CMS' Hospital-Acquired Conditions for the Neurohospitalist

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Abstract

In 2008, the Centers for Medicare and Medicaid Services (CMS) implemented a provision that denies Medicare payment for hospital-acquired conditions (HACs). This provision brings attention to the quality of patient care and the financial impact associated with “never-events” occurring during a patient’s hospitalization. Our review of HACs focuses on the 5 which are most pertinent to the neurohospitalist: stages III and IV pressure ulcers, catheter-associated urinary tract infection, vascular catheter-associated infection, manifestations of poor glycemic control, and falls resulting in fractures, dislocations, and/or intracranial injuries. We address why CMS came up with them, their impact on quality patient care and hospital finances, and how the neurohospitalist can continue to participate in the future of HAC prevention and management as they relate to one’s patients, hospital, and community.

Keywords

accidental falls, catheter-related infections, centers for medicare and medicaid services (US), hospitalists, humans, hyperglycemia, hypoglycemia, insurance, health, reimbursement, medicare, neurology, pressure ulcer, quality of health care, reimbursement mechanisms, safety, United States

Background

Hospital medicine is the fastest growing specialty in the United States, now with more than 30 000 hospitalists. Within hospital medicine, the neurohospitalist is growing in demand. Neurohospitalist was first described by Likosky and Amin in 2005 in an article titled Who Will Care for Our Hospitalized Patients?¹

Centers for Medicare and Medicaid Services and Hospital-Acquired Conditions

The Centers for Medicare and Medicaid Services (CMS), formerly Health Care Financing Administration, were formed in 1977 to administer Medicare and Medicaid programs.² In 2006, the CMS were required by the 2005 Deficit Reduction Act (DRA) to identify conditions that (a) are of high cost or high volume or both, (b) result in the assignment of a case to a Medicare Severity Diagnosis-Related Group (MS-DRG) that has a higher payment when present as a secondary diagnosis, and (c) could reasonably have been prevented through the application of evidence-based guidelines.³ The CMS subsequently identified “never-events” as described by the National Quality Forum,⁴ and conditions determined through research to meet 1 of the 3 DRA requirements.

From the work of the CMS came the Hospital-Acquired Condition (HAC) provision, which states that effective

October 1, 2008, hospitals that use the inpatient prospective payment system will not receive additional Medicare payment for cases in which one of the selected conditions was not present on admission (POA).³ Table 1 lists the 10 categories of HACs selected by the CMS and associated codes according to the *International Statistical Classification of Diseases, Ninth Revision (ICD-9)* and related health problems. *International Statistical Classification of Diseases, Ninth Revision* codes are a reasonable means of detecting adverse events.⁶

On February 16, 2011, the CMS proposed that the HAC provision expand to Medicaid as “provider preventable conditions” (PPCs).⁷ Provider preventable condition is “an umbrella term for hospital and nonhospital conditions identified by the State,”⁸ thereby allowing a state to include additional conditions. Medicaid’s PPC provision went into effect on July 1, 2011.

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Table 1. Ten Categories of Hospital-Acquired Conditions (HACs) Selected by CMS

HAC	CC/MCC (ICD-9-CM Code)
Foreign object retained after surgery	998.4 (CC), 998.7 (CC)
Air embolism	999.1 (MCC)
Blood incompatibility	999.60 (CC), 999.61 (CC), 999.62 (CC), 999.63 (CC), 999.69 (CC)
Pressure ulcers, stages III & IV	707.23 (MCC), 707.24 (MCC)
Falls & trauma	Codes within the following ranges: 800-829, 830-839, 850-854, 925-929, 940-949, 991-994
<ul style="list-style-type: none"> • Fractures • Dislocations • Intracranial injuries • Crushing injuries • Burns • Electric shock 	
Manifestations of poor glycemic control	250.10-250.13 (MCC), 250.20-250.23 (MCC), 251.0 (CC), 249.10-249.11 (MCC), 294.20-249.21 (MCC)
<ul style="list-style-type: none"> • Diabetic ketoacidosis • Nonketotic hyperosmolar coma • Hypoglycemic coma • Secondary diabetes with ketoacidosis • Secondary diabetes with hyperosmolarity 	
Catheter-associated urinary tract infection (UTI)	996.64 (CC). Excludes the following: 112.2 (CC), 590.10 (CC), 590.11 (MCC), 590.2 (MCC), 590.3 (CC), 590.80 (CC), 590.81 (CC), 595.0 (CC), 597.0 (CC), 599.0 (CC)
Vascular catheter-associated infection	999.31 (CC)
Surgical site infection following:	519.2 (MCC) + I of the following procedure codes: 36.10-36.19.
<ul style="list-style-type: none"> • Coronary artery bypass graft (CABG)—Mediastinitis • Bariatric surgery • Laparoscopic gastric bypass • Gastroenterostomy • Laparoscopic gastric restrictive surgery • Orthopedic procedures • Spine • Neck • Shoulder • Elbow 	Principal Diagnosis 278.01 + 998.59 (CC) + I of the following procedure codes: 44.38, 44.39, 44.95. (996.67 [CC] or 998.59 [CC]) + I of the following procedure codes: 81.01-81.08, 81.23, 81.24, 81.31-81.38, 81.83, 81.85.
Deep vein thrombosis (DVT)/pulmonary embolism (PE) following:	[415.11 (MCC), 415.19 (MCC) or 453.40-453.42 (MCC)] + I of the following procedure codes: 00.85-00.87, 81.51-81.52, 81.54.
<ul style="list-style-type: none"> • Total knee replacement • Hip replacement 	

