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The Effect of Standardized Photodocumentation on Coding of Pressure Injuries

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THE EFFECT OF STANDARDIZED PHOTODOCUMENTATION ON CODING OF PRESSURE INJURIES

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ABSTRACT

Background and Purpose: Pressure injuries (PI) are prevalent and costly for hospitals. Hospitals implement different practices to accurately document PIs ranging from pen and paper to photodocumentation in electronic medical records (EMRs). In some instances, PIs that have been documented are not coded for billing and reporting. The purpose of this study is to determine if different documentation practices affect the number of coded PIs.

Methods: Counts of coded PIs were collected from 2011- 2017 from two hospitals: a 500-bed acute care hospital (ACH) and a 42-bed acute rehabilitation hospital (ARH). A series of PI documentation practices were implemented over the course of the six years data were collected. The aim of the changes were to improve the accuracy of wound assessment, facilitate transparent and accurate reporting, and improve care. The four documentation practice time periods included 1) baseline, 2) PI photodocumentation with paper and all paper charting, 3) PI photodocumentation on paper and EMR for all other charting, and finally 4) all charting and documentation in the EMR.

Results: In the 500-bed facility, a statistically significant difference was found in the mean number of PIs coded among the four documentation periods ($F(3) = 45.460$; $p < 0.001$), with the highest number of PI's reported during PI photodocumentation with paper and all paper charting. In the ARH there was a statistically significant difference in the average number of PIs among the four different documentation periods (Period 1-ARH Mean = 56, Period 2-ARH Mean = 31, SD = 11.3, Period 3-ARH Mean = 36.1, SD = 14.4, Period 4-ARH Mean = 58.7, SD = 11.3; $F(3) = 5.994$; $p = 0.006$). In post hoc analysis a significant difference between Period 2-ARH and Period 4-ARH ($p = 0.036$), as well as between Period 3-ARH and Period 4-ARH ($p = 0.005$) was observed.

Discussion: Changes in documentation practice coincided with significant changes in the number of PIs being coded in the ACH and ARH. Improper or inaccurate documentation of PIs has the potential to result in inaccurate coding and therefore missed payment for services provided. More serious PIs that are not coded properly may cost the facility thousands of dollars in missed payments. Accurate assessment and subsequent coding of PIs ensures the facility is fairly compensated for services provided**.**

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INTRODUCTION

Pressure Injuries (PI) are common among patients needing inpatient medical care with an estimated annual incidence of 2.5 million.[1-4] Whittington et al. looked at prevalence of PIs over a 6 year period and found that among 158,235 patients observed from 1999-2004, 15.3% experienced a PI. In the United States it is estimated that the costs for treating these injuries range from $2.2 to $3.6 billion a year.[1-4] Looking at these conditions in terms of Medicare costs, in 2007 patients with a PI carried an associated average payment of $43,180 per episode.[5]

PIs are technically defined by the National Pressure Ulcer Advisory Panel (NPUAP) as localized skin and soft tissue damage typically found over a bony prominence.[6] The skin and soft tissue damage occurs after an extended period of pressure or combination of pressure with shear forces, sometimes caused by medical or other devices.[6] The term “pressure injury” replaced “pressure ulcer” after an April 2016 consensus conference held by the NPUAP.[6] The conference determined after a large literature review that “injury” was more appropriate because “ulcer” did not appropriately relate to all classifications, specifically Stage 1 and Deep Tissue Pressure Injuries.[6]

Often PIs are thought to be indicative of quality of care.[7] The NPUAP hosted a conference to gain a consensus on whether these injuries were mostly preventable. They found that with some exceptions most were avoidable.[7] This consensus, combined with high cost, prevalence, and patient discomfort, make appropriate care of PIs a high priority for our health care system.

