A Needs-Based Approach to Rehabilitation Capacity Planning

Dr. Matthew Meyer
May 25th, 2018
Outline/Agenda

- Introduction to Capacity Planning
- Capacity Planning in Healthcare
- The RCA’s Needs-Based Approach
What is Capacity Planning?

Systematic determination of resource requirements for the projected output, over a specific period*

The process of determining the capacity needed by an organization to meet changing demands for its products**

(eg. Manufacturing, Digital Networks, Customer Service)

* http://www.businessdictionary.com
** www.wikipedia.com
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Our Capacity Plan should tell us **resource requirements** for the **projected output**, over a **specific period**

Before we start, we need to think about the:
- Goal
- Market
- Demand
The Goal
Market

An actual or nominal place where forces of demand and supply operate, and where buyers and sellers interact (directly or through intermediaries) to trade goods, services, or contracts or instruments, for money or barter *

Eg. Students vs. families; basic vs. gourmet; take-out vs. sit-down, Large city vs. small town

* http://www.businessdictionary.com
The desire for a certain good or service, supported by the capacity to purchase it*

- **Individual vs. Market**: the demand by one consumer, or over a group of consumers
- **Organizational vs. Industry**: the demand for a product from a particular organization vs. the collective demand for products from all organizations in that industry
- **Autonomous vs. Derived**: Is the demand independent, or dependent on other products/services
- **Short-term vs. Long-term**: what time frame is being considered?

* [http://www.businessdictionary.com](http://www.businessdictionary.com)
Segmenting Demand

▲ Understanding variation in demand has huge implications for Capacity Planning

▲ Is the market consistent in their demand?

▲ If they aren’t, how can we meet these demands in a flexible way?
Is our market consistent in their demand?

What happens if we get it wrong?
Once we’ve thought about our goal, our market, and the demand, we should have a better sense of the:

**projected output**, over a **specific period**

We need to think about:

**resource requirements**
**What are Resources?**

**Resource:** An economic or productive factor required to accomplish an activity...and achieve a desired outcome. Three most basic resources are **land, labor, and capital** (others include energy, entrepreneurship, information, expertise, management, and time)\(^1\)
Capacity Planning Considerations

**Design Capacity** – The maximum amount of work an organization is capable of performing over a given period of time.

**Effective Capacity** – The maximum amount of work that an organization is capable of completing in a given period due to constraints such as quality problems, delays, material handling, etc.

**Actual Output** – The actual amount of work an organization produces in a given period of time.
Capacity Planning Considerations

- Design Capacity
- Effective Capacity
- Actual Output
Service Delays: As Utilization increases, so do service delays

http://blog.sflow.com/2013/02/delay-vs-utilization-for-adaptive.html
In the end, we hope to have a capacity plan with specific recommendations for resource requirements such as:

- Land
- Labour
- Capital

It’s not good enough to say... Enough ovens to ensure no one goes hungry or enough staff so that waiting lines are reduced.
Outline/Agenda

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What is Capacity Planning in Healthcare?

World Health Organization Health Planning*:

“the orderly process of defining health problems, identifying unmet needs and surveying the resources to meet them, establishing priority goals that are realistic and feasible, and projecting administrative action, concerned not only with the adequacy, efficacy and efficiency of health services but also with those factors of ecology and of social and individual behaviour that affect the health of the individual and the community”

"Nobody knew health care could be so complicated**.”

What is Capacity Planning in Healthcare?

A framework that guides the distribution of human resources and capital in order to achieve particular system-level goals over time

(Ettelt et al. 2009)
Health planning has developed differently in every health system.

Whoever pays, plans
- Unregulated free-market systems (little planning)
- Private insurance-based systems (providers plan)
- Universal healthcare systems (government plans)

Typically based on **comparative analysis** and associated **policy regulations**

Problem: What is the right amount?
WHO Physicians per 1000 population
A Needs-Based Approach

Traditional Approach:

Number of providers this year = (provider/population) × (population size)

Needs-Based Analytical Framework*:

Number of providers this year = (provider/services) × (services/need) × (needs/population) × (population size)

MOHLTC - Capacity Planning

Capacity planning is the process of addressing capacity gaps by optimizing available and planned resources to address the needs of the population.

How can capacity gaps be addressed?

