

Activity Based Costing and Case Mix Measurement

Jason Sutherland, PhD

**THE DARTMOUTH INSTITUTE
FOR HEALTH POLICY & CLINICAL PRACTICE**



Where Knowledge Informs Change



Activity Based Costing and Case Mix Measurement

- What is activity based costing?
 - Linking hospital products to patient care
 - Nursing hours (nursing workload measurement)
 - Laboratory
 - Diagnostic Imaging
 - Etc.
 - Precise knowledge of patient hospitalization costs



Activity Based Costing and Case Mix Measurement

- History of activity based costing in Canada
- Broad acceptance that cost weights for DRG did not represent hospital costs
- Established in 1992 as a joint initiative of the Ontario Hospital Association (OHA) and the Ontario government
- Each participating hospital was required to develop and implement the necessary systems and procedures to comply with the activity based costing standards
- Hospitals began collecting case cost data for acute inpatients on July 1, 1993



Activity Based Costing and Case Mix Measurement

- Mandate of activity based costing program
- Collection of case costing data to support the case mix measurement tools
- Develop a cost database at the patient level with the ability to link to the patient level clinical information
- Maintenance and improvement of case costing methodology
- Facilitate the adoption of case costing methodologies and associated management reporting by the health care community



Activity Based Costing and Case Mix Measurement

- Linking clinical information with detailed costing information

Hip and Knee Primary	Direct Cost	Indirect Cost	Total Cost
Facility A	8,577	2,080	10,657
Facility B	6,738	2,822	9,560
Facility C	7,895	1,558	9,454
Facility D	7,342	2,173	9,514
Facility E	7,463	1,996	9,459
Average Cost	7,518	2,075	9,593

*CMG 352, 354 Hip and Knee - Typical Cases only Fiscal 2002/03, 10th and 90th percentiles removed



Activity Based Costing and Case Mix Measurement

- Direct Cost
 - Hands on patient care departments
 - Inpatient Nursing
 - Medical/Surgical, Intensive Care Units, Operating Rooms
 - Diagnostic and Therapeutic
 - Laboratory, Diagnostic Imaging, Pharmacy, Physiotherapy, Social Work
 - Food Service
 - Inpatient Meals
- Indirect Cost
 - Support Services
 - Administration - Corporate, Finance Human Resources
 - Education and Research



Activity Based Costing and Case Mix Measurement

- Refining the patient costs:

Hip and Knee Primary	
Average Total Cost	
Nursing	3,055
Lab	143
DI	208
Pharmacy	465
Physio	1,074
Food	293
All Other	1,696

*CMG 352, 354 Hip and Knee - Typical Cases only Fiscal 2002/03, 10th and 90th percentiles removed



Activity Based Costing and Case Mix Measurement

- Methods for patient costing:
 - Top Down
 - Also known as Yale Cost Model, or Gross Costing
 - Expenditure divided by activity
 - Bottom Up
 - Also known as Activity Based Costing
 - Individually costing all activities and resources associated with activity
 - Ontario/Canada uses bottom up for acute and ambulatory



Activity Based Costing and Case Mix Measurement

- Top-down method:
- **Advantages:**
 - Straightforward
 - All costs included (complete)
- **Disadvantages:**
 - Allocating costs of non-measured activities by measured activities
 - Allocating costs appropriately across outputs?
 - Lack of sensitivity
 - Expensive drugs or surgical supplies not fully recognized for some patient types



Activity Based Costing and Case Mix Measurement

- Bottom-Up / Activity Base Costing method:
- **Advantages:**
 - Transparent, flexible
 - Literature consensus: More accurate
- **Disadvantages:**
 - Time consuming
 - Incorporating workload measurement systems into daily activities
 - Expensive relative to Top Down

