017: DISTINGUISHING HOSPITAL COMPLICATIONS OF CARE FROM PRE-EXISTING CONDITIONS

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Objective:
To determine the accuracy of computer algorithms applied to diagnosis codes from hospital abstracts to identify hospital complications with respect to pre-existing conditions.

Methods:
Reason for Study: Computer algorithms to identify hospital complications are being applied to coded diagnosis data from hospital abstracts to compare hospital performance. However, efforts to separate pre-existing conditions from hospital-acquired complications are limited. Referral centers are likely to have a higher concentration of patients with pre-existing conditions.
Data Sources/Study Setting: Administrative data including secondary diagnosis codes from hospital discharge abstracts, supplemented with an indicator to distinguish pre-existing from hospital-developed conditions, were used from all patients discharged from a large USA medical complex from 1997-1999. Included patients ranged from local, primary care patients to tertiary care referrals.
Study Design: This observational study compared the identification of potential hospital complications through published computer algorithms with a secondary diagnosis pre-existing condition indicator to determine the frequency with which identified “complications” were present on admission. Furthermore, through the use of “acquired” conditions, additional potential complications were identified which the algorithms excluded.
Data Collection/Extraction Method: Hospital discharge abstracts were processed through two independent sets of computer algorithms that use secondary diagnosis codes in conjunction with risk pools to identify cases which likely had a hospital complication. The pre-existing indicator for the diagnosis that triggered the complication was then used to determine if the condition was present at admission. Secondary diagnoses not present on admission which trigger complication codes were also identified among patients “not at risk” to assess the rates of false negatives for each algorithm.

Results:
The rate of cases identified with a complication which was coded as being present on admission (false positive) varied tremendously from 0% (postoperative hemorrhage) to 95% (complication of an orthopedic device/implant/graft). Patients with complications not detected by the algorithms (false negatives) also varied greatly from 0% (postoperative shock) to 78% (decubitus ulcers). For example, 6 of the 20 computer identified post-operative strokes were coded as present on admission (30% false positive). Meanwhile, there were 129 additional strokes not counted as complications which were coded as secondary diagnosis that were not present at admission (90% false negative). Some of these may not have been preventable, but further examination is merited. Similarly, 19 of the 37 computer identified post-operative acute myocardial infarctions were coded as present on admission (51% false positive), while there were 197 additional infarctions not detected by computer which were coded as not present at admission (92% false negative). Overall, surgical complications are more reliably identified than are medical complications, although fewer medical complication algorithms exist. A higher percentage of medical patients (8.4% versus 7.9%) and a much higher percentage of surgical patients (27.0% versus 19.6%) are identified with acquired conditions than with the computer algorithm complications. Our institution is increasing its use of information from the acquired condition indicator to focus its quality improvement efforts.

Conclusions:
Due to large variability in coding across hospitals and the insensitivity of existing computer algorithms to exclude conditions present on admission from true complications, complication rates based strictly on standard discharge abstracts are not useful for inter-hospital comparisons. However, complications of care do carry very high costs including extended stays and increased hospital mortality. Enhancing secondary diagnoses with a simple indicator identifying which diagnoses were present on admission greatly increases the accurate identification of complications for internal quality and patient safety improvements.

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