Abbreviations: CCs, complications and comorbidities. MCCs, major complications and comorbidities. ICD-9-CM, *International Classification of Diseases, Ninth Revision, Clinical Modification*.

Adapted from Preventable Hospital-Acquired Conditions (HACs), Including Infections. In: Federal Register. Vol 75. Rules and Regulations.; 2010:50080-50101.⁵

From Discharge to Reimbursement

When a Medicare patient is discharged, the medical record for the admission is translated into an *ICD-9* code format and submitted for reimbursement. Each primary condition, or reason for admission, sets the MS-DRG. The MS-DRG dictates reimbursement. In addition to the primary condition, secondary diagnoses are listed as complications and comorbidities (CCs) and/or major CC (MCCs). The MS-DRG for the primary condition varies slightly depending on the presence of CCs and MCCs. Oftentimes, the MS-DRG and the associated *ICD-9* reimbursement to a hospital for a primary diagnosis is higher when a CC and/or MCC is also recorded. With the HAC provision in place, the MS-DRG for a case may change if the CC and/or MCC is considered a HAC (Table 1).

All secondary diagnoses are stratified by POA status: present (Y), not present (N), status not clinically determined (W), documentation inadequate to determine status (U), or exempted *ICD-9* code (I). When a CC or MCC is a HAC, it is classified as “N” or “U.” This changes the MS-DRG from “primary diagnosis with CC and/or MCC” to only “primary diagnosis.” The exception to this rule is that if there is another CC or MCC that is not a HAC. In this case, the MS-DRG will remain as a “primary diagnosis with CC and/or MCC.” A change in MS-DRG by elimination of the comorbidity component often equates to a significant decrease in reimbursement.

Pertinent 5 HACs

We believe that 5 of the 10 HACs are particularly pertinent to the neurohospitalist: stages III and IV pressure ulcers,

Table 2. Epidemiology of Selected HACs

HAC	Incidence per Year in the United States, not Limited to Medicare	FY 2006: Medicare Cases With HAC as Secondary Diagnosis ^c	FY 2009: Number of Discharges With This Condition as Secondary Diagnosis ^{d,e}	FY 2009: Number of Discharges That Change MS-DRG Due to HAC ^{d,e}
Pressure ulcers, stages III & IV	1.7 million, ^a 2.7%-29.5% in hospitalized patients ^b	322 946	99 656	384
Catheter-associated UTI	561 667 ^c	11 780	14 089	223
Vascular catheter-associated infection	248 678 ^c	There was no existing unique ICD-9-CM code	6933	26
Manifestations of poor glycemic control	120 000 discharges in 2005 ^f , diabetic ketoacidosis only	Not reported	14 135	116
Falls and trauma	414 million (1350 per 1000 persons ^g), falls only	2591 (falls out of bed only), and ^c	126 078 (total falls & trauma) 113 306 (fracture) 895 (dislocation) 12 066 (intracranial injury)	1577 (total falls & trauma) 1355 (fracture) 4 (dislocation) 226 (intracranial injury)

Abbreviations: FY, Fiscal Year. HAC, Hospital-Acquired Condition. MS-DRG, Medicare Severity Diagnosis Related Groups. ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; UTI, urinary tract infection.

