
Concurrent Chart Review Provides More Accurate Documentation and Increased Calculated Case Mix Index, Severity of Illness, and Risk of Mortality



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BACKGROUND: Case mix index (CMI) is calculated to determine the relative value assigned to a Diagnosis-Related Group. Accurate documentation of patient complications and comorbidities and major complications and comorbidities changes CMI and can affect hospital reimbursement and future pay for performance metrics.

STUDY DESIGN: Starting in 2010, a physician panel concurrently reviewed the documentation of the trauma/acute care surgeons. Clarifications of the Centers for Medicare and Medicaid Services term-specific documentation were made by the panel, and the surgeon could incorporate or decline the clinical queries. A retrospective review of trauma/acute care inpatients was performed. The mean severity of illness, risk of mortality, and CMI from 2009 were compared with the 3 subsequent years. Mean length of stay and mean Injury Severity Score by year were listed as measures of patient acuity. Statistical analysis was performed using ANOVA and *t*-test, with $p < 0.05$ for significance.

RESULTS: Each year demonstrated an increase in severity of illness, risk of mortality, and CMI compared with baseline values ($p < 0.05$). Length of stay was not significantly different, reflecting similar patient populations throughout the study. Injury Severity Score decreased in 2011 and 2012 compared with 2009, reflecting a lower level of injury in the trauma population.

CONCLUSIONS: A concurrent documentation review significantly increases severity of illness, risk of mortality, and CMI scores in a trauma/acute care service compared with pre-program levels. These changes reflect more accurate key word documentation rather than a change in patient acuity. The increased scores might impact hospital reimbursement and more accurately stratify outcomes measures for care providers. (*J Am Coll Surg* 2015;220:652–656. © 2015 by the American College of Surgeons)

Medical record keeping has its origin in early history.¹ It was originally used in didactic teaching. Later, it progressed to an account of the medical conditions and treatments we

associate with medical records today. In 1983, the Centers for Medicare and Medicaid Services (CMS) introduced the prospective payer system.² Medical record documentation became important as a criterion for reimbursement to health care providers. Documentation requirements have grown increasingly complex. The most recent CMS proposal for the ICD-10 increases the number of codes in the ICD-9-CM from 13,000 to 68,000.³ This change in complexity reflects not only advances in modern medicine, but also a desire to more accurately compare outcomes in patient populations. Publicly reported quality metrics are receiving increased scrutiny, and could soon define level of reimbursement and scope of practice at hospitals. These include metrics such as case mix index (CMI), predicted risk of mortality (ROM), and severity of illness (SOI). These can vary, depending on the accuracy and detail of the documentation

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Abbreviations and Acronyms

CC	= complication code
CDAP	= continuous documentation accuracy program
CMI	= case mix index
CMS	= Centers for Medicare and Medicaid Services
DRG	= Diagnosis-Related Group
ISS	= Injury Severity Score
LOS	= length of stay
MCC	= major complication code
ROM	= risk of mortality
SOI	= severity of illness

of patients' diagnoses.⁴ Detailed term-specific inclusion of patients' complication codes and major complication codes can significantly affect these quality metrics.

Physicians can easily overlook the importance of term-specific documentation, as their primary focus is appropriately on the care of their patients. The role of extracting the patients' complication codes (CC) and major complication codes (MCC) is often relegated to certified medical coders. Coders can only extract from the medical record what is documented and supported by the eligible health care provider. The need to interact with physicians was cited as the top challenge to implementation of ICD-10 in a survey of certified coders.⁵ Our hospital initiated a continuous documentation accuracy program (CDAP) through concurrent chart review of inpatients by a physician panel of documentation specialists. This review evaluates the impact of that program on reported quality metrics.

METHODS

Starting in 2010, a physician panel concurrently reviewed the inpatient documentation of the trauma/acute care surgeons. Clarifications for CMS term-specific documentation were made by the panel and communicated to the clinicians by written notes for the first 2 years, then by email communication in subsequent years. The surgeon would determine the appropriateness of the clarifications, and could incorporate or decline the clarifications. A response of agree or disagree was required by clinicians to qualify as participation. Tracking of responses by the surgeons was performed for

feedback of program participation. The clarifications were for CMS term-specific documentation of diagnoses and treatments already in the medical record. The process reflected more accurate terminology and was not an effort to "up code" the patient. The emphasis of the program was documentation integrity and accuracy, rather than an attempt to influence reimbursement. A retrospective review of trauma/acute care inpatients was performed. The mean SOI, ROM, and CMI of the inpatients on the Trauma/Acute Care Surgery Service from 2009 were compared with the 3 subsequent years to determine if concurrent review influenced the values. To analyze if these quality metrics reflected a change in coding accuracy rather than a true change in patient acuity, two additional parameters reflecting patient acuity were analyzed. Mean length of stay LOS and mean Injury Severity Score (ISS) by year were listed as separate measures of patient acuity. Values from 2009 were again compared with each subsequent year. Statistical analysis was performed using ANOVA and *t*-test with $p < 0.05$ for significance.

RESULTS

Five hundred eighty-four patients were reviewed in the year before implementation of the program (Table 1). Severity of illness, predicted ROM, and CMI were 2.31, 1.90, and 2.11, respectively. Mean LOS was 5.5 days and mean ISS of trauma patients was 16.5. Severity of illness rose each subsequent year to 2.49, 2.58, and 2.71 ($p < 0.05$). Risk of mortality also increased each year to 2.08, 2.10, and 2.12 ($p < 0.05$). Finally, CMI increased each year to 2.27, 2.36, and 2.39 ($p < 0.05$) (Fig. 1). Mean LOS varied for each year, ranging from 5.73 to 6.14 days, but these differences were not statistically significant from baseline. Trauma patients represented roughly half of our inpatient census on the Trauma/Acute Care Service. Mean ISS in 2010 of 17.1 was not statistically different than the mean ISS in 2009, and the mean ISS in 2011 and 2012 of 14.3 and 13.9 were lower than 2009 ($p < 0.05$) (Fig. 2).

DISCUSSION

The prospective payer system implemented by CMS in 1983 uses the ICD-9-CM to assign individual diagnostic

Table 1. Measures of Patient Acuity

Year	Cases, n	Severity of illness	Risk of mortality	Case mix index	Length of stay, d	Injury severity score
2009	584	2.31	1.90	2.11	5.55	16.5
2010	553	2.49	2.08	2.27	5.75	17.1
2011	753	2.58	2.10	2.36	6.14	14.3*
2012	845	2.71	2.12	2.39	5.73	13.9*
p Value		<0.05	<0.05	<0.05	NS	<0.05*

*ANOVA and *t*-test.

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