMVL PROSTH HIP INC	-	1
8015	OTH ARTHROTOMY-HIP	5	1
8191	ARTHROCENTESIS	30	1
Sub-Total of Above Procedures			237

HIMS data reports only 1 patient each year without insurance (i.e. self-pay).

Patient Insurance	2014/15	2015/16	2016/17	Grand Total
GEHI	12	17	15	44
HID	8	19	30	57

Patient Insurance	2014/15	2015/16	2016/17	Grand Total
Other	1		2	3
Private	37	41	52	130
Self-Pay	***1***	***1***	***1***	***3***
Grand Total	**59**	**78**	**100**	**237**

Input/Advice from CoP Discussions:

The BHB orthopedic surgeons have determined that to promote high-quality, efficient care, all hips are done by the visiting surgeon who comes 3 x/ year and does 20 cases/ visit. 50% of hip replacements are re-surfacing, and complex. The visiting surgeon provides extremely high-quality care, and is trained and experienced to do complex procedures (e.g. Birmingham hip resurfacing). If the procedures were to be done by a less experienced local surgeon, some patients might opt to travel overseas for their procedures.

The orthopedic surgeons reported that to retain competency, a surgeon must do 80+ of these per year, and there isn't sufficient volume in Bermuda to justify provision of the procedure by a local surgeon. It was reported that 20% of patients are non-payors (and that this model helps to off-set the costs), but BHB HIMS data showed an average of only 1 non-payor patient per year over the past 3 fiscal years.

There may be opportunities to develop expertise on-island (i.e. for more straightforward procedures), and supplement volumes by performing surgeries off-island, or down-modulate other surgeries when visiting surgeons are on-island.

The challenge with the current (3 times per year) model is it leads to surgical peaks – which cause significant bed pressure. The current approach is not sustainable.

Other options discussed included:

- Increase the number of physios, or engage external allied health providers to handle service demands;
- Create a step down or rehab unit, communicate with other surgeons to have them reduce their own loads to accommodate for the volumes produced by visiting hip surgeon (currently this doesn't happen in a structured way);
- Have surgeon come more frequently and do less surgeries per visit (but increased in travel cost, and surgeon unwilling to come more frequently);
- Support BHB surgeons to get fellowships – get specialized training and expertise to support on-island capacity.

There is also a need to create a plan for when the visiting orthopaedic surgeon retires; this is reported to be in the next few years.

Related Research Evidence or Clinical Standards:

J Orthop. 2013 Aug 12;10(3):139-43. doi: 10.1016/j.jor.2013.06.002. eCollection 2013.

Volume-outcome relationship in revision hip replacement - Results from a low volume hospital.

Anwar F, Shah K, McLean I.

INTRODUCTION: Mortality and morbidity are both increased during revision hip surgery. Higher hospital procedure volumes have been associated with lower rates of mortality and/or complications according to some reports - the "practice makes perfect" hypothesis.

AIM: The aim of the study was to test "practice makes perfect; hypothesis with regards to revision hip surgery at our low volume hospital.

METHODS: This is a retrospective study of all the patients who underwent revision hip arthroplasty under the care of the senior author between February 2002 and January 2006. Data was collected about the 30-day and one-year mortality, post-operative complications like deep vein thrombosis (DVT), pulmonary embolism (PE), superficial or deep wound infections, dislocations, and the Oxford hip score.

RESULTS: The rate of revision hip surgery carried out in our hospital was 6.25 per year. There was no 30-day mortality, stroke within 3 months, dislocations within one year, re-admission within one month, one-year mortality and deep infections within one year. The final outcome after revision hip surgery, based on Oxford questionnaire, showed that 72% had an excellent outcome and 8% had poor outcome.

CONCLUSION: Volume and outcome relationship may not contribute towards the final outcome when individual surgeons and hospitals are considered. Good general hospital care can greatly affect the health outcome for a particular procedure. Strategies aimed at improving the general hospital care may benefit the patients as much as volume based regionalization.

BMC Musculoskelet Disord. 2012 Dec 15;13:251. doi: 10.1186/1471-2474-13-251.

Risk factors for revision of primary total hip arthroplasty: a systematic review.

Prokopetz JJ, Losina E, Bliss RL, Wright J, Baron JA, Katz JN.

BACKGROUND: Numerous papers have been published examining risk factors for revision of primary total hip arthroplasty (THA), but there have been no comprehensive systematic literature reviews that summarize the most recent findings across a broad range of potential predictors.

METHODS: We performed a PubMed search for papers published between January 2000 and November, 2010 that provided data on risk factors for revision of primary THA. We collected data on revision for any reason, as well as on revision for aseptic loosening, infection, or dislocation. For each risk factor that was examined in at least three papers, we summarize the number and direction of statistically significant associations reported.

RESULTS: Eighty-six papers were included in our review. Factors found to be associated with revision included younger age, greater comorbidity, a diagnosis of avascular necrosis (AVN) as compared to osteoarthritis (OA), low surgeon volume, and larger femoral head size. Male sex was associated with

revision due to aseptic loosening and infection. Longer operating time was associated with revision due to infection. Smaller femoral head size was associated with revision due to dislocation.

WITH SPECIFIC REFERENCE TO THE ISSUE OF "CRITICAL MASS" FOR HIP SURGERY, THE FOLLOWING IS EXCERPTED FROM AND ARTICLE WRITTEN BY BERSTOCK ET AL IN BONE AND JOINT RESEARCH PUBLISHED IN JUNE 2014

Does hospital/surgeon volume influence mortality?

Some studies have suggested an association between low surgeon or hospital volume and increased mortality after THR. Many of these studies have been performed in the United States, where differences in the organisation of healthcare and individual surgical practices mean that these data may not be generalizable to practice in other settings. Singh et al studied death rates after THR in an American region according to hospital volume, using a multivariate analysis to control for age, gender, co-morbidity, insurance provider, and geographical region. Although no difference in 30-day mortality was identified between hospitals of varying volume, the largest volume units (> 200 THR/year) had the lowest one-year mortality. In the Canadian study of Paterson et al, no relationship was identified between provider volume and mortality.

de Vries et al examined the association between unit procedure volume and complications after THR in a national study of all Dutch hospitals. Again, there was no significant association between volume and mortality. The lowest-volume group performed up to 100 THRs in a year, many more than low-volume groups used for comparison in other studies.

Chien et al examined surgeon procedure volume, observing a lower rate of adverse events and mortality after THR in patients treated by surgeons who performed > 25 procedures per year when compared with surgeons performing < 10 per year (mortality rates 0.57% and 2.55% respectively, adjusted OR 0.23).

After examining the studies in this review, it is difficult to make any firm conclusion regarding the effect of surgeon or unit volume on mortality. Local differences in training, healthcare organisation, and the extremes of case volume may account for observed differences.

Limitations

When interpreting data on mortality following joint replacement, selection bias remains a key confounder. Multivariate analyses can only control for the confounding data that have been collected, and cannot eliminate all aspects of bias. Studies including hip fracture patients, revision hip replacement patients, high numbers of patients with state-funded Medicare insurance, particular co-morbidities, or extremes of age, may explain the variation among reported mortality rates. For example, in studies which compare this subset of the population with the privately funded population undergoing THR, a higher mortality is noted amongst the Medicare population. The complex relationship between socioeconomic status and outcomes following THR has been studied by Clement et al. They identified an association between deprivation and outcomes such as dislocation and 90-day mortality.

Conclusion

THR is associated with a small increase in the risk of mortality in the immediate post-operative period, however, this risk appears to be reducing every year. The majority of excess mortality risk occurs in the first 30 days and has returned to baseline by 90 days. This reduction in mortality over time may be multifactorial, and is partially explained by the secular decline in mortality that has led to our ageing population. The introduction of the multi-disciplinary pre-operative assessment clinic has been shown to reduce mortality following joint replacement. Length of hospital stay also appears to be reducing, and the incidence of serious adverse events is decreasing. In addition, there has been a shift towards practices, such as spinal anaesthetic and routine thrombo-prophylaxis, that are associated with lower mortality.

In recent years, improved surgical safety and better post-operative care appear to have brought about a reduction in mortality following THR. Mortality will continue to change, affected by medical advancements, social factors and the organisation of health care as it continues to develop. It is likely that the trend for reduced mortality after THR will continue. Data presented here allow patients to make informed choices and allow clinicians to address

Community of Practice Advice:

There was agreement that the current model puts too much strain on BHB and that smoothing of workload is required. The BHB Clinical Services Plan will assume that smoothing of workload will be achieved, and that the current periodic pressures on both the OR, inpatient beds and allied health staff will be reduced.

Anticipated Benefits:

Smoothing of workload will reduce pressures on the BHB OR, staff and inpatient bed occupancy, and reduce the need to cancel other scheduled surgeries or have extremely high, and potentially unsafe, occupancy levels.

Other Considerations:

BHB should develop a long-term plan for provision of hip surgery in anticipation of the retirement of the current visiting surgeon, and the increase in demand for hip surgery associated with a larger elderly Bermuda population.

Improved Matching of Surgical Modalities with Procedure Requirements

Relevant Communities of Practice: Surgery

Description of Service/Initiative:

This initiative encompasses multiple issues and opportunities discussed by the Surgical CoP, including:

- Move surgical procedures not requiring main OR out of main OR
- Don't admit SOPU Patients where inpatient care is not required to provide safe and high quality care
- Move selected procedures not requiring sterile room out of the OR (and support shifting to physician community offices)
- Implement a 23-Hour Surgical Care Unit

The 23-hour surgical care unit manages the patient's surgical admission within a 23-hour period. Patients are admitted, prepared for their surgical intervention, monitored and provided with the appropriate pain relief post-surgery.

Relevant Background Data:

Many patients are admitted for short periods for procedures (e.g. tonsillectomy, lap chole), that, in other constituencies are conducted as outpatient procedures. The following table shows the IP surgical cases, by principal procedure, with 3 days or less stay, not admitted via the ED, and discharged home with self-care.

2016/17 IP Surgery Cases with Length of Stay 3 Days or Less, by Principal Procedure

Principal Procedure	IP Length of Stay (Days)				Total Short Stay
	0	1	2	3	
TOTAL KNEE RPLCMENT	0	9	18	34	61
LAPAROSCOPIC CHOLECYSTEC	1	29	25	4	59
TONSILLECTOMY	0	39	1	0	40
TOTAL HIP RPLCMNT	0	4	15	17	36
TAH NEC & NOS	0	0	2	28	30
SPINAL CANAL EXPLOR NEC	1	9	13	4	27
HIP RESURFACING-TOTAL	0	5	13	7	25
CRUCIATE LIG REPAIR NEC	0	10	4	0	14
SEPTOPLASTY NEC	0	13	0	0	13
IV DISC EXCISION	0	5	5	2	12
ROTATOR CUFF REPAIR	0	7	3	0	10
OTH TRANSURETHRAL PROSTA	0	4	3	3	10
REV TOTAL SHOULDER REPL	0	4	2	2	8
SUBTOT ABD HYST NEC&NOS	0	0	0	8	8
HEMORRHOIDECTOMY	0	4	3	1	8

A significant number of procedures are conducted in the main operating room that do not require the supports in that area (e.g. insertion of IUD, dental, endoscopy, vasectomy). The table below shows a sample of SOPU procedures that in some other jurisdictions may be done outside the hospital. Even in those jurisdictions, there may be situations where the procedures are done in a hospital, due to patient age, significant comorbid disease, or developmental delay.

Sample of 2016/17 BHB SOPU Procedures

ICD Proc. Code	Procedure Name	Day Surgery Cases	IP Cases	Total Cases	% Day Surgery
2309	TOOTH EXTRACTION NEC	44	-	44	100%
2319	SURG TOOTH EXTRACT NEC	301	-	301	100%
232	TOOTH RESTOR BY FILLING	13	-	13	100%
2341	CROWN APPLICATION	8	-	8	100%
4524	FLEXIBLE SIGMOIDOSCOPY	8	-	8	100%
4942	HEMORRHOID INJECTION	2	-	2	100%
4945	HEMORRHOID LIGATION	19	5	24	79%
6373	VASECTOMY	51	-	51	100%
697	INSERTION OF IUD	7	-	7	100%
8192	INJECTION INTO JOINT	168	-	168	100%
8339	EXC LES SOFT TISSUE NEC	62	-	62	100%
863	OTH LOCAL EXC LESION	43	1	44	98%
9771	REMOVAL IUD	7	-	7	100%
9929	INJECT/INFUSE NEC	15	-	15	100%

Some of these procedures can be (and often are) conducted in physician's or dentist's offices. In the alternative they can be conducted in a "clean" room (such as a minor procedure room). Creating an alternative "model of care" for these procedures may also decrease the amount of nursing and clerical time necessary as well as "decongesting" the PACU area.

Input/Advice from CoP Discussions:

There are mixed opinions on what, if anything, should be shifted outside the hospital:

- In Bermuda – no advantage to shifting out of hospital: hospital has the anaesthesiologist, the required built-in redundancy (e.g., staffing/ coverage), and/or the capital equipment (feel the risks of shifting care out of the hospital does not have a corresponding benefit) – unique challenges of an isolated island (and doesn't fracture care)
- Maybe: Most dentistry procedures do not need to occur in the hospital, but do because of restrictions around anaesthesiology. There are special groups who do require hospital-based care (e.g., special needs children)
- Gastroscopy/ endoscopy – mixed views on whether this can be shifted out of the hospital:
- No: shared airways – two most high-risk groups of patients, so advantage to keep procedure within the OR where there is strong support/ back-up. (Currently only do Propofol sedation so requires an anaesthesiologist)
- Yes: In other places, these are done in outpatient settings.
- Yes: In other countries – many of the procedures listed in table (e.g., endoscopy/ colonoscopy, insertion of IUDs, injection into joint, vasectomies, cataracts, and flexible sigmoidoscopy) would be done in a "clean room" – does not need to be a theatre (but ensure sufficient volume to maintain quality standards)

- Yes: We have previously identified things that can move out – e.g. pain, interventional radiology, but have had difficulty implementing the change, and finding an appropriate alternative space
- Yes: Especially if we had a vacant room - could do more orthopedics outside a theatre – doing a local anesthetic list: e.g. Carpal tunnel, trigger fingers, injections (if access to x-ray), pain
- Laser surgery capability being introduced in urology, which could enable inpatient cases to move to day surgery

Noted that it is likely not in anyone's interest to further fragment the service. There are small numbers for most services.

Also need to think about financial impact on patient…some procedures insurance will only pay for if it's done in hospital (even if it can be done in office). HIP and Future Care only fund in-hospital surgery (barrier to shifting procedures out of BHB). Other insurers – historically paid a premium to physicians for in-office surgical procedure (cover additional costs incurred by physicians), however – they stopped this payment (only fund "accredited" providers) so volume shifted back to the hospital. Might be possible to do in a suite in hospital though.

Insurance (Future care) will save money if they paid for these procedures to be completed in office rather than hospital, currently pay nothing to physician to provide in office, but will pay for it to be provided in hospital (pays both physician and hospital for OR time)

However, no anaesthesia provision occurs outside of the hospital …so no sigmoidoscopy, etc. happening in physician's offices. For example, dentists can do conscious sedation themselves, but if a patient needs general anaesthesia they must come into BHB.

Lap chole, laminectomies, tonsillectomies (for example) have not generally moved to day cases because of reimbursement. There has been no change in how procedures are reimbursed and financial incentive to admit/do as inpatient. Will need to advocate for policy changes that change behaviour over time but do not have immediate negative impact on revenues.

Is there opportunity to create an ambulatory surgery stream? This was originally planned for the new ACW (it never happened because of costs) … Identify a cohort of patients who are surgical patients but have different model of care (ambulatory) than general cohort of patients… plan was to treat the patients differently, but this did not occur.

Opportunity: In existing space, can we adopt a different model of care for a sub-set of surgical patients? (Seeking space to do this)

Do we need to do this because we are capacity constrained? NO Do we need to do it because we are cost constrained? YES…. we would do it to allow for a better patient experience, but also to save costs (by reducing the use of our main OR and the staffing in another area).

We could develop a 23-hour surgical step-down unit work (can't put medical patients on a unit that closes down) … would need physio and OT to help move people before end of day. A 23- hour unit:

- Could be part of the ambulatory stream (different nursing model would be required)

- Optimizes efficiency of operation of the unit
- Would have a positive impact on flow on our unit

Could have a 72-hour unit…short stay or step down…could be competition for these beds from medicine; there are many surgical patients that could use this unit; potential to get more surgeries in if we do it that way. This could have a positive impact on our ability to plan surgeries, and may allow for better patient experience.

Concern that we would not be able to staff with skeleton staff on these 23 and 72 hr units because our patients are older. Would still need to staff with allied to help get patients home. Would need to have home based post-acute rehab available to do this.

Related Research Evidence or Clinical Standards:

Many societies/clinical groups and regulatory agencies have created "standards" for out of hospital/out of operating room procedures and/or expressed opinions on the administration of anaesthesia/sedation in out of hospital premises. In general, they condone such practices with caveats regarding patient safety. The American society of anaesthesiology (ASA) published (in October 2003) guidelines for ambulatory anaesthesia and surgery as well as guidelines for medical procedural sedation.

The Ontario association of gastroenterology also published a policy and procedure manual for endoscopy (May 2016) and the college of physicians and surgeons of Ontario has also published guidelines for out of hospital premises offering endoscopy and colonoscopy.

In summary they do not believe that the attendance of an anaesthetist is mandatory, but do require the presence of a second professional (RN, NP, RT) to monitor the patient.

Extended day surgery - Guidelines for the implementation and evaluation of 23-hour service models in Victoria

23-hour models of care build on the day surgery and day of surgery admission principles that have been developed and refined over the past ten years. 23-hour care models recognise that selected procedures, not otherwise suitable for day surgery, can be provided within a 23-hour period in a non-inpatient environment. In these units, patients can be monitored post-operatively and discharged within 23-hours.

The fundamental components of effective 23-hour care models are:

- appropriate patient selection using predetermined admission criteria
- use of clinical protocols to plan, implement, monitor and report a patient's clinical pathway,
- including admission and discharge
- quarantined beds for elective surgery in close proximity to operating theatres
- clearly defined roles and expectations for staff and service providers that assist with the provision of 23-hour care.

The implementation of 23-hour models of care have been associated with the following service improvements:

- improved operating theatre utilisation
- reduced waiting lists
- predictable access to operating theatre sessions and post operative beds
- reduced length of stay
- fewer hospital–initiated postponements
- fewer unplanned overnight stays
- improved communication between medical, nursing, pharmacy, allied health and administrative staff.

Demand for 23-hour services can arise from many competing services, including:

- post operative surgical care
- emergency patients requiring short-term surgical or medical treatment
- medical patients requiring over night care
- all of the above for social reasons, if the only other alternative is overnight inpatient admission.

23-hour units can provide a transitional service where there is uncertainty about whether to transfer the routine performance of a procedure from overnight to day surgery care. The 23-hour pathway can be implemented while confidence and experience are achieved in managing a new pathway or when an individual patient's suitability for day surgery is difficult to anticipate.

23-hour models of care are not an alternative or substitute for day surgery, but an extension of services for patients unsuitable for day surgery

Community of Practice Advice – 23 hr. Unit:

An ambulatory surgery stream will be established, incorporating a 23-hour service model; patients for whom inpatient admission can be safely avoided, will not be admitted.

Anticipated Benefits:

Will reduce the patient inconvenience and administrative costs of admitting patients who do not need to be admitted, and will decrease pressures on inpatient beds.

Other Considerations:

Successful implementation will be contingent on changes in the current funding model that is perceived to incent unnecessary admissions of some SOPU patients. There are a variety of options and operational considerations for the development and implementation of such a unit; a precise business case will need to be developed.

Community of Practice Advice OR utilization:

The projections of future BHB surgical volumes in the Clinical Services Plan should plan for use of the main OR for only those procedures requiring that facility.

Anticipated Benefits:

Will create greater capacity in the main OR to accommodate the projected growth in surgical activity. Will reduce the cost of procedures that do not require the full resources of the Main OR and that can be safely performed in a procedure room.

Other Considerations:

There are a number of options to be considered in the development of a procedure room. It may be that one of the current Operating Theatres could be used for this purpose with appropriately adjusted staffing levels; the development of a separate ambulatory procedure room may also be an option; a precise plan and business case will need to be developed.

Pain Management Clinic

Relevant Communities of Practice: Surgery

Description of Service/Initiative:

Move pain service out of the main OR. Partner with community providers to shift some activity to the community.

Relevant Background Data:

In 2016/17, there were 2,419 Pain Management Clinic physician charges.

2016/17 BHB Outpatient Pain Management Clinic Physician Charges

Charge Number	Charge Description	Charges	Sum of Charge Amount
1605518	PM OFF CON LV IV	320	$ 223,080
1605385	PM OP VIS LV IV EP	559	$ 185,925
1605187	PM INJET N PERIPHIAL	131	$ 101,332
1605260	PM FLUOROGUIDE FOR SPINE IN	398	$ 54,849
1605013	PM INJ FORAMEN EPIDU L/S	116	$ 54,778
1604974	PM INJ PARAVERTEB L/S	114	$ 41,625
1604982	PM INJ PARAVERTE L/S AD	88	$ 39,039
1605138	PM DESTR PARAV NERVE	40	$ 35,035
1604941	PM N BLK OTHER PERIPHERA	58	$ 26,789
1605377	PM OP VIS LV III EP	103	$ 21,483
1604594	PM INJECT SPINE L/S (CD)	59	$ 20,805

Charge Number	Charge Description	Charges	Sum of Charge Amount
1605146	PM DESTR PARAVEL N EA ADD	34	$ 18,873
1605500	PM OFF CON LV III	37	$ 16,428
1604537	PM INJECT SACROILIAC JOINT	36	$ 13,902
1605153	PM DESTR PARAVE N	8	$ 9,040
1604958	PM INJ PARAVERTEB C/T	19	$ 8,740
1604750	PM N BLK INJ OCCIPITAL	19	$ 6,864
1604586	PM INJECT SPINE C/T	17	$ 6,765
All Other Services		263	$ 91,220
Total Pain Management Physician Services		2,419	$ 976,572

Input/Advice from CoP Discussions:

This is a service that can go elsewhere (or at least part of it). May be able to move pain management and endoscopy out of the main OR.

We have previously identified procedures that do not need to be accommodated in the main OR – e.g. pain, interventional radiology, but have had difficulty implementing the change, and finding an appropriate alternative space.

This programme is already transitioning out of hospital (should move to radiology equipped room). Current BHB providers shifting to become independent providers (shift to community clinic), but will continue to use BHB for interventional pain procedures. Presume that there is a reason to keep interventional procedures at BHB because it is revenue generating. Anticipate that BHB volumes will drop substantially.

Related Research Evidence or Clinical Standards:

Pain services are rarely offered in operating rooms. The procedures can, in general be performed in a “clean“ room.

Many pain clinics operate in Ontario as independent health facilities (out of hospital community based) and the college of physicians and surgeons of Ontario has specific regulations pertaining to the operation of such “independent health facilities”.

Community of Practice Advice:

Transition of outpatient pain management services (except for interventional pain management procedures) from BHB to community is underway. Clinical Services Plan should assume drop in BHB pain service volumes; the full services of an operating theatre are not necessary to support interventional pain management activity.

Anticipated Benefits:

Supports shifting of services not requiring hospital resources out of hospital and in to community. Will increase availability of BHB operating rooms.

Other Considerations:

Interventional pain management at BHB will require access to fluoroscopy and other diagnostic imaging.

Renal Transplant Program

Relevant Communities of Practice: Surgery

Description of Service/Initiative:

Providing renal transplantation in Bermuda for patients with chronic renal failure.

Relevant Background Data:

Royal Gazette: Operations for kidneys could be done locally - Lisa Simpson - Published May 9, 2017

The possibility of conducting kidney transplants in Bermuda is being reviewed by the Ministry of Health and other stakeholders. It comes after a team of Norwegian surgeons visited the island in March and submitted a proposal that is now being assessed for clinical and financial viability. "The ministry and other stakeholders have had discussions with a Norwegian group's Global Transplant Initiative, seeking to do kidney transplants locally," a spokeswoman told The Royal Gazette.

"The GTI team presented a proposal that they believe to be viable. It is being considered to determine if it would be viable and safe to do this complex procedure locally, and if it is financially viable. The process is ongoing. An important point of feedback is that there may be scope to enhance education to seek more live donors locally, which would increase the number of transplants annually."

According to the spokeswoman, the assessment includes a review by the ministry, the Bermuda Health Council, local nephrologists and insurance companies. The team of surgeons asked to tour King Edward VII Memorial Hospital and met with the Chief of Staff, according to a spokeswoman for Bermuda Hospitals Board. "It is important to note that Bermuda Hospitals Board did not initiate this meeting. The decision of whether or not or where to do kidney transplants does not lie with BHB. This is a matter for the Ministry of Health and Seniors, the Bermuda Health Council, local nephrologists and the insurance companies that pay for the procedures."

Input/Advice from CoP Discussions:

In the absence of surgeons who have conducted the procedure and the requisite diagnostic and nephrology supports, creation of a transplant programme is not recommended.

Related Research Evidence or Clinical Standards:

There are many documents attesting to current standards for renal transplantation (see the Welsh Specialized Services Committee," Renal Transplantation" written by Mateo, Hospital Medicine) all of which speak to the need for highly skilled well-trained nephrology and transplant surgeon (at least for 6 months) follow up and ongoing management of post transplant patients. The follow up also requires access to sophisticated lab testing.

Community of Practice Advice:

The BHB Clinical Services Plan should not include provision of renal transplant services in Bermuda.

Integrated patient scheduling system

Relevant Communities of Practice: Surgery

Description of Service/Initiative:

Implementation of an integrated, electronic surgical scheduling system

Input/Advice from CoP Discussions:

Major problem that the hospital continues to have is patient flow…so not just a matter of filling the operating theatre, but in filling it with the right types of patients (elective, day patients, etc.); need to balance. We currently have huge inefficiencies in our scheduling…tomorrow have 2 theatres that will not be used…could we fill those spaces last minute.

