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# Examination of the Accuracy of Coding Pressure Ulcer Stages

## Final Report

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## **Examination of the Accuracy of Coding Pressure Ulcer Stages**

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## SECTION 1 INTRODUCTION

The purpose of this study is to look at the accuracy of coding for pressure ulcers under the Medicare Hospital-Acquired Condition-Present on Admission (HAC-POA) Program. Accuracy of coding HACs and POA conditions is critical for accurate payment under the HAC-POA program and for evaluation of behavioral response to the implementation of the HAC-POA program. The conditions of stage III and stage IV pressure ulcers became subject to the payment adjustment for hospital-acquired conditions beginning October 1, 2008 (McCall, Dalton, Bernard, Healy, & Jordan, 2010). Pressure ulcers are coded with both a site code (*International Classification of Diseases*, 9th revision [ICD-9] codes 707.00–707.09) and a stage code (ICD-9 codes 707.20–707.25). Under the Centers for Medicare & Medicaid Services (CMS) HAC-POA program, hospitals have financial incentives to mischaracterize clinical conditions (e.g., a stage II pressure ulcer rather than stage III, if acquired during the hospitalization, or a stage III rather than stage II, if POA) and to reposition diagnosis codes to make a HAC-associated clinical condition one of the last listed secondary diagnoses on the hospital bill rather than one of the first. Only the first eight secondary diagnoses are captured in the Medicare data systems and used by the Medicare program for purposes of assigning the case to a Medicare Severity Diagnosis Related Group (MS-DRG).<sup>1</sup> There is no requirement that a stage code be in the first eight secondary diagnosis code fields.<sup>2</sup> It is possible that a site is coded in the eighth field and a stage in the ninth field, but CMS’s data systems will pick up only the site. In this scenario, the claim would not be considered as having reported a HAC.<sup>3</sup>

The analysis in this report focuses on answering three research questions:

1. What percentage of *claims* with a pressure ulcer site coded had no accompanying pressure ulcer stage coded?
  - a. What percentage of pressure ulcer *site codes* reported had no accompanying pressure ulcer stage code reported?
2. Is the rate of stage III/IV Pressure Ulcer HACs sensitive to the number of diagnosis fields reported in the Hospital Cost and Utilization Project (HCUP) state data files (SIDs) data?
3. Does the distribution of the percentage of claims with a pressure ulcer site code with no accompanying pressure ulcer stage coded vary by major hospital characteristics?

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<sup>1</sup> Beginning in January 2011, CMS was able to receive claims from all providers that were processed in the “5010” format, which allows for up to 25 diagnoses. Before this, providers submitted claims in the “4010” format, which cuts all diagnoses off after the 10th. Providers were allowed to transition to the 5010 format at any time during 2011. All providers must submit claims in the new format starting July 1, 2012. As providers transition to the 5010 format, additional diagnoses have become available in the published claims files (Medicare Provider Analysis and Review [MedPAR] or Standard Analytical File [SAF]).

<sup>2</sup> The guidelines for POA indicator coding are set forth in Appendix I of the ICD-9-CM official guidelines for coding and reporting, effective October 1, 2008.

<sup>3</sup> The ICD-9-CM Official Coding Guidelines require that for a patient admitted with a pressure ulcer at one stage that progresses to a higher stage, the code for highest stage reported for the site should be reported. This may result in a situation where a patient is admitted with a Stage II pressure ulcer that is coded as being POA that progress to a Stage III pressure ulcer which would remain coded as POA.

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## SECTION 2 DATA AND METHODS

In this section, we present the data and methods used to address each of the research questions posed in the Introduction. The section is separated into subsections according to each research question.

### **2.1 What percentage of *claims* with a pressure ulcer site coded had no accompanying pressure ulcer stage coded?**

We examined Medicare claims data for FYs 2009 and 2010 to determine the degree to which pressure ulcer stages were not being reported when a pressure ulcer site code was reported. Our intent was to examine the potential degree of underreporting the presence of stage III/IV pressure ulcers. We excluded all claims with a pressure ulcer of any stage (ICD-9 diagnosis codes 707.20–707.25) *reported as* POA (POA of “Y” or “W”). We next selected all claims with a secondary diagnosis code of pressure ulcer site (ICD-9 diagnosis codes 707.00–707.09) that were *not reported as* POA (POA of “N” or “U”). For these claims, we created a binary indicator variable for the presence or absence of *any* pressure ulcer stage diagnosis code. The indicator was set equal to 1 if any secondary diagnosis code for a pressure ulcer stage was found on the claim, and 0 otherwise. As a comparison, we also perform this analysis where a principal or primary diagnosis of a pressure ulcer site was reported not POA and created a similar binary variable for presence or absence of *any* pressure ulcer stage.