^a As estimated for 1989; Kuhn BA, Coulter SJ. Balancing the pressure ulcer cost and quality equation. *Nurs Econ.* 1992;10(5):353-359.¹⁰

^b Reported in 2004; Gordon MD, Gottschlich MM, Helvig EI, Marvin JA, Richard RL. Review of evidenced-based practice for the prevention of pressure sores in burn patients. *J Burn Care Rehabil.* 2004;25(5):388-410.¹¹

^c Per CDC; Centers for Medicare and Medicaid Services (CMS), HHS. Changes to the Hospital Inpatient Prospective Payment System and Fiscal Year 2008 Rates. 2007.¹² <https://www.cms.gov/AcuteInpatientPPS/downloads/CMS-1533-FC.pdf>. Accessed March 15, 2011.

^d Research Triangle Incorporated (RTI). RTI Evaluation of FY 2009 Updated Data.¹³ <http://www.rti.org/reports/cms/>. Last accessed November 17, 2011.

^e Per CDC; Number (in Thousands) of Hospital Discharges with Diabetic Ketoacidosis as First-Listed Diagnosis, United States, 1980–2005. Centers for Disease Control and Prevention (CDC).²¹ http://www.cdc.gov/diabetes/statistics/dkafirst/diabetes_complications/fig1.htm. Last accessed November 17, 2011.

^g Rubenstein LZ, Josephson KR. The epidemiology of falls and syncope. *Clin Geriatr Med.* 2002;18(2):141-158.²³

catheter-associated urinary tract infection (UTI), vascular catheter-associated infection, manifestations of poor glycemic control, and falls resulting in fractures, dislocations, and/or intracranial injuries. All 5 HACs are also considered “never-events” by the National Quality Forum. Refer to Tables 2 and 3 for epidemiology and financial impact of these 5 HACs. Data subsequent to the October 1, 2008 HAC provision are limited and will continue to be collected through Fall 2011. The Research Triangle Incorporated (RTI), an independent nonprofit research and development organization, was selected to collect data during the post-HAC provision era. Current data as reported by RTI are included below.

Pressure Ulcers, Stages III and IV

Imagine your inpatient lying immobile with the head of the bed above 30°, occasionally transferred by hospital staff with the help of bed sheets, and the patient has poor urinary continence or fever with perspiration. Pressure ulcers, commonly known as decubitus ulcers, pressure sores, and bedsores, develop in an environment of pressure, friction, shearing forces, and moisture.⁹ By classification, stage III pressure ulcers have full-thickness skin loss and subcutaneous necrosis that does not extend through underlying fascia. Stage IV

pressure ulcers have full-thickness tissue damage, extending to muscle, bone, or supporting structures.⁹

Estimates of stages III and IV pressure ulcer incidence per year in the United States are 1.7 million, affecting 2.7% to 29.5% of hospitalized patients (Table 2).^{10,11} Prior to the CMS HAC provision, the Centers for Disease Control and Prevention (CDC) determined that there were over 300 000 Medicare cases reported as a secondary diagnosis in fiscal year (FY) 2006.¹² This number decreased with RTI's latest postprovision data, with only about 100 000 cases for FY 2009.¹⁴ This equates to a \$5615 net savings for Medicare per discharge for cases in which the MS-DRG was reassigned due to the presence of an HAC (Table 3).^{5,13} Padula et al used a model to simulate patient admissions and health states that can lead to hospital-acquired pressure ulcers at their institution.¹⁴ They found that it is more cost effective for their institution to pay for prevention of hospital-acquired pressure ulcers than to pay for the standard care of the HAC, which is no longer reimbursed by CMS.

Catheter-Associated UTI

A UTI applies to clinical conditions ranging from asymptomatic bacteriuria to severe nephritis with resultant sepsis.¹⁵ Patients with neurological disease are often at a higher risk for

