Case Mix Index

ANALYZING CASE MIX INDEX AND THE IMPACT ON CDI PROGRAMS
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By Gerri Birg, MSN, RN, CCDS, managing director, Huron Healthcare

Case Mix Index (CMI) is the average relative weight for all cases reported in a Base MS-DRG. MS-DRGs at lower severity levels have lower relative weights and MS-DRGs at higher severity levels have higher relative weights. Therefore, CMI is a barometer that summarizes a patient population and is a predictor of illness severity and expected reimbursement.

CMI = Sum of all DRG RWs divided by the number of cases/month/year

The CMI value is used in determining the allocation of resources necessary to provide care for and/or treat the patients in an identified group. The CMI of a facility reflects the diversity and clinical complexity of the patients and the associated resources utilized in the care of those patients.

The Case Mix Index has historically been used to calculate adjusted average cost per patient (or day) for a given hospital relative to the adjusted average cost for other hospitals by dividing the average cost per patient (or day) by the hospital’s calculated CMI. The adjusted average cost per patient would reflect the charges reported for the types of cases treated in that year. For example, if Hospital A has an average cost per patient of $1,000 and a CMI of 0.80 for a given year, their adjusted cost per patient is $1,000 / 0.80 = $1,250. Likewise, if Hospital B has an average cost per patient of $1,500 and a CMI of 1.25, their adjusted cost per patient is $1,500 / 1.25 = $1,200. Therefore, if a hospital has a CMI greater than 1.00, their adjusted cost per patient or per day will be lowered and, conversely, if a hospital has a CMI less than 1.00, their adjusted cost will be higher.

The CMI of a facility reflects the diversity and clinical complexity of the patients and the associated resources utilized in the care of those patients.”

Fran Jurcak
senior director
Huron Healthcare

Factors Impacting CMI

| 1 | Accuracy and specificity of documentation |
| 2 | Accuracy of coding |
| 3 | Volumes: |
| 4 | Service lines: |
| 5 | Annual updates to the DRG relative weights |
| 6 | Coding guideline changes |

CMI = Sum of all DRG RWs divided by the number of cases/month/year

These factors directly impact the ability to adopt CMI as a performance metric of a Clinical Documentation Improvement (CDI) program. While CMI has traditionally been a gut check to measure CDI program success, annual changes in relative weights over the past three years for the top medical DRGs have negatively impacted most of these DRGs, preventing accurate comparison of CMI from year to year. Fluctuations in patient admissions and surgical staff/services also impact the ability to utilize the CMI as an accurate measurement of CDI program influence on overall facility finances. A high volume of short stays can negatively impact CMI as these short stay cases are often reimbursed under the lowest relative weight.

Source: Huron Healthcare
ANALYZING CMI
It is important to remove as many of the variables as possible when analyzing CMI. Thus, separating volumes of medical and surgical DRGs is necessary to create a base level of measurement. Separating the high-weighted DRGs, such as tracheostomies and ventilators, and monitoring the volumes of high-weighted surgical procedures will create a base from which to measure the impact from improved documentation.

Example of Recommended Data Points for CMI Review and Analysis

<table>
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<tr>
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</tr>
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<tbody>
<tr>
<td>Total Discharges</td>
<td>310</td>
<td>327</td>
<td>290</td>
<td>329</td>
<td>316</td>
<td>288</td>
<td>310</td>
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<tr>
<td>Overall CMI</td>
<td>1.532</td>
<td>1.587</td>
<td>1.666</td>
<td>1.455</td>
<td>1.537</td>
<td>1.532</td>
<td>1.552</td>
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<tr>
<td>Medical Discharges</td>
<td>221</td>
<td>212</td>
<td>195</td>
<td>233</td>
<td>231</td>
<td>217</td>
<td>222</td>
</tr>
<tr>
<td>Medical CMI</td>
<td>1.096</td>
<td>1.146</td>
<td>1.17</td>
<td>1.138</td>
<td>1.173</td>
<td>1.175</td>
<td>1.150</td>
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<tr>
<td>Surgical Discharges</td>
<td>89</td>
<td>115</td>
<td>95</td>
<td>76</td>
<td>85</td>
<td>71</td>
<td>89</td>
</tr>
<tr>
<td>Surgical CMI</td>
<td>2.614</td>
<td>2.400</td>
<td>2.685</td>
<td>2.509</td>
<td>2.525</td>
<td>2.625</td>
<td>2.560</td>
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<tr>
<td>Trachs*</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Vents**</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>2.5</td>
</tr>
</tbody>
</table>

* Number of tracheostomies (DRGs 3, 4, & 11 – Surgical DRGs)
**Number of ventilators (DRGs 207, 208 & 870 – Medical DRGs)
(Note: In this example, CDI staff was in training through month of September.)

Source: Huron Healthcare

Analysis by Month
This chart demonstrates how to separate the data to better track trends and issues that are measured by the CMI, including the potential impact of a CDI program on the quality of documentation.