Have just investing in a perioperative solutions technology… this allows us to capture utilization data that we have never been able to get (or needed to extract manually). It is very early in introduction of this (4 weeks old). Decisions will be based on this data. This will help us improve our scheduling.

Monitoring our scheduling will help us to identify areas for improvement; can help us in operating room (identify gaps and fill some of these gaps); can identify actual utilization and performance (who shows up late, who takes more time than booked, etc.), but will need to not just monitor, but make changes based on performance. We do not modify allocations of OR blocks or surgical beds very frequently. The new system has the capability of balancing patient types in scheduling (but we need to have intestinal fortitude to make changes required through OR committee).

Related Research Evidence or Clinical Standards:

No research found re efficacy of operating room information systems, but research re opportunities to improve OR utilization.

J Surg Res. 2016 Aug;204(2):371-383. doi: 10.1016/j.jss.2016.04.054. Epub 2016 Apr 29.

Efficiency improvement in the operating room.

Fong AJ, Smith M, Langerman A.

BACKGROUND: In the changing health care environment, health systems, hospitals, and health care providers must focus on improving efficiency to meet an increasing demand for high-quality, low-cost health care. Much has been written about strategies and efforts to improve efficiency in the perioperative periods, yet the time when the patient is in the operating room-the intraoperative period-has received less attention. Yet, this is the period in which surgeons may have the most influence.

METHODS: Systematically review published efforts to improve intraoperative efficiency; assess the outcomes of these efforts, and propose standardized reporting of future studies.

RESULTS: A total of 39 studies were identified that met inclusion criteria. These divided naturally into small (single operative team), medium (multi-operative team), and large (institutional) interventions. Most studies used time or money as their metric for efficiency, though others were used as well.

CONCLUSIONS: There is substantial opportunity to enhance operating room efficiency during the intraoperative period. Surgeons may have a particular role in procedural efficiency, which has been relatively unstudied. Common themes were standardizing tasks, collecting and using actionable data, and maintaining effective team communication.

Anaesthesist. 2010 Jun;59(6):549-54. doi: 10.1007/s00101-010-1726-6.

Quality of OR planning. Avoiding operating room underutilization or overutilization.

Grote R, Sydow K, Walleneit A, Leuchtmann D, Menzel M.

BACKGROUND: Accurate scheduling of operations is essential for an efficiently used OR. The aim of this investigation was to describe the quality of OR scheduling in the analyzed OR. Furthermore, suggestions for avoiding underutilization or overutilization through optimized OR planning should be addressed if possible.

METHODS: The planned duration, the real duration and the differences in minutes of 10,831 operations were analyzed. The statistical distribution was determined and the median, the quartiles, the interquartile range and the number of operations with a real duration lasting longer than planned were calculated. All operations were grouped in ascending order from the shortest planned duration. All planning groups were analyzed statistically, and the results were compared.

RESULTS: The planned OR durations did not show a normal distribution and 34% of all operations showed a real duration lasting longer than planned. The median of the differences was 10 min indicating that 50% of all operations were finished within 10 min earlier than planned. Operations with planned longer durations (>150 min) showed significantly more frequently a real duration lasting longer than planned. Furthermore, the differences between planned and real durations were additionally larger when planned durations were longer than 150 min.

CONCLUSION: Prognosis of operations with longer planned duration (>150 min) should be improved in the OR area analyzed. Scheduling of these operations at the beginning of the OR list or with a sufficient

time interval towards the end of the appointed OR block time within the OR list can avoid or at least minimize underutilization and overutilization of the OR.

Community of Practice Advice:

There are opportunities to improve OR scheduling and increase utilization of the existing theatre capacity. BHB has already invested in a new perioperative information system, and it is anticipated that this system will provide data to support improved utilization management.

Anticipated Benefits:

Improved utilization of existing BHB operating theatre capacity, reduced cancellation of procedures, and reduced requirement for staff overtime.

Other Considerations:

Increased information analysis capability may be required to take full advantage of the information available via the system.

Maternal Child

Comprehensive Antenatal Program

Relevant Communities of Practice: Maternal Child

Description of Service/Initiative:

Notwithstanding the commitment of BHB Obstetricians to provide care to uninsured patients, there is a wide variation in the quality and comprehensiveness of antenatal care in the country. In the current model, there is a cohort of patients with limited access to antenatal care (often due to socio-economic status). We also know that given the rate of diabetes in the country, there are opportunities to do better at identifying and caring for high risk mothers and babies in the antenatal phase. There is significant variation in the antenatal preparation that mothers have had when they enter the hospital to give birth, independent of where antenatal care has been secured, and some antenatal programs provided (e.g. through public health clinics) are not well understood by physicians. This is a cause for concern, both in terms of outcomes for mothers and babies, and because risks shift to BHB and the Obstetricians who must deliver these mothers and babies in hospital.

Proposal is to develop a standardized, comprehensive, evidence based antenatal programme for Bermuda to improve maternal and newborn outcomes. This would include, at a minimum, two important components:

1. A single, predictable wellness based antenatal program/approach available to all pregnant women in Bermuda to ensure they have access to high quality education, screening and care, no matter where they access ante-natal care. BHB should lead the standardization of antenatal care across Bermuda
2. A consistent or "common care pathway" that includes Obstetrician supervised care for all women in their last trimester of pregnancy.

Relevant Background Data:

We have data that allows us to anticipate that the volume of demand for birthing services and paediatric cases will decrease in the next several years based on demographic changes. Based on population projections and current data, it is anticipated that there will be fewer maternity cases and fewer hospital days (at $40K less cost) and fewer newborn cases (with fewer days and $160K less cost) in 2020/21 than today.

However, it was suggested by participants that because the economy is improving in Bermuda, fertility rates may increase as women choose to have children and/or larger families.

We have data that show the number of Emergency Department and UCC visits for maternal cases, and would expect these numbers to decrease with improved antenatal care across Bermuda.

We also know that there are high rates of non-communicable chronic diseases (NCDs) in Bermuda, particularly diabetes, and particularly in those with lower socioeconomic status. We do not have good

data for secondary diagnoses for maternal cases. CoP members estimate that 10- 20% of maternal cases have diabetes (higher than 14% population rate), and that the rates of gestational diabetes are higher.

We know that our caesarean deliveries without complications or comorbidities (a common outcome measure associated with quality) are high (40%) and increasing steadily in the last 4 years. Our inpatient length of stays for normal birthing cases are quite low (2.8 days, which is lower than CMS expected LOS of 3.2 days) and that there are very few outlier birthing cases with long lengths of stay.

We know that in 2016/17, 400 women used BHBs outpatient maternity services (which provides antenatal, birthing and post-natal care), with an average of 2.5 visits per patient. There is a sense from stakeholders that these numbers are low, and reflect an opportunity to increase access to high quality antenatal care.

We anticipate that approximately 10 percent of our maternal population (i.e. 5 or 6 births a month, or about 60 births per year) are high risk from a social perspective, and are difficult to serve prenatally. These patients are higher risk for complications with both their pregnancy or infants.

We know that approximately *71% of all mothers have private insurance, 9% have GEI, 5 % have* HID (requiring a 25% copay), 7% are self pay with subsidy, and 8% are self pay with no subsidy. It is those with high copays and self pays (12% of the population) that are likely not to seek prenatal care.

So overall, for about 90% of our maternal population, a standard pathway for obstetrical care is important. For the remaining 10%, we need to take a multi-agency collective approach to try to provide better care and reduce complications/needs.

There is no evidence compiled re the quality of prenatal care that is being provided in Bermuda from any sources.

Input/Advice from CoP Discussions:

The opportunity proposed is not intended to reduce the cost or demand for maternal care, but to improve outcomes, and, to potentially reduce future demand for services (by sick babies or mothers with complications). Health literacy, and a wellness approach to antenatal and newborn care, are both considered to be important for improving outcomes in Bermuda.

There are many choices for ante-natal care on the Island. Access to these choices is partially based on preference, but most often dependent on ability to pay.

Currently there is limited consistency in education or approach among the various ante-natal programmes/approaches that are accessed. There are likely opportunities to develop an approach that can be used across Bermuda, that can be delivered by all types of providers that allows women to have choices they prefer, and that raises the quality and impacts clinical outcomes. The intent is not to limit choices, but to ensure that we are maximizing outcomes no matter which path each mother is on.

Similar challenges exist in postnatal and well baby care. This recommendation could also apply to care after delivery. There is also an opportunity to consolidate all maternal care or at least to collate data /information on what care has been provided so OBs have information needed when patients whose antenatal care has not been provided by the OBs, come to hospital to deliver or for management. There is a need to ensure our data systems, between the community, government services, and BHB are integrated. We can do better as a connected system. There is a gap in information and access to information. To raise the quality bar, we need to connect the parts of our system more effectively. This speaks to the need for an EMR in Bermuda, with requirements that all physicians have a system with connectively by a given date. This will require reinforcement through policy.

There is currently a gap between BHB OBs and community physicians. There is an opportunity to come together to collaborate for improved outcomes.

There is no consistency when women are referred to and seen by the hospital OB prior to delivery. Some are seen at 28 weeks, some are seen early, some not at all. There may be an opportunity to standardize "the runway" leading up to delivery to improve outcomes, ensuring that OBs are either supervising or delivering care for every woman who will deliver in Bermuda.

Almost all mothers deliver in hospital (regardless of ability to pay), and the OBs treat all with equal quality and respect. However, those who have had poor access to, or ineffective antenatal care, are higher risk to care for/ higher risk of poor outcomes. There is increased risk for OBGYNs who must deliver the babies of mothers that they have not cared for antenatally. BHB is the only "landing strip" for deliveries in Bermuda. The question is, is it right and appropriate and safe for BHB to accept responsibility for incoming mothers when we don't know anything about their condition, the condition of the baby and the prenatal care provided. OBGYNs need to be involved, or at least aware of, the case history before delivery.

This opportunity to extend OB care applies not just to at risk populations but to all pregnant women. There is a potential to develop a national programme that is delivered "under the auspices of BHB" (i.e. BHB takes a leadership role in establishing the quality standards, but the care in adherence to these standards is delivered in a distributed way). It may not be exclusively an OB that is required to provide this prenatal/hospital clinic care (there may be opportunities for mixed types of providers such as OB, midwives) and perhaps a need to include multidisciplinary providers in this model (dieticians, social workers, etc.).

Related Research Evidence or Clinical Standards:

There is a wide body of evidence on the effectiveness of prenatal and antenatal care, and the many models used to deliver this care. A landmark review (Alexander & Kotelchuck, 2001: Assessing the Role and Effectiveness of Prenatal Care: History, Challenges, and Directions for Future Research) concluded that despite the widespread use of prenatal care, the evidence for its effectiveness remains equivocal and its primary purpose and effects continue to be a subject of debate. However, they associated this with challenges in conceptually defining prenatal care in terms of the type, content and quality of care delivered, and with the difficulty in evaluating the value of prenatal care.

Given the lack of strong evidence on the effectiveness of the content, frequency, and timing of visits in standard antenatal-care programmes, Carolli et al. (2001) completed a systematic review of randomized control trials for routine antenatal care for the WHO. They concluded that "new approaches" to antenatal care that involved fewer visits than standard antenatal programs achieved similar clinical outcomes for reducing pre-eclampsia, urinary-tract infection, postpartum anaemia, maternal mortality, low birthweight, and perinatal mortality. While women's satisfaction with care was somewhat lower, the costs associated with care were also less.

There are many maternity care pathways that have been developed by various jurisdictions that lay out critical milestones in care based on best evidence and are intended to standardize the care provided to a population. One excellent example is the BC Perinatal Health Program's Obstetrical Guideline, which lays out a care plan and is used along with a patient "Pregnancy Passport" to improve outcomes. See http://www.perinatalservicesbc.ca/Documents/Guidelines-Standards/Maternal/MaternityCarePathway.pdf

Community of Practice Advice:

BHB should provide system leadership to develop a standardized approach to antenatal (and potentially postnatal/well-baby) care on the Island. A single, predictable wellness based antenatal program/ approach available to all pregnant women in Bermuda to ensure they have access to high quality education, screening and care, no matter where they access ante-natal care, is the goal. The common antenatal pathway needs to include the OBGYN who will be responsible for the delivery.

Anticipated Benefits:

A common pathway should standardize care, improve quality and lead to healthier mothers and babies with healthier development. Impact on patients is an improved patient experience and better health. This is a cost- avoidance strategy that may increase hospital costs in the short- to mid-term, but should lead to longer term reduction in costs for Bermuda.

Other Considerations:

This strategy will require strong leadership, collaboration and partnership across multiple providers (in an out of hospital, and across health and social sectors). It would be enabled by an electronic medical record and systems connectivity. This will be an opportunity to consider and define roles in Bermuda further (e.g. midwifery / Surgical technicians / nurse practitioners / etc.).

Gynaecology Minimally Invasive Surgery

Relevant Communities of Practice: Maternal Child, Surgery

Description of Service/Initiative:

There is a shift in practice patterns from offering open to providing laparoscopic or robot-assisted approaches as accepted practice for some gynecologic procedures (TAH, vaginal repairs etc.), but this shift has not yet been completed at BHB.

Many gynaecology conditions can now be dealt with efficiently on an outpatient basis. Clinical services are being redesigned to the patient's benefit with traditional models of out-patient consultation and inpatient surgery being replaced by "one-stop" clinics and day surgery operations. Ambulatory gynaecology combines a "see and treat" model in outpatient clinics with minimally invasive surgery in an outpatient setting thereby providing care in a more cost-effective manner and shortening the care pathway for patients.

Proposal is to consider the development of an ambulatory gynaecology programme that offers preventative, primary and minimally/low-risk invasive procedures to provides a "one-stop, see and treat" environment for specific gynaecological conditions.

The overall objectives of such service would be to:

- Shorten the treatment process/care pathway for patients
- Speed up recovery and return to work
- Reduce wait times for patients
- Enhance patient centered care and improve the patient experience
- Increase outpatient procedures and increase SDS rates
- Reduce the overall cost of treatment

Relevant Background Data:

3 Fiscal Year Inpatient Data for MDC Diseases and Disorders of the Female Reproductive System

Principal Procedure		IP Cases	IP Days	Avg. LOS
6849	TAH NEC & NOS	110	443	4.0
(blank)	No Procedure	55	577	10.5
6829	UTERINE LES DESTRUCT NEC	36	107	3.0
6839	SUBTOT ABD HYST NEC&NOS	32	110	3.4
6529	LOCAL DESTR OVA LES NEC	12	41	3.4
6561	OTH REM BOTH OVA/TUBES S	8	27	3.4
7051	CYSTOCELE REPAIR	7	12	1.7
9904	PACKED CELL TRANSFUSION	6	32	5.3
6549	OTH UNI SALPI-OOPHORECTO	6	21	3.5
5411	EXPLORATORY LAPAROTOMY	4	17	4.3
6909	D & C NEC	4	12	3.0
6859	VAG HYST NEC & NOS	4	7	1.8
5491	PERCUTANEOUS ABD DRAINAG	4	39	9.8
3491	THORACENTESIS	4	23	5.8
5421	LAPAROSCOPY	3	8	2.7

Principal Procedure		IP Cases	IP Days	Avg. LOS
6525	OTH LAP LOCAL EXCI OVARY	3	3	1.0
6651	REMOVE BOTH FALLOP TUBES	3	14	4.7
5424	CLOSED BX INTRA-ABDOMINA	2	11	5.5
All Other Procedures		31	187	6.0
Grand Total		334	1,691	5.1

3 Fiscal Year Gynaecology Inpatient and Day Surgery Cases by ICD-9 Procedure Code

ICD Proc. Code	Procedure Name	IP Cases	Day Surgery Cases	Total Cases	% Day Surgery
Grand Total		334	209	542	39%
6909	D&C NEC	4	140	144	97%
6849	TAH NEC&NOS	110	-	110	0%
6829	UTERINE LES DESTRUCT NEC	36	22	58	38%
(blank)	(blank)	55	-	55	0%
6839	SUBTOT ABD HYST NEC&NOS	32	-	32	0%
598	URETERAL CATHETERIZATION	2	16	18	89%
6529	LOCAL DESTRO VALES NEC	12	-	12	0%
5421	LAPAROSCOPY	3	8	11	73%
6812	HYSTEROSCOPY	1	8	9	89%
3893	VENOUS CATHETER NEC	1	7	8	88%
6525	OTH LAP LOCAL EXCIOVARY	3	5	8	63%
6561	OTH REMBOTHOVA/TUBESS	8	-	8	0%
7051	CYSTOCELE REPAIR	7	-	7	0%
6549	OTH UNISALPI-OOPHORECTO	6	-	6	0%
9904	PACKED CELL TRANSFUSION	6	-	6	0%
3491	THORACENTESIS	4	-	4	0%
5411	EXPLORATORY LAPAROTOMY	4	-	4	0%
5491	PERCUTANEOUS ABD DRAINAG	4	-	4	0%
6859	VAG HYST NEC&NOS	4	-	4	0%
5451	LAPAROSOPIC LYSISPERADH	2	1	3	33%
6651	REMOVE BOTH FALLOP TUBES	3	-	3	0%
5424	CLOSED BX INTRA-ABDOMINA	2	-	2	0%
6539	OTH UNILAT OOPHORECTOMY	2	-	2	0%
6639	BILAT TUBAL DESTRUCT NEC	1	1	2	50%
674	AMPUTATION OF CERVIX	2	-	2	0%
6841	TLH	2	-	2	0%
6851	LAVH/LAPVAGINAL HYSTE	2	-	2	0%
All Other Procedures		16	-	16	0%

Input/Advice from CoP Discussions:

MIS is an accepted level of care that BHB should be able to provide. It is considered a modern method of gynecological care. (Note that we are talking about MIS techniques, not robot assisted surgeries.) There could be multiple benefits to the patient and the organization.

There has been poor uptake of minimally invasive surgeries at BHB to date– especially for gynae procedures because of barriers to implementation, most significantly access to equipment and formalized skill acquisition. There are physicians here that have the capacity to provide this type of care.

Training would be required to move to MIS approaches. Do we have enough volume to allow OB/surgeons to acquire/maintain competence for these procedures?

The volumes would be relatively low, but it is anticipated that we could convert 60% of the gynecological surgeries that could be done by MIS to MIS and an ambulatory approach with dedication to this strategy. It would be helpful to have better data to understand demands. Need to push to use ICD-10 codes instead of ICD-9, since ICD-10 better describes surgical techniques.

Related Research Evidence or Clinical Standards:

The clinical and cost benefits of MIS for treating a variety of gynecological conditions are well documented (Wright et al, 2012, Warren et al, 2009, Kongwattanakul & Khampitak, 2012, Wiser et al, 2013).

Driven by patient demands, there is a growing trend to develop less invasive approaches to common surgical procedures. Many operative procedures are now performed by minimally invasive surgery. While laparoscopic gynaecologic surgery has been in place since the 1970's, the use of robotic technology has been more recent.

Robotic technology offers all the benefits of minimally invasive surgery and addresses many of the limitations in laparoscopic surgery. Similar to other laparoscopic procedures, robotic assisted surgeries offer the patient improved cosmesis, shorter hospital stay, reduced postoperative pain, decreased intra-operative blood loss, shorter recovery time, reduced exposure of the intra-abdominal contents to the external environment, less risk of infection etc. More specifically, however, robotic techniques offer 3-dimensional vision, improved ergonomics, increased robotic instrument maneuverability, physiologic tremor reduction and dexterity with 7degree articulation and reduced overall procedural costs.

Within gynaecological surgery, the utilization of robotics has evolved from the use of Aesop® - a robotic arm for camera manipulation to a full robotic system such as Zeus® and the da Vinci® surgical system. The latest robotic device, the da Vinci Surgical System was approved by the Food and Drug Administration (FDA) for intra-abdominal surgeries in 2000 and in April 2005 for use in gynaecological procedures. It is now the only commercially available robotic system approved for gynaecologic surgery. Robotic assisted surgery is now being increasingly used for specific gynaecologic procedures and in 2009 was used in at least 10 of the top 20 gynaecology programs in the USA. Robotic assisted surgeries are used in several gynaecological procedures including:

- Ovarian cystectomy

- Ovarian transposition
- Laparoscopic assisted vaginal hysterectomy
- Laparoscopic supracervical hysterectomy
- Total laparoscopic hysterectomy
- Tubal reanastomosis
- Myomectomy (uterine fibroid removal)
- Sacrocolpopexy (treatment for post-hysterectomy Vaginal vault prolapse)
- Vesicovaginal fistula

There are, however, several limitations to robotic assisted surgery including its initial cost of acquisition (approximately $1.5 million), lack of adequate training in residency programs, lack of training opportunities outside dedicated fellowships, lack of mentors within the profession, and the length of time required to develop the requisite skills in robotic surgery. On the other hand, it should be noted that fundraising is amenable to a focus on leading edge technologies.

Community of Practice Advice:

BHB should develop an ambulatory gynaecology programme that offers preventative, primary and minimally/low-risk invasive procedures to provides a "one-stop, see and treat" environment for specific gynaecological conditions. There may be an opportunity to convert inpatient surgeries to MIS approaches; no investment in robotic surgery is suggested now.

Anticipated Benefits:

This is the right thing to do. We can offer an improved standard of care locally for this cohort of patients. This patient cohort would benefit by avoiding inpatient admissions/shortened lengths of stay, improved patient experience, improved/shortened recovery for patients with potential for fewer complications, reduced overall cost of treatment, and potentially improved throughput and shorter wait times for procedures. There is also a sense that there is a desire to expand physician skills to include MIS as part of the standard of GYN care at BHB.

Other Considerations:

Physicians will need to build skill and capacity for these procedures as there is a learning curve to achieve efficiency/excellence. Will need to advocate that the reimbursement model supports/does not inhibit the adoption of this approach.

Paediatric Asthma Clinic

Relevant Communities of Practice: Maternal Child

Description of Service/Initiative:

Asthma is prevalent in Bermuda and results in many paediatric ED visits and hospitalizations. We know that asthma control is an important strategy to reduce the need for hospital visits.

Proposal is that access to a multidisciplinary asthma clinic with a focus on children might significantly reduce the number of acute paediatric asthma episodes, thus decreasing the use of ED and rate of admissions to the hospital.

Relevant Background Data:

Asthma is a significant challenge for our paediatric population at BHB, and the treatment of asthma consumes a significant amount of BHB resources.

We have data to show that Bronchitis and Asthma was the most frequent reason for inpatient admission for paediatric patients in 2016/17. There were 48 cases, which account for 73 hospital days, each case averaging 1.5 days length of stay. We also know that asthma is recorded as the most common secondary diagnosis, recorded for 23% of all paediatric admissions (and likely under-reported). It also accounts for 12.5% of paediatric ICU cases, and 8.7% of ICU days used for paediatric patients.

2016/17 BHB KEMH Paediatric Acute Inpatient Discharges by DRG

Diagnosis Related Group	Cases	Total Days	Avg. LOS
Bronchitis & Asthma w/o CC/MCC	***48***	***73***	***1.5***
Esophagitis, Gastroent & Misc Digest Disorders w/o MCC	23	29	1.3
Other Ear, Nose, Mouth & Throat O.R. Procedures w/o CC/MCC	22	21	1.0
Viral Illness w/o MCC	18	19	1.1
Simple Pneumonia & Pleurisy w CC	17	52	3.1
Simple Pneumonia & Pleurisy w/o CC/MCC	14	29	2.1
Seizures w/o MCC	9	42	4.7
Otitis Media & Uri w/o MCC	9	22	2.4
Bronchitis & Asthma w CC/MCC	***8***	***23***	***2.9***
Red Blood Cell Disorders w/o MCC	8	17	2.1
Misc Disorders Of Nutrition,Metabolism,Fluids/Electrolytes w/o MCC	8	19	2.4
Lower Extrem & Humer Proc Except Hip,Foot,Femur w/o CC/MCC	7	8	1.1
Appendectomy w/o Complicated Principal Diag w/o CC/MCC	6	11	1.8
Other Digestive System Diagnoses w/o CC/MCC	5	5	1.0
Diabetes w/o CC/MCC	5	15	3.0
Appendectomy w Complicated Principal Diag w/o CC/MCC	5	20	4.0
Kidney & Urinary Tract Infections w/o MCC	4	11	2.8
Poisoning & Toxic Effects Of Drugs w/o MCC	4	3	0.8
Other Respiratory System Diagnoses w/o MCC	4	4	1.0
All Other DRGs	99	317	3.2
Total	323	740	2.3

Most Common Secondary Diagnoses Recorded for Paediatric Discharges (3 Fiscal Years)

Secondary Disease	Patients	Prevalence as Secondary
Asthma	***166***	***23.0%***
Dehydration	74	10.2%
Noninfective Enteritis and Colitis	38	5.3%
Acute Upper Respiratory Infections	38	5.3%
Otitis Media	33	4.6%
Other Viral Diseases	30	4.2%
Anaemias	28	3.9%
Abnormalities of Breathing	28	3.9%
Coagulation Defects & Other Haemorrhagic Conditions	27	3.7%
Nausea and/or Vomiting	24	3.3%
Sleep Disorder	24	3.3%
Fever	23	3.2%
Other Diseases Of The Respiratory System	21	2.9%
Acute Bronchiolitis	21	2.9%
Dermatitis and Eczema	21	2.9%
Pneumonia	19	2.6%
Other Diseases Of Upper Respiratory Tract	15	2.1%
Signs/Symptoms invol. Emotional State	14	1.9%
Constipation	14	1.9%
General Symptoms and Signs	14	1.9%
Other Disorders Of The Nervous System	13	1.8%
Electrolyte and Acid Base Disorders	13	1.8%
Poisoning by Drugs/Medicaments/Biolog. Subst.	11	1.5%
Diabetes	10	1.4%
Sepsis	9	1.2%
Complications of Surgical & Medical Care	9	1.2%
Epilepsy	7	1.0%
Other Neurotic, Stress-Related & Somatoform Disorder	6	0.8%
Fracture of Skull and Facial Bones	6	0.8%

2016/17 Paediatric DRGs with Highest Volume of ICU Days

Diagnosis Related Group	Total Cases	Total Days	Avg. LOS	ICU Cases	ICU Days	ICU LOS	% ICU Cases	% ICU Days
Tracheostomy For Face,Mouth & Neck Diagnoses w MCC	1	33	33.0	1	3	3.0	100.0%	9.1%
Bronchitis & Asthma w CC/MCC	***8***	***23***	***2.9***	***1***	***2***	***2.0***	***12.5%***	***8.7%***
Traumatic Stupor & Coma, Coma <1 Hr w CC	1	10	10.0	1	2	2.0	100.0%	20.0%
Other Injury, Poisoning & Toxic Effect Diag w MCC	1	2	2.0	1	1	1.0	100.0%	50.0%
Viral Meningitis w/o CC/MCC	2	7	3.5	1	1	1.0	50.0%	14.3%
Bronchitis & Asthma w/o CC/MCC	***48***	***73***	***1.5***	***1***	***1***	***1.0***	***2.1%***	***1.4%***
Simple Pneumonia & Pleurisy w CC	17	52	3.1	1	1	1.0	5.9%	1.9%

Highest Volume Paediatric ED/UCC Visits by Diagnosis Group by Fiscal Year

Diagnosis Group	14/15	15/16	16/17	Grand Total
Asthma	***759***	***703***	***636***	***2,098***
Acute Upper Respiratory Infections	704	653	646	2,003
Other Viral Diseases	387	338	225	950
Injuries to Knee and Lower Leg	268	279	267	814
Injuries to Wrist and Hand	287	223	223	733
Other Injuries To The Head	229	281	200	710
Otitis Media	261	221	203	685
Open Wound of Head	237	229	213	679
Dislocation/Sprain Joints/Ligaments Ankle/Foot	195	197	168	560
Acute Bronchiolitis	202	168	134	504
Noninfective Enteritis And Colitis	153	193	126	472
Fever	191	140	139	470
Disease Of External Ear	140	159	132	431
Abdominal Pain	140	147	142	429
Superficial Injury of Head	139	145	129	413
Injuries to Elbow and Forearm	130	143	140	413
Injuries to Ankle and Foot	135	117	111	363
Nausea and/or Vomiting	95	158	102	355
Abnormalities of Breathing	125	114	103	342
Dislocation/Sprain of Wrist/Hand	102	102	126	330
Pneumonia	87	99	77	263
Closed Fracture - Elbow/Forearm	75	85	80	240
Disorders of Conjunctiva	90	73	77	240
Injuries to Hip and Thigh	90	63	72	225
Rash/Skin Eruption	96	76	50	222
Other Dermatologic Conditions	85	78	57	220
Examination and Investigation	81	69	58	208
Constipation	79	56	70	205

Input/Advice from CoP Discussions:

There is a sense that hospital treatment of asthma could be reduced with better asthma management. This is typically a primary care/prevention/ CDM self management approach. However, in Bermuda it appears we are not effectively managing paediatric asthma through GP office visits or, GPs refer patients to the ED or hospital to get puffers when in exacerbation.