Table 3. Financial Impact of Selected HACs

HAC	Estimated Annual Cost in United States, not Limited to Medicare	FY 2006: Average Charge for the Entire Hospital Stay When Reported as Secondary Diagnosis ^a	FY 2009: Net Savings for Discharges With MS-DRG Reassigned Due to Presence of HAC ^{c,d}	FY 2009: Net Savings per Discharge With MS-DRG Reassigned Due to Presence of HAC ^{c,d}
Pressure ulcers, stages III & IV	\$9.5 billion ^a	\$40 381	\$2 156 113	\$5615
Catheter-associated UTI	\$424 million-\$451 million ^b	\$40 347	\$642 003	\$2879
Vascular catheter-associated infection	Unable to identify costs given that there is no existing unique ICD-9-CM code ^a		\$85 254	\$3276
Manifestations of poor glycemic control	\$8189 higher per patient than in those who did not experience DKA ^e	Not reported	\$611 428	\$5271
Falls & trauma	\$4200 higher per patient than in patients who do not fall ^f	\$24 962	\$8 093 391 (Total Falls & Trauma) \$6 979 013 (Fracture) \$16 506 (Dislocations) \$1 150 807 (Intracranial injury)	\$5132 (Total Falls & Trauma) \$5151 (Fracture) \$4127 (Dislocations) \$5092 (Intracranial injury)

Abbreviations: FY, fiscal year. HAC, hospital-acquired condition. MS-DRG, Medicare Severity Diagnosis-Related Groups. ICD-9-CM, *International Classification of Diseases, Ninth Revision, Clinical Modification*; DKA, diabetic ketoacidosis. UTI, urinary tract infection.

^a Per CDC; Centers for Medicare and Medicaid Services (CMS), HHS. Changes to the Hospital Inpatient Prospective Payment System and Fiscal Year 2008 Rates. 2007.¹² <https://www.cms.gov/AcuteInpatientPPS/downloads/CMS-1533-FC.pdf>. Accessed March 15, 2011.

^b Foxman B. Epidemiology of urinary tract infections: incidence, morbidity, and economic costs. *Am J Med*. 2002;113(suppl 1A):5S-13S.¹⁸

^c Research Triangle Incorporated (RTI). RTI Evaluation of FY 2009 Updated Data.¹³ <http://www.rti.org/reports/cms/>. Last accessed November 17, 2011.

^d Preventable Hospital-Acquired Conditions (HACs), Including Infections. In: Federal Register. Vol 75. Rules and Regulations.; 2010:50080-50101.⁵

^e Javor KA, Kotsanos JG, McDonald RC, et al. Diabetic ketoacidosis charges relative to medical charges of adult patients with type I diabetes. *Diabetes Care*. 1997;20(3):349-354.²²

^f Hitcho EB, Krauss MJ, Birge S, et al. Characteristics and circumstances of falls in a hospital setting: a prospective analysis. *J Gen Intern Med*. 2004;19(7):732-739.²⁴

UTI due to neurogenic bladder dysfunction. Vickrey found that “eighty percent of persons with [spinal cord injury] experience a . . . UTI by their 16th year post-injury, and diseases of the urinary system are the 5th most common cause of death”.¹⁶ His study also determined that “over 70 percent of persons with [multiple sclerosis] develop bladder dysfunction over the course of their disease.”¹⁶ Poisson et al recently investigated UTI in stroke patients, finding that “patients with stroke have different risks for, consequences of, and barriers to reducing UTI than other hospitalized patients.”¹⁷

In addition to baseline risks for UTI, urinary catheter use is a common cause of infection. The CDC estimates the annual incidence of catheter-associated UTI to be 561 667.¹² Comparing the data on Medicare cases with HAC as a secondary diagnosis in FY 2006 versus FY 2009, the number increased from 11 780 to 14 089 (Table 2).^{5,12} The HAC provision yielded a net savings for Medicare of \$2879 per discharge in FY 2009 for cases in which the MS-DRG was reassigned (Table 3).^{5,13}

Vascular Catheter-Associated Infection

Some patients require a central intravenous (iv) catheter during hospitalization or are admitted with a central iv catheter already in place. Microorganisms, predominantly microflora

of the skin within the first week of placement or via the catheter hub later on, can gain access to the patient’s venous blood via an iv.¹⁹ In fact, intravascular device-related bacteremias result in approximately 14% of nosocomial infections, most of which are central-line derived.¹⁹ In the United States, approximately 250 000 cases of central line-associated bloodstream infections (CLABSIs) occur each year (Table 2).¹² The CMS HAC “vascular catheter-associated infection” is specific to central venous catheters and is often referred to as CLABSI. According to the FY 2009 RTI data, there was a \$3276 net savings for Medicare per discharge for cases in which the MS-DRG was reassigned due to the presence of a HAC (Table 3).^{5,13}

Manifestations of Poor Glycemic Control

The neurohospitalist is often concerned with a patient’s glycemic state. For instance, hyperglycemia is common in critically ill neurological patients including those with acute ischemic stroke and is associated with poor clinical outcomes.²⁰ Poor glycemic control refers to both hypo- and hyperglycemia in patients with or without a diagnosis of diabetes mellitus type 1 or 2. The HAC provision refers to 5 complications: diabetic ketoacidosis, nonketotic hyperosmolar coma, hypoglycemic

coma, and secondary diabetes with either ketoacidosis or hyperosmolarity.