The NPUAP classification system includes stages from 1-4, an “unstageable” category, or a category of “Deep Tissue Pressure Injury”.[6,8] Patients typically undergo skin assessments at admission to look for developing or developed pressure injuries.[9-22] If present, a stage is assigned and documented.[9-22] The documentation by physicians is used by medical coding personnel to assign an appropriate code for billing and reporting.[9-22] PIs may be classified by

medical coders as Hospital Acquired Conditions (HAC) or Present on Admission (POA).[23-27] As the names imply, HACs would be PIs that are new during the patient's hospital stay whereas POAs would be PIs present before admission.[23-27] If during initial skin assessment a PI that was POA goes undetected but is then observed at a later time, it will be coded as a HAC.[23-27] Too many HACs can result in financial penalties for a hospital.[23-27]

In order for medical facilities to receive appropriate payment for services and to truly account for the occurrence and cost associated with PIs, accurate medical coding must take place.[28-30] Once documentation of care is completed, the information regarding that care is used by a medical coder to assign an appropriate code that translates to an amount to be billed.[28-30] This documentation must be signed by or originate from a physician in order to be coded.[31] The process of assigning codes to patient conditions from documentation is one place mistakes can be made. In some circumstances PIs that are staged and documented by a medical provider will never be assigned payment codes.[28-30] Undetected PIs POA and inaccurate medical coding may contribute to the hospital not receiving appropriate payment for services provided and inaccurate reporting of statistics.[28-30]

Some possible strategies for reducing the incidence of uncoded PIs include the use of electronic medical records (EMR) and photodocumentation, the use of photography to aid a clinician in documenting the morphology and activity of a wound.[9-22] In addition to accurate coding, these practices have been shown in other studies to improve adherence to PI prevention protocols and reduce staging errors of PIs.[9-22] Due to the number of patients with PIs and the growing costs associated with health care, there is a need to identify and correct coding mistakes and determine if procedures like photodocumentation and EMRs make a difference in reducing coding errors.[28-32] Therefore the purpose of this study, a retrospective record analysis, is to determine how different types of documentation procedures, specifically the use of photodocumentation and EMRs, affect the number of coded PIs.

METHODS

Facilities

Data included in this study were gathered from two hospital settings. These were a 500-bed acute care hospital (ACH) setting and a 42-bed acute rehabilitation hospital (ARH) setting. In the ACH, counts of coded PIs from billing records were collected from the first quarter of 2011 through the first quarter of 2017. In the ARH, counts of coded PIs from billing records were collected from the first quarter of 2012 through the first quarter of 2017. The data collected from these two settings included the quarterly total count of coded PIs, the quarterly total count of coded POA PIs, and the quarterly total count of coded stage 3 or 4 HAC PIs during the respective time frames.

Study Design

Six years ago, the Program Supervisor for Physical Medicine and Director of the Advanced Wound Care Team at the ACH and ARH made the first of several changes to improve the accuracy of wound assessment, facilitate transparent and accurate reporting, and improve care. Over the span of six years, she led a transition from no standardized PI documentation procedures, to completely paper photodocumentation, to completely EMR photodocumentation of PIs. These transitions created four time periods or documentation practices as follows: Period 1 - baseline, Period 2 - PI photodocumentation with paper and all paper charting, Period 3 - PI photodocumentation on paper and EMR for all other charting, Period 4 - all charting and documentation in the EMR.

The primary aim of the study is to see if there is a difference in the number of coded PIs among the four different periods of documentation practice.

Hypothesis 1: There will be a significant difference in the number of *total* coded PIs among the 4 different periods of documentation practice.

Hypothesis 2: There will be a significant difference in the number of *POA* coded PIs among the 4 different periods of documentation practice.

Hypothesis 3: There will be a significant difference in the number of stage 3 or 4 *HAC* coded PIs among the 4 different periods of documentation practice.