One factor which drives this is the difference between compensation approaches between community and hospital services.

A more effective strategy may be to provide a primary care clinic that can provide both or either of improved asthma management and or rapid response to support admission avoidance and secondary prevention. This approach would be consistent with current practice in many jurisdictions, including in North America and the UK. However, there is a sense that this may not be necessary in Bermuda. There are many existing resources already in place (Open Airways, etc.) that have not been optimized and that need better coordination. Financial disincentives need to be reduced so that patients receive better access to asthma self management in primary care. Pharmacists can also make significant contribution t to reducing ED visits by ensuring patients have their puffer medications in a timely way. There will need to be consideration for improved coordination and better marketing of chronic disease services (e.g., Open Airways) to both GPs and the public, so people are aware of service offerings and are able to utilize the service if this strategy is to be successful.

Availability of a paediatric nurse to the ED when a child with asthma presents may be an additional strategy. ED should ensure that referral to the clinic or diversion to the clinic if it has rapid response capability, is part of the ED care pathway for those presenting with breathing difficulties.

Related Research Evidence or Clinical Standards:

There is a strong body of evidence to suggest that the availability and use of primary care asthma clinics can have a positive impact on the use of ED services and admissions. One good and recent example for reference is:

Snyder DA, Thomas OW, Gleeson SP, Stukus DR, Jones LM, et al. (2017: **Reducing Emergency Department Visits Utilizing a Primary Care Asthma Specialty Clinic in a High Risk Patient Population)** found that a primary care-based asthma clinic was associated with a significant and sustainable reduction in ED utilization versus usual care. This study describes a comprehensive, multi-disciplinary and innovative model for an asthma management programme within the medical home that demonstrated a significant reduction in emergency department visits, an increase in spirometry utilization and an increase in controller fills in a high-risk asthma population versus comparison group.

Further, there are multiple models that have been evaluated for offering primary care asthma care, and the following study suggests that strong results can be achieved with approaches used in small jurisdictions:

Kwong KY, Redjal N, Scott L, Li M, Thobani S, Yang B. (2017: **Adaptation of an asthma management program to a small clinic)** examined options for asthma management clinics in smaller population, as a way of adopting a “breathmobile” approach to be more affordable. In this study, they extended validated asthma disease management principles from the Breathmobile program to a smaller clinic system utilizing existing resources and compared clinical outcomes. A weekly asthma disease management clinic was initiated in an existing multi-specialty pediatric clinic in collaboration with the Breathmobile program. Existing nursing staff was utilized in conjunction with an asthma specialist provider. Patients were referred from a regional healthcare maintenance organization and patients were evaluated and treated every 2 months. A total of 116 patients were enrolled over a period of 1 year. Mean patient age was 6.4 years at the time of their first visit. After 1 year of enrollment, there

was a 69% and 92% reduction in ED/urgent care visits and hospitalizations, respectively, compared with the year before enrollment. Up to 70% of patients achieved asthma control by the third visit. Thirty-six different patients were seen during 1 year for a total of $15,938.70 in contracted reimbursements.

Community of Practice Advice:

BHB should not support the development of a multidisciplinary asthma clinic with a focus on children. Instead, it should advocate for optimization of existing chronic disease management resources in the community and in primary care, which will result in better asthma control for children, and reduced number of acute paediatric asthma episodes. It should make a paediatric nurse available for ED consultations when children with asthma present to help manage individual cases and reduce number of admissions.

Anticipated Benefits:

Improved primary management of asthma in children will result in improved health and better patient experience. For the hospital, there will be reduced number of ED visits and admissions through the ED. This should result in reduced cost of care overall in Bermuda.

Other Considerations:

It is in BHB's best interest to advocate for and provide leadership where needed to ensure that effective primary care /chronic disease management strategies are in place for children with asthma. This may include advocacy to eliminate funding disincentives.

The nurse staffing model will require consideration to accommodate prn consults to the ED.

Admissions for Drug Coverage

Relevant Communities of Practice: Maternal Child

Description of Service/Initiative:

There are several patients who are admitted for drugs or infusions at BHB because the drug is on the hospital's formulary and therefore not purchased by the family. Similarly, some families in Bermuda opt not to get insurance coverage for their children because they know that care will be provided in the hospital for free. There is an opportunity to avoid unnecessary hospital admissions for these children.

Proposal is that BHB should no longer provide admissions exclusively to subsidize the cost of medication to the family.

Relevant Background Data:

Further data is required to understand the extent of this issue, including the number of patients who are accessing care this way, and the approximate cost to BHB of this care.

Anecdotal estimates are that there are a small number of patients who regularly access their treatments this way.

Input/Advice from CoP Discussions:

Families do not have coverage for these treatments, and cost is otherwise prohibitive, so the hospital provides this care as a "safety net" service.

These patients are admitted as inpatients directly to the unit and are treated and released, come as outpatients to the unit to get immunoglobulins, infusions, etc. (i.e. functionally an ambulatory service).

If funding for their treatments was available, they could receive treatments in either an ambulatory setting or a home setting.

If there was an IV infusion clinic in the ED these patients could be seen in the infusion clinic. Some of the community services (private insurance) do offer these infusions, but just aren't good at providing them to paediatric clients (so often we do part of it, and bill for it).

These are reimbursement policies that force behaviours that do not support system effectiveness, and are not "de-escalating" care in the best interest of the patient.

There is a need to identify alternate settings for these patients to receive this care. A gap in Bermuda is paediatric home nursing capacity. If this existed, services could be provided in this way.

More importantly, there is a need to ensure that families can access these medications/treatments for their children when appropriate. Changes to formularies or insurance guidelines will be required in order to divest this service from BHB.

Related Research Evidence or Clinical Standards:

N/A

Community of Practice Advice:

It is not appropriate for paediatric patients to be admitted to BHB to receive infusions/treatments because these treatments are paid for in the hospital. It would be more appropriate for paediatric patients to receive infusions at an infusion clinic (another strategy being recommended) or through home care nursing. However, it may be a short-term reality to continue to provide these infusions/ treatments as we advocate for systems level change.

Anticipated Benefits:

More appropriate and effective use of systems resources; better patient experience.

Long Stay Physically Disabled Patients

Relevant Communities of Practice: Maternal Child, Post-Acute, Medicine

Description of Service/Initiative:

There are two young adults with physical disabilities and complex care needs who reside on Gosling Ward at BHB. These individuals have lived on Gosling for several years, and it is anticipated that they will continue to be "long stay patients" as there are not alternative settings in Bermuda that can provide care for them. Although BHB's acute team has responded very effectively to manage their environments, an acute care hospital is not the most appropriate setting for these individuals.

Proposal is that Bermuda will develop more appropriate and cost-effective places/settings to manage the long term needs of paediatric and/or young adults with long term care needs. These individuals should be deinstitutionalized.

Relevant Background Data:

These individuals are difficult to track in the existing data because they are discharged and re-admitted once per year for reimbursement purposes. Individual audit/data gathering would be required. The number of hours of skilled care required per day for these patients is unclear. These patients do receive a number of other allied and social services intermittently, and accessed through special arrangement and as a result of advocacy from both BHB and their families.

The BHB charge for these acute beds is $600 per day, but recovery of this revenue is dependent on patient insurance status.

Input/Advice from CoP Discussions:

This issue speaks to the need for a more robust post-acute or long-term care system in Bermuda.

This is a small number of individuals that has a large impact on budget and availability of beds on Gosling ward. These patients do not have particularly complex care needs, and should be able to be managed in the community if there were appropriate spaces for them. These children need a more normalized setting, ideally a group home setting (with care supports) or other types of congregate living.

These individuals have overall needs that are similar to some of the other young adults in BHB's system, for example in our Learning Disabilities population. Increased capacity for younger individuals with ongoing care needs is required and should be planned for, so that these individuals can live in the least "institutionalized" setting as possible and can maximize their choice, independence and ability.

Should BHB become a provider of intermediate or complex long-term care services, it should include capacity that would meet the needs of these types of individuals. Should BHB not be the provider, and capacity to manage more complex care needs is developed in the community, BHB should consider its role, if any, in supporting these settings to ensure high quality, ongoing care for these residents.

Related Research Evidence or Clinical Standards:

There is a body of research examining the benefits of deinstitutionalization for patients with a number of challenging, including intellectual disabilities, physical/developmental disabilities and chronic

psychiatric challenges. In general, findings are that, on a number of different measures, people can be supported more effectively in the community than institutions.

An excellent reference is a recent comprehensive review completed by Raymond Lemay in 2009 **(Deinstitutionalization of People with Developmental Disabilities: A Review of the Literature)**. He concludes that on the whole, the data are compelling: People, irrespective of their degree of disability, are apt to do better in the community on most measures and do no worse when it comes to challenging behaviours. Measures included mortality and morbidity, adaptive behaviours, challenging behaviours, quality of life, and cost effectiveness. Moreover, these findings suggest a serious underperformance by community-based services, which can be addressed through systematic training approaches that teach staff and family members the attitudes and competencies required for taking advantage of community living.

Community of Practice Advice:

Bermuda should develop more appropriate and cost-effective places/settings to manage the long term needs of paediatric and/or young adults with long term care needs who reside on Gosling ward. BHB should advocate for this, but may need to continue to care for these residents until more appropriate settings exist.

Anticipated Benefits:

Living in less institutional settings would likely be a significant improvement to quality of life for these individuals. BHB would see cost savings and have increased bed availability.

Other Considerations:

Advocacy will be required.

Mental Health and Addictions

Dual Diagnosis Outreach

Relevant Communities of Practice: Mental Health and Addictions

Acute Mental Health inpatient services are provided at the Somers Annex Psychiatric Intensive Care Unit, the Somers Ward Acute Inpatient Unit and Child and Adolescent Services (CAS) Inpatient Unit. The Somers Annex Psychiatric Intensive Care Unit is a secure area for service users who need close observation and behavioural control, typically during the early stages of admission. Service users admitted to this unit are typically transferred to the less restrictive Somers Ward as soon as their mental state allows. The Somers Ward Acute Admission Unit is a short-term psychiatric care unit in an open environment. Adult service users of all ages and both sexes who require observation, assessment and treatment may be admitted. CAS' Inpatient Unit provides short-term Inpatient care, and serves as a "temporary/step down" unit for Youths transitioning between care arenas to/from abroad.

Acute Mental Health services are also provided in the community through the Community Mental Health Services which has Acute and Rehabilitation Programs. This service provides assessment and treatment for adults diagnosed with major depressive and bipolar disorders, schizophrenia and other psychological disorders. The service also operates a 24 hour on-call service that responds to after-hours mental health crises in collaboration with community partners.

The Community Rehabilitation Service provides support to service users who have experienced severe and enduring mental health disorders adapt to community living by enhancing their existing life skills, social skills and coping techniques; services include assertive outreach. CAS provides outpatient, Day programme services, and Autism Spectrum Disorder assessment clinic. Encompassed within our assertive outreach initiatives.

Substance abuse services are offered through Turning Point. Treatment is provided to clients over the age of 18 and includes individual counselling, case management and referral services tailored to individual service user needs covering:

- Inpatient detoxification,
- Intensive Outpatient Treatment, and
- Methadone Maintenance Treatment Programme.

The mental health outreach and substance abuse programs are distinct services; outreach designed explicitly for dual diagnoses patients is not currently available.

Description of Service/Initiative:

A Dual Diagnosis Consultation Outreach Team / Assertive Community Treatment (ACT) model is a multidisciplinary team that serves the mental and physical health needs of dual diagnosed clients. The DDCOT would work with the individual, family members, service providers, family physicians and other referral sources to determine a diagnosis and develop individual treatment recommendations to

improve the quality of life of a person living with dual diagnosis. Team members would include nursing, occupational therapy, psychiatry, psychology, social work, and speech and language pathology.

Treatment occurs inside the person's home or community as clinically feasible, offering comfort that many mentally ill individuals do not get in traditional inpatient therapy. The idea is to provide comprehensive treatment for the maximum level of effectiveness. The goal for ACT is to eliminate or reduce the symptoms of severe mental illness and to enhance the individual's quality of life. In effect, by teaching coping and life skills while working in tandem with the mental illness, when effectively executed, such programs can also reduce hospital time. Such a team also works to maintain individuals in their home and community and to prevent hospitalization and is associated with superior outcomes in the substance use domain.

Relevant Background Data:

Services designed explicitly for dual diagnoses patients are not currently available in Bermuda. The current individual outreach teams (the Acute Community Mental Health Program, the Community Rehabilitation Intensive Case Management Team; and the Turning Point Substance Abuse Treatment) experience a significant degree of comorbidity, with staff typically not trained in the corresponding discipline.

Input/Advice from CoP Discussions:

Initial discussions had focused on the need for a dual diagnosis (mental health and addictions) outreach team; as the CoP discussed the extremely high proportion of dual diagnosis patients, the consensus developed around the need to recognize that integration of care would be preferable. Further, it was felt that a distinct dual diagnosis outreach approach would not integrate well with existing outreach services.

The CoP advises that, rather than creating a separate dual diagnosis outreach team, the current outreach teams in mental health (the Acute Community Mental Health Programme and the Community Intensive Case Management Team) should receive training in substance abuse; and that the members of the Turning Point Substance Treatment Programme should receive training in mental health. More specifically, both teams should receive training in how to address the common elements of co-occurrence such that the current services are tailored to address the common interactive elements.

Further, as research has suggested that outcomes are improved if case management programs closely follow ACT principles, the CoP advises that both the Acute Community Mental Health Programme and the Rehabilitation Intensive Case Management Team, review their approach to ensure that they are following ACT principles and design. It is noted that although the Acute Community Mental Health caseloads would not facilitate implementation of the ACT model, some of the principles of care could potentially transition. This should include the engagement of primary care physicians following the team interventions; this may require that mental health, addictions, and dual diagnosis elements, training be made available to primary care practitioners.

A key success factor to this advice is the recruitment of a Clinical Educator; these resources are extremely limited at MWI. An advanced educator would ensure that team members and community partners are up-to-date on internal practice standards / policies / care maps and ensure appropriate training on the elements of co-occurrence. This role would also provide the necessary out-facing education of community partners, families and service users to set appropriate expectations of the services available.

Related Research Evidence or Clinical Standards:

Adults with severe mental illness have extraordinarily high rates of co-occurring substance use disorders, typically around 50% or more, which adversely affect their current adjustment, course, and outcome. Separate and parallel mental health and substance abuse treatment systems do not offer interventions that are accessible, integrated, and tailored for the presence of co-occurrence. In the traditional system of parallel substance abuse and mental health services, few clients can access needed treatments for both disorders.

The Assertive Community Treatment model of mental health service delivery has been extensively studied and has undergone various modifications over the past twenty years. It is one of the best-researched mental health treatment models, with 25 randomized controlled trials evaluating its effectiveness. In the United States, studies have shown that there have been significant drops in the length of hospital stays and superior outcomes in the substance abuse domain for those states that have implemented ACT programs. Such teams also increase housing stability, and moderately improve symptoms and subjective quality of life. In addition, they are highly successful in engaging patients in treatment. Research also suggests that the more closely case management programs follow ACT principles, the better the outcomes.

While ACT services are costly, studies have shown the costs of ACT services to be offset by a reduction in hospital use in patients with a history of extensive hospital use. A key component of ACT team programming is a low staff to patient ratio. Thus, the success of this recommendation would rely upon adequate clinician resources. Transitioning service users to primary care when clinically appropriate would assist in the recalibration of Acute Community Mental Health caseloads.

ACT is significant because it offers a clearly defined model, and is clinically appealing to practitioners, financially appealing to administrators and scientifically appealing to researchers

Gregory J. McHugo, Robert E. Drake, Gregory B. Teague, and Haiyi Xie. **Fidelity to Assertive Community Treatment and Client Outcomes in the New Hampshire Dual Disorders Study.** Psychiatric Services, Published online: June 01, 1999.

Dane Wingerson & Richard K. Ries. **Assertive Community Treatment for Patients with Chronic and Severe Mental Illness Who Abuse Drugs.** Journal of Psychoactive drugs; Pages 13-18 | Published online: 23 Jan 2012

Bond, G.R., Drake, R.E., Mueser, K.T. et al. **Assertive Community Treatment for People with Severe Mental Illness: Critical Ingredients and Impact on Patients.** Dis-Manage-Health-Outcomes (2001) 9: 141. https://doi.org/10.2165/00115677-200109030-00003

Drake, R.E., Mueser, K.T., Brunette, M.F. **Management of persons with co-occurring severe mental illness and substance use disorder: program implications.** World Psychiatry. 2007;6(3):131-136.

Community of Practice Advice:

Rather than establishing a specific dual diagnosis (mental health and addictions) outreach team, the BHB Clinical Services Plan should include cross training of existing outreach team members in the common elements of co-occurrence such that the current services are tailored to address the common interactive dual diagnosis elements. It is noted that the MWI psychology team has developed a CBIT training programme which could provide an initial framework for programing.

Further, both the Acute Community Mental Health Services and the Community Rehabilitation Intensive Case Management Team, should review their approach with the goal of incorporating relevant research-proven ACT principles and design.

This should include the engagement of primary care physicians following the team interventions; this will require that mental health, addictions, and dual diagnosis elements, training be made available to primary care practitioners.

Anticipated Benefits:

This approach will ensure coordinated services between mental health and substance abuse / addictions. Benefits to patients will be access to interventions that are integrated, and tailored for the presence of co-occurrence and may reduce the need for treatment by multiple teams. It is expected that this will promote the de-escalation of care and engagement of primary care physicians. Benefits to BHB should be greater ability to address the demand for care within existing services and a reduction in acute mental health length of stay.

Other Considerations:

This initiative requires access to training resources for staff (nursing, allied health and medical).

Step Down Mental Health Unit - Partial Hospitalization

Relevant Communities of Practice: Mental Health and Addictions

Description of Service/Initiative:

Acute Mental Health inpatient services are provided at the Somers Annex Psychiatric Intensive Care Unit, the Somers Ward Acute Inpatient Unit and Child and Adolescent Services (CAS) Inpatient Unit. The Somers Annex Psychiatric Intensive Care Unit is a secure area for service users who need close

observation and behavioural control, typically during the early stages of admission. Service users admitted to this unit are typically transferred to the less restrictive Somers Ward as soon as their mental state allows. The Somers Ward Acute Admission Unit is a short-term psychiatric care unit in an open environment. Adult service users of all ages and both sexes who require observation, assessment and treatment may be admitted. CAS' Inpatient Unit provides short-term Inpatient care, and serves as a "temporary/step down" unit for Youths transitioning between care arenas to/from abroad.

Shortly after admission, each service user is assigned a primary nurse and an associate nurse responsible for their daily care. The full multidisciplinary care team includes these nurses, the resident doctor, clinical psychologist, mental welfare officers and psychiatric social worker, as well as vocational rehab, occupational and recreational therapists. The team is headed by the service user's consultant psychiatrist.

Acute Mental Health services are also provided in the community through the Community Mental Health Services. This service provides assessment and treatment for adults, children and youths (4-18 yrs.) diagnosed with major depressive and bipolar disorders, schizophrenia and other psychological disorders.

The service also operates a 24 hour on-call service that responds to after-hours mental health crises in collaboration with community partners. The BHB Mental Health plan recognizes the limitations of institutionally focused mental health treatment and calls for a greater focus on patient-centred mental health care in the community. While MWI has made great progress in deinstitutionalising the population with mental illness in Bermuda, much work remains to be done. The effort to provide care to citizens with mental illness provides an over-emphasis on inpatient care, instead of community-based approaches. The result has been a 'revolving door' of service users being institutionalised and returning to the community to find too little support, then re-entering an institution.

The introduction of a Partial Hospitalization Programme (PHP) is intended to bridge the gap between acute inpatient mental health treatment and care in the community. These types of programmes are designed to offer highly structured treatment for clients experiencing acute psychotic and severe mental health issues.

The programme would offer an intensive acute care day hospitalization for clients who continue the stabilization process initiated on an inpatient unit, serving as a step-down service for patients transitioning from inpatient care to community living.

It is also intended as an alternative to inpatient admission, by providing coordinated, intensive and multidisciplinary treatment that is therapy based and meets the individual recovery needs of each patient. In this way, it functions as a diversion from hospitalization for service users who require a highly structured treatment programme to prevent decompensation and admission.

A PHP programme typically provides a multi-disciplinary team consisting of:

- Psychiatrists

- Nurses
- Social worker
- Occupational therapists
- Recreationists
- Peer support worker
- Pharmacist and
- Clinical psychologists.

The addition of a PHP programme would not necessarily require additional full-time positions in each of these roles, however the allocation of protected time to the PHP from current positions would be a necessity. Clients receive individualized, recovery focused, goal-oriented treatment to facilitate stabilization of symptoms in a less restrictive, non-institutional environment. The menu of services typically offered by a PHP include:

- Psychiatric assessment and consultation
- Comprehensive psychological, medical, medication monitoring
- Social, functional, family assessments,
- Individual and therapeutic activity groups
- Music and art therapy
- Leisure and recreation groups
- Social and vocational rehabilitation.
- Outreach services
- Family engagement
- Metabolic monitoring

Relevant Background Data:

The 2011 Health in Review report stated: "There has been no clear trend in unplanned hospital re-admissions for mental disorders, but Bermuda's rates are consistently higher than the OECD average."

Input/Advice from CoP Discussions:

The CoP has suggested that a partial hospitalization service would fill a significant gap in the current services offered at BHB. The primary outcome of interest would be a reduction in readmission to institutional care. Such a programme would help manage the gap between acute care and outpatient services – there is need for transitional services to reduce inappropriate use of acute beds and transition people out of hospital more successfully. Supported residences are currently available for service users within the community rehabilitation services. However, these are not staffed by MWI clinicians. There are also no LTC homes that offer psychiatric LTC.

This type of approach was recommended in the Mental Health Plan; it was implemented for a period within Acute Community Mental Health Programme but not sustained.

Related Research Evidence or Clinical Standards:

The literature generally concludes that Day hospitals are a less restrictive alternative to inpatient admission for people who are acutely and severely mentally ill and that such treatment is as effective as inpatient care in treating acutely ill psychiatric patients. However, further data are still needed on the cost effectiveness of day hospitals. (Max Marshall, Ruth Crowther, William Hurt Sledge, John Rathbone, Karla Soares-Weiser, **Day Hospital versus admission for acute psychiatric disorders**, Article first published online: 7 Dec 2011 | DOI: 10.1002/14651858.CD004026.pub2, Cochrane database of Systematic reviews.)

Community of Practice Advice:

The BHB Clinical Services Plan should include a Step-down Mental Health Unit. This may be referred to as a partial hospitalization unit or a virtual ward. It should promote collaboration among current service offerings and be able to provide support to patients that can often not access such services, such as the homeless population. It should be designed to provide intensive and timely community treatment following acute care, or in response to community crisis.

Anticipated Benefits:

Benefits to patients will be access to an intermediate level of service between inpatient and community mental health that is not currently available. Benefits to BHB should include reduction in overall patient length of stay and a reduction in acute mental health readmission rates.

Other Considerations:

This initiative will have facility and staffing (both allied health and medical) implications for BHB. Introduction of a partial hospitalization / day hospital mental health unit will also require a change in the funding model to incorporate appropriate reimbursement for this type of care.

Short-term Residential Treatment for Substance Abuse Patients (Clinically Managed and Medically Monitored)

Relevant Communities of Practice: Mental Health and Addictions

Description of Service/Initiative:

At present, Turning Point offers treatment to clients over the age of 18 including individual counselling, case management and referral services tailored to individual service user needs covering:

- Inpatient detoxification,
- Intensive Outpatient Treatment, and
- Methadone Maintenance Treatment Programme.