The CDC reports an estimate of 120 000 discharges in 2005 for hospitalized patients with diabetic ketoacidosis (Table 2).²¹ Medicare had over 14 000 discharges with a manifestation of poor glycemic control in FY 2009.^{5,13} This resulted in a net savings for Medicare of \$5271 per discharge for cases in which the MS-DRG was reassigned due to the presence of a HAC (Table 3).^{5,13}

Falls Resulting in Fractures, Dislocations, and/or Intracranial Injuries

Falls are the most prevalent of all 5 HACs discussed here. A patient who does not have a catheter so as to avoid catheter-associated UTI, but who does have a gait deficit, may fall when unassisted and ambulating for elimination.^{23,24} Another patient, status post cerebrovascular accident with subsequent visual deficit, may fall during hospitalization.²³ Top risk factors for falls include muscle weakness, gait and balance problems, visual or cognitive impairment, depression, functional decline, and medications.²³

Approximately 414 million falls and traumas occur annually in the United States (Table 2).²³ During FY 2009, over 126 000 Medicare cases reported a fall or trauma as a secondary diagnosis.^{5,13} The consequences of a fall can be severe. For FY 2009, almost 90% of these falls resulted in fracture and almost 10% in intracranial injury. The number of cases in which the MS-DRG was changed as a result of the HAC was 1577 for total falls and trauma, primarily resulting in fracture.^{5,13} This yielded a \$5132 net savings for Medicare per discharge for cases in which the MS-DRG was reassigned (Table 3).^{5,13}

Recommendations

Pertinent 5 HACs

With patient care as a priority, some institutions are leading the way toward eliminating HACs. The theme of evidence-based recommendations is patient safety must be an omnipresent priority. This can materialize through each component of a patient's care—direct hospital staff, measures implemented by a hospital-based patient safety team, and tools used to manage patient care. Table 4 shows a selected list of evidence-based recommendations for each of the pertinent 5 HACs, in addition to current practice guidelines. We encourage review of these methodologies as the neurohospitalist learns about and pursues means to reduce HACs.

Invest in Your Hospital

It is important for the neurohospitalist to invest in the system in which he or she works. The Society of Hospital Medicine sponsored and developed core competencies in hospital medicine to serve as a framework for curriculum development

and to outline the role of hospitalists in general.³⁹ Reviewing the core competencies reminds the neurohospitalist that hospitalists are “agents of change (1) to develop and implement systems to enable best practices to occur from admission through discharge, and (2) to promote the development of a safer culture within the hospital.”³⁹ Finding time to serve as an “agent of change” is imperative. Arora et al emphasize the importance of utilizing “periods of ‘diastole,’ or the portion of a hospitalist’s time spent in nonclinical activities,” as a “time devoted to the pursuit of complementary interests, career advancement, and job diversity.”⁴⁰ Allotting time and efforts to such goals “can lead to significant improvement in quality, education, research, and outcomes for an academic medical center,” as well as potentially prevent burnout.⁴⁰ Investing in one’s hospital can augment the neurohospitalist’s career and hospital.

Establishing and enhancing relationships with hospital staff will help the neurohospitalist achieve individual goals and improve patient care. At the individual goal level, hospitalists should collaborate with case management to ensure that patient safety is at the forefront of health care.⁴¹ At the institutional level, the neurohospitalist can help lead organization-wide changes through the quality improvement process. Also, working closely with hospital pharmacists can augment patient care.⁴² For instance, the neurohospitalist can work with a pharmacist to develop and refine protocols for insulin administration and antibiotic use, effectively promoting prevention and management of 3 HACs. Ultimately, effective patient care calls for an interdisciplinary team in which the neurohospitalist has an active role.