For each year, separately, we report the percentage of *claims* with a secondary diagnosis of a pressure ulcer site code that had no accompanying pressure ulcer stage code. We also report the percentage of *claims* with a principal or primary diagnosis of a pressure ulcer site code that had no accompanying pressure ulcer stage code. No statistical testing was done comparing the two fiscal years.

#### **2.1.1 What percentage of pressure ulcer site codes reported had no accompanying pressure ulcer stage code reported?**

It is possible that a claim can have more than one pressure ulcer site code recorded (e.g., a pressure ulcer on the shoulder and a second on the ankle). As another approach to examining the incidence of pressure ulcer claims being reported without a stage, we examined the counts of pressure ulcer codes recorded. Utilizing claims from fiscal year (FY) 2009 *only*, we identified the claims with a pressure ulcer site recorded and counted the number of recorded pressure ulcer site codes and the number of recorded pressure ulcer stage codes.<sup>4</sup> We report the percentage of pressure ulcer site secondary diagnosis codes that had no accompanying pressure ulcer stage code.

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<sup>4</sup> To reduce computing resource time and costs, we restricted this analysis to a single year of MedPAR data (2009).

## **2.2 How does the number of diagnosis code fields available in the reporting system affect the pressure ulcer HAC rates for stage III and IV pressure ulcers?**

To examine this question, we looked to results from another RTI International HAC-POA report, *Examination of Spillover Effects and Unintended Consequences* (Healy, Spain, & Cromwell, 2011). In this report, analyses were performed using the 2009 HCUP SID data for California, Florida, and New York. These three states report more secondary diagnosis fields in the HCUP data than were captured in the MedPAR file: California reported 24 secondary diagnosis fields, Florida reported 30, and New York reported 14.

In the current report, we focus on the results for claims for which Medicare was the primary payer. These results allow examination of the impact of including more diagnosis fields when calculating hospital-acquired stage III and IV pressure ulcer rates. The pressure ulcer HAC rates were calculated per 10,000 discharges using all available secondary HCUP diagnoses and also for the first eight secondary diagnoses to compare to Medicare claims (which capture only the first eight secondary diagnoses). We report the rates per 10,000 discharges and the ratio of the rates. No statistical testing of the differences in the rates is conducted.

## **2.3 How does the distribution of the percentage of claims with a pressure ulcer site code with no accompanying pressure ulcer stage code vary by major hospital characteristics?**

To investigate the third research question, we selected claims for hospitals that recorded at least one pressure ulcer stage code (707.20–707.25) on a claim in FY 2009 or FY 2010. We then supplemented the Medicare data with hospital characteristics available from the 2010 Provider of Services File (POS) and rural-urban codes from the census.<sup>5</sup> Information on academic medical centers (AMC) was obtained from the University Health Consortium.<sup>6</sup> The hospital characteristics were merged to the Medicare claims data by Medicare provider ID.

To examine the distribution of claims across hospital types in which a secondary diagnosis of pressure ulcer site was reported without an accompanying pressure ulcer stage code, we constructed estimates of the percentage of all secondary diagnosis pressure ulcer claims not POA that had no accompanying pressure ulcer stage code by major hospital characteristics. We first constructed percentage estimates at the hospital level and then constructed unweighted mean percentages by major hospital characteristics.