In addition, Turning Point offers:

- Individual counselling
- Chemical dependency education

- Recreation and exercise therapy
- Aftercare services
- Relapse prevention
- Family education and counselling
- Family intervention
- Anger management
- Women's focus group
- Outpatient detoxification
- Outpatient support groups
- Psychiatric consultation and follow-up
- Psychological assessment and follow-up
- Drug testing
- Referral to local and overseas services
- Liaison with Drug Court, Family Services, etc.
- Public talks and forums
- Substance use assessments

Clinically managed and medially monitored inpatient treatments are not currently available in Bermuda.

A continuum of care for substance abuse treatment includes: early intervention; outpatient treatment; intensive outpatient/partial hospitalisation; residential/ inpatient treatment, and medically managed intensive inpatient treatment. Services fall into the following stages along a continuum of care, such as: prevention/education, recognition, treatment, and maintenance. The programmes available have been classified within this spectrum as follows: [52]

Local Early Intervention Services

- Benedicts Associates Ltd.
- Bermuda Assessment and Referral Centre
- Bermuda Professional Counselling Services
- Employee Assistance Programme Bermuda
- Focus (Club House)
- Solstice
- The Family Centre

Outpatient Services:

- Benedicts Associates Ltd.
- Counselling and Life Skills Services
- Employee Assistance Programme Bermuda
- Focus Counselling Services
- Men's Treatment (After Care)

[52] Department for National Drug Control. (2016). *Survey of Substance Abuse Treatment Services in Bermuda 2016*. Government of Bermuda.Available at: https://www.gov.bm/sites/default/files/SSATS%20in%20Bermuda%202016%20-%20Final%20rev%20with%20Qnaire.pdf

- Pathways Bermuda
- Right Living House (After Care)
- Salvation Army Community Life Skills
- Transitions
- Women's Treatment Centre (After Care)

Intensive Outpatient:

- Turning Point Substance Abuse Programme

Partial Hospitalization:

- None

Clinically-Managed Low-Intensity Residential:

- Focus (Supportive Residence)

Clinically-Managed Medium-Intensity Residential:

- Men's Treatment
- Women's Treatment Centre
- Salvation Army Harbour Light
- Right Living House

Clinically-Managed High-Intensity Residential:

- None

Medically-Monitored Intensive Inpatient Services:

- None

Medically-Managed Intensive Inpatient Services:

- Turning Point (Detox Unit)

Relevant Background Data:

A waiting list is not properly maintained for such services.

Input/Advice from CoP Discussions:

The CoP identified the absence of short-term clinically managed treatment as a significant gap in current continuum of services offered by BHB and other providers. There are patients living in the community who need a hospital bed and waiting for beds behind the patients who live in Somers. Service users are either on the street, at home, or pool family resources to get oversees treatment. They need to be managed by physician and to obtain longer-term addictions health.

Related Research Evidence or Clinical Standards:

While there is minimal evidence for differential improvement among patients treated in an inpatient versus outpatient setting for withdrawal management, a higher proportion of inpatients tend to complete treatment.

Arthur Alterman; Charles P. Brien; A. Thomas McLellan, et al. **Effectiveness and Costs of Inpatient versus Day Hospital Cocaine Rehabilitation**, Journal of Nervous & Mental Disease:

Helen M. Pettinati; Kathleen Meyers; Jacqueline M. Jensen; Frances Kaplan; Bradley D. Evans. **Inpatient vs outpatient treatment for substance dependence revisited**, Psychiatric Quarterly, June 1993, Volume 64, Issue 2, pp 173–182

Community of Practice Advice:

The BHB Clinical Services Plan should include shorter-term residential treatment options following discharge from the detoxification unit. Current programs are residential 9 to 12 month services. A shorter (3 month) clinically-managed and medically monitored programme would be more attractive to many patients and fill an existing service gap.

Anticipated Benefits:

Benefits to patients will be access to a level of service between inpatient detoxification and longer-term residential treatment. Benefits to BHB should include reduction in readmissions to the detoxification unit and potentially shorter detoxification lengths of stay.

Other Considerations:

This initiative will have facility implications as transitional housing / group home facilities would need to be identified and developed.

Cross-stream Substance Abuse & Mental Health Intervention Team

Relevant Communities of Practice: Mental Health and Addictions

Description of Service/Initiative:

There was a concern raised that there is poor communication among substance-abuse treatment and Mental Health services / providers.

On the paediatric side, there is "The High Risk Intervention Committee" (THRIC). This group helps manage access to care if an individual is known or engaged with two or more agencies; in these situations, the patient is flagged, and the team of providers is managed by the Committee. CAS and DCFS initiated this. Individuals are case managed, but the key feature is that all the community team / providers are around the table.

Such a team would be advantageous to initiate in the adult population. This type of coordination has just started informally with some of the high acuity shared cases.

There is a successful model on the Corrections side as one of the initiates in the Mental Health Plan. The Mental Health and Corrections Committee meets monthly and recently marked its 100th sitting.

A Cross-stream Substance Abuse Intervention team to help coordinate and case manage adult patients, modelled after the paediatric "High Risk Intervention Committee" would help coordinate care.

Relevant Background Data:

Over the past decade, Bermuda has managed to develop a full spectrum of services that provide treatment and support for clients addicted to substances. A continuum of care for substance abuse treatment includes: early intervention; outpatient treatment; intensive outpatient/partial hospitalisation; residential/ inpatient treatment, and medically managed intensive inpatient treatment. Services fall into the following stages along a continuum of care, such as: prevention/education, recognition, treatment, and maintenance.

There is little coordination among providers.

Input/Advice from CoP Discussions:

Following a long discussion on various models of access to services (case management versus single point of entry / contact) the CoP felt that a coordination / case model resembling the current "High Risk Intervention Committee" in paediatrics would be beneficial.

This was preferred over a single point of contact – the model would be more one of team-based case management to help identify appropriate services and understand the providers that are engaged in treatment and coordinate the care provided.

There may be a need to identify "frequent fliers" between mental health services, and provide intensive case management/ access to services to break the trend. Work has started to identify these type of service users – but more work could be done.

A unique challenge with this approach in the adult population is the need for permission to share information across providers; it was felt that the efforts required to seek permission may be challenging, but that improved coordination of care would be worth the effort.

Related Research Evidence or Clinical Standards:

Considering the complexity of drug dependence and the multiplicity of services for substance abusers, co-ordination and continuity of care are important prerequisites for the quality of substance abuse treatment. One review identified that the most positive effects concern reduced use of inpatient services and increased utilization of community-based services, prolonged treatment retention, improved quality of life, and high client satisfaction.

In both the United States and Europe, case management is regarded as an important supplement to traditional substance abuse services, as it provides an innovative approach—client centered, comprehensive, and community based—and contributes to improved access, participation, retention, service use, and client outcomes. Compared with case management for persons with mental illness,

case management for persons with substance use disorders has little evidence available of effectiveness.

Case management for substance use disorders is no panacea, but it positively affects the delivery of services and can help to stabilize or improve an individual's complex situation. On the basis of empirical findings from the United States, the Netherlands, and Belgium, several prerequisites for a well-conceptualized implementation of this intervention can be mentioned. Integration of the program in a comprehensive network of services, accessibility and availability, provision of direct services, use of a team approach, application of a strengths-based perspective, intensive training, and regular supervision all contribute to successful implementation and, consequently, to beneficial outcomes.

Wouter Vanderplasschen, Richard C. Rapp, Judith R. Wolf, Eric Broekaert. **The Development and Implementation of Case Management for Substance Use Disorders in North America and Europe**. Psychiatr Serv. 2004 Aug; 55(8): 913–922.

Vanderplasschen W, De Bourdeaudhuij I, Van Oost P. **Co-ordination and continuity of care in substance abuse treatment. An evaluation study in Belgium**. Eur Addict Res. 2002 Jan;8(1):10-21.

Vanderplasschen W, Wolf J, Rapp RC, Broekaert E. **Effectiveness of different models of case management for substance-abusing populations.** J Psychoactive Drugs. 2007 Mar;39(1):81-95.

Community of Practice Advice:

The CoP felt that such care coordination among providers would be beneficial where permission to share information across providers was granted.

Anticipated Benefits:

Benefits to patients will be improved coordination of care across multiple providers. For BHB benefits would be derived from more seamless transitions.

Intellectual Disabilities

Long Term ID Residential Group Home

Relevant Communities of Practice: Intellectual Disability

Description of Service/Initiative:

BHB currently administers and supports 13 group homes in Bermuda. Each home supports between 3 and 9 people, for a total of 71 residents. Group homes are staffed by Community Support Workers, managed by 2 Clinical Managers and supported by members of the multi-disciplinary team.

The proposal is that BHB should not be in the business of administering group homes for ID individuals, and should divest this to another entity, ministry and/or the community.

Relevant Background Data:

There is limited data on the utilization of the group homes, including occupancy, types of residents and resident needs. There is a potentially increasing demand for group home places due to the increasing prevalence of ID on the island. This is evidenced anecdotally by the number of requests to the Ministry of Health, Aging and Disability service, for access to group homes and other supported living arrangements.

The proposal to divest is consistent with the Task Force for Developmentally Disabled 2010 recommendations for a single entity to administer and coordinate access to a continuum of integrated services for this population. A medical service model is less likely to achieve the desired outcomes of rights, choice, independence, and inclusion.

Input/Advice from CoP Discussions:

Group homes are an important part of the continuum of care for people with ID in Bermuda, but should not fall within the scope of acute or sub-acute services that BHB provides, and that are dependent on specialized resources only available in hospitals. The current model (group homes managed by the hospital) is not consistent with international models; it has evolved, however because there is no alternative local model or inspection regime that would maintain appropriate standards. If such an alternative existed, BHB would divest itself of the responsibility of the group homes and concentrate its role on providing residential nursing care to ID patients with very complex needs that cannot be managed in one of the group homes or in a private home setting.

As in other long-term settings, there may be a need in the future to “segment” the type of care provided in the group homes to meet different levels of need for the ID population, recognizing that as this population is changing and aging, the level or type of care required to support these individuals may also change.

BHB should continue to provide Multi-Disciplinary Team Service to support the needs of residents in Bermuda’s group homes. However, MDT consults and support should also be available to any Bermuda

residents with ID needs, not only to group home residents and inpatients. This will be increasingly important as both the ID population increases and needs expand, and as the capacity of group homes do not, as more patients are managed in home settings. At present the MDT is not sufficiently staffed to meet the needs of ID inpatients, group home residents and those individuals living in the community.

Related Research Evidence or Clinical Standards:

There are multiple guidelines and standards for operating group homes for individuals with Intellectual Disabilities. There was no evidence identified on the benefits of group homes being administered by an acute hospital versus community services. There is evidence that residents in group homes need access to medical care which can typically be managed by a GP, and that other needs of these individuals (specialized medical needs, individual developmental plans or behavioural planning) should be carried out through formal linkages/partnerships/agreements between those supporting them in their own settings and specialists (psychology, allied health, etc.) who will support the development and/or delivery of their care.

Current practice is that acute/speciality hospitals typically provide support over the short term for people with ID (to address specific rehabilitation or medical need) and sometimes transitional care. Some acute or specialty hospitals provide long-term care for patients with ID but typically only when there are complex and ongoing medical care (ventilation, complex wound care, dialysis, etc.) or behavioural/psychological needs that cannot be managed in other settings and not expected to improve over time.

For a summary of various out-of-home options for people with ID two good references are Friedman et al. (2014) Pediatrics: **Out of Home Placements for Children and Adolescents with Disabilities** and McConkey (2006) Irish Journal of Psychological Research: **Variation in Residential Accommodations for Adults with Intellectual Disabilities: the Example from Northern Ireland.**

Community of Practice Advice:

While the CoP agreed that the Group Homes did not need to be managed and operated by BHB, no alternate service provider was identified; the service is an essential element in the continuum of care for people with ID in Bermuda and must be maintained and potentially expanded.

A number of challenges associated with transitioning to another provider were identified including the need to maintain / regulate standards / accreditation; no specific funding for group homes is made available to BHB, so no provider would assume responsibility.

The BHB Clinical Services Plan will assume that BHB will continue to provide this service (within the planning horizon [i.e. 2025] of the plan), and that there will be a funding model established to ensure that BHB is fully compensated for the provision of the service.

Other Considerations:

There is a lack of data on the changing needs and demand for services to support Bermuda residents with Intellectual Disabilities. There is a need to better assess the current and changing demands to better understand service requirements and to develop improved funding models. The CoP strongly supported the establishment of a National Disabilities Register to include Bermuda residents with ID as a component of the Chronic Disease Management register currently being established by the Ministry of Health.

The 3 – 5 year Long Term Care Strategy that is being led by the Ministry of Health is considering the need to increase long term care homes and home care capacity; it is expected that the needs of people with intellectual disabilities will be included in this planning.

Day Program

Relevant Communities of Practice: Intellectual Disability

Description of Service/Initiative: The New Dimensions Day Programme provides an array of services for up to 25 service users at a time who attend from the BHB group homes, as well as some service users who live with their families in the community. The New Dimensions staff also provide recreational activities to service users on inpatient wards and to those in the Group Homes. New Dimensions empowers and supports all service users in their quest to reach their full potential in an inclusive, diverse and creative environment. Service users are encouraged to excel in many different areas, such as arts and crafts, bowling, cricket, fishing, spirituality, exercise, work skills and visiting places of interest in the community.

The K. Margaret Carter Centre also provides an adult day centre programme for adults with ID that includes social, recreational and community awareness activities as well as arts and crafts, gardening and music therapy.

At present, the decision about which Day Programme will support a given client is largely based on whether they live in a family home or an MWI group home.

It is proposed that the New Dimensions Day Programme and the K. Margaret Carter Adult day centre programme be merged. This will help to provide a better continuum of provision across all levels of need as well as support greater independence, choice and vocational training. Discussions have already started to promote more integration and better collaboration between the two services.

Relevant Background Data:

There is limited utilization or cost data available for the New Dimensions Programme. Programme outcomes have not been formally evaluated.

Input/Advice from CoP Discussions:

The Day Programme is felt to be an important option for many individuals with ID in Bermuda. It supports socialization, recreation, and development of independence/life skills/pre-vocational skills, and may be an important modality for many individual's care plans/ Person Centred Passport. However, there is a sense that this service is a community living/ social/recreational support and not an acute or sub-acute service or treatment approach that should fall into the basket of services offered by BHB.

Related Research Evidence or Clinical Standards:

There is much literature describing day programs for individuals with Intellectual Disability. Current approach that these programs are typically not provided by acute hospitals (although some specialty hospitals continue to provide day programming for higher need service users), but by Community Living or Housing Service, the Disabilities Administration or long-term care provider.

Community of Practice Advice:

The CoP agreed that enhanced coordination and allocation of client placement based on programme resources is required; initial collaboration is underway to determine ways to achieve this. The CoP agreed that to achieve this, the two existing adult day programmes should amalgamate.

Anticipated Benefits:

Amalgamation would ensure that the existing two programmes would be administered as a single programme. This would help avoid the situation where individuals are 'lost' between the two programs; no exclusion criteria can be applied when there is a single programme.

Other Considerations:

The New Dimensions programme also provides services to the current ID group homes, the Somers ward and to some Child and Adolescent Services (CAS) populations. These services should be retained by BHB.

Inpatient Care for Complex ID Patients

Relevant Communities of Practice: Intellectual Disability, Maternal Child, Post-Acute Care

Description of Service/Initiative:

There are a small number of individuals with ID who are "permanent" or "long term residents" at MWI because there are no other placement options for these individuals (unable to be cared for in Group Homes due to capacity and higher needs than can be supported by unqualified care staff). A portion of these individuals have complex medical or behavioural needs that are too challenging for the current group homes to manage. These patients may be in acute beds receiving acute assessment & treatment for a psychiatric condition (Somers) or rehab beds (Devon Lodge) awaiting Long-term placement on Reid.

Proposal is to develop the capacity to accommodate medically complex and behaviourally challenged ID individuals in a more appropriate setting. A minority of these individuals may be required to be accommodated in specialized long-term care beds at BHB.

Relevant Background Data:

Utilization data does not provide a clear picture of these patients. It is estimated that there are 4 to 5 individuals with ID with longer-term needs that are inappropriately placed in BHB's inpatient beds. Placement has been long duration (reportedly up to several years).

Input/Advice from CoP Discussions:

Current state is an inappropriate care setting for these patients: it neither provides a quality patient experience, nor is it an efficient use of BHB's inpatient resources. While group homes do not currently have the necessary capability to manage these individuals' needs, a portion may also be more appropriately cared for in a specialized long-term care setting.

Bermuda is proposing to develop improved capacity in long-term care in the community to better align capacity with the anticipated long-term care needs of the population. Beds for Individuals with ID with more complex care needs should be included in the LTC capacity plan. BHB would no longer be the "setting of only resort". BHB may be the provider of some of these specialized long-term care beds, but some may be administered more appropriately by others in the community.

It will be important that wherever the care setting, these individuals and caregivers have access to the MDT for input/support and consultation in managing the ID care needs of these individuals over time.

Note re Advice from other CoPs: The Maternal Child CoP has also identified the need for long-term care beds for some children with chronic medical conditions. The Post-Acute Care CoP has recommended that BHB provide inpatient long-term care for patients requiring the "Complex and Intermediate Skilled" level of care (as defined in the LTC Action Plan), but not the "Personal Care, Cognitive Care, Intermittent Skilled Nursing" level of care.

Related Research Evidence or Clinical Standards:

Current practice is to house and support people in the least institutional setting as possible, with as much integration into the community as possible. There is a movement towards LTC homes developing skills and settings to effectively manage patients with a-typical challenges, including challenging or responsive behaviours. While it is recognized that there are a variety of patients with diverse needs (Dual / triple diagnosis - ID/substance abuse/mental health; Autism spectrum disorder; ABI; behavioural challenges) which might not typically be amenable to care in one single facility, the reality of Bermuda is that a single Complex and Intermediate skilled residential nursing long-term care facility, operated by BHB, would be the most cost efficient approach to meet the needs of these specialized (and often small) sub-populations.

Community of Practice Advice:

The CoP agreed that as BHB develops LTC capacity, a component of this capacity should be designed to support individuals with ID (and other high-needs sub-populations) who are currently in rehab beds (Devon Lodge) and older adult beds (Reid), and who are too complex to be supported in group homes.

Anticipated Benefits:

A more appropriate and more efficient setting would be made available for this diverse patient population while reducing the occupancy in Devon Lodge and Reid.

ID Multidisciplinary Team Services

Relevant Communities of Practice: Intellectual Disability

Description of Service/Initiative:

The Multi-Disciplinary Support Team (MDT) provided by BHB includes nurses, a clinical psychologist, an occupational therapist, a part-time physiotherapist, and a social worker. The team has access to a consultant psychiatrist as needed. The team primarily provides support to the service users and community support workers in the ID group homes, as well as a small number of families who care for their family members at home.

The proposal is that Multi-Disciplinary Community Support teams be expanded to support the needs of the entire adult ID population regardless of living location. The scope of service will expand to include early intervention and caregiver support/education, with the goal of supporting individuals as effectively as possible from an early date. To encourage efficiency and quality, consideration should be given to moving towards an integrated case management approach, so that all service providers supports are around the table.

Relevant Background Data:

Utilization data exists, but is not consolidated or reported beyond the individual program/service level. There are no programme level outcomes, quality or cost data available.

Input/Advice from CoP Discussions:

There is a need to reach a broader array of ID individuals in Bermuda, to provide a different focus to supports and services provided. Services and supports are currently accessed and provided in many ways, and by many different types of provider/programs. There is expertise in ID in many different pockets within the system.

One of the weaknesses of the “social” model approach that has been used in Bermuda is that people with ID are expected to access general and specialist services just like anyone else. Yet we know that ID patients have higher needs than the general population. There are barriers to accessing some of these services (lack of transportation and community integration was identified as a significant gap) that result

in gaps in accessing such items as GP services, basic health prevention and promotion, dental care, etc. There is limited expertise in the general hospital and other specialties in understanding the ID population. Further, there is a misconception / and some expectation that when individuals receive services at MWI that they will receive a "full package of care". This is erroneous.

Opportunities to provide more integrated care exist. There is not a desire to develop a single point of assessment for this community, but to provide more integrated and coordinated services, leveraging the full range of social and community services and supports and health supports available as effectively as possible.

There is a sense that if the current providers (social, health, and supports) were better organized to provide more integrated, case managed care, we would be able to improve services provided and perhaps expand reach to more users. While there is a small group of ID users that will need inpatient care, the greatest need is for community based care. There is a need for a coordinated array of services that reach service users in their own settings (regardless of the setting in which they live) and help them to identify and address issues early, support and educate caregivers, and focus on management of issues that will improve function, quality of life, independence and choice. BHB's MDT should be included as a resource that provides this community outreach, ensuring that individuals who need more specialized care have both access to active treatment and or longer-term oversight by the MDT providers/expertise that sit at BHB in its ID practice.

Related Research Evidence or Clinical Standards:

There is an array of literature available to describe and evaluate community-based models of care delivery for the Intellectually Disabled population.

One resource that may be extremely helpful in planning a movement toward this model of service delivery is a whitepaper developed by the National Learning Disabilities Senate in the UK in March, 2015 Delivering Effective Specialist Community Learning Disabilities Health Team Support to People with Learning Disabilities and their Families or Carers: A Briefing Paper on Service Specifications and Best Practice for Professionals, NHS Commissioners, CQC and Providers of Community Learning Disabilities Health Team.

Community of Practice Advice:

The BHB Clinical Services Plan should assume that the BHB ID MDT services will focus on care for clients in the ID group homes and BHB inpatient beds; and at the moment resources are limited to this level of activity. Like the day programme however, opportunities for more integrated and efficient care would be realized with amalgamation and expansion of MDT resources so that support was provided to the entire adult ID population regardless of living location. This would require the amalgamation of the BHB MDT Team with the variety of services and supports that are currently available across many different providers within the system.

Anticipated Benefits:

The integration of ID MDT services, improved coordination of care and integrated case management is expected to improve access to available resources particularly in the community; this can be expected to decrease avoidable admissions to residential care and also decrease potential incentives to admit service users so that they can receive care not available in the community.

Other Considerations:

The CoP agreed that the ID MDT services are currently stretched. The CoP expressed a concern that expanding the responsibility of the team beyond the group homes (and the recommended BHB LTC ID patients) would further stretch these resources. While consolidation of current resources into a single service is expected to improve the situation, it is expected that resources will need to be expanded.

Respite Care to Support ID Caregivers

Relevant Communities of Practice: Intellectual Disability

Description of Service/Initiative:

Respite care is provided in three beds in the group homes (1 bed in three separate homes). Adults who live in their family home can apply for respite of up to six weeks per year. The aim of respite care is to provide regular breaks for families to enable them to support their family member throughout the rest of the year. Access to respite care is coordinated through BHB's social worker.

The availability of respite care is felt to be inadequate (no specific evidence maintained, but requests often go unmet); With the recommendation that BHB becomes a provider of complex long-term care, respite care (including respite for specialized populations like ID) should be specifically planned as part of that service offering.

Relevant Background Data:

There is no data on the amount of respite services provided or demanded in group homes. It is difficult to predict the demand for respite care, or how this demand might change if the service model for individuals with ID in Bermuda changes. It is reported that the current respite beds available for ID in the group homes are often 'blocked' with other patients.

Input/Advice from CoP Discussions:

Should BHB become a provider of complex long-term care, there will be an opportunity to offer respite to the ID population, as well as other specialized populations. This would most likely be appropriate for only a certain segment of the ID population, and it may be advisable to "segment" the respite population by type of need. Individuals with more complex medical or challenging behavioural needs would receive respite in BHB's long-term care beds; those who do not require such intense respite, should continue to be accommodated in group home respite care when these beds are available.

Related Research Evidence or Clinical Standards:

None identified.

Community of Practice Advice:

The CoP agreed that the capacity to provide respite care should be expanded across BHB for all patient groups.

Anticipated Benefits:

Ensuring the availability of respite care in a range of settings will better support community care givers and allow individuals to be supported longer / permanently in the community.

Other Considerations:

The current advice is dependent on BHB assuming a role in complex long-term care.

National Disabilities Register to include Bermuda residents with intellectual disabilities.

Relevant Communities of Practice: Intellectual Disability

Description of Service/Initiative:

Develop a national data base and ID register. This resource would identify all residents of Bermuda with ID. Consistent with recommendations from the Learning Disabilities task force, this may also include a data base where service providers from any sector may enter and access patient utilization information.

Relevant Background Data:

At present, the Ministry of Health is implementing a Chronic Disease Registry that will include ID service users.

Input/Advice from CoP Discussions:

This is considered an important foundational step in improving services for people with ID in Bermuda. The ability to identify those with ID is critical to ensuring that we can plan for services and needs. BHB's role in the development and upkeep of a National Registry requires further discussion.

Note re Advice from Other CoPs: The Chronic Disease Management CoP has recommended that BHB support the development of a Bermuda National Electronic Record (EHR) and that the EHR support the creation of Chronic Disease Registries. As such a National EHR is developed, it should include information about Bermuda residents with ID to support the creation of the National Disabilities Registry to include Bermuda residents with ID.

Related Research Evidence or Clinical Standards:

Many countries have developed disability registries. A useful resource that contains good analysis of options may be "Exploring Disability Data Registry: Progress Report Aruba" (https://www.cdc.gov/nchs/data/washington.../wg14_session6_2_suykerbuyk.pptx).

Community of Practice Advice:

The BHB Clinical Services Plan should support the development of a Bermuda National Electronic Health Record, which should include the information to support the establishment of a National Disabilities Register to include Bermuda residents with ID. The CoP is strongly supportive of the Chronic Disease Register currently under development by the Ministry f Health.