Discussion

The neurohospitalist must understand the HAC provision and participate in the future of HAC prevention and management, as the ramifications permeate one’s career through both direct patient care and the hospital. Since the 2005 DRA requirement, there has been much discussion surrounding the selection and implementation of HACs. After 6 years, discussion is still abuzz. Is each condition entirely preventable? As the DRA states, a condition only needs to reasonably have been prevented through the application of evidence-based guidelines. If each condition is not preventable, must hospitals endure the financial loss? If a hospital can endure the financial loss, can one also endure a quality rating system that, to the public, lacks a stratification of patients with a HAC? Is a single HAC in one of thousands of patients unacceptable? These questions are difficult to answer, and individual physicians and hospitals should try to do so. To help the neurohospitalist participate in HAC discussions, we describe below some current perspectives on physician and hospital issues in quality care and finance.

The neurohospitalist, as a physician, must do no harm and avoid iatrogenic conditions. However, the HAC provision may dictate patient care, leading to medical ramifications that

Table 4. Selected Recommendations and Practice Guidelines

HAC	Example	Practice Guideline
Pressure ulcers, stages III & IV	Braden Scale for patient that is bed- or chair-bound, or with impaired ability to reposition ^{a,b} Educational programs targeting all health care providers, patients, and family or caregivers ^a Interdisciplinary present-on-admission team ^c	European Pressure Ulcer Advisory Panel and National Pressure Ulcer Advisory Panel. Prevention and treatment of pressure ulcers: quick reference guide. Washington DC: National Pressure Ulcer Advisory Panel; 2009. ^a
Catheter-associated UTI	Electronic medical record reminder of catheter presence and clinical need ^d	Infectious Diseases Society of America, Diagnosis, prevention, and treatment of catheter-associated urinary tract infection in adults, 2009 ^e
Vascular catheter-associated infection	Daily goals sheet ^f Electronic prediction model ^g	Centers for Disease Control and Prevention, Guidelines for the Prevention of Intravascular Catheter-Related Infections, 2011 ^h
Manifestations of poor glycemic control	Measure the blood glucose concentration at hospital admission ⁱ Order point-of-care glucose monitoring in a pattern appropriate to the patient's diagnoses and carbohydrate exposure if hyperglycemia is present at hospital admission or if conditions present high risk for developing hyperglycemia ⁱ Avoid strict blood glucose control in the intensive care unit setting ⁱ	American Association of Clinical Endocrinologists, Medical Guidelines for Clinical Practice for the Management of Diabetes Mellitus, 2007 ⁱ American College of Physicians, Use of Intensive Insulin Therapy for the Management of Glycemic Control in Hospitalized Patients, 2011 ^j
Falls & trauma	Computerized fall risk assessment ^k Fall consultation service or coordinator with individualized recommendations ^l Consider characteristics of hospital falls when monitoring falls ^m Communicate patient fall risk ⁿ	Gerontology, Moreland et al., Evidence-based guidelines for the secondary prevention of falls in older adults, 2003 ^l

Abbreviations: HAC, hospital-acquired condition. UTI, urinary tract infection.

^a European Pressure Ulcer Advisory Panel and National Pressure Ulcer Advisory Panel. Prevention and treatment of pressure ulcers: quick reference guide. Washington DC: National Pressure Ulcer Advisory Panel; 2009.²⁶

^b Jackson SS. Incidence of hospital-acquired pressure ulcers in acute care using two different risk assessment scales: results of a retrospective study. *Ostomy Wound Manage.* 2011;57(5):20-27.²⁶

^c Vose C, Murphy RX, Burmeister DB, et al. Establishing a comprehensive networkwide pressure ulcer identification process. *Jt Comm J Qual Patient Saf.* 2011;37(3):131-137.²⁷

^d Saint S, Kaufman SR, Thompson M, et al. A reminder reduces urinary catheterization in hospitalized patients. *Jt Comm J Qual Patient Saf.* 2005;31:455-462.²⁸

^e Hooton TM, Bradley SF, Cardenas DD, et al. Diagnosis, prevention, and treatment of catheter-associated urinary tract infection in adults: 2009 International Clinical Practice Guidelines from the Infectious Diseases Society of America. *Clin Infect Dis.* 2010;50(5):625-663.²⁹

^f Pronovost P, Needham D, Berenholtz S, et al. An intervention to decrease catheter-related bloodstream infections in the ICU. *N Engl J Med.* 2006;355(26):2725-2732.³⁰