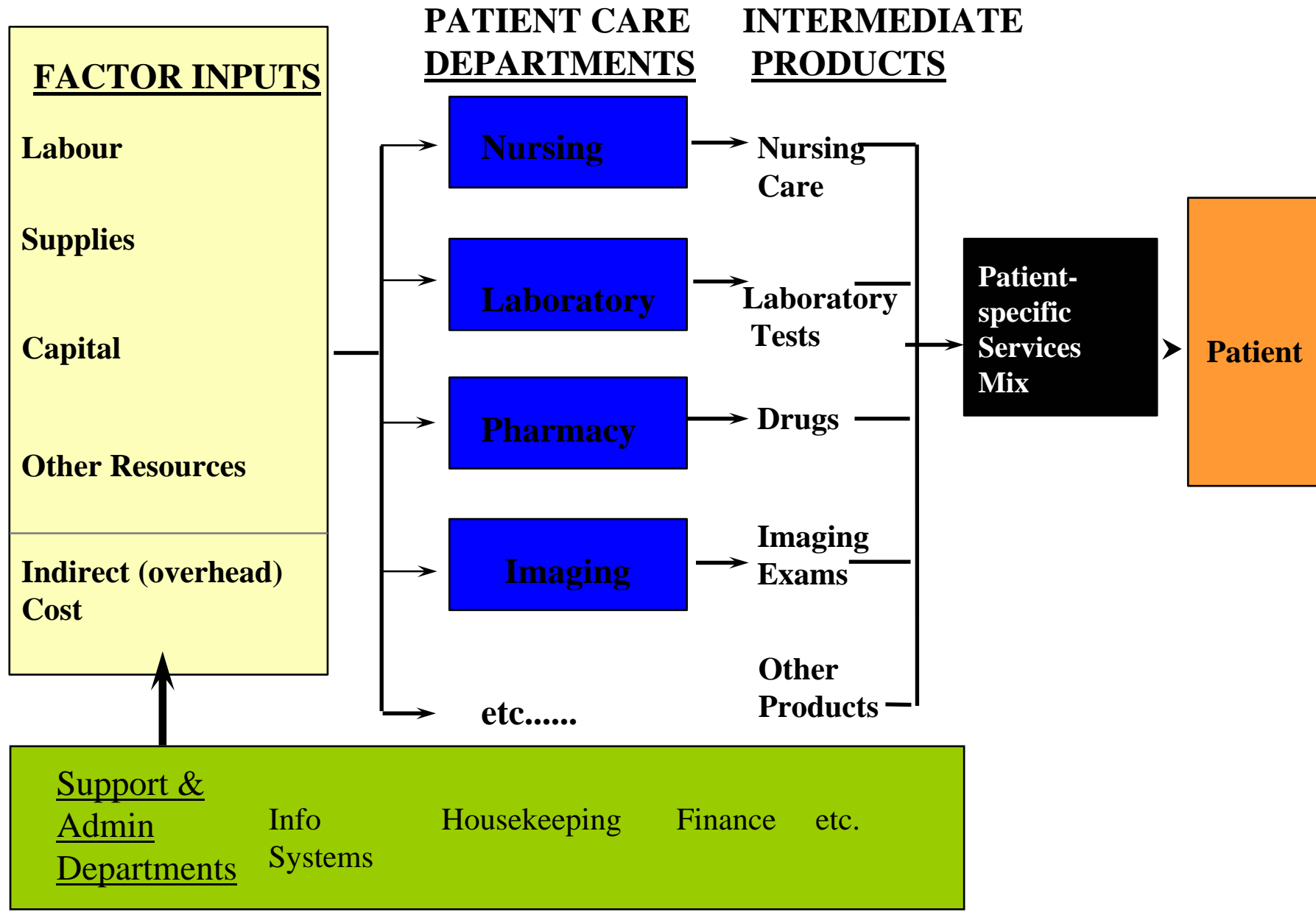


Activity Based Costing and Case Mix Measurement

- Differences in costing methods:

	Top Down	Activity Based Costing
Level of detail	Less Detail	Higher
Accuracy for each Proc/Dx	Less Precise	Higher
Completeness	Comprehensive	May Exclude Elements
Cost	Less Expensive	More Expensive
Time	Easy to implement	Longer

HOSPITAL PRODUCTION MODEL: Departmental View





Activity Based Costing and Case Mix Measurement

- Methodological Standards:
 - A standard framework for the collection of financial and statistical data
 - Departments are called 'Functional Centers'
 - National standards for workload measurement
 - Comparability between hospitals
 - Allow for the comparability between health care sectors



Activity Based Costing and Case Mix Measurement

- Nursing Inpatient Medical

- Diagnostic Imaging
 - Ultrasound

- Clinical Labs
 - Clinical Chemistry
 - Urinalysis

- Pharmacy

Function Center Level					
	3	4	5	Direct	Indirect
	71210			\$2,100	\$1,300
	71415	30		\$850	\$500
	71410	25	20	\$475	\$320
	71440			\$180	\$95



Activity Based Costing and Case Mix Measurement

Refining the patient costs: Examining Nursing Costs

Patient ID	Service Date	the sum, tot_cost	day2
425	20060110	307.06	1
425	20060111	584.65	2
425	20060112	441.24	3
425	20060113	321.96	4
425	20060114	181.83	5
425	20060115	246.21	6
425	20060116	547.82	7
425	20060117	296.86	8