Post-Acute Care

Short Stay IP Rehabilitation Care Unit

Relevant Communities of Practice: Post-Acute Care, Medicine, Surgery

Description of Service/Initiative:

Rehabilitation services for KEMH patients are provided during the patients' acute stay. Services include physical, occupational, speech, and recreational therapy divisions. Inpatient types receiving therapy services include, but are not limited to general surgery, orthopedics, neurology, oncology, and psychiatry. BHB also treats outpatients after surgery, sports injury, stroke or illness, and for hydrotherapy related to wound care.

The proposed initiative is to establish a separate acute rehabilitation inpatient unit with dedicated rehab programming, rather than continuing to only provide inpatient rehabilitation services in conjunction with acute care.

Relevant Background Data:

Currently rehabilitation services are provided to KEMH acute care inpatients during their acute care stay. There is no formal designation when a patient transitions from acute care to rehabilitative care. As a result, those patients who may have an extended stay for rehabilitation exhibit much longer lengths of stay in acute beds than would be expected.

For example, the average BHB KEMH Acute length of stay for stroke patients in 2016/17, excluding "alternate level of care" (ALC) days was 39.5 days. The average U.S. CMS acute care LOS (which is used to calculate BHB DRG reimbursement rates) was 4.2 days.

2016/17 BHB KEMH Acute Inpatient Stroke Length of Stay

ICD-9 Diagnosis		Cases	Days (excl. ALC)	BHB Acute LOS	CMS Acute LOS	BHB LOS as % of CMS	Total BHB Days	% ALC Days
43491	CEREB ART OCC, UNSP W/CI	126	5,086	40.4	4.4	910%	7,230	30%
4359	TRANS CEREB ISCHEMIA NOS	30	159	5.3	2.5	211%	159	0%
43411	CEREBRAL EMBOLISM W CI	21	3,106	147.9	5.0	2941%	3,106	0%
431	INTRACEREBRAL HEMORRHAGE	15	147	9.8	4.2	233%	710	79%
43311	OCC/STEN CAR ART W CI	13	198	15.2	4.1	375%	462	57%
4321	SUBDURAL HEMORRHAGE	6	75	12.5	5.0	252%	75	0%
430	SUBARACHNOID HEMORRHAGE	4	13	3.3	5.4	61%	13	0%
43310	OCC/STEN CAR ART W/O CI	2	11	5.5	4.1	134%	11	0%
4377	TRANSIENT GLOBAL AMNESIA	2	9	4.5	5.5	83%	9	0%
43889	OTH LE CV DISEASE	2	26	13.0	5.9	220%	26	0%
4351	VERTEBRAL ARTERY SYNDROM	1	11	11.0	2.5	440%	11	0%
4329	INTRACRANIAL HEMORR NOS	1	8	8.0	6.2	129%	8	0%
43401	CEREBRAL THROMBOSIS W/CI	1	9	9.0	4.2	214%	9	0%

ICD-9 Diagnosis	Cases	Days (excl. ALC)	BHB Acute LOS	CMS Acute LOS	BHB LOS as % of CMS	Total BHB Days	% ALC Days
Grand Total	224	8,858	39.5	4.2	***931%***	11,829	25%

Another patient population that (in North America) often is referred to an inpatient rehabilitation is hip fracture patients. The following table shows the BHB average acute LOS for these patients was 16.2 days, compared with the CMS average LOS of 5.8 days.

2016/17 BHB KEMH Acute Inpatient Hip Fracture Length of Stay

ICD-9 Diagnosis		Cases	Days (excl. ALC)	BHB Acute LOS	CMS Acute LOS	BHB LOS as % of CMS	Total BHB Days	% ALC Days
82101	FX FEMUR SHAFT-CLOSED	7	145	20.7	6.3	327%	145	0%
82123	SUPRACONDYL FX FEMUR-CL	6	80	13.3	4.9	274%	80	0%
82100	FX FEMUR NOS-CLOSED	3	16	5.3	5.7	93%	16	0%
82111	FX FEMUR SHAFT-OPEN	3	35	11.7	6.0	194%	35	0%
82120	FX LOW END FEMUR NOS-CL	2	20	10.0	3.5	286%	84	76%
82122	FX LOW FEMUR EPIPHY-CLOS	1	5	5.0	7.8	64%	5	0%
82133	SUPRACONDYL FX FEMUR-OPN	1	83	83.0	8.0	1038%	83	0%
82121	FX FEMORAL CONDYLE-CLOSE	1	4	4.0	8.0	50%	4	0%
Grand Total		24	388	16.2	5.8	278%	452	14%

With the current lack of specific identification of provision of rehabilitation programming (i.e. as distinct from rehabilitation services), it is not possible to assess the impact of rehabilitation on functional status and other outcomes. The BHB Long-Term Care Action Plan includes a "Short Stay Rehab or Restorative Care" level of care, and identifies KEMH has the location for provision of this service in Bermuda.

Level of Care	Definition	Setting
Short Stay Rehab or Restorative Care	RN on duty 24/7, post-acute recovery period where more than 2 therapeutic services such as PT, OT, speech, respiratory, nutritional 5 days/week or more, and skilled nursing treatments, health education / monitoring needed up to 100 days. Access to mental health services.	KEMH

Input/Advice from CoP Discussions:

Optimize delivery of proactive, front-loaded acute rehab (especially for specific populations: e.g., hips, stroke, amputees) and sub-acute rehab: "cohorting" patients, establishment of standalone rehab services, etc. (current staffing model, infrastructure, and capacity has inhibited this)

Enhance both rehab services and programs (outpatient rehab is not presently meeting the demand, and there is an absence of a step-down unit)

Inpatient Rehab Unit. This is Acute Rehab. Avoid saying Restorative Care Unit as that can happen at other levels of care as well. Patients are medically stable and expected to participate in 2 to 3 hours of therapy daily or 15 hours weekly. Requires multiple Allied Health disciplines and oversight by Physiatrist who serves as Medical Director. Full time physiatrist may be required. Transfer to rehab would be moving to hospital to either neurologist or physiatrist.

Length of stay range 7 to 30 days; average 14 to 21 days. Can set goal discharge to home rate of 80% as quality metric to follow. A new gym will be required for this endeavour and would create one space to be utilized by both inpatient Rehab Team and Day Hospital. The advantage of this is for smooth transition and continuity of care. More collaboration and cross-coverage by Allied Health professionals which will help in specialized programme development such as for stroke.

How big is the prize? 40 days LOS of acute care for stroke patients in BDA vs about 4 days elsewhere plus 26 to 28 days in rehab (for a select group) …this could be at least 10 days of savings? If we cohort them, we may be able to reduce length of stay, offer better care. Strong utilization and effectiveness argument.

Need to consider outcome measures…have been interested in the FIM, but our operating system does not allow for this at present.

There will have to be change in reimbursement (payment that hospital receives for rehabilitative care be changed).

Rehab was not planned in the acute care wing...challenge has been space, buy-in and financial structure. Our allied staffing has been very thin. Staffing will be another challenge. Significant opportunity to optimize provision of rehab program/ services. A previous proposal was developed, but never implemented. 2005 BHB Estate Plan included 24 bed inpatient rehabilitation unit. Staff had started some data gathering for this and investigations with Spaulding rehab.

This is a modern method of medical care…at least for the acute surgical and medical services that we provide. Yes…this should be a recommendation. Will need to include not just people who are in acute care at KEMH and people coming oversees. We need to stop medicalizing care in Bermuda…. would need to be clear that this is a rehab model of care (which is different from an acute medical model).

Related Research Evidence or Clinical Standards:

Disabil Rehabil. 2017 Sep 18:1-7. doi: 10.1080/09638288.2017.1377296. [Epub ahead of print]

Timely access to inpatient rehabilitation after stroke: a qualitative study of perceived barriers and potential solutions in Ontario, Canada.

Meyer MJ, Teasell R, Kelloway L, Meyer SB, Willems D, O'Callaghan C.

PURPOSE: Stroke units have been established as best practice care, in part because they offer timely initiation of rehabilitation. Experts in Ontario, Canada recommend that eligible patients be transferred to inpatient rehabilitation (on average) by day 5 after ischemic stroke and day 7 after a hemorrhagic stroke. This study explores perceived barriers to implementation of these recommendations and potential solutions.

METHOD: Exploratory focus groups were held with stakeholders from five geographically diverse regions across Ontario between September 2011 and January 2012. Participants were asked to consider the recommendations, list perceived barriers and to collectively discuss potential solutions. Data analysis included coding of transcribed data, sorting material to identify themes and confronting themes with a formalized body of knowledge.

RESULTS: Barriers identified by participants fell into three categories: patient-centered, clinician-focused and resource or system based, within these, specific challenges included managing patients' medical and emotional readiness for rehabilitation, timely completion of medical tests, staff comfort in discharging patients, dedicated transportation, and funding-related concerns.

CONCLUSIONS: The structure of Ontario's health care system presents challenges to early transfer of stroke patients to inpatient rehabilitation, yet the stakeholders consulted in this study felt that these could be addressed with proper planning, improved coordination and targeted investment. Implications for rehabilitation Stroke units are a well-established best practice in stroke care and timely access to rehabilitation is a key component of their effectiveness. Stroke experts in Ontario, Canada recommend transfer of suitable patients to inpatient rehabilitation on day 5 and day 7, on average, after ischemic and hemorrhagic stroke, respectively. Stakeholders report that meeting these targets may require some adjustments to local processes of care, many of which can be achieved with little to no financial investment.

Med Care. 2010 Sep;48(9):776-84. doi: 10.1097/MLR.0b013e3181e359df.

Medicare spending and outcomes after post acute care for stroke and hip fracture.

Buntin MB, Colla CH, Deb P, Sood N, Escarce JJ.

BACKGROUND: Elderly patients who leave an acute care hospital after a stroke or a hip fracture may be discharged home, or undergo post acute rehabilitative care in an inpatient rehabilitation facility (IRF) or skilled nursing facility (SNF). Because 15% of Medicare expenditures are for these types of post acute care, it is important to understand their relative costs and the health outcomes they produce.

OBJECTIVE: To assess Medicare payments for and outcomes of patients discharged from acute care to an IRF, a SNF, or home after an inpatient diagnosis of stroke or hip fracture between January 2002 and June 2003.

RESEARCH DESIGN: This is an observational study based on Medicare administrative data. We adjust for observable differences in patient severity across post acute care sites, and we use instrumental variables estimation to account for unobserved patient selection.

STUDY OUTCOMES: Mortality, return to community residence, and total Medicare post acute payments by 120 days after acute care discharge.

RESULTS: Relative to discharge home, IRFs improve health outcomes for hip fracture patients. SNFs reduce mortality for hip fracture patients, but increase rates of institutionalization for stroke patients. Both sites of care are far more expensive than discharge to home.

CONCLUSIONS: When there is a choice between IRF and SNF care for stroke and hip fracture patients, the marginal patient is better off going to an IRF for post acute care. However, given the marginal cost of an IRF stay compared with returning home, the gains to these patients should be considered in light of the additional costs.

Top Stroke Rehabil. 2012 Mar-Apr;19(2):122-31. doi: 10.1310/tsr1902-122.

Rehabilitation of individuals with severe stroke: synthesis of best evidence and challenges in implementation.

Pereira S, Graham JR, Shahabaz A, Salter K, Foley N, Meyer M, Teasell R.

PURPOSE: The rehabilitation of patients who are recovering from severe stroke is associated with a substantial use of resources but limited potential for functional improvement. As a result, these individuals are not perceived as being ideal candidates for inpatient stroke rehabilitation. The objective of this review was to describe the evidence for and discuss some of the challenges of providing inpatient rehabilitation services for individuals with severe stroke.

METHODS: A literature search was conducted to identify relevant studies. Studies were included if (a) inpatient rehabilitation was compared to other rehabilitation settings and (b) the study population included individuals with severe stroke-related disability. Following data abstraction, the methodological quality of randomized controlled trials (RCTs) that met inclusion criteria was assessed using the PEDro scale.

RESULTS: Fourteen studies (including 4 RCTs) met inclusion criteria. Despite making limited functional improvement, persons with severe strokes who received inpatient rehabilitation had reduced mortality, decreased lengths of hospital stay, and increased likelihood of discharge home when compared to those who received rehabilitation in other settings. Rehabilitation on specialized stroke units resulted in better outcomes than other forms of inpatient rehabilitation for this group.

CONCLUSION: Inpatient rehabilitation is beneficial for individuals with severe stroke. However, for this group, it may be necessary to rethink the emphasis on functional improvement and focus more on discharge planning. These individuals may still have restricted access to rehabilitation as a result of limited resources, the perception that they have poor rehabilitation potential, limited understanding of the goals of rehabilitation for this population, and a lack of research.

Community of Practice Advice:

Yes, the BHB Clinical Services Plan should include the development of an inpatient rehabilitation unit.

Anticipated Benefits:

Establishment of a dedicated inpatient rehabilitation unit will support provision of focused rehabilitation programming, following a rehabilitation philosophy (i.e. as opposed to an acute medical model of care) for the subset of BHB patients with restorative potential who would benefit from rapid access to intensive rehabilitative care. Benefits to patients should include reduced long-term loss of function and greater opportunity to return to independent living. Benefits to BHB should include reduction in overall patient length of stay in the hospital, and greater ability to separately monitor length of stay and outcomes for acute care and post-acute bedded rehabilitation care.

Other Considerations:

This initiative will have significant facility, equipment, and staffing (both allied health and medical) implications for BHB. Introduction of a rehabilitation unit will also require a change in the funding model to acknowledge the distinction between acute and rehabilitation care, and to incorporate appropriate incentives for cost-effective care (i.e. maximum improvement in patient function, as quickly as possible).

Complex Skilled and Intermediate Skilled LTC

Relevant Communities of Practice: Post-Acute Care, Medicine

Description of Service/Initiative:

The Bermuda LTC Action Plan describes the Complex Skilled and Intermediate Skilled levels of care. The only setting identified in the Action Plan for these levels of care was KEMH.

Level of Care	Definition	Setting
Complex Skilled	RN on duty 24/7, MD on call 24/7, includes health assessments, skin and wound care, artificial feedings, ostomy care, IV, oxygen, airway, chronic ventilator management, psycho-behavioural moderate-severe dementia, and care planning and coordination. 65% of residents have 3 or more ADL limitations. Average total nursing care hours 4hr/day/pt includes RN 1.6hr/day/pt. Access to rehabilitation/therapeutic services. Access to mental health services.	KEMH
Intermediate Skilled	RN on duty 24/7, MD on call 24/7, includes health assessments, artificial feedings, ostomy care, IV, oxygen, airway, chronic ventilator management, psycho-behavioural moderate/severe dementia, and care planning and coordination. 65% of residents have 3 or more ADL limitations. Average total nursing care hours 2.5hr /day/pt. Access to rehabilitation/therapeutic services. Access to mental health services.	KEMH

The proposed initiative is that BHB designates a subset of LTC beds (or unit(s)) for which Complex Skilled and Intermediate Skilled care will be provided. Reimbursement rates for patients in these beds would reflect the cost of providing the designated level of care for the unit.

Relevant Background Data:

The LTC Action Plan included the action item:

"Redesign hospital reimbursement rates for hospital long stays, for utilization and cost control to ensure system sustainability and to enact post-acute care initiative" (April 2017, MOHS, BHB)

LTC Action Plan: Unmet need

"Available data makes it impossible to ascertain the exact level of unmet need – i.e. persons who require long term care and are not receiving it; and caregivers in need of support. However, anecdotally, based on reports from agencies working with these populations, it is understood that large numbers of seniors and persons with disabilities don't have access to the level of care required. The causes include the limited amount of home care and institutional care, unaffordability of care for families, lack of support for family and carers and, at times, family members and next of kin who are unable or unwilling to care for a dependent adult. While unmet need can't be fully quantified at this time, demand for beds and long-term hospitalizations indicate that existing capacity is not meeting population needs."

Input/Advice from CoP Discussions:

The assessment tool to support categorization of LTC clients according to the LTC Action Plan levels of care has been developed and is now being pilot tested. The LTC per diem rates introduced for 2017 are not specific to the individual levels of LTC listed in the LTC Action Plan, since the mechanism to assess the level of care for LTC patients at KEMH has not been finalized.

Designation of specific KEMH unit(s) by level of care, and establishment of level-specific reimbursement rates should allow BHB to set staffing levels that reflect client need and available resources.

Geriatric comprehensive assessment tool is being used now at BHB. Setting/options currently reflect what exists at present... not what we think is needed. Intention is that skills and capacity in the community will increase over time. We should incent it.

Complex patient will stay at BHB because of level of need. Intermediate skilled is the area where patients could be accommodated in the community…but significant workforce training and capacity building is required. Need to build/incent desire to open up in this area…. this is area of greatest need.

Analysis for long-term care planning (using assessment tool) suggests that current BHB LTC population includes approximately 75 intermediate patients, and 25 or 30 complex patients.

Community of Practice Advice:

Yes, the BHB Clinical Services Plan should include the establishment of specific units for patients who require each of Complex Skilled and Intermediate Skilled long-term care.

Anticipated Benefits:

Stratification of patients according to need would allow BHB to establish staffing models and care protocols that reflect the needs of the patients. This should lead to higher quality care and reduced cost by ensuring that, for example, patients who require Intermediate Skilled care, receive that level of care, rather than being placed on a combined unit with patients who required Complex Skilled care, where the default staffing model reflects the higher needs of patients requiring the Complex Skilled level of care.

Other Considerations:

Segmentation of patients into separate units based on required level of care will require that funding levels also be separately established for each level of care.

Where other CoPs have suggested that the BHB complex and skilled LTC unit should be designed to accommodate specific specialized sub-populations (Intellectually disabled / behavioural challenges / paediatrics), staff training considerations need to be taken into account.

The development of this capacity, combined with the aging of the population, will necessitate the recruitment of a second Geriatrician.

Personal Care, Intermittent Skilled Nursing, Cognitive Care

Relevant Communities of Practice: Post Acute Care

Description of Service/Initiative:

The Bermuda LTC Action Plan describes the Personal Care, Intermittent Skilled Nursing, Cognitive Care level of care. This level of care was identified as being provided in both KEMH and Community Based Care Homes.

Level of Care	Definition	Setting
Personal Care, Intermittent Nursing Care, Cognitive Care	Shared housing, group home, assisted living for meals, accommodation, and self-care including mobility, supervision for safety, medications, Mild-moderate dementia care. Access to rehabilitation/therapeutic services. Access to mental health services	KEMH and Community Based Care Home

Is this a level of care that should be offered by BHB? If so, should BHB designate a number of KEMH hospital beds to provide this level of long-term care? Or should BHB examine options for off-site (i.e. away from acute care hospital) provision of this level of care?

Relevant Background Data:

In 2016/17, there were 199 KEMH acute and LTC patients discharged to "Skilled Nursing Facility/ Long-Term Care". These 199 patients had an average length of stay of 83.3 days, used the equivalent of 40 KEMH beds, and 70.8% of their stay was categorized as "Alternate Level of Care" (ALC, i.e. waiting for access to a lower level of care).

2016/17 KEMH Acute and LTC Discharges by Discharge Disposition

Discharge Disposition	Cases	Total Days	ALC Days	Avg. LOS	% ALC Days
Home, Self Care	5,314	64,103	2,250	12.1	3.5%
Expired	212	14,589	2,315	68.8	15.9%
SNF/LTC	***199***	***16,570***	***11,738***	***83.3***	***70.8%***
Acute - Abroad	185	1,137	0	6.1	0.0%
Hospice	74	1,237	10	16.7	0.8%
Home Health Care	43	1,477	654	34.3	44.3%
AMA	28	123	2	4.4	1.6%
MWI	12	103	0	8.6	0.0%
KEMH	3	165	0	55.0	0.0%
Correctional Facility	2	9	0	4.5	0.0%
Police Station	1	9	0	9.0	0.0%
Grand Total	**6,073**	**99,522**	**16,969**	**16.4**	**17.1%**

LTC Action Plan: Unmet need

"Available data makes it impossible to ascertain the exact level of unmet need – i.e. persons who require long term care and are not receiving it; and caregivers in need of support. However, anecdotally, based on reports from agencies working with these populations, it is understood that large numbers of seniors and persons with disabilities don't have access to the level of care required. The causes include the limited amount of home care and institutional care, unaffordability of care for families, lack of support for family and carers and, at times, family members and next of kin who are unable or unwilling to care for a dependent adult. While unmet need can't be fully quantified at this time, demand for beds and long-term hospitalizations indicate that existing capacity is not meeting population needs."

Input/Advice from CoP Discussions:

Barriers to discharge have been identified and need to be better understood: Limitation in long-term care places or rehab options. Something needs to be planned to deal with post-acute need of our patients. Currently, the assessment for eligibility for home care and LTC services is typically the first source of delay. Some services will only take transfers on M, T, W; won't take patients with catheters,

etc. They are private homes, so they can pick and choose. The "system" is not set up to facilitate effective or efficient use of acute care beds by enabling movement to a more appropriate level of care.

The BDA LTC plan…current perception is that there is "a lot of plan, not a lot of $ to execute the plan". Participants are reminded that we are spending money already by keeping patient inappropriately in costly, acute care beds.

BHB has responsibility within the act to recommend what other parts of the system need to do. We must figure out in this planning what makes the most sense. We should act to influence new policy of government.

Decant "personal care/ intermediate care" patients to other community-based facilities (however, insufficient community capacity to accept patients). Move a subset of patients to a different location, and BHB to care for them there (currently there is insufficient capacity/ resourcing to do this)

Feed into upcoming SHB discussions. Legislation is currently looking at how funding if re-allocated, to enable people to be cared for at home

BHB has very few of these patients who are total care. There are a lot in the long-term care setting where these were grandfathered in. Nursing home send back to us because of dementia/behaviours, psycho-behavioural issues. These will fall into Intermediate definition.

Issue will be enforcing these new levels of care… people refuse to leave. May need to not retroactively apply. Patients should be case managed on acute care side, and go to whatever bed is available… while waiting for preferred bed.

There have been lots of talk in the past, but not much action… there has been a lack of coordination. And many moving parts.

The homes that we do have are trying to raise their standards, but bigger challenges are the harder to move on. To make assumption that financing structure will be changed by 2020 is a stretch. But things are happening… by 2025 we can plan for more capacity. Need to plan not just for more beds and institutional care… need to have home care.

Community of Practice Advice:

BHB should not provide the Personal Care, Intermittent Nursing Care, Cognitive Care level of long-term care, either in hospital beds, or in an off-site facility. However, the small number of patients currently in the BHB long-term care beds who require this level of care, should be assumed to remain in BHB until such time as the capacity and capability of the community based care homes are enhanced and able to take these patients. These patients should be assumed to still require BHB beds in 2020, but by 2025, they should be accommodated in community based care homes.

Anticipated Benefits:

Once community based care homes can assume responsibility for patients requiring this level of care, BHB can focus on long-term care patients requiring a level of care that should be provided in a hospital environment (i.e. Complex Skilled and Intermediate Skilled long-term care). Patients will benefit from having the opportunity to live in a less institutional environment and not be as exposed to the iatrogenic risks of living in a hospital.

Other Considerations:

The ability of BHB to cease offering this level of care is contingent on the successful implementation of the Bermuda LTC Action Plan, and the increase in capability and capacity of community care homes to assume sole responsibility for this level of care. Enabling legislation may also be required to facilitate appropriate placement of patients in the appropriate levels of care.

In-Home Care

Relevant Communities of Practice: Post-Acute Care, Medicine, Surgery

Description of Service/Initiative:

The Bermuda Long-Term Care Action Plan defines a single level of home care:

Level of Care	Definition	Setting
Home Care	Personal care and / or homemaking assist, episodic skilled nursing visit / consult, cognitive care for safety, adult day care	Private Home

The Post-Acute Care CoP discussed three types of in-home care:

- **Post-Acute** – Immediate, time limited, post-discharge in-home care, focused on meeting the nursing needs of acute care patients
- **Long-Term** – Continuing in-home care, intended to support individuals to remain living independently in the community, primarily provided by non-professionals.
- **Rehabilitation** – Time limited, post-discharge, in-home rehabilitation care, coordinated by professional therapist staff, intended to enhance patient function.

The proposed initiative is that BHB should assume a role in delivery of Post-Acute and Rehabilitation in-home care, but not in Long-Term in-home care.

Because of the direct dependence of BHB on the availability and quality of immediate post-discharge home care services for KEMH acute care patients, should BHB consider providing (in partnership with other providers?) post-acute and rehabilitation in-home care. This home care service would focus on responding to the post-acute needs of KEMH patients, and would not offer non-professional supports intended to help keep the aging in their homes.

Relevant Background Data:

In the most recent fiscal year, fewer than 1% of KEMH discharges were referred to home health care.

Discharge Disposition of KEMH Acute and LTC Discharges

Discharge Disposition	2014/15	2015/16	2016/17
Home, Self-Care	***5,190***	***5,422***	***5,314***
Expired	193	193	212
Acute - Abroad	137	153	185
SNF/LTC	98	83	199
Hospice	79	69	74
AMA	28	35	28
Home Health Care		7	43
MWI	16	18	12
KEMH	5	4	3
Correctional Facility	1		2
Police Station	1		1
Grand Total	**5,748**	**5,984**	**6,073**
% to Home Health Care	***0.0%***	***0.1%***	***0.7%***

In fiscal year 2016/17, the average length of stay in KEMH for the patients discharged to Home Health Care was 34.3 days, and these patients spent 44.3% of their time in hospital as ALC.

2016/17 KEMH Acute and LTC Activity by Discharge Disposition

Discharge Disposition	Cases	Total Days	ALC Days	Avg. LOS	% ALC Days
Home, Self-Care	5,314	64,103	2,250	12.1	3.5%
Expired	212	14,589	2,315	68.8	15.9%
SNF/LTC	199	16,570	11,738	83.3	70.8%
Acute - Abroad	185	1,137	0	6.1	0.0%
Hospice	74	1,237	10	16.7	0.8%
Home Health Care	***43***	***1,477***	***654***	***34.3***	***44.3%***
AMA	28	123	2	4.4	1.6%
MWI	12	103	0	8.6	0.0%
KEMH	3	165	0	55.0	0.0%
Correctional Facility	2	9	0	4.5	0.0%
Police Station	1	9	0	9.0	0.0%
Grand Total	**6,073**	**99,522**	**16,969**	**16.4**	**17.1%**

LTC Action Plan: Formal home-based care

"There are 15 agencies providing in-home care services ranging from assistance with activities of daily living (ADLs), to rehabilitative therapy and skilled nursing services. These are provided by 12 private agencies, one charity, the Department of Health and the Bermuda Hospitals Board. There is little

provision of palliative and end-of-life care, and there is a regrettable lack of cultural acceptance of end-of-life care as an appropriate, and at times preferable, treatment option for some patients."