Using the POS file, we assigned each hospital an ownership type based on the control type. Hospitals for which the control type equaled 1, 2, or 3 were coded as “nonprofit,” whereas hospitals with a control type of 4 were classified as “for-profit.” Hospitals with a control type of 6 or 7 were classified as “state or local government,” and hospitals with control type of 5 or 8 were classified as “other government.”<sup>7</sup> No other control types were associated with the POS

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<sup>5</sup> <http://www.census.gov>

<sup>6</sup> The 2012 list can be found here; a prior year’s list was used in analysis:  
[https://www.uhc.edu/docs/003675405\\_UHCMembershipList.pdf](https://www.uhc.edu/docs/003675405_UHCMembershipList.pdf)

<sup>7</sup> The control types in the POS file are 01, Voluntary non-profit—church; 02, Voluntary non-profit—private; 03, Voluntary non-profit—other; 04, Proprietary; 05, Government—federal; 06, Government—state; 07, Government—local; and 08, GOV. - HOSP. DIST. or AUTH.



file for acute care hospitals. The 2003 census rural-urban codes were used to assign hospitals to an urban-city. Hospitals located in counties with a metropolitan area with a population of 1 million or more were classified as “large urban.” Hospitals located in counties with any metropolitan area with a population of up to 1 million were classified as “small urban.” All other counties were classified as “rural.” Finally, an indicator variable was created for hospitals considered to be AMCs. The indicator variable was set equal to 1 if the hospital was an AMC and 0 otherwise. To determine which hospitals were AMCs, the current member list from the University Health Consortium was used. AMC status was assigned to full member hospitals or hospital systems.

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### SECTION 3 RESULTS

In this section, we present the results from the methods used to address each of the research questions posed in the Introduction. The section is separated into subsections according to each research question.

#### 3.1 What percentage of *claims* with a pressure ulcer site coded had no accompanying pressure ulcer stage coded?

**Table 1** displays the number of claims with a secondary diagnosis of a pressure ulcer site not POA and the *percentage of claims* that did not have a pressure ulcer stage code in any of the first eight secondary diagnosis fields for FY 2009 and FY 2010, respectively. The first and third data columns in Table 1 report the number of claims in FY 2009 and FY 2010. The second and fourth data columns report the corresponding fiscal year’s percentage of claims. In FY 2009, 54 percent of claims with a secondary diagnosis code of a pressure ulcer site did not have any pressure ulcer stage code (707.20–707.25) in any of the first eight secondary diagnosis fields. The percentage of claims with a pressure ulcer site but without a pressure ulcer stage code was 7 percentage points higher in FY 2010 than in FY 2009.

**Table 1**  
**Percentage of claims with a secondary diagnosis of pressure ulcer site not present on admission with and without a reported pressure ulcer stage code, FY 2009 and FY 2010**

Stage present?	Number of claims with a PU site code FY 2009	Percentage of claims without a PU stage code FY 2009	Number of claims with a PU site code FY 2010	Percentage of claims without a PU stage code FY 2010
No	6,284	54%	6,159	61%
Yes	5,365	46%	3,920	39%

NOTES: PU, pressure ulcer.

SOURCE: RTI analysis of FY 2009 and FY 2010 Medicare Provider Analysis and Review claims.

Computer output: pucoding03

**Table 2** displays the percentage of claims with a pressure ulcer site recorded as a principal or primary diagnosis that did and did not report a pressure ulcer stage code (707.20–707.25) in any of the first eight secondary diagnosis fields in FY 2009 and FY 2010. In contrast to the earlier findings, when a pressure ulcer site was recorded as the principal or primary diagnosis, nearly 90 percent of the claims had a pressure ulcer stage code. The percentage of claims with a pressure ulcer site code recorded as the principal or primary diagnosis that did not have a pressure ulcer stage code was constant between FY 2009 and FY 2010.

**Table 2**  
**Percentage of claims with a primary diagnosis of pressure ulcer site with and without a reported pressure ulcer stage code, FY 2009 and FY 2010**

Stage present?	Number of claims with a PU site code FY 2009	Percent of claims without a PU stage code FY 2009	Number of claims with a PU site code FY 2010	Percent of claims without a PU stage code FY 2010
No	2,430	13%	2,139	12%
Yes	16,115	87%	15,701	88%

NOTES: PU, pressure ulcer.

SOURCE: RTI analysis of FY 2009 and FY 2010 Medicare Provider Analysis and Review claims.