^g Hota B, Harting B, Weinstein RA, et al. Electronic algorithmic prediction of central vascular catheter use. *Infect Control Hosp Epidemiol.* 2010;31(1):4-11.³¹

^h O Grady NP, Alexander M, Burns LA, et al. Guidelines for the prevention of intravascular catheter-related infections. *Am J Infect Control.* 2011;39(4 suppl 1):S1-S34.³²

ⁱ Rodbard HW, Blonde L, Braithwaite SS, et al. American Association of Clinical Endocrinologists medical guidelines for clinical practice for the management of diabetes mellitus. *Endocr Pract.* 2007;13(suppl 1):1-68.³³

^j Qaseem A, Humphrey LL, Chou R, Snow V, Shekelle P. Use of intensive insulin therapy for the management of glycemic control in hospitalized patients: a clinical practice guideline from the American College of Physicians. *Ann Intern Med.* 2011;154(4):260-267.³⁴

^k Hook M. Using a Computerized Fall Risk Assessment Process to Tailor Interventions in Acute Care. In: *Advances in Patient Safety: New Directions and Alternative Approaches. Vol 1.* Rockville MD: Agency for Healthcare Research and Quality; 2008.³⁵ <http://www.ncbi.nlm.nih.gov/books/NBK43610/>. Accessed March 13, 2011.

^l Moreland J, Richardson J, Chan DH, et al. Evidence-based guidelines for the secondary prevention of falls in older adults. *Gerontology.* 2003;49(2):93-116.³⁶

^m Schwendimann R, Bühler H, De Geest S, Milisen K. Characteristics of hospital inpatient falls across clinical departments. *Gerontology.* 2008;54(6):342-348.³⁷

ⁿ Boushon B, Nielsen G, Quigley P, Rutherford P, Taylor J, Shannon D. *Transforming Care at the Bedside How-to Guide: Reducing Patient Injuries from Falls.* Cambridge, MA: Institute for Healthcare Improvement; 2008.³⁸ www.IHI.org. Last accessed November 17, 2011.

are at odds with the neurohospitalist's insight. For example, will medical staff avoid circumstances that precipitate HACs? Patients with a fall risk may not receive routine ambulation but bed rest may increase the risk of pressure ulcers. Antimicrobials may be administered prematurely, either as unnecessary prophylaxis or at the first signs of infection in a patient with a urinary or central venous catheter. Unfortunately, this could "put the patient at risk for additional ailments or lead

to the spread of drug-resistant microorganisms."⁴³ While strict glycemic control can prevent a manifestation of poor glycemic control, a change in blood glucose "may be a sentinel warning or occur as a physiologic response to a worsening patient condition."⁴⁴ In fact, Puente et al argue that "changes brought about by recurrent moderate hypoglycemia can be viewed, paradoxically, as providing a beneficial adaptive response in that there is mitigation against severe

hypoglycemia-induced brain damage and cognitive dysfunction.”⁴⁵ Is HAC avoidance harmful? While clinical judgment is imperative to quality patient care, understanding HACs and the CMS provision must supplement this judgment.

As an active pillar of hospital care, the neurohospitalist is affected by public perspective on the quality of patient care. In April 2011, the CMS increased transparency by making the reporting of HACs available on *Hospital Compare*, a public online resource.⁴⁶ Pichert suggests using patient complaints to promote patient safety.⁴⁷ Whether on the public front or behind the scenes, the neurohospitalist should take on an active role in quality improvement.

Management of patient safety and prevention of HACs needs expert guidance and effective collaboration. The concept of improving the health care team is “a direct result of ‘To Err is Human,’”⁴⁸ the comprehensive interview published in the early years of the Institute of Medicine’s Quality of Health Care in America project. Just like a patient’s medical team of physicians, nurses, and ancillary staff, a team for patient safety should be diverse. To fully address pressure ulcers, “educational programs . . . should be directed at all levels of health care providers, patients, and family or caregivers.”²⁵ Furthermore, effective communication is imperative. As Cunningham and Gellar suggest, “for optimal patient safety improvement, the culture of health care needs to be modified so caregivers and their patients feel safe reporting and learning from medical mistakes observed or anticipated.”⁴⁹ From a legal perspective, Brennan notes, “Any effort to prevent injury due to medical care is complicated by the dead weight of a litigation system that induces secrecy and silence. . . . To address the problem of iatrogenic injuries seriously, we must reform the system of malpractice litigation.”⁵⁰ The neurohospitalist is well equipped to serve on patient safety teams to promote effective communication.