Current BHB home care (only four nurses), is predominately focused on wound care.

Input/Advice from CoP Discussions:

Noted that "Home health care" is a private business, we need to use the more accurate term home care (which we know home nursing is limited to wound care). Large capacity of acute care being used for people who need to be going to LTC or home, but as soon as we change diagnosis to LTC, the per diem reimbursement rate is reduced. If we started a home care programme from scratch, how would you build it:

- Establish a multi-disciplinary "re-ablement" team – introduce team to patient pre-op and proactively identify and manage any discharge needs, and follow-patient home and provide follow-up care
- Eliminate handovers to community-based nursing (change result in gaps in coverage). We would prefer if our nurses provided all care needed.

Need for in-home wound care and for diabetic foot ulcers treatment in home

ADL Assistance (has been an increase in number of providers offering this service)

BHB has informal leadership role… helping to pull the post-acute service model together, coordinating care of cases, but not necessarily of home care. Model should be to transition person, hand off to another provider in the community.

For frail elderly who are in community and not necessarily in the hospital, does BHB have a role? This is a community responsibility... they should be managed in community regardless of any contact through the hospital. There is some home care rehab service in Bermuda, but very little capacity: "Assessment and go"

Need home care services (at minimum post-acute) that people can access regardless of income. In-home care (both for therapy and for personal supports) should be a component of the health system in Bermuda.

The Dept. of Health has no (adult) SLPs, 2 OTs and 3 PTs to service entire island… they go into home but also into long term care… this is inadequate. Need to structure a private system that is accessible.

Focus on changing culture by building up home care rehab services… our culture supports people not leaving the hospital until they are totally well.

The ideal role is BHB to define scope of home care/post-acute services. BHB is one component of the system. BHB has resources that should be shared and clear delineation of who does what in the system. There are agencies in the community that are anxious to provide in home and even hospital services. BHB could take a leadership role in establishing quality standards in each part of the sub-acute system.

May also need to talk to professional licencing bodies to ensure professionals have standards they need. So we can be a leader, but don't police.

We are talking about developing a national system… but what happens to those with no coverage?

We need to advocate for the development of the system… we can't do it all ourselves.

By 2020/2025 there will be slow improvement in community capacity (home care, "de-escalation" of care) so that by 2025 we will see some progress in this that will reduce demand for inpatient services.

Related Research Evidence or Clinical Standards:

Arch Phys Med Rehabil. 2013 Jun;94(6):1038-47. doi: 10.1016/j.apmr.2012.12.024. Epub 2013 Feb 4.

Rehabilitation in home care is associated with functional improvement and preferred discharge.

Cook RJ, Berg K, Lee KA, Poss JW, Hirdes JP, Stolee P.

OBJECTIVE: To investigate the impact of physiotherapy (PT) and occupational therapy (OT) services on long-stay home care patients with musculoskeletal disorders.

DESIGN: Observational study.

SETTING: Home care programs.

PARTICIPANTS: All long-stay home care patients between 2003 and 2008 (N=99,764) with musculoskeletal disorders who received a baseline Resident Assessment Instrument for Home Care assessment, 1 follow-up assessment, and had discharge or death records.

INTERVENTIONS: PT and OT.

MAIN OUTCOME MEASURES: The effects of PT and OT services on transitions in functional state, discharge from home care with service plans complete, institutionalization, and death were assessed via multistate Markov models.

RESULTS: Home care patients with deficiencies in instrumental activities of daily living and/or activities of daily living at baseline and who received home-based rehabilitation had significantly increased odds of showing functional improvements by their next assessment (for a state 3 to state 2 transition: odds ratio [OR]=1.17; 95% confidence interval [CI], 1.10-1.26; P<.0001; for a state 2 to state 1 transition: OR=1.36; 95% CI, 1.14-1.61; P=.0005). Receipt of PT/OT also significantly reduced the odds of mortality and institutionalization in this group.

CONCLUSIONS: With increasing numbers of older adults with chronic conditions and limited funding for health care services, it is essential to provide the right services at the right time in a cost-effective manner. Long-stay home care patients who receive rehabilitation at home have improved outcomes and lower utilization of costly health services. Our findings suggest that investment in PT and OT services for relatively short periods may provide savings to the health care system over the longer term.

J Am Geriatr Soc. 2017 Aug;65(8):1863-1869. doi: 10.1111/jgs.14889. Epub 2017 Apr 3.

Home- and Community-Based Occupational Therapy Improves Functioning in Frail Older People: A Systematic Review.

De Coninck L, Bekkering GE, Bouckaert L, Declercq A, Graff MJL, Aertgeerts B.

OBJECTIVES: The objective is to assess the effectiveness of occupational therapy to improve performance in daily living activities in community-dwelling physically frail older people.

DESIGN: We conducted a systematic review and meta-analysis. We included randomized controlled trials reporting on occupational therapy as intervention, or as part of a multidisciplinary approach. This systematic review was carried out in accordance with the Cochrane methods of systematic reviews of interventions.

MEASUREMENTS: Meta-analyses were performed to pool results across studies using the standardized mean difference. The primary outcome measures were mobility, functioning in daily living activities, and social participation. Secondary outcome measures were fear of falling, cognition, disability, and number of falling persons.

RESULTS: Nine studies met the inclusion criteria. Overall, the studies were of reasonable quality with low risk of bias. There was a significant increase in all primary outcomes. The pooled result for functioning in daily living activities was a standardized mean difference of -0.30 (95% CI -0.50 to -0.11; P = .002), for social participation -0.44 (95% CI -0.69, -0.19; P = .0007) and for mobility -0.45 (95% CI -0.78 to -0.12; P = .007). All secondary outcomes showed positive trends, with fear of falling being significant. No adverse effects of occupational therapy were found.

CONCLUSION: There is strong evidence that occupational therapy improves functioning in community-dwelling physically frail older people.

Community of Practice Advice:

BHB should not independently assume an expanded role in the provision of in-home care services as part of the Clinical Services Plan. BHB should have a role to play in helping to determine and establishing quality standards for post-acute in-home care, but this should be done within the context of a national plan to establish a Bermuda system of in-home care.

Anticipated Benefits:

The Clinical Services Plan should not assume that any expanded capability or capacity of in-home care will exist by 2020, but we do anticipate that in-home care will be more widely accessible by 2025, and that this can contribute to reduced length of stay in hospital. An enhanced in-home care system will support Bermuda residents in their ability to return to independent living, and allow community care home and hospital beds to be used for patients who require institutional levels of care.

Other Considerations:

The Post-Acute Care CoP members recognize the value of in-home care, and the potential for an improved system to support patient flow through the hospital system, and to allow BHB to focus on providing hospital care for patients who have a level of need that cannot be met in the community.

Case Management

Relevant Communities of Practice: Post-Acute Care, Medicine, Surgery

Description of Service/Initiative:

Case management is a collaborative process that includes the assessment, planning and coordination of health care and other services to meet a patient's needs. Effective case management utilizes available resources to achieve high-quality and cost-effective outcomes. Transition planning is one function of case management. In the hospital setting, case managers assist patients and families in developing a discharge plan, including coordination of community based services and, when necessary, admission to a post-acute care service, such as an acute rehabilitation unit, community care home, or in-home care services.

Relevant Background Data:

In 2016/17, there were 316 KEMH acute or LTC patients discharged to post-acute care (e.g. SNF/LTC, hospice, or home health care). While these 316 patients were only 5% of all discharges, they accounted for 19% of all KEMH inpatient days, and 73% of all BHB Alternate Level of Care days.

2016/17 KEMH Acute and LTC Discharges by Discharge Disposition

Discharge Disposition	Cases	Total Days	ALC Days	Avg. LOS	% ALC Days
Home, Self-Care	5,314	64,103	2,250	12.1	3.5%
Expired	212	14,589	2,315	68.8	15.9%
SNF/LTC	199	16,570	11,738	83.3	70.8%
Acute - Abroad	185	1,137	0	6.1	0.0%
Hospice	74	1,237	10	16.7	0.8%
Home Health Care	43	1,477	654	34.3	44.3%
AMA	28	123	2	4.4	1.6%
MWI	12	103	0	8.6	0.0%
KEMH	3	165	0	55.0	0.0%
Correctional Facility	2	9	0	4.5	0.0%
Police Station	1	9	0	9.0	0.0%
Grand Total	**6,073**	**99,522**	**16,969**	**16.4**	**17.1%**
All Transfers to Post-Acute Care	***316***	***19,284***	***12,402***	***61.0***	***64.3%***

64.3% of the days in hospital for these patients discharged to post-acute care were spent as ALC. Any initiative that can help patients avoid these discharge delays will improve care and effectively create additional acute care capacity.

Input/Advice from CoP Discussions:

If BHB provides acute care, it has an obligation to do the transitional care to get patients out the door and back into the community. This means case coordination, discharge planning, etc., so that people do not bounce back. Care Coordination is the responsibility of BHB. BHB should coordinate the discharge and ideally hand over to the social services to do ongoing coordination of care.

BHB currently has only 1 Social worker dedicated to LTC and a second shared between acute care and palliative care; this is not enough to support the number of patients we discharge.

BHB has an informal leadership role with respect to community post-acute care (i.e. helping to pull the model together, coordinating care of cases), but should not be a direct service provider of post-acute community care. The model should be to transition and hand off to another provider in the community.

BHB cannot rely on the primary care physicians to manage and coordinate post-discharge service. We do a very poor job in following up on our patients when they leave the hospital. Ideally, the primary care system would take the lead role in coordination of care and managing transitions, but this is unrealistic, given current physician reimbursement policies. Financing needs to change, so that people can access primary care. Physicians need to be part of it, but may not need to be drivers. Need to shift model to a multidisciplinary approach so it is not just physician to physician communication, but all providers.

Current case managers provided by social system (only 2) are doing only crisis care…this is very inadequate capacity. Case management should be part of the discharge planning function in the hospital.

For frail elderly who are in community and not necessarily in the hospital, does BHB have a role? This is a community responsibility. They should be managed in community regardless of any contact through the hospital.

Case management is a gap, and is important. BHB has a role in ensuring that patients are effectively transitioned into the community when leaving BHB. May be that hospital needs to provide case management for post-acute care because it is important to get people out fast, and helping them not bounce back.

Related Research Evidence or Clinical Standards:

Int Nurs Rev. 2017 Jun;64(2):296-308. doi: 10.1111/inr.12335. Epub 2016 Nov 11.

Case management effectiveness in reducing hospital use: a systematic review.

Joo JY, Liu MF.

AIM: This systematic review synthesizes recent evidence of the effectiveness of case management in reducing hospital use by individuals with chronic illnesses.

BACKGROUND: Hospital use by individuals with chronic illnesses accounts for 66% of healthcare costs in the United States. It has been cited that care coordination can reduce healthcare costs; however, its effectiveness in improving hospital use outcomes is contradictory, and no review has yet synthesized recent studies of case management with respect to hospital use outcomes.

METHODS: This systematic review followed the Cochrane processes and was guided by use of PRISMA statements. Five electronic databases were searched to obtain randomized controlled trials published within the last 10 years that evaluated case management hospital use as a primary outcome by individuals with chronic illnesses.

RESULTS: Ten studies published between 2007 and 2015 were retrieved and assessed for risk of methodological bias. All studies used case management as an intervention, focused on transitional care services and reported hospital use, including readmissions and emergency department and hospital visits, as a primary outcome. Analysis of the studies showed that case management greatly reduced hospital readmissions and emergency department visits.

LIMITATIONS: Only studies published in English were searched, and retrieved studies tended to report positive results.

CONCLUSIONS: There was strong evidence of significant reductions in hospital use with case management as an intervention. However, other results about the effectiveness of case management remain mixed; more rigorously designed studies with case management interventions are needed.

IMPLICATIONS FOR NURSING AND HEALTH POLICY: The complexity and cost of chronic illnesses means that case management should be considered as a tool to improve quality of care and lower healthcare costs.

CMAJ. 2014 Oct 21;186(15): E568-78. doi: 10.1503/cmaj.140289. Epub 2014 Sep 15.

Effectiveness of quality improvement strategies for coordination of care to reduce use of health care services: a systematic review and meta-analysis.

Tricco AC, Antony J, Ivers NM, Ashoor HM, Khan PA, Blondal E, Ghassemi M, MacDonald H, Chen MH, Ezer LK, Straus SE.

BACKGROUND: Frequent users of health care services are a relatively small group of patients who account for a disproportionately large amount of health care utilization. We conducted a meta-analysis of the effectiveness of interventions to improve the coordination of care to reduce health care utilization in this patient group.

METHODS: We searched MEDLINE, Embase and the Cochrane Library from inception until May 2014 for randomized clinical trials (RCTs) assessing quality improvement strategies for the coordination of care of

frequent users of the health care system. Articles were screened, and data abstracted and appraised for quality by 2 reviewers, independently. Random effects meta-analyses were conducted.

RESULTS: We identified 36 RCTs and 14 companion reports (total 7494 patients). Significantly fewer patients in the intervention group than in the control group were admitted to hospital (relative risk [RR] 0.81, 95% confidence interval [CI] 0.72-0.91). In subgroup analyses, a similar effect was observed among patients with chronic medical conditions other than mental illness, but not among patients with mental illness. In addition, significantly fewer patients 65 years and older in the intervention group than in the control group visited emergency departments (RR 0.69, 95% CI 0.54-0.89).

INTERPRETATION: We found that quality improvement strategies for coordination of care reduced hospital admissions among patients with chronic conditions other than mental illness and reduced emergency department visits among older patients. Our results may help clinicians and policy-makers reduce utilization through the use of strategies that target the system (team changes, case management) and the patient (promotion of self-management).

Community of Practice Advice:

BHB should formalize and expand the case management role, particularly with respect to elderly patients, and those with chronic illness. This will require an additional investment in case management personnel and training, and incorporation of this role in BHB care pathways.

Anticipated Benefits:

Enhanced case management should lead to reduced ED visits and a reduction in time spent in hospital beds for patients waiting for access to post-discharge community-based services.

Other Considerations:

The expanded case management role should be implemented in conjunction with the anticipated expansion in the capability and capacity of post-acute community services in Bermuda, such as LTC. The case management role will only be fully effective if there is a parallel expansion of community services for the projected increase in the elderly Bermuda population that is most likely to require that care.

Palliative Care

Relevant Communities of Practice: Post-Acute Care

Description of Service/Initiative:

The World Health Organization (WHO) definition of palliative care is:

“Palliative care is an approach that improves the quality of life of patients and their families facing the problem associated with life-threatening illness, through the prevention and relief of suffering by means

of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual. Palliative care:

- provides relief from pain and other distressing symptoms;
- affirms life and regards dying as a normal process;
- intends neither to hasten or postpone death;
- integrates the psychological and spiritual aspects of patient care;
- offers a support system to help patients live as actively as possible until death;
- offers a support system to help the family cope during the patient's illness and in their own bereavement;
- uses a team approach to address the needs of patients and their families, including bereavement counselling, if indicated;
- will enhance quality of life, and may also positively influence the course of illness;
- is applicable early in the course of illness, in conjunction with other therapies that are intended to prolong life, such as chemotherapy or radiation therapy, and includes those investigations needed to better understand and manage distressing clinical complications.

For purposes of development of the BHB Clinical Services Plan, with the projected change in the demographics of the Bermuda population there is anticipated to be an increased need for palliative care, and BHB needs to plan to respond to this increased need, unless it can be assumed that the increased need will be met through the expansion of non-hospital, community-based end of life care options.

Relevant Background Data:

In 2016/17, there were 74 KEMH acute care patients transferred to Agape, and 212 other patients who died in a KEMH acute or LTC hospital bed. The patients transferred to Agape had an average acute care stay of 16.7 days, and very few ALC days. The other patients who died in a KEMH acute or LTC hospital bed had an average LOS of 68.8 days, and spent 15.8% of their stay (on average) as ALC.

2016/17 KEMH Acute and LTC Discharges by Discharge Disposition

Discharge Disposition	Cases	Total Days	ALC Days	Avg. LOS	% ALC Days
Home, Self-Care	5,314	64,103	2,250	12.1	3.5%
Expired	212	14,589	2,315	68.8	15.9%
SNF/LTC	199	16,570	11,738	83.3	70.8%
Acute - Abroad	185	1,137	0	6.1	0.0%
Hospice	74	1,237	10	16.7	0.8%
Home Health Care	43	1,477	654	34.3	44.3%
AMA	28	123	2	4.4	1.6%
MWI	12	103	0	8.6	0.0%
KEMH	3	165	0	55.0	0.0%
Correctional Facility	2	9	0	4.5	0.0%
Police Station	1	9	0	9.0	0.0%
Grand Total	**6,073**	**99,522**	**16,969**	**16.4**	**17.1%**

The LTC Action Plan states that "There is little provision of palliative and end-of-life care, and there is a regrettable lack of cultural acceptance of end-of-life care as an appropriate, and at times preferable, treatment option for some patients."

The LTC Action Plan identified a proposed level of care as "Hospice and/or End of Life Care", and described this level of care as "Intermediate to complex skilled nursing care provided in the last 3 to 6 months of life related to terminal illness or end of life conditions. Focus on comfort, psychological supports, dignity." The possible settings for this level of care were described as "KEMH / Agape/ community".

Input/Advice from CoP Discussions:

There is no end of life care plan on the Island. We do not know enough about where patient want to die, and therefore have not developed a national plan.

Palliative care: many people don't want to die at home. LTC homes don't want patients to die there (reputational problem). PALS for people with cancer (but PALS is not hospice).

There is a rudimentary move toward home hospice, but the reimbursement structure ($265/day?) makes it unattractive for anyone to pick it up.

Friends of Hospice is finding much interest in end of life care, and there are preliminary plans to build a new hospice. 5 years from now there will likely be a new hospice with programs for patients/families. It might be collocated with hospital, but have not decided on this yet.

Need to have hard conversations about DNR, end of life, etc. This may decrease the number of patients that are ending life in hospital, ICU, etc. who would have rather died in a non-institutional setting.

BHB's role is to ensure that people are having the conversation about end of life/ DNR.

We do not need an increased number of beds for hospice at BHB, but we do need an increased workforce.

Related Research Evidence or Clinical Standards:

Health Aff (Millwood). 2017 Jul 1;36(7):1265-1273. doi: 10.1377/hlthaff.2017.0164.

A National Strategy for Palliative Care.

Meier DE, Back AL, Berman A, Block SD, Corrigan JM, Morrison RS.

In 2014 the World Health Organization called for palliative care to be integrated as an essential element of the health care continuum. Yet in 2017 US palliative care services are found largely in hospitals, and hospice care, which is delivered primarily in the home, is limited to people who are dying soon. The majority of Americans with a serious illness are not dying; are living at home, in assisted living facilities, or in nursing homes; and have limited access to palliative care. Most health care providers lack knowledge about and skills in pain and symptom management, communication, and care coordination,

and both the public and health professionals are only vaguely aware of the benefits of palliative care and how and when to access it. The lack of policy supports for palliative care contributes to preventable suffering and low-value care. In this article we outline the need for a national palliative care strategy to ensure reliable access to high-quality palliative care for Americans with serious medical illnesses. We review approaches employed by other countries, list the participants needed to develop and implement an actionable strategy, and identify analogous US national health initiatives to inform a process for implementing the strategy.

U.K. NHS End of Life Care Strategy - Promoting high quality care for all adults at the end of life. July 2008

Forward:

"This strategy, published just after the 60th birthday of the NHS, represents an important milestone for health and social care. It is the first comprehensive framework aimed at promoting high quality care across the country for all adults approaching the end of life.

Each year around 500,000 people die in England. We know that although some people receive excellent care at the end of life, many do not. One of the fundamental problems is that services are not always joined up and as a result communication between staff and agencies can break down. **From surveys of the general public we know that, given the opportunity and right support, most people would prefer to die at home. In practice, only a minority manage to do so. Many people die in an acute hospital, which is not their preferred place of care.**

However, we also know that many people receive excellent care as their life draws to a close. Over the past forty years hospices and specialist palliative care services have demonstrated what can be done to provide physical, psychological, social and spiritual care for people and their families. In recent years new models of care have been developed by the NHS and by the voluntary sector to bring good care to a wider number of patients.

This strategy builds on the vision and expertise of hundreds of people and organisations from all walks of life. Initial work on addressing the challenges of providing high quality end of life care had commenced before the Next Stage Review got underway. This early work was given further shape and strengthened through the participation of the many clinicians who contributed to the development of the Strategic Health Authorities' visions for end of life care. This national strategy can genuinely be said to have been developed from the bottom up.

This strategy provides a framework on which local health and social care services can build. It also sets out a commitment from the government to enhance funding for end of life services. As a result of this we can be confident that the quality of end of life care, which matters to us all, will improve year on year."

Community of Practice Advice:

The BHB Clinical Services Plan should assume that future increased needs for end of life care will be met primarily via increased availability of home-based / community-based services. The current capacity of KEMH hospital beds and Agape hospice beds to support end of life care should be maintained, but will not be planned to increase by 2020 and 2025.

Anticipated Benefits:

If the wishes of Bermuda residents are similar to those in most developed countries that have produced national end of life strategies, expanding availability of non-institutional palliative care services will provide more patient centred care than expanding hospital based palliative care services.

Other Considerations:

The opportunity to not increase the use of KEMH and Agape beds for palliative care in response to the aging of the Bermuda population depends on the increased availability of community hospice and in-home end of life care services. It may also depend on changes in cultural expectations with respect to palliative care. If these changes do not occur, then BHB will need to increase capacity in KEMH and Agape to accommodate increased need for end of life care.

Chronic Disease Management

Overarching Advice – BHB Supports Partner Initiatives

BHB's vision for its role in chronic disease management (CDM) is as a support to grow a more robust solution for CDM in Bermuda. BHB needs to play a quality leadership role, but will not necessarily be responsible for the direct public interventions required to reduce the incidence of chronic disease. BHB will support public self-management of chronic disease.

BHB will provide leading practice models and establish quality standards for CDM. As the acute care facility for the island and with the largest cohort of skilled healthcare practitioners, BHB will be in the best position to facilitate coordinated assessment and referral of patients to partners who are best able to impact population health status.

There will be situations, particularly for the non- and un-insured, where there may be gaps in availability of community based CDM services, and where BHB will be required to play a direct service role. As well, during development and refinement of services, BHB may need to temporarily assume direct service roles as gaps are identified and partner organizations transition fully to fill the gaps. BHB will work with, and support, partners such as primary care physicians, the Department of Health, and community-based health and social service agencies, to implement a coordinated national approach to CDM. But BHB's priority will always be to identify and support partners in their provision of direct CDM service to the public, where partners who are willing and able to meet quality standards are available.

BHB recognizes that effective chronic disease management must be rooted in a broad-based approach across the education, healthcare, and social service sectors throughout Bermuda. BHB recognizes the critical role of primary care providers in healthcare in prevention and management of chronic disease and sees a partnership with the community doctors as essential to the success of CDM.

BHB strongly supports the recent announcement of the Ministry of Health to establish a registry of patients with Chronic Diseases in Bermuda.

Health Promotion Partnership

Relevant Communities of Practice: Chronic Disease Management

Description of Service/Initiative:

Active identification of external partners for chronic disease management and support for joint initiatives, with BHB providing direct CDM services only for diseases or patient populations for which no external partners are available.

Relevant Background Data:

Prevalence of chronic diseases in Bermuda population, and increases associated with population aging.

Input/Advice from CoP Discussions:

Consider opportunities for the hospital to partner with the community to more effectively promote health, prevent illness and ensure best possible treatment is provided. There is a need to involve the public and stimulate disruptive innovation to address our highly prevalent and preventable issues (for example, provide diabetes clinic in grocery stores).

BHB may have an interest in providing, or partnering in the provision of, prevention and promotion and/or Chronic Disease Management activity in areas that are having a significant impact on our population to reduce the demand for hospital services in the future. It is critical that BHB is not working in isolation, but as a player in a larger system (support comprehensive efforts).

BHB should support the launch of a national health promotion campaign. There needs to be better promotion of programs and services offered in the community to ensure appropriate referrals get made. DoH publishes a "directory of services" (what agencies exist, what services they provide – currently an initiative to optimize this for diabetes and obesity).

BHB can partner with community/ colleges to provide self-management workshops/education of ADLs, foot care, etc. – to empower people to care for themselves and their loved ones in the home. BHB should play a collaborative role: it doesn't need to drive these programs, but needs to support and facilitate them (e.g. "Piece of the Rock "campaign). BHB may not be the driver of the campaign and not the funder, but role may be to facilitate, promote and lend expertise.

Related Research Evidence or Clinical Standards:

Extensive research re value of chronic disease management. No literature found emphasizing primary role for hospital.

Community of Practice Advice:

BHB should identify and nurture partnerships with other organizations to support health promotion, as part of its role as a resource to chronic disease management and health promotion in Bermuda. While

health promotion initiatives have the potential to impact population health and associated health care needs, the BHB Clinical Services Plan will not assume that significant reductions in needs for hospital care will occur due to improved health promotion prior to 2025.

Anticipated Benefits:

Long-term improvement in the health status of the population of Bermuda, and mitigation of growth in need for health care services.

National Electronic Health Record

Relevant Communities of Practice: All

Description of Service/Initiative:

Implementation of an integrated health information system for Bermuda.