Computer output: pucoding03

**3.1.1 What percentage of pressure ulcer site codes reported had no accompanying pressure ulcer stage code reported?**

It is possible that a claim could have multiple pressure ulcer site codes recorded (e.g., a pressure ulcer on the shoulder and a second on the ankle) and fewer stage codes than site codes. **Table 3** displays the counts of *pressure ulcer site codes* reported as not POA (these are the frequency of the pressure ulcer diagnoses, not claim counts) and pressure ulcer stage codes recorded in the first eight secondary diagnosis fields of the claims. The percentage of site codes without a stage code is displayed in the third column. In FY 2009, 12,674 pressure ulcer site codes were reported and 5,797 stage codes were reported; 54 percent of pressure ulcer site codes did not have a corresponding stage code. This large percentage of missing stage codes may be due, in part, to stage codes being recorded in secondary diagnosis fields nine and beyond, as well as to claims with more than one site code recorded having fewer stage codes recorded. Current coding guidelines restrict secondary diagnoses to being listed once per claim, so that a claim for a beneficiary with two stage III pressure ulcers at different sites will have two site codes but only one stage code.

**Table 3**  
**Count of reported pressure ulcer site and stage codes from claims with a secondary diagnosis of pressure ulcer site reported not present on admission, FY 2009**

Number of pressure ulcer site codes	Number of pressure ulcer stage codes	Percentage of pressure ulcer site codes with no stage code
12,674	5,797	54%

SOURCE: RTI analysis of FY 2009 Medicare Provider Analysis and Review claims.

Computer output: pucoding03b

### 3.2 How does the number of diagnosis code fields available in the reporting system affect the rate of stage III/IV pressure ulcer HACs?

The third column of **Table 4** displays the rates of the stage III and IV pressure ulcer HACs per 10,000 Medicare discharges for the first eight secondary diagnoses. The fourth column displays the stage III and IV pressure ulcer HAC rates calculated per 10,000 Medicare discharges using all available secondary diagnoses. The final column displays the ratio of rates using eight secondary diagnosis code fields to rates using more than eight secondary diagnosis codes.

The ratio of stage III/IV pressure ulcers that are hospital acquired ranged from 0.38 to 0.70 and was lowest in New York, which reports 14 secondary diagnosis codes, and highest in California, which reports 24 secondary diagnosis codes. Clearly, the use of only the first eight secondary diagnosis codes reduces the reported rate of hospital-acquired stage III/IV pressure ulcers among Medicare beneficiaries.

**Table 4**  
**Medicare stage III and IV hospital-acquired pressure ulcer rates per 10,000 discharges for three states, FY 2009**

State	Number of secondary diagnosis fields reported by state	Hospital-acquired pressure ulcer rate in the first eight secondary diagnosis codes only	Hospital-acquired pressure ulcer rates in all HCUP secondary diagnosis codes	Ratio of HAC rates based on the first eight secondary diagnoses to HAC rates based on all reported HCUP secondary diagnoses
California	24	2.0	2.9	0.70
Florida	30	1.3	2.8	0.47
New York	14	2.6	6.8	0.38

NOTES: Hospital acquired (HAC) pressure ulcer rates per 10,000 discharges.

SOURCE: 2009 Hospital Cost and Utilization Project state data files data for California, Florida, and New York. See tables 2.3 and 2.11 in Healy, D. A., Spain, P. C., & Cromwell, J. (2011, September). *Examination of spillover effects and unintended consequences of Medicare HAC-POA program* (CMS Contract No. HHSM-500-2005-00029I). Prepared for Centers for Medicare & Medicaid Services.

### 3.3 How does the distribution of the percentage of claims with a pressure ulcer site code with no accompanying pressure ulcer stage code vary by major hospital characteristics?

To examine whether the distribution of claims in which a secondary diagnosis of pressure ulcer site was reported without an accompanying pressure ulcer stage code varied by hospital type, we constructed estimates of the percentage of claims with a secondary diagnosis of pressure ulcer site not POA that had no accompanying pressure ulcer stage code, first at the hospital level, and then aggregated by major hospital characteristics. **Table 5** summarizes the percentage of claims with missing pressure ulcer stage codes by major hospital characteristics. Of the 2,154 Inpatient Prospective Payment System (IPPS) hospitals, 100 were AMCs. Among the AMCs, on average, 58 percent of claims with a secondary diagnosis of pressure ulcer site had

no accompanying pressure ulcer stage code (707.20–707.25). Among non-AMCs, only 31% of claims with a pressure ulcer site did not have an accompanying pressure ulcer stage code. A pairwise statistical comparison showed that the difference in the percentage of claims with a secondary diagnosis of pressure ulcer site missing a pressure ulcer stage code between AMCs and non-AMCs was statistically significant at better than the 1% level.<sup>8</sup>

