Case Mix -
Putting HIMs in the Mix

HealthAchieve
November 3, 2014
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Canadian Institute for Health Information
Objectives

• Case mix in general
• How do HIM professionals affect case mix
• How does case mix effect funding
• Vision of the future
### Grouping Methodologies and Sources of Data

<table>
<thead>
<tr>
<th>Data Complexity</th>
<th>Discharge Abstract Database (DAD)</th>
<th>National Ambulatory Care Reporting System (NACRS)</th>
<th>National Rehabilitation Reporting System (NRS)</th>
<th>Ontario Mental Health Reporting System (OHMRS)</th>
<th>Continuing Care Reporting System (CCRS)</th>
<th>Home Care Reporting System (HCRS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Episode</td>
<td>Single Episode</td>
<td>Single Episode</td>
<td>Longitudinal Episode</td>
<td>Longitudinal Episode with Re-entries</td>
<td>Longitudinal Multi-dimensional</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data Collection Standard</th>
<th>DAD Abstract</th>
<th>NACRS Abstract</th>
<th>National Rehab Tracking Forms</th>
<th>RAI-MH</th>
<th>MDS 2.0</th>
<th>MDS-HC</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Grouping Methodology</th>
<th>CMG+/HIG</th>
<th>CACS</th>
<th>RPG</th>
<th>SCIPP</th>
<th>RUG-III</th>
<th>RUG-III-HC</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Resource Indicators</th>
<th>RIW/ELOS</th>
<th>RIW</th>
<th>Rehab Cost Weights (Episode and Per-diem)</th>
<th>Case Mix Index (Per diem)</th>
<th>Case Mix Index (Per diem)</th>
<th>n/a</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Source of Resource Indicators</th>
<th>CIHI Canadian Patient Cost Database (CPCD)</th>
<th>CIHI Canadian Patient Cost Database (CPCD)</th>
<th>Ontario MOHLTC Ontario Case Costing Initiative (OCCI)</th>
<th>Ontario MOHLTC Staff Time Minutes, Ontario Case Costing Initiative (OCCI)</th>
<th>CIHI Staff Time Minutes, RUG Weighted Patient Day distribution, OHA Wage Rates</th>
<th>n/a</th>
</tr>
</thead>
</table>

| RUG III (44)                | CIHI MOHLTC                                  | RUG III (34) MOHLTC                          | n/a                                                 | n/a                                                       | n/a                                                               |
CMG+ Data Used for Grouping

- MRDX/Type 6 diagnosis and intervention
  - Additional significant diagnosis or intervention codes for CMG splits
    - Diagnoses Types 1, 2, 6, W, X, Y
  - Gender
  - Age
  - Entry Code

- Newborn and Neonates
  - Gestational Age
  - Birth Weight
CMG+ Data Used for Resource Intensity Weights and Expected Length of Stay

- Length of stay
- Discharge Disposition
- Transfers between acute facilities
## Summary of CMG Factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Percentage of Activity Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comorbidity Level = 1 to 4</td>
<td>19.50%</td>
</tr>
<tr>
<td>Flagged Intervention &gt; 0</td>
<td>10.60%</td>
</tr>
<tr>
<td>Intervention Event = 2 or 3</td>
<td>1.27%</td>
</tr>
<tr>
<td>Out of Hospital Intervention &gt; 0</td>
<td>0.73%</td>
</tr>
<tr>
<td>Factor Cases</td>
<td>25.78%</td>
</tr>
</tbody>
</table>
Valid MRDx?

Yes

Stillbirth or Cadaver Donor?

Yes

CMG 991 or CMG 992

No

Assign to MCC 14

No

NB or admit age <29 days?

Yes

No

CMG 999
CMG+ High Level Business Rules
CMG+ and HIG – What's the Difference?

Case Mix Groups Plus (CMG+)

• First released for use with 2007 Discharge Abstract Database (DAD) data.

HBAM Inpatient Groups (HIG)

• First released for use within HBAM in 2011
• CMG+ grouper output and clinical information from the DAD are the required inputs
The vast majority of Ontario cases are assigned to a HIG cell equivalent to the CMG+ cell.

<table>
<thead>
<tr>
<th>HIG Split Type</th>
<th>CMG+ Cells</th>
<th>HIG Cells</th>
<th>Cases Affected</th>
<th>Percentage of Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unchanged</td>
<td>536</td>
<td>536</td>
<td>924693</td>
<td>81.43%</td>
</tr>
<tr>
<td>Refined</td>
<td>4</td>
<td>11</td>
<td>36,836</td>
<td>3.24%</td>
</tr>
<tr>
<td>Comorbidity</td>
<td>14</td>
<td>28</td>
<td>173,280</td>
<td>15.27%</td>
</tr>
<tr>
<td>Grouping Reassignment</td>
<td>19</td>
<td>1</td>
<td>757</td>
<td>0.06%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,135,566</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on DAD 2012/13 data.
CMG+ Cell Assignment

- **Mycocardial Infarction/Shock/Arrest**
  - Yes → **Coronary Angiogram**
    - Yes → 193
    - No → 194
  - No → (next step not shown)
HIG Cell Assignment

- **Mycocardial Infarction/Shock/Arrest**
  - Yes → **Coronary Angiogram**
  - No →

**Coronary Angiogram**
- Yes → **Comorbid Cardiac Conditions**
- No →

**Comorbid Cardiac Conditions**
- Yes → 193b
- No → 193a

193b → 194b
193a → 194a
### Differences Between Resource Indicators

<table>
<thead>
<tr>
<th>Factor</th>
<th>CMG+</th>
<th>HIG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiplicative</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Additive</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Comorbidity Level (CL)</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Number of Eligible Flagged Interventions</td>
<td>17</td>
<td>15</td>
</tr>
<tr>
<td>Short Stay Adjustments</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Special Care Unit (SCU)</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Discharged to Homecare</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Maternal Age ≥40</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>
Funding effects

- Coding
- Up-coding
- Funding formula countermeasures and data auditing
CIHI’s Learning Centre

To view ALL of CIHI’s courses, click on the “Courses/Registration” tab above and select a catalogue.