Relevant Background Data:

2011 Bermuda Health Plan – Health Sector Goals (bolding and italics added)

"6. An ***integrated*** health IT system shall be established throughout the health sector to improve quality of care and efficiency

Health information technology (IT) system is used here to refer to digital records of patient data designed to enable the systematic collection of information about healthcare for individual patients and populations. Such systems can apply to a single institution or be shared across a range of healthcare settings. They may include a range of information including demographics, medical history and billing. Integrated health IT systems have been found to improve healthcare quality by reducing medical errors, streamlining the patient journey, and providing evidence-based decision support; they have also been found to reduce healthcare costs and improve reporting. Such systems must ensure confidentiality and may enable improved patient access to relevant information. ***They have also been shown to improve coordination of care between healthcare settings and providers***, which improves patient outcomes and reduces testing, errors and costs. Bermuda's healthcare sector requires improved communication and coordination between stakeholders, to which an integrated health IT system can contribute significantly. In particular, any system introduced must provide sufficient ***access and support to primary care physicians***, and tie in laboratories and diagnostic facilities; as this will make it possible to improve quality of care, and reduce costs to the system. Collaboration between providers and payors will be required to build on current electronic data interface capability, and extend it further to include integrated electronic health records.

Moving Bermuda's health sector to an integrated health information system is estimated to require ***five years to develop, design and achieve a phased implementation in 75% of the health sector***. Initial developments to establish infrastructure requirements and build on electronic claims submission will take place in the first two years."

Input/Advice from CoP Discussions:

An integrated EMR system for inpatient care that interfaces with community providers, will support care coordination and better management of transitions of patients between providers.

EHRs and the ability to exchange health information electronically can help you provide higher quality and safer care for patients while creating tangible enhancements for your organization. EHRs help providers better manage care for patients and provide better health care.

An example of CDM supports that could be facilitated via the development and implementation of a National EHR are development of chronic disease registries (e.g. Diabetes and Asthma registry). These registries would support standardized data collection across providers and support outcome measurement. This would in turn support better planning and utilization of services, resulting in better care and outcomes, and reduced health system costs.

Related Research Evidence or Clinical Standards:

Ireland – National Health Record Business Case - http://www.ehealthireland.ie/Strategic-Programmes/Electronic-Health-Record-EHR-/Progress/National-EHR-Strategic-Business-Case-Exec-Summary.pdf

A National Electronic Health Record is Essential to Deliver Reform

The delivery of health and social care services in Ireland is unsustainable without significant reform. There is a recognised need to do things differently and to redesign care delivery with a shift in emphasis from acute care to more care delivered in the community. This is reflected in the ambition of the current Reform Programme across the healthcare system that aims to transform clinical, structural, and financial, aspects of care delivery.

Based on international experience of the implementation and adoption of Electronic Health Records (EHR), the characteristics and challenges of the Irish health system, and the level of ambition set out in this strategic case, we believe the programme is most likely to span a 10-year period of transformation. EHR directly supports the ambition of health reform in Ireland and therefore the effectiveness and success of the EHR programme will be assured through alignment with this reform journey over the same period.

An EHR is a comprehensive solution that supports the creation and sharing of key patient information. It is a core capability required for the future delivery of healthcare. It will move us from a position where patient records and key information is locked in a paper format and within specific organisations, to an environment where digital patient records are shared securely across care settings with appropriate consent. This will result in:

- Better, safer clinical decision making,
- More informed and engaged patients and citizens,
- Integration of services across care settings,

- Increased availability of information to enable proactive management of patients and conditions,
- Improved patient outcomes.

Among a wide spectrum of healthcare technology solutions, the Electronic Health Records is foundational in terms of support for clinical environments and wider patient engagement. The National EHR is a significant investment and a long-term commitment to transform health service delivery – it is not simply about adding technology to existing ways of work but incorporating digital solutions to support and enable changes and standardisation in clinical care.

Better Business Cases

New Zealand Ministry of Health - Strategic Assessment: Establishing the Electronic Health Record 24 August 2016

The New Zealand Health Strategy launched in April 2016 has set an ambitious goal of a people-powered, smart health system by 2025. The opportunity to utilise new health and digital technologies will be one of the ways to make progress towards this outcome. The Digital Health Work Programme 2020 has been designed to address the goals of the NZ health strategy.

This paper outlines a strategic assessment for an enabler of the Digital Health work programme, the establishment of an electronic health record (eHR) for New Zealanders. An eHR is a digital solution, or platform, that provides a single set of information for the benefit and use by individuals, health professionals (and their care teams). The information from the eHR will also be useful intelligence for health planners/funders and social service partners.

This initiative is closely aligned to the strategies being pursued by the Ministry and also shows direct connection to improving productivity, making the best use of information technology, ensuring the security of patient records and allowing digital access to information for the consumer.

In addition, there is a growing awareness of the benefits arising from joining up health and social services data at critical points in the lives of New Zealanders. Health professionals want to know more about the background and social context of the individual they are engaging with, equally they support sharing information when a person is vulnerable or where they are missing out on appropriate government services.

The provision of integrated systems between hospitals, GPs, pharmacies, aged care providers and other community providers, supports clinical integration and will enable information sharing across and between regions.

- Clinicians will have access to correct and up-to-date information which increases patient safety, saves lives, reduces the need for repeat tests, saves time for clinicians and patients, and contributes to savings resulting from reduced acute admissions and readmissions.

- Patients will have access to their electronic health information, which will give them an opportunity to improve their wellness and self-management, encouraging healthier lives and connect them in smart ways with their care team.

Community of Practice Advice:

BHB should support the development of a National Bermuda electronic health record. The BHB Clinical Services Plan should identify this as an important step in developing the Bermuda health system infrastructure, but will not attribute any reduced need for BHB hospital services by 2025 to implementation of such a system.

Independent of the timing and implementation of a National Bermuda electronic health record, BHB will introduce a unified EHR for itself. The current BHB system, "Clinical Suites", is no longer supported and must be replaced. This effort should be done in full coordination with the development of the National Bermuda electronic health record.

Anticipated Benefits:

Improve quality of care by supporting sharing of critical health information and coordination of care for patients across providers. Support standards of care and facilitate implementation of care pathways.

Other Considerations:

To maximize benefits of a national EHR, Bermuda residents should have access to their electronic health information. Respect and protection of confidentiality and privacy of sensitive personal health information will be critical.

Care Plan Prompt for Referral to CDM Service

Relevant Communities of Practice: CDM, Emergency, Medicine

Description of Service/Initiative:

Incorporate identification of patients with common chronic diseases in care plans, with prompts for referral of patients to appropriate clinic or CDM service (either within BHB or external partner).

Relevant Background Data:

Prevalence of chronic diseases, and projected increase with change in age composition of Bermuda population.

Input/Advice from CoP Discussions:

BHB has not been effective at identifying patients with chronic disease and routinely referring them to available services. If the ED interaction is purely transactional, and it only meets presenting need, that is a failure of chronic disease management. We need to create a more robust CDM model/ services to

better meet needs of patient. This would be a more constructive care system that changes the cycle of care – more planned care, less reactive care – in partnership with hospital and community providers.

If a co-morbidity is identified in ED/ inpatient, BHB should: if it is stable –confirm plan/ resources in place to manage in the community; if unstable or has a significant impact on functioning – it should be treated/ managed in an inpatient setting

Develop a more integrated CDM system (both routine care and acute care) – in absence of integration, there is more likely to be rapid onset of acute exacerbations. Plan for 24/7 management of acute needs in hospital, and build a community system that provide primary and secondary prevention and treatment, and follow-up.

MDT team to deal with immediate issues in hospital (e.g., diabetes, asthma, CHF), and facilitate referrals to community-based follow-up. (An alternative model proposed was for one service on-island to manage full spectrum of care (both within and outside of the hospital)).

At time of diagnosis, physicians to facilitate an immediate referral to "education and management programs" and creation of personalized care/ action plans (strategies to facilitate this: add step to care maps, add financial incentives to developing/ adhering to recommended plan of care). But it will be important to keep GPs informed of referrals, and to engage them in the ongoing education and support of their patients with respect to their chronic disease(s).

Incorporation of referral prompts in standardized care plans, and in clinical information systems, will help improve the linkage of BHB patients with appropriate CDM services.

Many people are never referred to the Diabetes Centre for education at the time of their initial diagnosis. Physicians want to manage their patient's diabetes, but they may not have the time or appropriate reimbursement to support this care.

Many patients feel they can manage their diabetes on their own, or look for "quick fixes" through weight loss programs or herbal remedies or seek advice from non-clinical sources. It is several years after diagnosis that we then see these patients for the first time, when the evidence of diabetes complications is starting to become apparent.

BHB can set an example by requiring that all BHB staff who are identified as having or who have been hospitalized with diabetes/asthma/COPD should be seen at the Diabetes and Asthma centres at the time of diagnosis or prior to returning to work after illness from documented chronic disease.

Related Research Evidence or Clinical Standards:

Cochrane Evidence: Early referral to a specialist doctor for people with kidney disease

Some degree of kidney failure affects about 15% to 25% of people and is a silent disease that creeps up on an individual with symptoms and signs developing only very late. When kidney failure becomes end-stage, life supporting therapy in the form of dialysis or transplantation is the only option available for

the patient. This form of therapy is very expensive and highly intrusive into the patients' life. Measures to prevent progression to this terminal stage are of great importance to prevent this catastrophe.

Our analyses of 40 studies of people with chronic kidney disease shows that people referred earlier to a specialist kidney doctor lived longer. Death rates in people referred early were about half of those referred late and these benefits were seen as early as three months and lasted for at least five years. People referred early also spent less time in hospital and were better prepared for dialysis. Dialysis first requires surgical placement of a fistula and early referral to specialist services often means better preparation, a lower risk of infection and other complications.

We did not discover any adverse effects from early specialist referral. Randomised controlled trials provide the most reliable information of all study designs, so it should be noted that all 40 studies analysed for this review used a cohort design. Cohort studies are the next best level of evidence and the only available evidence. For ethical reasons it is unlikely that a randomised controlled trial that deliberately assigns patients to late specialist referral will ever be conducted.

Authors' conclusions: Our analysis showed reduced mortality and mortality and hospitalisation, better uptake of peritoneal dialysis and earlier placement of arteriovenous fistulae for patients with chronic kidney disease who were referred early to a nephrologist. Differences in mortality and hospitalisation data between the two groups were not explained by differences in prevalence of comorbid disease or serum phosphate. However, early referral was associated with better preparation and placement of dialysis access.

Community of Practice Advice:

BHB should build in (in care plans and clinical information systems) prompts for referrals of patients with chronic disease to appropriate CDM services. The BHB Clinical Services Plan should identify this as an important process change, but will not attribute any reduced need for BHB hospital services by 2025 to implementation of this change.

Anticipated Benefits:

Increase identification of patients with chronic disease, and referral to CDM services. Access to these services should (over time) help improve the health status of Bermuda residents, and reduce their needs for hospital care.

Other Considerations:

Important that primary care physicians be informed of referrals to CDM services.

Asthma/COPD Chronic Disease Management

Relevant Communities of Practice: CDM, Medicine

Description of Service/Initiative:

Diabetes Respiratory Endocrine and Metabolism (DREAM) Centre at MWI provides Asthma and COPD nurse educator clinic 3 days per week. Initial 60- to 90-minute assessment, with follow-up visits of 20 minutes. Focus is to teach self-management skills to people who have been diagnosed with asthma to help them maintain control using the least amount of medication. Proposed initiative is to expand capability and referral to Asthma/COPD clinic.

Relevant Background Data:

2016/17 Visits and Patients for Asthma Management Clinic – BHB Charges

Outpatient Service	Charges	Individuals	Charges per Person
Asthma Management	179	134	1.34

2016/17 Outpatient Visits and Physician Charges – Patients with Asthma Diagnosis

CHARGE NUMBER	CHARGE DESCRIPTION	Visits	Total Charges
1616143	COS -HOSPITALIST LV 2 EP	166	$29,520
1616150	COS -HOSPITALIST LV 3 EP	23	$5,957
1616127	COS -HOSPITALIST LV 3 NP	19	$8,296
1604396	ANEST C CARE 1ST HOUR	15	$15,975
1616135	COS -HOSPITALIST LV 1 EP	7	$686
1710490	CARD TTE W/O DOPPLER COMPLETE	6	$1,504
1616119	COS -HOSPITALIST LV 2 NP	6	$1,980
1730027	INTERNIST OV LV3 NP	2	$834
1730068	INTERNIST OV LV2 EP	2	$206
1730191	INTERNIST OFFICE CONSLT HIGH COMPLE	2	$1,382
1616234	COS -INTENSIVIST LV 1 EP	2	$360
1730084	INTERNIST OV LV4 EP	1	$324
1616242	COS -INTENSIVIST LV 2 EP	1	$328
1604347	ANEST INPAT CON LV I	1	$236
1602754	ANEST UNLISTED ANESTH PROC	1	$140
1616218	COS -INTENSIVIST LV 2 NP	1	$606
Grand Total		**255**	**$68,334**

High prevalence of respiratory disease for BHB patients.

Input/Advice from CoP Discussions:

Establish a Pulmonary Clinic. No central control of current pulmonary services provided – fragmented services, delivered expensively. Patients fall through the cracks, and present as super-users to the ED. (Tenuous relationship between hospital and GPs). For services that are presently offered (e.g., pulmonary function tests), there are lengthy wait lists. Identified as possible rapid response clinic to support admission avoidance and secondary prevention.

Opportunity to strengthen asthma services. We should be hub... spokes are speciality services, primary health, primary care. BHB should have leadership role in helping to elevate the quality of asthma care.

Efficiency of referrals to the clinic needs to be improved and need greater capacity in the clinic to help with self-management of asthma patients.

Better marketing of chronic disease services (e.g., Open Airways) to both GPs and the public, so people are aware of service offering.

There are no other areas/pulmonary services in the community to provide asthma care … Open Airways and school asthma nurse only. Nurse led, and clinic led… there is no pulmonary functions lab.

There could be a community based hub… but the capacity of the community to be the hub may be limited; This is too important for the hospital to not ensure that we build a service that is currently more resilient than it is.

Dynamic smoking cessation is required (quick smart runs through MWI). Smoking cessation shared responsibility between Dept. of health and BHB.

Related Research Evidence or Clinical Standards:

J Asthma. 2017 Aug 30:0. doi: 10.1080/02770903.2017.1369989. [Epub ahead of print]

Reducing Emergency Department Visits Utilizing a Primary Care Asthma Specialty Clinic in a High-Risk Patient Population.

Snyder DA, Thomas OW, Gleeson SP, Stukus DR, Jones LM, et al.

OBJECTIVE: Asthma is a leading cause of pediatric emergency department(ED) use. Optimizing asthma outcomes is a goal of Nationwide Children's Hospital(NCH) and its affiliated Accountable Care Organization. NCH's Primary Care Network, comprised of 12 offices serving a predominantly Medicaid population, sought to determine whether an Asthma Specialty Clinic (ASC) operated within a single primary care office could reduce ED asthma rates and improve quality measures, relative to all other network offices.

METHODS: An ASC was piloted with four components: patient monitoring, provider continuity, standardized assessment, and multi-disciplinary education. A registry was established to contact patients at recommended intervals. At extended-length visits, a general pediatrician evaluated patients and a multi-disciplinary team provided education. Novel educational tools, were utilized, guideline-based templates recorded, and spirometry obtained. ED asthma rate, spirometry utilization, and controller fills by intervention office patients were compared to all other network offices before and after ASC initiation.

RESULTS: At baseline, asthma ED visits by intervention and usual care populations were similar ($p = 0.43$). After, rates were significantly lower for intervention office patients versus usual care office patients ($p < 0.001$), declining in the intervention population by 26.2%, 25.2% and 31.8% in 2013, 2014,

and 2015, respectively, from 2012 baseline, versus increases of 3.8%, 16.2%, and 9.5% in the usual care population. Spirometry completion, controller fills, and patients with favorable Asthma Medication Ratios significantly increased for intervention office patient relative to the usual care population.

CONCLUSIONS: A primary care-based asthma clinic was associated with a significant and sustainable reduction in ED utilization versus usual care. What's new: This study describes a comprehensive, multi-disciplinary and innovative model for an asthma management program within the medical home that demonstrated a significant reduction in emergency department visits, an increase in spirometry utilization and an increase in controller fills in a high-risk asthma population versus comparison group.

Am J Manag Care. 2017 Jul 1;23(7):e231-e237.

Adaptation of an asthma management program to a small clinic.

Kwong KY, Redjal N, Scott L, Li M, Thobani S, Yang B.

OBJECTIVES: Asthma management programs, such as the Breathmobile program, have been extremely effective in reducing asthma morbidity and increasing disease control; however, their high start-up costs may preclude their implementation in smaller health systems. In this study, we extended validated asthma disease management principles from the Breathmobile program to a smaller clinic system utilizing existing resources and compared clinical outcomes.

STUDY DESIGN: Cox-regression analyses were conducted to determine the cumulative probability that a new patient entering the program would achieve improved clinical control of asthma with each subsequent visit to the program.

METHODS: A weekly asthma disease management clinic was initiated in an existing multi-specialty pediatric clinic in collaboration with the Breathmobile program. Existing nursing staff was utilized in conjunction with an asthma specialist provider. Patients were referred from a regional healthcare maintenance organization and patients were evaluated and treated every 2 months. Reduction in emergency department (ED) visits and hospitalizations, and improvements in asthma control were assessed at the end of 1 year.

RESULTS: A total of 116 patients were enrolled over a period of 1 year. Mean patient age was 6.4 years at the time of their first visit. Patient ethnicity was self-described predominantly as Hispanic or African American. Initial asthma severity for most patients, classified in accordance with national guidelines, was "moderate persistent." After 1 year of enrollment, there was a 69% and 92% reduction in ED/urgent care visits and hospitalizations, respectively, compared with the year before enrollment. Up to 70% of patients achieved asthma control by the third visit. Thirty-six different patients were seen during 1 year for a total of $15,938.70 in contracted reimbursements.

CONCLUSIONS: A large-scale successful asthma management program can be adapted to a stationary clinic system and achieve comparable results.

Community of Practice Advice:

The BHB Clinical Services Plan will support increased access and coordination of CDM services forBermuda residents with (or with risk of acquiring) respiratory disease. BHB will play a leadership role as the provider of acute respiratory care, with some responsibility for direct CDM service through the DREAM Centre but planned in conjunction with external partners. The Clinical Services Plan projections of future service needs will assume no impact of expanded services on needs for respiratory care by 2020, but a small mitigation of growth in need for care by 2025.

Anticipated Benefits:

Promote better self-management of asthma and COPD and improve patient quality of life and outcomes. Over time, should reduce need to hospital care for patients with respiratory disease.

Other Considerations:

Important to engage and coordinate provision of CDM with primary care providers as partners rather than competitors.

Metabolic and Diabetes CDM

Relevant Communities of Practice: CDM, Medicine

Description of Service/Initiative:

The DREAM Centre is directed and staffed by accredited nurses, dietitians and a specialist physician. We offer a variety of educational programmes to meet individual needs. Offers one-on-one appointments and 12-hour courses in an interactive classroom setting. The DREAM Centre collaborates with other programmes, such as:

- The Successful Schools Programme, which has removed junk food and soda machines from schools and is working to restore physical education programmes that have been cut.
- Community screenings and talks: Staff are available to participate in community events and to present health talks.
- Continuing medical education (CME) to keep community physicians up to date on Type 2 diabetes prevalence, prevention and treatment.
- Clinical trials – The DREAM Centre is a recruitment resource for ongoing international research trials.

Incorporate identification of patients with diabetes and referral to the Diabetes Centre in ED and inpatient care paths. Expand capacity and services available via Diabetes Centre (e.g. foot care).

Relevant Background Data:

High prevalence of diabetes among Bermuda population.

In 2016/17, there were 708 distinct individuals recorded as having a non-physician service from the Diabetes Centre.

2016/17 Visits and Patients for Diabetes Centre – BHB Charges

Outpatient Service	Charges	Individuals	Charges per Person
Diabetes Centre	4,019	708	5.7

There were also 2,598 visits to BHB outpatient clinics (i.e. not just the Diabetes Centre) for physician services by patients with a diabetes diagnosis.

2016/17 Outpatient Visits and Physician Charges – Patients with Diabetes Diagnosis

Charge Number	Charge Description	Visits	Total Charges
1616143	COS -HOSPITALIST LV 2 EP	842	$150,480
1607076	ENDOCRINOLOGIST OV LV3 EP	421	$120,253
1607084	ENDOCRINOLOGIST OV LV4 EP	272	$87,480
1607068	ENDOCRINOLOGIST OV LV2 EP	95	$9,785
1607183	ENDOC OFFICE CONSULT MOD COMPLEX	92	$39,468
1616150	COS -HOSPITALIST LV 3 EP	66	$16,576
1607050	ENDOCRINOLOGIST OV LV1 EP	65	$3,510
1607167	ENDOC OFFICE CONSULT MINOR	53	$7,685
1616242	COS -INTENSIVIST LV 2 EP	47	$14,760
1730233	INTERNIST HOSP CONSLT MOD COMPLX	47	$33,229
1607043	ENDOCRINOLOGIST OV LV5 NP	41	$38,335
1616127	COS -HOSPITALIST LV 3 NP	40	$14,640
1616135	COS -HOSPITALIST LV 1 EP	34	$3,136
1607035	ENDOCRINOLOGIST OV LV4 NP	30	$15,750
1607191	ENDOC OFFICE CONSULT HIGH COMPLEX	24	$16,584
1740133	NEPHROLOLOGIST HV LV1 EP	23	$5,428
1616119	COS -HOSPITALIST LV 2 NP	22	$7,260
1730241	INTERNIST HOSP CONSLT HIGH COMPLX	21	$21,525
1604438	ANEST COMPLICATED BY ER	21	$1,785
1710490	CARD TTE W/O DOPPLER COMPLETE	19	$6,392
1607027	ENDOCRINOLOGIST OV LV3 NP	18	$7,506
1604396	ANEST C CARE 1ST HOUR	16	$17,040
1607092	ENDOCRINOLOGIST OV LV5 EP	16	$9,968
All Other Charges		273	$117,897
Grand Total		2,598	$766,472

Input/Advice from CoP Discussions:

Comprehensive diabetes prevention is needed --primary care system not adequate to meet this demand: Current primary care practice model and remuneration does not facilitate the provision of comprehensive care only have 15 minutes per patient. Also need a more robust IT system to allow for audits of diabetes care provided in primary care (e.g., regular assessment of HbA1C, foot checks, etc.) and consider linking to compensation to incent compliance – like programs in other countries.

Need foot clinic, need eye screening service (this has not worked in the past for operational reasons) ... these are current gaps that need to be addressed.

Community service in endocrine will be opening shortly. BHB needs to run endocrine service within the hospital…will be parallel in quality (strong community service and strong hospital service). Hospital needs to set health standards, be a "safe" place to be, and we cannot ask others to prevent chronic disease if we are not promoting health.

Challenge – was established to be a MDT clinic, but we have never had a podiatrist (challenge was a billing issue). Suggestion: Cross train a nurse to function as a podiatrist? Challenge with proposed solution: legislative issue. Big issue is offloading (lack skill and expertise), would be enhanced with a podiatrist.

Diabetes Inpatient complication screening data collected at department level from 2007-2012 at KEMH and submitted in the Diabetes Centre annual report showed that 65% of patients had never had any diabetes education.

All Diabetes Centre services are covered 100% by all insurances (including HIP and future care)

Opportunities for expansion of services:

- Telephone consultations
- Skype appointments (will help for those who cannot leave work, difficulty in attending the Centre from home…. mobility issues/transportation issues
- Consider the possibility of self-referral to the Diabetes Centre
- Technology development (Health apps)
- Expansion of psychologist services – Many people struggle to deal with chronic disease (which can include multiple co morbidities). It often leads to increased stress levels which further impacts on their quality of life and leads to further complications developing
- Services of a social worker
- Pressure Point (re introduction)
- Smoking Cessation (Advertise)
- Shuttle service from the hospital (needs to be expanded)
- Bus service is limited and needs to be expanded

Primary care considerations re Diabetes Centre and diabetes education – once referred to the Centre, they don't return to the primary care physician for diabetes care. Need to keep primary care doctor in the loop – go back to the physician. Electronic health record could that help bring them back to PCP

So much duplication (if not in triplicate). Part of this is the funding model (no co-pay with the clinic). Example of the nebulizer provided by primary care provider: PCP does not get reimbursed, but ED visit is free to patient and reimbursed.

Related Research Evidence or Clinical Standards:

BMC Health Serv Res. 2017 Aug 7;17(1):533. doi: 10.1186/s12913-017-2486-7.

A combination of process of care and clinical target among type 2 diabetes mellitus patients in general medical clinics and specialist diabetes clinics at hospital levels.

Sieng S, Hurst C.

BACKGROUND: This study compares a combination of processes of care and clinical targets among patients with type 2 diabetes mellitus (T2DM) between specialist diabetes clinics (SDCs) and general medical clinics (GMCs), and how differences between these two types of clinics differ with hospital type (community, provincial and regional).

METHODS: Type 2 diabetes mellitus patient medical records were collected from 595 hospitals (499 community, 70 provincial, 26 regional) in Thailand between April 1 to June 30, 2012 resulting in a cross-sectional sample of 26,860 patients. Generalized linear mixed modeling was conducted to examine associations between clinic type and quality of care. The outcome variables of interest were split into clinical targets and process of care. A subsequent subgroup analysis was conducted to examine if the nature of clinical target and process of care differences between GMCs and SDCs varied with hospital type (regional, provincial, community).

RESULTS: Regardless of the types of hospitals (regional, provincial, or community) patients attending SDCs were considerably more likely to have eye and foot exam. In terms of larger hospitals (regional and provincial) patients attending SDCs were more likely to achieve HbA1c exam, All FACE exam, BP target, and the Num7Q. Interestingly, SDCs performed better than GMCs at only provincial hospitals for LDL-C target and the All7Q. Finally, patients with T2DM who attended community hospital-GMCs had a better chance of achieving the blood pressure target than patients who attended community hospital-SDCs.

CONCLUSIONS: Specialized diabetes clinics outperform general medical clinics for both regional and provincial hospitals for all quality of care indicators and the number of quality of care indicators achieved was never lower. However, this better performance of SDC was not observed in community hospital. Indeed, GMCs outperformed SDCs for some quality of care indicators in the community level setting.

Community of Practice Advice:

The BHB Clinical Services Plan will support increased access and coordination of CDM services for Bermuda residents with (or with risk of acquiring) diabetes. BHB plays a leadership role as provider of acute diabetes care, and a provider of diabetes management care through the DREAM Centre, with some responsibility for direct service, but planned in conjunction with external partners. The Clinical

Services Plan projections of future service needs will assume no impact of expanded services on needs for diabetes care by 2020, but a small mitigation of growth in need for care by 2025.