Next, we examined the percentage of secondary diagnosis pressure ulcer site claims without any stage codes by hospital size. As the size of the hospital grows, so does the percentage of claims with a pressure ulcer site code without an accompanying stage code. Hospitals with more than 500 beds have, on average, roughly 50 percent of claims with a pressure ulcer site code without any stage codes, compared with 19–37 percent of claims for hospitals with fewer than 500 beds. Pairwise comparisons showed that the difference between the percentage of claims with a secondary diagnosis of pressure ulcer site missing a pressure ulcer stage code at hospitals with 500 or more beds and hospitals with fewer than 500 beds were statistically significant at the 5% level or better. Furthermore, the percentage of claims with a secondary diagnosis of pressure ulcer site missing a pressure ulcer stage code among the hospitals with fewer than 500 beds were statistically different from each other (<100 beds, 100–249 beds, and 250–499 beds).

**Table 5**  
**Percentage of claims with a secondary diagnosis of pressure ulcer site not present on admission without any pressure ulcer stage code, by hospital characteristics, 2009 and 2010**

Hospital characteristic	Hospital count	Average percentage of pressure ulcer claims without any stage codes
Overall	2,154	68%
<b>AMC status</b>		
AMC	100	58%
Not AMC	2,052	31%
Missing	2	50%
<b>Bed size</b>		
<100	413	19%
100–249	778	28%
250–499	649	37%
500–749	222	50%
750–999	59	49%
>1,000	31	54%
Missing	2	50%

(continued)

<sup>8</sup> All pairwise comparisons are shown in Appendix Table A-1.

**Table 5 (continued)**

**Percentage of claims with a secondary diagnosis of pressure ulcer site not present on admission without any pressure ulcer stage code, by hospital characteristics, 2009 and 2010**

Hospital characteristic	Hospital count	Average percentage of pressure ulcer claims without any stage codes
<b><i>Hospital ownership</i></b>		
For profit	359	24%
Nonprofit	1,426	35%
Other government	208	33%
State or local government	159	31%
Missing	2	50%
<b><i>Urban or rural status</i></b>		
Large urban	893	35%
Small urban	740	36%
Rural	519	22%
Missing	2	50%

NOTES: AMC, academic medical center.

SOURCE: RTI analysis of 2009 and 2010 Medicare Provider Analysis and Review claims.

Computer output: HospCharc01

Hospital ownership may lead to different incentives for coding practices. We examined the percentage of secondary diagnosis pressure ulcer claims without any stage codes by hospital ownership type. The percentage of pressure ulcer site claims without any stage codes was, on average, lowest in for-profit hospitals, at 24 percent of claims. Pairwise comparisons showed that the difference between the percentage of claims with no stage code at for-profit hospitals and hospitals with other ownership types was statistically significant at the 10% level or better, with the for-profit hospitals having lower average rates of percentage of claims with missing stage codes. However, no statistically significant differences were found between nonprofit (35 percent of claims), state or local government (31 percent of claims), and other government (33 percent of claims) ownership types.

We also examined the average percentage of pressure ulcer claims with a secondary diagnosis of pressure ulcer site without any stage codes by geographic location. Hospitals in large and small urban areas had, on average, approximately 35 percent of claims with a pressure ulcer site code without any stage codes, compared with 22 percent in rural areas. Pairwise comparisons showed that the differences between large urban and rural hospitals and small urban and rural hospitals were statistically significant at the 1% level or better. No statistically significant difference was found between large and small urban hospitals.

Lastly, we examined the average percentage of pressure ulcer claims with a secondary diagnosis of pressure ulcer site without any stage codes by state. **Table 6** displays the variation in the percentage of pressure ulcer claims with a secondary diagnosis of pressure ulcer site without any stage codes by state. The percentage ranges from 9 to 50 percent. There is no obvious geographic pattern.