1. Creating new capacity
2. Optimizing existing capacity
3. Minimizing Needs
Our Capacity Plan should tell us **resource requirements** for the **projected output**, over a **specific period**

Begin with the:
- Goal
- Market
- Demand
The Goal

Image from: http://www.healthcareitnews.com/sponsored-content/solving-healthcare-value-equation-0
All the inhabitants of a particular place
• A particular group or type of people living in a place

Eg. Province vs. LHIN vs. sub-LHIN; Disease specific vs. Needs vs. Risks; Younger vs. Older; High vs. Low Income; Urban vs. rural
WHO Health Need: Objectively determined deficiencies in health that require health care, from promotion to palliation*

Potential Alternative: A Condition or Circumstance where intervention is likely to lead to a meaningful increase in health outcomes

Types of Need

Perceived health needs: the need for health services as experienced by the individual and which he/she is prepared to acknowledge.

Professionally defined health needs: the need for health services as recognized by health professionals from the point of view of the benefit obtainable from advice, preventive measures, management or specific therapy.

Scientifically confirmed health needs: the need confirmed by objective measures of biological, anthropometric or psychological factors, expert opinion or the passage of time; it is generally considered to correspond to those conditions that can be classified in accordance with the International Classification of Diseases.
Segmenting Need

Is the population consistent in their Needs?

What happens if we get it wrong?

Responsiveness

High

Low

Cost

High

Low
Once we’ve thought about our goal, our population, and their needs, we should have a better sense of the:

**projected output**, over a **specific period**

We need to think about:

**resource requirements**
What are Resources?

**Resource:** An economic or productive factor required to accomplish an activity...and achieve a desired outcome. Three most basic resources are **land, labor, and capital** (others include energy, entrepreneurship, information, expertise, management, and time)¹
How do we plan our staffing?

1 FTE = 1950 hrs  
1 FTE – vacation = 1800  
1 FTE – vacation – sick time = 1725  
1 FTE – vacation – charting/indirect time = 1380 (assuming 6hrs direct time/day)  
1 FTE – vacation – charting/indirect time = 920 (assuming 4 hrs direct time/day)
Capacity Planning Considerations

Service Delays: As Utilization increases, so do service delays

https://www.oecd-ilibrary.org/docserver/health_glance-2015-
Capacity Considerations

Response time as a function of Utilization: $m/m/n$

Patients in ALC

Provided by Felipe Rodriguez, PhD (cand) Ivey Business School
In the end, we hope to have a capacity plan with specific recommendations for resource requirements such as:

- Land
- Labour
- Capital

It’s not good enough to say...
Enough ovens to ensure no one goes hungry or enough staff so that waiting lines are reduced

Why is it good enough to say...
Enough staff to provide best-practice care or to reduce ALC
Outline/Agenda

- Introduction to Capacity Planning
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Support LHINs in applying a standardized approach to capacity planning for rehabilitative care.
Focus of work

Support LHINs in applying a standardized approach to capacity planning

- Develop Guiding Principles
- Apply and test the approach using 1 to 2 target populations.
- Summarize overarching recommendations based on the results
- Develop a knowledge-to-action cycle

Develop a simplified approach to rehabilitative care capacity planning
RCA Vision: Patient and system outcomes are optimized through the integration of rehabilitative care at all levels of health services policy, planning and delivery.

Planning Question: How can we optimize patient and system outcomes through the integration of rehabilitative care at all levels of health services policy, planning and delivery?
Guiding Principles:

The RCA Capacity Planning approach will:

• Be built around the evidence-informed rehabilitative care needs of patients/clients
• Seek to optimize the outcomes of patients/clients through emphasis of value-based service provision
• Account for the preferences and choices of patients/clients where possible and reasonable
• Provide opportunity for appropriate contextualization within a given region
• Place emphasis on actionable planning recommendations
What does an Effective Capacity Plan Look Like?

An effective **Capacity Plan** should set **Specific Objectives** for a **Population** related to:

- Human Resources
- Capital
- System-level Goals
Capacity Planning Approach

- **Step 1**: Select and Scope a **Priority Population**
- **Step 2**: Outline the Health **Needs** of the Population
- **Step 3**: Determine the **Resources** Required to Meet the Needs
- **Step 4**: Outline the **Data** required for Capacity Planning
- **Step 5**: Create a Population-Specific **Capacity Plan**
- **Step 6**: **Assess** the Current Capacity
- **Step 7**: Determine **Gaps**
The goal of the **Capacity Planning Canvas** is to provide high-level guidance related to the needs of a population. Ex, to complete a description such as:

<table>
<thead>
<tr>
<th>For every 100,000 residents of your LHIN:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• &lt;&gt; will experience a xxxxx</td>
</tr>
<tr>
<td>• &lt;&gt; will need inpatient care, &lt;&gt; will need outpatient care, &lt;&gt; will need in home care</td>
</tr>
<tr>
<td>• To meet their rehabilitation needs according to best-evidence, you should make available &lt;&gt; hours of PT, &lt;&gt; hours of nursing, &lt;&gt; hours of OT, &lt;&gt; hours of assistant time, &lt;&gt; inpatient rehab bed days, &lt;&gt; outpatient attendances etc.</td>
</tr>
</tbody>
</table>