For a schedule of upcoming sessions, click on the Calendar link underneath the “Courses/Registration” tab.
Education Roadmap for HIMs

Education Roadmap: Reach Your GOAL With Classifications, DAD, NACRS and Case Mix

Getting Started
This is the first level of learning. These courses will appeal to anyone new to Classifications, DAD, NACRS or Case Mix.

- Applied Diagnosis Types and Main/Other Problem Assignment
- CCI Code Assignment: Selection of Interventions to Code for Inpatient and Ambulatory Care
- CCI Ten Years in Action
- Classifying Post-Intervention Conditions: ICD-10-CA Code Assignment
- Coding for Diabetes—Introduction
- Emergency Department Coding: Getting Your Diagnosis Codes Right
- Introduction to the National Ambulatory Care Reporting System
- Making DAD and NACRS Work for You
- Moving Forward Using ICD-10-CA/CCI
- Search Techniques for ICD-10-CA/CCI using Fido Views
- Trending and ICD-10-CA/CCI

Opportunities to Develop
These courses build on the basics in Getting Started. In this level, learners will find courses dealing with more specific subject areas. Learners may select courses that appeal to them or that are pertinent to their work.

- Acute Coronary Syndrome—Understanding the Spectrum—Part 1
- Acute on Chronic Renal Failure
- Basic DAD Abstracting
- Coding for Diabetes—Acute Short-Term Complications of Diabetes Mellitus
- Coding for Diabetes—Basic Diabetes Mellitus Coding Principles
- DAD Data Submissions and Corrections: Rules and Tools
- Different Codes for Different Strokes
- Exploring the Lower GI Tract With CCI
- Focus on Emergency Department Data Collection
- Identifying Post-Intervention Events: Prefix 5 and 6 Assignment
- Improving the Quality of Admitting and Registration Data
- NACRS Data Collection Fundamentals
- NACRS Data Submission and Corrections

Advancing Your Skills
This level is for those who want to further develop their skills and knowledge in a particular subject area.

- Acute Coronary Syndrome—Part 2
- Coding Flaps and Grafts of Skin and Soft Tissue
- Coding for Diabetes—Diabetic Angiopathy
- Diagnostic Rheumatology
- Diabetic Neuropathy
- Diabetic Retinopathy
- Introduction to CACS
- Introduction to Case Mix for DAD and NACRS
- Introduction to CMG+ and NACRS
- Introduction to CMG+ and NACRS
- Introduction to HIG Grouping and Weighting Methodology for Ontario
- Introduction to Resource Indicators (RW and ELIS) for DAD and NACRS
- Knee Joint Replacement
- Obstetrical Coding—Moving Beyond the Basics
- Staying on Track Series
- What’s New for CMG+ and NACRS
- What’s New for DAD
- What’s New for NACRS
- What’s New for Classifications and Terminologies

Lifting Your Confidence
Even Further
This level provides additional opportunities to apply skills and knowledge gained through any of the previous levels. Courses on data usage for decision-making are included here.

- Coding for Diabetes: Final Assessment
- Decision Support for CMG+
- eDAD: An Essential Tool in Decision Making
- eNACRS: An Essential Tool in Decision Making

Supporting Resources
- Canadian Coding Standards
- Coders’ Resource Page
- Tips for Coders
- CCM+ Directory
- eQuery Tool
- DAD Abstracting Manual
- NACRS Abstracting Manual
- DAD and NACRS Data Submission Manual
- DAD and NACRS Bulletins
Future

- 3yr cycle starting 2015-2016
- CACS2
- Population Risk Adjustment Grouping Methodology
Population Risk Adjustment Grouping Methodology (PRAG)

• PRAG Clinical profiles
  – Diagnoses from hospital stays, physician claims, assessments for long-term care residents
  – Plus…functional status for long-term care residents
  – Health system encounters over multiple years
  – Diagnosis codes mapped to PRAG health conditions
  – **Person-based classification:** for each person, PRAG health conditions are tagged “on” or “off” based on diagnoses observed

• PRAG Indicators
  – E.g. Person-level estimates of next year’s cost to health system
  – Based on clinical classification for person, plus additional information such as age, gender
<table>
<thead>
<tr>
<th>Methodology development data</th>
<th>2010-2011</th>
<th>2011-2012</th>
<th>2012-2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person-level linkable historical clinical data (diagnosis, functional status) for classification</td>
<td></td>
<td>Future cost/utilization data for indicators</td>
<td></td>
</tr>
</tbody>
</table>

**Methodology outputs**

**Person 1234**
(Male, 75 yrs.)

- Difficulty making self understood
- Needs assistance with toileting

- Q03: Depression
- C41: Otitis Media
- H81: Neuromuscular Signs & Symptoms
- J02.1: Diabetes Mellitus
- J03: Obesity

$5,000 expected cost next year (hospital + physician costs only)

2% likelihood of inpatient hospitalization next year

*Illustration only*
PRAG timelines

• September 2014
  – Released preliminary mapping tables of ICD codes to PRAG health conditions

• March 2015
  – Health condition classification: mapping tables + tagging rules
  – Functional status classification
  – Predictive indicator: total person-level cost next year

• September 2015 / March 2016
  – More enhancements (e.g. clinical hierarchies, mutually exclusive, more indicators)
Comments / Questions?