**Table 6**  
**Percentage of claims with a secondary diagnosis of pressure ulcer site not present on admission without any pressure ulcer stage code by state, FY 2009 and FY 2010**

State	Hospital count	Average percentage of pressure ulcers claims missing stage code	State	Hospital count	Average percentage of pressure ulcers claims missing stage code
AK	7	9%	NC	66	34%
AL	51	24%	ND	7	15%
AR	31	22%	NE	15	35%
AZ	36	46%	NH	12	22%
CA	187	36%	NJ	59	36%
CO	30	37%	NM	17	24%
CT	25	31%	NV	17	44%
DC	6	22%	NY	139	36%
DE	4	36%	OH	87	36%
FL	107	33%	OK	46	25%
GA	57	27%	OR	22	40%
HI	8	39%	PA	107	27%
IA	23	48%	RI	11	39%
ID	4	33%	SC	32	39%
IL	80	32%	SD	9	50%
IN	54	34%	TN	55	28%
KS	32	28%	TX	156	29%
KY	32	41%	UT	15	37%
LA	48	17%	VA	56	41%
MA	43	41%	VT	4	37%
ME	14	31%	WA	36	33%
MI	68	35%	WI	43	26%
MN	31	36%	WV	27	34%
MO	54	22%	WY	6	18%
MS	29	32%	Missing	39	28%
MT	10	29%	—	—	—

SOURCE: RTI analysis of FY 2009 and FY 2010 Medicare Provider Analysis and Review claims and hospital characteristics.

Computer output: HospCharac01



## SECTION 4 CONCLUSION

This report examined the presence of pressure ulcer stages coding for claims with a secondary diagnosis of a pressure ulcer site that was not coded as POA. The conditions of stage III and stage IV pressure ulcers became subject to the payment adjustment for IPPS HACs beginning October 1, 2008. Pressure ulcers are coded with both a site code (ICD-9 codes 707.00–707.09) and a stage code (ICD-9 codes 707.20–707.25). The accuracy of coding HACs and the proper use of POA indicators are critical for accurate payment under the HAC payment policy and for evaluation of behavioral response to the implementation of the HAC payment policy.

Only the first eight secondary diagnoses are captured in the Medicare data systems and used by the Medicare program for purposes of assigning a case to an MS-DRG. There is no requirement for pressure ulcer coding that the stage code must be in the first eight secondary diagnosis code fields. It is possible that the site is coded in the eighth field and the stage in the ninth field but CMS's data systems will process only up to the eighth secondary diagnosis and therefore may pick up only the site. Thus, the claim would not be considered as having reported a HAC.

The analyses in this report focused on the percentage of claims with a secondary diagnosis of a pressure ulcer site that had no accompanying pressure ulcer stage coded, coding sensitivity to the number of diagnosis fields available, and variation in coding by major hospital characteristics. We primarily used FY 2009 and FY 2010 MedPAR files for this analysis and augmented the data with hospital characteristics from the FY 2010 POS files. We also used results from another RTI HAC-POA report that used the 2009 HCUP Medicare payment data for California, Florida, and New York to examine the sensitivity to the number of diagnoses captured.

Our results show that the coding of pressure ulcer stages in the first eight secondary diagnosis fields occurs on somewhat less than one-half of all IPPS claims; 54 percent of the claims in FY 2009 and 61 percent of the claims in FY 2010 with a pressure ulcer site recorded as a secondary diagnosis did not have a pressure ulcer stage code in any of the first eight secondary diagnosis fields. Further analysis found that when a pressure ulcer site was recorded as the principal or primary diagnosis a pressure ulcer stage code was recorded on nearly 90% of the claims.

Analyses from another RTI HAC-POA report, *Examination of Spillover Effects and Unintended Consequences* (Healy et al., 2011), examined the impact of including more diagnosis fields when examining hospital-acquired pressure ulcer rates. HAC rates per 10,000 discharges using all available secondary HCUP diagnoses and for the first eight secondary diagnoses only were calculated for Medicare patients. We found that including a greater number of fields reporting secondary diagnosis codes led to an increase in HAC rates for stage III and IV pressure ulcers.

Lastly, we examined the distribution of pressure ulcer claims without any stage codes across hospital types. We found significant variation across important hospital characteristics.