With regard to reimbursement, is the CMS proposing changes that are actually more expensive to fix? The RTI has an ongoing evaluation of the HAC Present on Admission program, with data from September 30, 2009 to September 29, 2011, to be collected and analyzed. Current reported data from FY 2009 is a limited view of the financial impact of the CMS changes, and each institution is unique. An institution’s expense depends on factors including patient profile and the chosen method(s) of reducing HAC incidence. The issue of implementation cost of programs for HAC prevention versus permitting HAC occurrence is evolving.

Given the change in reimbursement, the HAC provision establishes a punitive rapport between the CMS and hospitals. A potential revision would be to offer financial incentives for successful diminution of HACs. According to Berkowitz et al, a financial incentive can reduce readmission, thus potentially decreasing gross expenditure.⁵¹ Incentives include that offered via the 2010 Affordable Care Act: starting January 1, 2012, programs that commit “to quality thresholds may share in the cost savings they achieve for the Medicare program.”⁵² The California-based Delivery System Reform

Incentive Program (DSRIP) is a federal pay-for-performance initiative intended to offer California public hospital systems a significant portion of \$3.3 billion federal funding over 5 years.⁵³ Participants must successfully implement multiple projects that span 4 categories. The fourth category, Urgent Improvement in Care, includes projects to reduce iatrogenic pressure ulcers, CLABSI, and falls. Teufack et al even suggest “rewarding hospitals with higher quality of care by naming them ‘centers of excellence’ and directing patients toward these facilities.”⁵⁴

For financial reasons, will hospitals avoid admitting high-risk Medicare patients? Simply put, “overzealous application of HACs restrictions may remove from tertiary centers the incentive to treat high-risk patients.”⁵⁴ Patients may be diverted to academic hospitals, “which commonly have populations of complex patients with a higher risk of HACs” and continue to have challenges to meet financial targets.⁵⁴ However, with more secondary diagnoses, the hospital may not experience a change in the MS-DRG and thus avoid a decrease in reimbursement. The neurohospitalist should understand the vulnerability of one’s practice with regard to case diversity and severity.

To ensure proper reimbursement, the neurohospitalist must use accurate and adequate documentation within the medical record. Recall that for the POA status of a secondary diagnosis, “documentation inadequate to determine status (U)” is treated as “not present (N)” when determining MS-DRG. Balentine offers coding tips that apply to documentation of a patient with a potential fall risk: “‘Ambulatory dysfunction’ and ‘deconditioning’ lack the required specificity to ensure accurate coding; when possible, use ‘abnormal gait,’ ‘difficulty walking,’ ‘muscle weakness,’ and so forth.”⁵⁵ Also, when documenting a catheter-associated UTI, “‘Urosepsis’ codes to urinary tract infection site NOS: write ‘sepsis with urinary origin.’”⁵⁵ Because coders can use only documentation by physicians who are directly caring for the patient during that admission,⁵⁵ it is the neurohospitalist’s responsibility to use proper documentation for appropriate reimbursement.

What lies ahead? As discussed previously, Medicaid implemented the Provider Preventable Conditions provision beginning July 1, 2011. Will the HAC provision in Medicare expand to limiting physician reimbursement?²³ Will additional HACs come into play? Will other insurers follow suit? Will payment not only be excluded for the HAC, but also for its consequences or readmissions?⁵⁶ How will the role of the hospitalist or neurohospitalist and his or her patients change? Physicians, hospitals, the CMS, and communities are in the midst of knowing these answers. Hospitalists, particularly neurohospitalists, are equipped to provide for their patients and support their hospitals in the setting of a changing care and reimbursement system.

Conclusion

The CMS provision outlining 10 HACs for which hospitals are no longer reimbursed influences the neurohospitalist in many

ways. As a physician, the concern for quality patient care is innate. The community expects the hospitalist in general and the neurohospitalist to maintain a standard of care. However, physicians may feel restrained, and medical decisions may be made ineptly to avoid HACs. Financial implications will vary by hospital, but they are not limited to a simple loss in hospital funding due to lack of reimbursement. While future changes and consequences are uncertain, the HAC provision and expectations of patient care by a neurohospitalist are real. We hope that a better understanding of CMS, HACs, current guidelines, and new approaches will help neurohospitalists continue to best serve their patients, hospitals, and communities.

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