LHINs where the following factors exist in Higher or Lower levels than the provincial average should plan for **INCREASED** capacity accordingly:

- Resource-Relevant Factor #1
- Resource-Relevant Factor #2
<table>
<thead>
<tr>
<th>Population</th>
<th>Needs</th>
<th>Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What</td>
<td>Where</td>
<td></td>
</tr>
<tr>
<td>When</td>
<td>Why</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Resource-Relevant Factors</th>
<th>Data Requirements</th>
</tr>
</thead>
</table>
Proposed Approach

- System Planners identify priority population
- SME group & System Planners complete “Population” section
- SME group begins “Need” section
- Patient/caregiver group validate and finalize “Need” section
- SME and System Planners complete “Resources” section
- Patient/caregivers validate and/or refine “Resources” section
- All groups co-design final system resources table and canvas
The Setting and Service section of the canvas is supplemented with:

<table>
<thead>
<tr>
<th>Setting</th>
<th>% in Need</th>
<th>Service/Resource</th>
<th>% in Need</th>
<th>Average Recommended Frequency &amp; Duration</th>
<th>Total Direct Resource Time/ Incident Case</th>
<th>Alternate Options &amp; Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute care</td>
<td></td>
<td>Bed</td>
<td></td>
<td>X day LOS</td>
<td>X days</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>PT</td>
<td></td>
<td>X mins, X times/week for X weeks</td>
<td>X hours direct care</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SLP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inpatient Rehab</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Outpatient Clinic</td>
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<td></td>
</tr>
<tr>
<td>In-home</td>
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<td></td>
</tr>
<tr>
<td>Assisted Living</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Long-Term Care</td>
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</tr>
</tbody>
</table>
Achievements to Date

- System Planners identify priority population (Hip Fracture, COPD)
- SME group & System Planners complete “Population” section
- SME group begins “Need” section
### Population

<table>
<thead>
<tr>
<th>Who</th>
<th>Adults ≥18 years with low-energy trauma hip fracture (exclude metastatic disease, MVC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>What</td>
<td>Rehabilitative Care Services According to the RCA Definition*</td>
</tr>
<tr>
<td>Where</td>
<td>Ontario</td>
</tr>
<tr>
<td>When</td>
<td>1) 0-3 months  2) 3-6 months  3) 6-24 months</td>
</tr>
<tr>
<td>Why</td>
<td>Improve Quality of Live, Return to Community, Functional Status</td>
</tr>
</tbody>
</table>

#### Needs

- A. Pain management education (1,2)
- B. Positioning education for comfort relief (1,2)
- C. Pressure Ulcer Prevention(1,2,3)
- D. Fluid Nutrition and Elimination (1,2)
- E. Medication management (1,2,3)
- F. Manage Delirium/Depression/Dementia(1,2,3)
- G. Independence in Self-Care (1,2)
- H. Transfer training (1,2)
- I. Balance, strengthening, gait assessment and training (1,2,3)
- J. Stair training (1,2)
- K. Transitional Care Planning(1,2)
- L. Education on safety and fall prevention (1,2,3)
- M. Environmental modifications (1,2,3)
- N. Osteoporosis management and education (1,2,3)
- O. Transportation (1,2,3)
- P. Caregiver Participation(1,2,3)
- Q. Ongoing exercise program (1,2,3)
- R. Instrumental Activities of Daily Living (1,2,3)
- S. Social Reintegration (1,2,3)
- T. Complex Geriatric Assessment (1)

#### Resources

<table>
<thead>
<tr>
<th>Setting</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

#### Resource-Relevant Factors

- Frailty; Prior living status (home healthy, home complex, LTC); Non-weight bearing; Delirium/Depression/Dementia; Neurological disease affecting neuro-muscular control; Cognitive issues; Pressure sores and wound management; Medication use; Rural/Urban/Remote; Age

#### Data Requirements

- Annual incidence of Adults ≥18 years with low-energy trauma hip fracture; 3 month, 6 month and 2-year survival rates
Next Steps for the Hip Fracture HSSA

- Patient/caregiver group validate and finalize “Need” section
- SME and System Planners complete “Resources” section
- Patient/caregivers validate and/or refine “Resources” section
- Patient/caregivers, SME, and system planners co-design final system resources table and canvas

www.rehabcarealliance.ca
Next Steps for Capacity Planning Initiative

▲ Continue development of the Hip Fracture Capacity Canvas
▲ Begin process for COPD Capacity Canvas
▲ Formalize the Capacity Planning Canvas methodology and approach
Questions/Comments