Hospitals that were classified as AMCs, on average, had a higher percentage of claims with a secondary diagnosis of a pressure ulcer site that had no accompanying pressure ulcer stage code than non-AMCs. The percentage of pressure ulcer claims without any stage codes was also, on average, higher at larger hospitals. Variation was also found by hospital ownership. The percentage of pressure ulcer claims without any stage codes was, on average, lower in for-profit hospitals than in nonprofit hospitals, state or local government hospitals, or other government hospitals. Analyses were also performed by hospital location. Hospitals in large and small urban areas were found to have, on average, a higher percentage of claims with a pressure ulcer site code without any stage codes. Significant variation, from 9 to 50 percent, was also found by state.

The accuracy of coding for the pressure ulcer stages III and IV HAC is complicated by the fact that only the first eight secondary diagnoses are captured in the Medicare data. It is possible that claims with pressure ulcer stages III and IV HAC are not classified correctly because CMS does not process more than eight secondary diagnosis codes when calculating the MS-DRG assignment. This problem will, in all likelihood, be reduced through the changed-in-claim process that now allows for the ability to process 25 diagnosis codes and 25 procedure codes per claim. Thus, CMS is likely to observe an increased reported rate of pressure ulcer stages III and IV when the larger number of diagnosis codes is evaluated.

## REFERENCES

- Healy, D. A., Spain, P. C., & Cromwell, J. (2011, September). *Examination of spillover effects and unintended consequences of Medicare HAC-POA program* (CMS Contract No. HHSM-500-2005-00029I). Prepared for Centers for Medicare & Medicaid Services.
- ICD-9-CM official guidelines for coding and reporting, effective October 1, 2008. In *2009 ICD-9-CM*, pp. 1–34. Retrieved from [http://www.ama-assn.org/resources/doc/cpt/icd9cm\\_coding\\_guidelines\\_08\\_09\\_full.pdf](http://www.ama-assn.org/resources/doc/cpt/icd9cm_coding_guidelines_08_09_full.pdf)
- McCall, N., Dalton, K., Bernard, S.L., Healy, D. A., & Jordan, H. S. (2010, June). *Hospital-acquired conditions—present on admission (HAC-POA) program evaluation design report* (CMS Contract No. HHSM-500-2005-00029I). Prepared for Centers for Medicare & Medicaid Services.

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**APPENDIX**

**Table A1**  
**Pairwise comparisons (Bonferroni) for hospital characteristics analysis**

Group 1	Group 2	Difference in average percentage of pressure ulcer claims without any stage codes	Level of significance
<i><b>AMC status</b></i>			
AMC	Not AMC	0.27	0.000
<i><b>Bed size</b></i>			
<100	100–249	0.09	0.000
<100	250–499	0.18	0.000
<100	500–749	0.31	0.000
<100	750–999	0.30	0.000
<100	>1,000	0.35	0.000
100–249	250–499	0.09	0.000
100–249	500–749	0.21	0.000
100–249	750–999	0.21	0.000
100–249	>1,000	0.26	0.000
250–499	500–749	0.12	0.000
250–499	750–999	0.12	0.029
250–499	>1,000	0.17	0.018
500–749	750–999	–0.01	1.000
500–749	>1,000	0.04	1.000
750–999	>1,000	0.05	1.000
<i><b>Hospital ownership</b></i>			
For profit	Nonprofit	0.11	0.000
For profit	Other government	0.09	0.003
For profit	State or local government	0.07	0.066
Nonprofit	Other government	–0.02	1.000
Nonprofit	State or local government	–0.03	0.977
Other government	State or local government	–0.02	1.000

(continued)

**Table A1 (continued)**  
**Pairwise comparisons (Bonferroni) for hospital characteristics analysis**

Group 1	Group 2	Difference in average percentage of pressure ulcer claims without any stage codes	Level of significance
<i>Urban/rural status</i>			
Large urban	Rural	-0.13	0.000
Large urban	Small urban	0.00	1.000
Small urban	Rural	0.14	0.000

NOTES: AMC, academic medical center.

SOURCE: RTI analysis of 2009 and 2010 Medicare Provider Analysis and Review claims.

Computer output: HospCharc02