Cost
per
day

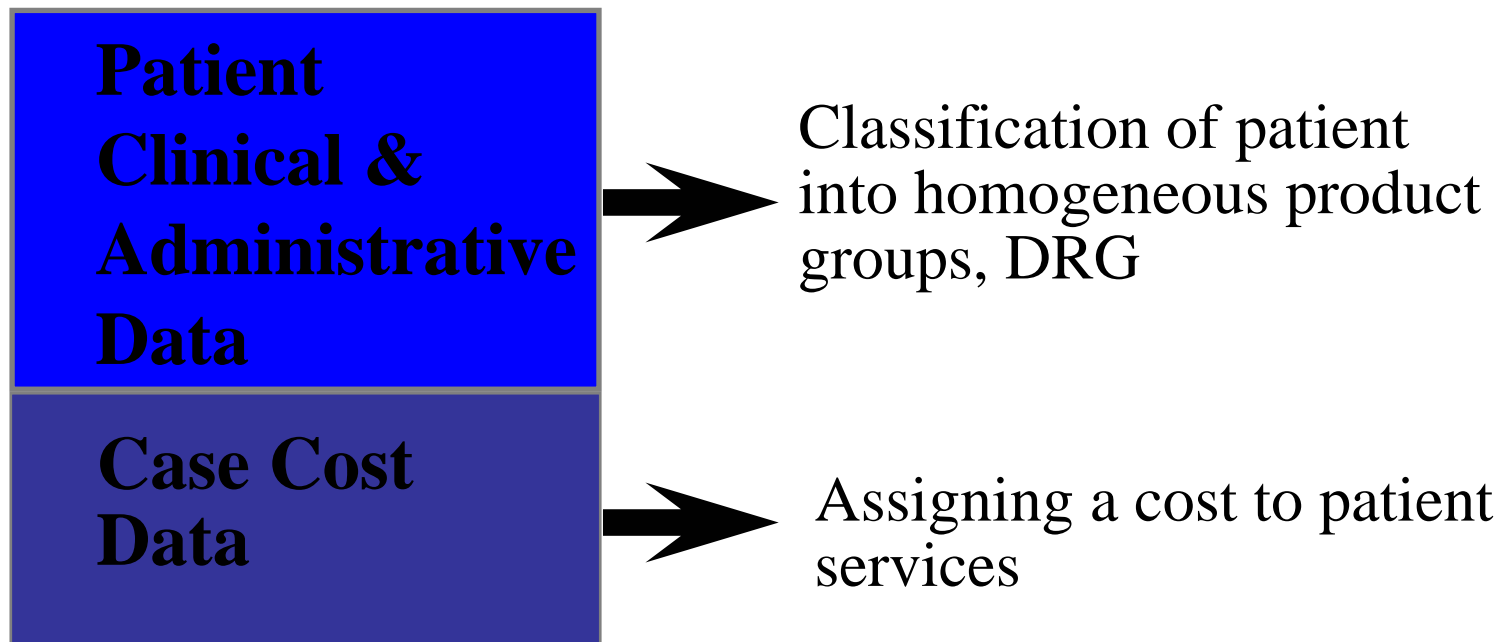
Examples:

- Cost of drugs per day
- Device costs



Activity Based Costing and Case Mix Measurement

Complete Patient Record



No other source links clinical data with cost information



Activity Based Costing and Case Mix Measurement

- Informed decision making:
- Service contracts (defining outputs)
 - Performance/volume based funding¹
 - Improved accountability²
- Rationalization of services
 - Consolidation of similar services between sites³
- Clinical Research
 - Outcome vs. Lower Cost

¹ R. Smith, CEO, Fraser Health Authority, BC

² W. McKendrick, ADM, AB Health and Wellness

³ S. Weatherill, Pres. and CEO, Capital Health



Activity Based Costing and Case Mix Measurement

- Informed decision making:
- Calculating relative cost weights
- Priority funding
- Operational reviews
- Hospital planning and budgeting processes
- Efficiency analysis:
 - Standardization of treatments and protocols
 - Benchmarking
 - Impact of changing case mix
 - Assessing required resources for planned programs and services



Activity Based Costing and Case Mix Measurement

- Activity based costing:
 - Conducted by hospitals
 - Not mandated by government
 - Little direct compensation to hospitals from government for collecting and sharing data
 - Large expansion ongoing
 - Rehabilitation
 - Mental Health
 - Chronic Care
- Activity Based Costing standards:
Penny.Weeks@ontario.ca