<table>
<thead>
<tr>
<th></th>
<th>Medical</th>
<th>Surgical</th>
<th>Analysis/Comments</th>
</tr>
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</table>
| Sept ’14       | Average number of medical discharges with lower than average medical relative weights | Average number of surgeries with slightly higher than average surgical relative weights | CDI program needs to refocus efforts on medical discharges
High acuity of surgical cases |
| Oct ’14        | Increased CMI with lower than average number of discharges | Much higher than average surgical discharges with lower than average relative weights | Specificity of documentation resulted in increased capture of medical CMI
Volume of surgeries, while lower-weighted, still impacted the overall CMI |
| Nov ’14        | Lower than average number of discharges with significant increase in medical CMI
Higher than average number of vents | Surgical volumes slightly above average with higher relative weights
Higher than average number of trachs | Trachs/vents likely impacted overall CMI
Higher acuity of patient population reflected in CMI
CDI program likely significant impact to overall CMI |
| Dec ’14        | Higher than average medical discharges with below average CMI | Lower than average surgical discharges with average CMI | Holiday month, review for shorter LOS (typically means lower relative weights for medical and surgical)
Review CDI staffing and metrics of coverage |
| Jan ’15        | Higher than average medical discharges with higher CMI
Higher than average vents could impact Medical CMI | Average surgical discharges with average relative weights | Higher acuity of medical discharges, could be impacted by increased vents |
| Feb ’15        | Lower than average medical discharges
Higher than average vents
Highest medical CMI | Lower than average surgical discharges Above average CMI | Higher acuity of patient population reflected through higher relative weights for medical and surgical
Would review CDI program metrics for validation of CMI |

Source: Huron Healthcare
This analysis demonstrates that changes in Case Mix Index are often multifactorial and require a further deep dive into key data to understand the impact of documentation improvement programs. The importance of accurate, complete, and consistent documentation is imperative to ensure an accurate CMI. Yet, it is also important to review for other influences that can positively and negatively impact the CMI regardless of the quality of documentation. CMI in itself is not an accurate measurement of CDI program success but should be utilized in conjunction with other metrics to evaluate program growth and sustainability.

OTHER METRICS TO CONSIDER
CDI productivity metrics reflect the impact of CDI staff work in supporting accurate and compliant documentation that has the potential to increase the relative weight of the final coded DRG. Metrics that should be monitored include: review rates, query rates, physician response rates, and physician acceptance rates. Achieving industry benchmarks for these metrics should be reflected in an improved CMI.

Additionally, the average length of stay should also be monitored in conjunction with the CMI to demonstrate that more acutely ill patients with higher weighted DRGs are admitted for a longer period of time than those patients who are less acutely ill. Monitoring medical versus surgical length of stay should also occur to align the data with the types of patients and anticipated outcomes.

TRENDING DATA OVER TIME
Adjustment to the relative weights of each DRG occurs annually on October 1, making it difficult to accurately monitor trends over time. They are revised to accommodate changes in operating and capital expenses in acute care hospitals to better reflect the severity of illness and average costs associated with monitoring and treating medical conditions. Comparing current CMI to a previous year’s CMI provides no information regarding the direct impact of the CDI program. Many of the common medical DRGs have seen significant decline of their relative weight over the past few years. This indicates that overall medical CMI will be decreased last year to this year regardless of volumes. As surgical volumes shift from the inpatient to the outpatient environment, overall surgical CMI should increase simply due to the increased relative weights of those surgical DRGs that require inpatient status to perform.

The use of overall payer CMI as the sole measurement of patient acuity or CDI program success is shortsighted and inappropriate. It is important to take a deeper dive into the data and separate medical and surgical volumes, average length of stay, and CMI.

SUMMARY
Although there are many factors that can influence a healthcare facility’s Case Mix Index, a well-established clinical documentation improvement program is necessary to ensure and provide accurate, consistent and compliant documentation to reflect an accurate CMI. It is also important to review additional CDI metrics to optimize the impact of the CDI program and make good decisions regarding budgets, staffing, and program expectations and growth. Leading practice workflows that drive accurate documentation and data integrity, and dashboards that provide validated metrics support decisions that sustain successful CDI programs.
CONTACT
To find out more about analyzing Case Mix Index and the impact of CDI programs, please contact:

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Gerri Birg is the National Lead for Huron’s CDI solution practice. Over the last 12 years, she has led large-scale CDI implementation efforts working with a variety of clients, including children’s hospitals, large academic medical centers, and multi-hospital systems. Her extensive background in healthcare operations management encompasses utilizing outcome data to coach, guide, and train staff in providing strategic direction, benchmarking opportunities, and appropriate outcome management techniques as it integrates into continuous quality improvement.

REFERENCES

ABOUT HURON HEALTHCARE
Huron Healthcare is the premier provider of performance improvement and clinical transformation solutions for hospitals and health systems. In 2015, Huron acquired Studer Group, the market leader in driving healthcare cultural transformation. The combination of Huron and Studer Group is focused on improving healthcare providers’ clinical, operational, and financial outcomes. By partnering with clients, Huron delivers solutions that improve quality, increase revenue, reduce expenses, and enhance physician, patient, and employee satisfaction across the healthcare enterprise. Clients include leading national and regional integrated healthcare systems, academic medical centers, community hospitals, and physician practices. Modern Healthcare ranked Huron Healthcare third on its 2014 list of the largest healthcare management consulting firms. Learn more at www.huronconsultinggroup.com/healthcare or follow us on Twitter: @Huron.

To see how Huron Healthcare solutions can empower your mission, contact us at 1-866-229-8700 or visit www.huronconsultinggroup.com/healthcare.

REFERENCES
Ginsburg, Paul B. and Grace M. Carter. “Medicare case-mix index increase.”