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Attribution 2.0: whose complication is it?



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Abstract

BACKGROUND: Payment models aimed at improving quality and curbing costs are being deployed, and hospitals are evaluating complications more closely. To decrease complications, hospitals must first “attribute” them to a responsible party. Our study uses a rigorous approach to attribution in the trauma population.

METHODS: Twelve months of complications were reviewed by a multidisciplinary panel. Physicians, patients, nursing, and the hospital were all incorporated into the model. A point system was developed for each complication. Fractional points were given when multiple parties were involved.

RESULTS: One hundred twenty-five complications were analyzed. Complications were attributed as follows: 30% neurosurgery, 22% trauma surgery (100% using the traditional method), 17% orthopedic surgery, 14% nursing, 9.6% plastics, 3.8% hospital, 1.6% patient, 1.4% urology, and .6% vascular.

CONCLUSIONS: Up to 78% of complications were incorrectly ascribed using the traditional method. Almost 20% of complications resulted from factors outside the physician’s control. Before complications can be reduced, their most proximate cause must be identified. Surgeons should own these data and lead the effort to improve quality and decrease complications.

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In 2002, the Centers for Medicare and Medicaid Services (CMS) in partnership with the Agency for Healthcare Research and Quality developed a standardized, publicly reported tool for evaluating hospital-specific clinical

outcomes. CMS now uses this clinical outcome metric in the value-based purchasing (VBP) financial incentive program.

In 2017, the CMS will allocate an estimated \$850 million toward the VBP, and hospitals are reimbursed based on their total performance score (TPS).¹ The TPS has 2 main components and is calculated based on clinical outcomes (70%) and patient satisfaction (30%). As a result of these and other financial incentives in concert with the public reporting of data, hospitals are keenly interested in identifying patient populations that negatively contribute to clinical outcomes. In this process,

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hospitals attempt to determine the most proximate cause of complications. This is known as attribution. Attribution is defined as the process of ascribing complications to a responsible party. Historically at our institution, the policy has been to attribute all complications of a hospital stay to the admitting physician. This is based on the underlying assumption that the admitting physician is responsible for delivering the majority of care and, thus, the related complications (“traditional” method).

The care of the trauma patient is complex and often requires the co-ordination of a multispecialty team. This makes the attribution of complications especially challenging. As a result, trauma surgeons who admit and co-ordinate the care of these patients may be incorrectly ascribed complications beyond their control and purview. In response, we created a multidisciplinary, physician-led quality improvement process to more accurately attribute complications in the trauma population (“panel” method).

Methods

After institutional review board approval, a retrospective analysis was performed on all admitted trauma patients over a 12-month period. Patients with single-system trauma who were admitted and had care provided solely by the admitting service were excluded. The remaining patients were evaluated for complications experienced during the index or subsequent admission (up to 90 days) that could be related to their trauma. For those patients with complications, we evaluated the following: mechanism of injury, age, ethnicity, sex, injury severity score, intensive care unit length of stay, hospital length of stay, number of readmissions, and complications.

A multidisciplinary panel composed of 5 disciplines (trauma surgery, neurosurgery, orthopedic surgery, pulmonary critical care, and nursing) was assembled to review trauma complications. The panel met once a month immediately before regularly held trauma morbidity and mortality conferences. In our first meeting, the panel developed a broadly applicable set of rules that allowed for “automated” attribution when a single complication could be clearly linked to a single responsible party. For example, the complication of an anastomotic leak after a small bowel resection could be attributed to the general surgeon or a hardware infection after a hip hemiarthroplasty to the orthopedic surgeon. These complications did not require further panel review.

Attribution was much more challenging in cases where complications could not be ascribed to a single responsible party. Assessing causation in a patient who presented with a diminished level of consciousness requiring intubation, an intraparenchymal hemorrhage, and multiple rib fractures and who developed pneumonia is problematic. In these cases, shared or fractional attribution was used by the panel as a means of improving accuracy. Fractional attribution is the process of dividing one complication among all

potentially responsible groups. The 4 groups to which complications could be attributed were the hospital, treating physicians, patient, and nursing. A summary of the workflow is presented in Fig. 1. The previously described panel method was compared with the traditional method and differences were noted.

Results

During the study period, 1,526 trauma admissions were reviewed. After exclusions, 1,019 patients were included; 125 total complications occurred in 73 patients (7.2%). Patient demographics consisted of 49 ± 22 years of age, 63% male, 34% Caucasian, 33% African American, 30% Hispanic, and 3% Asian. Among these, 92% were blunt injuries. Cause of injury included 43% motor vehicle collisions, 41% falls, 7% auto-pedestrian collisions, 6% gunshot wounds, 2% stab wound, and 1% assault. In patients with complications, the injury severity score was 21 ± 12 , the hospital length of stay was 16 ± 13 days, and the intensive care unit length of stay was 9 ± 8 days. There were a total of 7 unexpected readmissions during the study period. The most common complications observed were urinary tract infection (UTI) (18%), pneumonia (12%), decubitus ulcer (12%), and acute kidney injury (6%) (Table 1).

When the traditional method was used, the trauma surgeon was attributed 100% of the 125 complications. Utilizing the panel method, complications were attributed as follows: 30% neurosurgery, 22% trauma surgery, 17% orthopedic surgery, 14% nursing, 9.6% plastic surgery, 3.8% hospital, 1.6% patient, 1.4% urology, and .6% vascular (Table 1). Fractional attribution was used in 18% of reviewed complications.

Urinary tract infections were the most frequent complication with 22 incidences identified. The neurosurgery service was attributed with 32% (7 of 22), whereas 28% (6.25 of 22) went to other treating physicians and 18% (4 of 22) went to orthopedics. Sacral decubitus ulcers were the next most common, with 15 noted during the study period. Nursing was the responsible party for all sacral decubitus ulcers. There were a total of 13 wound infections. Wound infections were attributed to neurosurgery in 38% (5 of 13), orthopedics in 23% (3 of 13), plastics in 23% (3 of 13), and acute care surgery in 15% (2 of 13). Seven patients had unexpected readmissions. Most (5 of 7) were related to orthopedics. Table 1 demonstrates a breakdown of all complications as attributed by the panel.

Comments

With the implementation of the VBP, health care is undergoing a rapid transformation. Costs of complications are now being shifted to the hospital rather than the government or third-party payers. Despite our best efforts, complications in trauma patients are inevitable and

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