Anticipated Benefits:

Promote better self-management of diabetes and improve patient quality of life and outcomes. Over time, should reduce need to hospital care for patients with diabetes (and sequelae).

Other Considerations:

Important to engage and coordinate provision of CDM with primary care providers as partners rather than competitors.

Cardiology and Hypertension Clinic

Relevant Communities of Practice: CDM, Medicine, Emergency

Description of Service/Initiative:

Ambulatory clinic for patients requiring diagnosis, treatment and/or management of high blood pressure. Patients with very low blood pressure may also seen at the clinic.

Relevant Background Data:

Hypertension reported as highest prevalence disease for BHB patients.

Input/Advice from CoP Discussions:

Improve the management of hypertension – currently a gap in the system. Many patients do not have regular blood pressure checks, and are unaware of their high blood pressure. Suggestion to resume offering the "Pressure Point" clinic (was a valuable clinic, but closed due to lack of referrals)

BHB currently only provider of in house care (community cardiologists won't come to hospital) and we do. There is a strength of cardiology services in the community, but BHB could act as a hub to the community spokes… being informal leader, engaging community cardiologists and ensuring that we drive quality across Bermuda.

BHB needs to enhance collaboration with "spoke" cardiology centres. Would be good to connect with the 3-4 cardiology centres on island (has been a lost relationship with these centres).

Related Research Evidence or Clinical Standards:

Curr Hypertens Rep. 2016 Jun;18(6):50. doi: 10.1007/s11906-016-0654-5.

Public Health, Hypertension, and the Emergency Department.

Brody A, Janke A, Sharma V, Levy P.

Hypertension (HTN) is the most common cardiovascular disease worldwide and is associated with severe long-term morbidity when not treated appropriately. Despite this, blood pressure (BP) control remains suboptimal, particularly among underserved populations and those who rely on emergency departments (EDs) as a source of primary care. ED providers encounter patients with severely elevated BP daily, and yet adherence to minimal standards of BP reassessment and referral to outpatient medical care, as recommended by the American College of Emergency Physicians, is limited. Barriers such as provider knowledge deficits, resource constraints, and negative attitudes towards patients who utilize EDs for nonurgent complaints are compounded by perceptions of HTN as a condition that can only be addressed in a primary care setting to contribute to this. Efforts to reduce this gap must go beyond government mandates to address systemic issues including access to care and payment models to encourage health promotion. Additionally, individual physician behavior can be shifted through targeted education, financial incentives, and the accumulation of high-quality evidence to encourage more proactive approaches to the management of uncontrolled HTN in the ED.

Acad Emerg Med. 2008 Jun;15(6):529-36. doi: 10.1111/j.1553-2712.2008.00132.x.

Untreated hypertension and the emergency department: a chance to intervene?

Umscheid CA, Maguire MG, Pines JM, Everett WW, Baren JM, Townsend RR, Mines D, Szyld D, Gross R.

OBJECTIVES: Untreated hypertension (HTN) is a major public health problem. Screening for untreated HTN in the emergency department (ED) may lead to appropriate treatment of more patients. The authors investigated the accuracy of identifying HTN in the ED, the proportion of ED patients with untreated HTN, patient characteristics predicting untreated HTN, and provider documentation of untreated HTN.

METHODS: The authors performed a retrospective cross-sectional study on a random sample of 2,061 adults treated at an urban academic ED. The validity of six candidate definitions of HTN in the ED was assessed in a subsample using outpatient clinic records as the reference standard. "Untreated HTN" was HTN without a HTN medication listed in the ED history. "Documentation of untreated HTN was documentation of HTN as a visit problem, specific referral for HTN, or ED discharge with a HTN" information sheet or a HTN medication. Multivariable logistic regression was used to determine associations.

RESULTS: The preferred definition of HTN in the ED had sensitivity of 86% (95% confidence interval [CI] = 80% to 90%), specificity of 78% (95% CI = 69% to 85%), and accuracy of 83% (95% CI = 78% to 87%). Of the 42% (95% CI = 40% to 44%) of ED patients with HTN, 43% (95% CI = 39% to 46%) had untreated HTN. Patients who were younger and male, without primary care physicians, with fewer prior ED visits, and without cardiovascular comorbidities, had higher odds of untreated HTN. Of those with untreated HTN, 8% (95% CI = 5% to 11%) had their untreated HTN documented.

CONCLUSIONS: Untreated HTN was common in the ED but rarely documented. Providers can use ED blood pressures along with patient characteristics to identify those with untreated HTN for referral to primary care.

Pulm Circ. 2017 Aug 22:2045893217726063. doi: 10.1177/2045893217726063. [Epub ahead of print]

Multispecialty pulmonary hypertension clinic in the VA.

Jankowich M, Hebel R, Jantz J, Abbasi S, Choudhary G.

Pulmonary hypertension (PH) is often associated with cardiopulmonary co-morbidities, especially in older adults. A multispecialty approach to suspected PH is recommended, but there are few data on adherence to guidelines or outcomes in such patients. This was a single-center retrospective study of consecutively evaluated Veteran patients with suspected PH evaluated in a multispecialty PH clinic at a Veterans Affairs Medical Center, evaluating clinical characteristics, workup outcomes, and prognosis. The referral population (n = 125) was older (mean ± SD age = 73.6 ± 9.8 years) with frequent co-morbidities (e.g. COPD 60%) and obesity (mean ± SD BMI = 32.8 ± 8.1 kg/m(2)). Of 94 patients undergoing right heart catheterization (RHC), 73 (78%) had confirmed PH (mean pulmonary artery pressure ≥ 25 mmHg). PH was associated with higher BMIs (odds ratio [95% CI] for PH per 1 unit increase = 1.10 [1.02-1.19]) and brachial pulse pressures (odds ratio per 1 mmHg increase = 1.07 [1.02-1.13]).

Seventy out of 73 were classifiable by WHO PH groupings. Most patients underwent guideline-recommended PH evaluation. Observed one-year mortality was high (17.8%); the one-year hospitalization rate was 34.2%. These results compare favorably to observations from the VA Clinical Assessment, Reporting, and Tracking cohort of Veterans with PH by RHC (19.1% and 60.9% one-year mortality and hospitalization rates, respectively). Multispecialty PH clinic evaluation revealed a high prevalence of co-morbidities in veterans with suspected PH; PH was prevalent in this referral population. PH patients had significant morbidity and mortality, but supportive care measures improved following PH evaluation. Further prospective randomized study is needed to determine if a multispecialty clinic approach improves PH morbidity and mortality in veterans.

Community of Practice Advice:

BHB should (re)establish a hypertension clinic. The BHB Clinical Services Plan will not estimate any impact of such a service on needs for BHB hospital services by 2020, but will assume that there may be a mitigation of need for hypertension associated cardiology care by 2025.

Anticipated Benefits:

Reduction in patient morbidity and mortality, and reduction in needs for hospital care.

Other Considerations:

BHB will need to improve communications and partnerships with other providers, such as community cardiology providers and primary care physicians.

Nephrology and Dialysis

Relevant Communities of Practice: Chronic Disease Management

Description of Service/Initiative:

The Dr. Beresford Swan Dialysis Unit is a specialised provider of hemodialysis and peritoneal dialysis services to patients with kidney disease, including patients suffering from chronic kidney failure.

A dedicated clinical dietitian is assigned to work with those who receive dialysis. The Dialysis team also treats patients in the Intensive Care Unit.

The Clinical Services Plan needs to consider the relative role of BHB and community partners in the provision of dialysis services in the future.

Relevant Background Data:

2016/17 BHB Dialysis Patients and Visits

Outpatient Service	Charges	Individuals	Charges per Person
Renal Dialysis	23,754	187	127.0
Peritoneal Dialysis	118	17	6.9
Grand Total	23,872	198	120.6

Royal Gazette "Dialysis patients triple in a decade" Published Mar 19, 2015.

(The previous) Health Minister Jeanne Atherden told MPs: "The issues surrounding chronic disease management, in particular diabetes, continue to put enormous strain on the Bermuda Hospitals Board. Dialysis services are projected to grow and, on the hospital's current best estimates, at a rate of 9 per cent by the end of the current fiscal year and by up to a further 10 per cent in the year 2015. The Bermuda Hospitals Board is entitled to be paid fairly for all the services which it properly provides, but it has continued to provide care even when payment has not been possible, and this impacts its revenues. On many occasions during the last year, the Bermuda Hospitals Board has also provided skills and experience, facilities and equipment, to assist with national issues at no charge, and it will continue to fulfil this public commitment. But to do so, the Bermuda Hospitals Board has to carefully manage its resources to ensure that its core mandate of providing acute care services is not endangered. In short, choices have to be made and if the funds are not there, these additional "free of charge" services will no longer be able to be provided."

Bermuda Home Dialysis Service (BHDS) offers peritoneal dialysis, a procedure that patients can perform on themselves and at home — often scheduling the daily procedure to run while they are asleep.

Input/Advice from CoP Discussions:

BHB must provide dialysis as an essential service for inpatients. But BHB will not be the sole provider of dialysis services in Bermuda. BHB, as the hub of nephrology care on the Island should have the role of establishment of quality standards for nephrology care.

BHB should partner with BHDS to promote expansion of home dialysis, where clinically appropriate, in accordance to accepted quality standards. As opportunities arise to support satellite haemodialysis services away from the KEMH site, BHB should work with potential partners to establish high quality community based services close to where patients live.

Peritoneal dialysis should be initiated before haemodialysis while patients still have residual renal function (stage 5) and this should be coordinated between BHB and community service providers (i.e. BHB should continue to provide both haemodialysis and peritoneal dialysis).

Adding one more transplant coordinator could increase the number of people who can be transplanted (estimated that 25% of the current population could be transplanted and come out of dialysis).

Disagreement about screening… may not be cost effective to screen whole population.

Related Research Evidence or Clinical Standards:

Clin J Am Soc Nephrol. 2011 Feb;6(2):447-56. doi: 10.2215/CJN.07920910. Epub 2010 Nov 29.

Peritoneal dialysis first: rationale.

Chaudhary K, Sangha H, Khanna R.

The use of peritoneal dialysis (PD) has become wide spread since the introduction of continuous ambulatory PD more than 25 years ago. Over this time, many advances have been made and PD is an alternative to hemodialysis (HD), with excellent comparable survival, lower cost, and improved quality of life. The percentage of prevalent PD patients in the United States is approximately 7%, which is significantly lower compared with the 15% PD prevalence from the mid-1980s.

Despite comparable survival of HD and PD and improved PD technique survival over the last few years, the percentage of patients performing PD in the United States has declined. The increased numbers of in-center HD units, physician comfort with the modality, perceived superiority of HD, and reimbursement incentives have all contributed to the underutilization of PD. In addition to a higher transplantation rate among patients treated with PD in the United States, an important reason for the low PD prevalence is the transfer to HD. There are various reasons for the transfer (e.g., episodes of peritonitis, membrane failure, patient fatigue, etc.).

This review discusses the various factors that contribute to PD underutilization and the rationale and strategies to implement "PD first" and how to maintain it. The PD first concept implies that when feasible, PD should be offered as the first dialysis modality. This concept of PD first and HD second must not be seen as a competition between therapies, but rather that they are complementary, keeping in mind the long-term goals for the patient.

Kidney Dis (Basel). 2015 Dec;1(3):157-64. doi: 10.1159/000437286. Epub 2015 Sep 3.

Peritoneal Dialysis in Western Countries.

Struijk DG.

BACKGROUND: Peritoneal dialysis (PD) for the treatment of end-stage renal failure was introduced in the 1960s. Nowadays it has evolved to an established therapy that is complementary to hemodialysis (HD), representing 11% of all patients treated worldwide with dialysis. Despite good clinical outcomes and similar results in patient survival between PD and HD, the penetration of PD is decreasing in the Western world.

SUMMARY: First the major events in the history of the development of PD are described. Then important insights into the physiology of peritoneal transport are discussed and linked to the changes in time observed in biopsies of the peritoneal membrane. Furthermore, the developments in peritoneal access, more biocompatible dialysate solutions, automated PD at home, the establishment of parameters for dialysis adequacy and strategies to prevent infectious complications are mentioned. Finally, non-medical issues responsible for the declining penetration in the Western world are analyzed.

KEY MESSAGES: Only after introduction of the concept of continuous ambulatory PD by Moncrief and Popovich has this treatment evolved in time to a renal replacement therapy. Of all structures present in the peritoneal membrane, the capillary endothelium offers the rate-limiting hindrance for solute and water transport for the diffusive and convective transport of solutes and osmosis. The functional and anatomical changes in the peritoneal membrane in time can be monitored by the peritoneal equilibrium test. Peritonitis incidence decreased by introduction of the Y-set and prophylaxis using mupirocin on the exit site. The decrease in the proportion of patients treated with PD in the Western world can be explained by non-medical issues such as inadequate pre-dialysis patient education, physician experience and training, ease of HD initiation, overcapacity of in-center HD, lack of adequate infrastructure for PD treatment, costs and reimbursement issues of the treatment.

FACTS FROM EAST AND WEST: (1) PD is cheaper than HD and provides a better quality of life worldwide, but its prevalence is significantly lower than that of HD in all countries, with the exception of Hong Kong. Allowing reimbursement of PD but not HD has permitted to increase the use of PD over HD in many Asian countries like Hong Kong, Vietnam, Taiwan, Thailand, as well as in New Zealand and Australia over the last years. In the Western world, however, HD is still promoted, and the proportion of patients treated with PD decreases. Japan remains an exception in Asia where PD penetration is very low. Lack of adequate education of practitioners and information of patients might as well be reasons for the low penetration of PD in both the East and West. (2) Patient survival of PD varies between and within countries but is globally similar to HD. (3) Peritonitis remains the main cause of morbidity in PD patients. South Asian countries face specific issues such as high tuberculosis and mycobacterial infections, which are rare in developed Asian and Western countries. The infection rate is affected by climatic and socio-economic factors and is higher in hot, humid and rural areas. (4) Nevertheless, the promotion of a PD-first policy might be beneficial particularly for remote populations in emerging countries where the end-stage renal disease rate is increasing dramatically.

Adv Perit Dial. 2012;28:102-5.

Urgent-start peritoneal dialysis: report from a U.S. private nephrology practice.

Casaretto A, Rosario R, Kotzker WR, Pagan-Rosario Y, Groenhoff C, Guest S.

Urgent-start peritoneal dialysis (PD) can be defined as initiation of PD within 2 weeks of catheter insertion. Urgent-start PD can be offered to patients who are referred late to a nephrologist and who would typically be initiated on hemodialysis with a temporary vascular access. An urgent-start PD capability requires expedited options education, catheter placement, unique change in the PD unit infrastructure, and new processes of care. This report describes the urgent-start PD program established by a nephrology private practice in the United States. Operational aspects of the program and initial clinical results are described.

Editorial Group: Cochrane Kidney and Transplant Group, First published: 18 October 2004

Continuous ambulatory peritoneal dialysis (CAPD) versus hospital or home haemodialysis for end-stage renal disease in adults

Luke Vale, June D Cody, Sheila A Wallace, Conal Daly, Marion K Campbell, Adrian M Grant, Izhar Khan, Alison M MacLeod

Background

Renal replacement therapy (RRT) with dialysis and transplantation is the only means of sustaining life for patients with end-stage kidney disease (ESKD). Although transplantation is the treatment of choice, the number of donor kidneys are limited, and transplants may fail. Hence many patients require long-term or even life-long dialysis. Continuous ambulatory peritoneal dialysis (CAPD) is an alternative to hospital or home haemodialysis for patients with ESKD.

Objectives

To assess the benefits and harms of CAPD versus hospital or home haemodialysis for adults with ESKD.

Search methods

We searched the Cochrane Central Register of Controlled Trials (CENTRAL in The Cochrane Library Issue 12, 2011), the Cochrane Renal Group's specialised register (12 January 2012), MEDLINE (1966 to May 2002), EMBASE (1980 to May 2002), BIOSIS, CINAHL, SIGLE and NRR without language restriction. Reference lists of retrieved articles and conference proceedings were searched and known investigators and biomedical companies were contacted.

Selection criteria

Randomised controlled trials (RCTs) or quasi-RCTs comparing CAPD to hospital or home haemodialysis for adults with ESKD were to be included.

Data collection and analysis

Two authors independently assess the methodological quality of studies. Data was abstracted from included studies onto a standard form by one author and checked by another. Statistical analyses were

performed using the random-effects model and the results expressed as risk ratio (RR) for dichotomous outcomes and mean difference (MD) for continuous outcomes with 95% confidence intervals (CI).

Main results

One trial, reported in abstract form only, was located in the most recent search. There was no statistical difference in death or quality adjusted life years score at two years between peritoneal dialysis or haemodialysis patients.

Authors' conclusions

There is Insufficient data to allow conclusions to be drawn about the relative effectiveness of CAPD compared with hospital or home haemodialysis for adults with ESKD. Efforts should be made to start and complete adequately powered RCTs, which compare the different dialysis modalities.

Community of Practice Advice:

The BHB Clinical Services Plan should assume that BHB will provide both haemodialysis and peritoneal dialysis.

Anticipated Benefits:

Dialysis is a life-saving intervention, and expanded capacity on the island will be necessary to respond to increasing population needs.

Diagnostic and Allied Health

Interventional Radiology

Relevant Communities of Practice: Diagnostic and Technical Support Services

Description of Service/Initiative:

At present, interventional radiology is not routinely offered by BHB. As a result, a number of interventional procedures have been suggested for possible inclusion in the clinical services plan.

There are a variety of interventional procedures that may be considered; interventional techniques allow for minimally invasive procedures that utilize imaging and catheterization to diagnose and treat (predominantly) vascular diseases. The major interventional specialities are radiology, cardiology and neuroradiology. Interventional radiologists can also perform many nonvascular interventions such as biopsies, liver imaging and biliary system interventions, vascular access, drain insertions, feeding tubes, and a variety of ablative procedures.

The medical CoP did consider the development of an interventional cardiology laboratory and advised against its inclusion in the CSP now; this advice was based predominantly on an anticipated volume of procedures that would be too low to establish a viable programme.

Interventional radiology and cardiology are analogous approaches to diagnoses and treatment with cardiologists focused on the coronary arteries while radiologists focus of the carotid and peripheral arteries.

Input/Advice from CoP Discussions:

The CoP has suggested that an interventional radiology service / laboratory may be a helpful addition to BHB services. The procedures discussed included vascular access, peripheral angiograms & stenting; suggested cardiology procedures included AICD and pacemaker insertions; renal and liver biopsies. No specific activity volumes were identified.

Community of Practice Advice:

The CoP felt that BHB should consider an interventional radiology service. However, since no specific activity volumes were identified in the CoPs where the possibility of an Interventional Radiology Service was discussed, the CSP will make no assumptions about the development of an interventional radiology service at this time.

Anticipated Benefits:

Depending on the specific procedure, Interventional Radiology offers a number of patient advantages: speed of diagnosis, shorter recovery time than open procedures, and can eliminate the need for open and exploratory surgery. These benefits need to be weighed against the risks associated with increased radiation exposure.

Other Considerations:

There are a variety of options and operational considerations associated with the development and implementation of an interventional radiology service; most obviously the specific procedures required to serve the needs of Bermuda. A precise business case will need to be developed.

Cardiac Diagnostics

Relevant Communities of Practice: Diagnostic and Technical Support Services

Description of Service/Initiative:

The **Mary & David Barber Cardiac Diagnostic Unit** at BHB provides tests to help evaluate the cardiac function of adults and, to a limited extent, children. The following tests are available in the unit:

- Electrocardiogram (ECG)
- Echocardiogram (echo)
- Ultrasound
- Exercise (treadmill) stress tests (with and without echocardiogram)
- Holter monitoring
- 24-hour automated blood pressure monitoring

Other devices, such as pacemakers, defibrillators and reveal recorders, even those not installed by the hospital, are monitored within the Cardiac Diagnostic Unit.

Cardiac Rehabilitation Services are offered to patients and their families following a heart attack, heart surgery or coronary angioplasty/stents and heart failure. The main goal of this service is to assist patients in developing a healthy lifestyle plan that includes physical activity, education, stress management, and nutrition counselling.

It has been suggested that the addition of specific cardiac diagnostic services may be a useful addition to the cardiac services provided by BHB.

Relevant Background Data:

Cardiac Related ED Visits

ED Dx Group	14/15	15/16	16/17
AMI	66	95	98
Angina	11	6	6
Atrial Fibrillation and Flutter	124	134	96
Chest Pain	1,019	1,201	1,107
Congestive Heart Failure	278	283	306
Hypertensive Diseases	201	212	145
Other Cardiac Arrhythmias	70	58	56
Other Forms of Heart Disease	170	161	177

ED Dx Group	14/15	15/16	16/17
Syncope/Dizziness	639	697	760
Tachycardia	22	24	21
Grand Total	**2,600**	**2,871**	**2,772**

Input/Advice from CoP Discussions:

The CoP noted that with the projected aging of the Bermuda population the need for cardiac services will increase. The addition of specific cardiac diagnostic services would add to the value of services offered at BHB:

Peripheral Arterial Disease Screening: Individuals most susceptible to developing PAD smoke cigarettes or have diabetes mellitus, high blood pressure, or high cholesterol. The American College of Cardiology/American Heart Association recommends PAD screening with ankle-brachial index (ABI) in patients at increased risk, including adults ≥65 years old, adults ≥50 years old with a history of smoking or diabetes, and adults of any age with exertional leg symptoms or nonhealing wounds.

Long-Term Cardiac Rhythm Monitoring: Heart rhythm disorders (arrhythmias) occur when there is a malfunction in the heart's electrical impulses that coordinate how it beats. Cardiac arrhythmias and symptoms often come and go in a transient manner, and therefore they may be difficult to detect. Cardiac monitors allow detection over a period of time. BHB cardiac diagnostics already provides Holter monitoring designed for short-term use, typically carried by a patient for between 24 hours to 30 days.

Implantable or Insertable Monitors are designed for long-term use and placed just under the skin of the chest during an outpatient procedure. The device detects and records abnormal heart rhythms over long periods of time (up to three years) to help determine whether a patient has an abnormal heart rhythm.

Cardiac Computed Tomography: Cardiac CT uses CT technology with or without intravenous contrast media to image the heart anatomy, coronary circulation, and vessels. CT Angiography (CTA) is a non-invasive imaging technique that can be performed much quicker than a diagnostic cardiac catheterization with potentially less risk and discomfort to the patient, as well as less recovery time. While coronary angiograms remain the standard diagnostic test for heart disease, the development of a cardiac catheterization lab has not been recommended. CTA has been demonstrated to be useful to determine if chest pain is caused by stenosis; however, the specific guidelines for the use of CTA are still under development.

Community of Practice Advice:

The CoP felt that the CSP should include PAD screening, long-term rhythm monitoring and cardiac CT as enhancements to the cardiac diagnostic Unit. The Board of BHB has recently approved long-term rhythm monitoring and cardiac CT.

Bermuda Hospitals Board

Appendix G – Government of Bermuda/BHB LTC Needs Assessment Form

Medical & Nursing Care Needs	Functional Care Needs for ADL's	Level of Care
○ **3 or more chronic fluctuating medical conditions, needing unscheduled medical adjustments** to treatment plan, ○ Mood, memory or behavioral conditions that post **moderate to severe risk to self or others,** ○ Includes **predicted and unpredicted nursing assessments** due to changing conditions, ○ Greater than once **daily pain management,** ○ Skin and wound care for **Stage 3 & 4** complex wounds, ○ IV therapy includes daily infusions, or central line care or TPN, ○ Tube feedings, ○ Isolation precautions for skin and stool antibiotic resistant bacteria, ○ Oxygen, airway, and/or chronic ventilator management, ○ Care planning and coordination	○ **Needs physical assistance or has total dependence** for **3 or more ADL** limitations, ○ **Total dependence** for mobility/positioning self in bed.	○ **Complex Care:** (Complex skilled nursing) Predictable and unpredictable complex care needs. Frequent need for revisions to care plan, treatments or medications. May have 6-8 episodes of health exacerbations/year requiring extra MD visits. **Recommended Minimum Staffing:** RN 24/7 on-site Average total nursing care hours 4 hrs./day/pt. includes RN time of 1.6 hours/day/pt. MD on-site for assessment for admission, monthly for first 3 months and then quarterly as needed for change, transfers. MD on-call 24/7
○ **Complex but stable** chronic medical conditions, needing unscheduled medical adjustments to treatment plan. ○ **Predicted and unpredicted nursing assessments** due to changing conditions, ○ Mood, memory or behavioral conditions that may pose moderate to severe risk to self or others, **easily redirected** ○ **Episodic** pain management ○ Skin and wound care for **Stage 1 & 2** wounds ○ Tube feedings ○ Isolation precautions for skin and stool antibiotic resistant bacteria, ○ Ostomy care, with well-established & intact stoma ○ IV therapy, **episodic or infrequent** ○ Care planning and coordination	○ **Physical assistance or total dependence** for 2 or more ADL, ○ May need cueing or supervision for some ADLs ○ **Total dependence** for mobility/positioning in bed	○ **Intermediate Care:** (Skilled Nursing) Recommended Minimum Staffing: RN on site 24/7 Average total nursing care hours 2.5/day/pt. MD on-site assessment for admission, monthly for first 3 months and then quarterly, as needed for change, transfers. MD on-call 24/7
○ Relatively stabilized (physical or mental) chronic disease, ○ Mild – moderate dementia ○ **Predictable** health assessments ○ **Episodic** nursing for medication management, interventions, assessments or treatments, ○ Simple wound care ○ Elder fragility (more than 85 yrs.) ○ Care planning and coordination	○ Supervision or verbal cueing for ADLS or personal safety ○ Physical assist for mobility ○ Needs assist for IADLs (meal prep, grocery shopping, housekeeping, transport, laundry, etc.)	○ **Personal Care:** Recommended Minimum Staffing: MD on site assessment for admission and then quarterly, or as needed for change, transfers MD on-call 24/7