Documentation Practices & Periods

The first change from baseline in PI documentation practice was the development of the NE1 Wound Assessment Tool (NE1 WAT).[9] The NE1 WAT is an L-shaped, ruled paper, with a lightly adhesive backing. It contains written descriptions including keywords about wound color, NPUAP stage definitions, and pictures to represent each stage of a PI. Its layout follows the acronym HATT standing for History, Anatomy, Tissue, Touch, which guide the clinician toward accurate staging of a PI.[9] The NE1 WAT was also developed to help with proper documentation. The tool is printed with strict color quality so that they all have the same appearance. This allows for a consistent comparison of the tool to any wound, regardless of room lighting. Most importantly, it facilitates a comparative image being part of photodocumentation of the wound. The tool features metric-ruled borders and space for the clinician name, date, time, and wound location to be filled in by the clinician. Therefore, when a picture of a wound is taken with the tool positioned at the wound margins, length and width measurements can be obtained at a later time. This allows for wound specialists to reassess original clinical assessments. Others have described similar processes to aid in standardized PI documentation; however, they have not examined the effect of these processes in a clinical setting.[11,33] In addition, a photograph provides visual information regarding the progression or deterioration of the wound over time.

The psychometric properties of the NE1 WAT have been previously tested.[9] The tool demonstrated good reliability with an intraclass correlation coefficient of 0.8 (95% CI: 0.7-0.9) and evidence for validity by improving staging accuracy up to 37%.[9] With this evidence, use of the NE1 WAT photodocumentation on paper was added to the all paper charting throughout the ACH in the 4th quarter of 2011 and throughout the ARH in the 2nd quarter of 2012. To summarize the process in this second documentation practice period (Period 2), PI photodocumentation with paper and all paper charting, once a wound was identified by a clinician the NE1 WAT was filled out by the clinician, framed around the wound, and then a photo was taken using a hospital approved camera. The wound photo was printed and taped to a paper photo mount and then the clinician filled out the paper document; following which the clinician then manually drew lines on the photo to frame the wound for length and width measurements. The completed document was signed by all clinicians involved, placed into the paper chart, and flagged for the MD to view and sign.

After fully implementing paper photodocumentation, the hospital adopted an EMR system. This third documentation practice (Period 3) was put into place in 4th quarter of 2012 in both the ARH and ACH. This EMR system can generate electronic physician orders and handle all medical charting including electronic signatures. However, management of high-resolution, color photodocumentation was not possible.[34-37] Even though the paper photodocumentation was still being generated, the workflow process was changed when the EMR was adopted. The wound photo forms stayed in the paper chart until the patient was discharged from the facility; after which the paper chart was carried down to the medical record department for scanning into the permanent electronic medical record. The electronic record was then sent to the coding department for coding and billing. If the coder found the wound documents were not signed by the physician, an electronic notification was sent to the physician to view the scanned wound form (then in fair resolution and often black and white or color

distorted) to make the final determination of the wound condition. This third documentation process (Period 3), PI photodocumentation on paper and EMR for all other charting, resulted in treating clinicians and physicians rarely visiting the paper photodocumentation, which was placed in the paper chart, until the patient was discharged and the photo had been scanned into the EMR with poor quality.

The advanced wound care team director began to work with a representative at a company to design a software solution to integrate full color and full resolution wound photographs into the EMR in real time and have a digital wound measurement feature. They integrated this system into the EMR in 4th quarter of 2014. This fourth documentation practice (Period 4) of photodocumentation/EMR integration made documentation of PIs available to all health care providers in real time. Clinicians were trained to perform standardized photodocumentation and physicians were trained to access the photodocumentation for review and signature. In summary, the fourth documentation practice (Period 4) involved the digital photo of the wound being uploaded for electronic viewing, following which a clinician then views the high-resolution image and treating clinicians could document their assessment electronically following HATT. The digital photodocumentation is sent electronically to a wound specialist for further review which allows the wound specialist to use an electronic measurement tool to accurately measure the length and width of the wound. The completed assessment is then sent electronically to the physician to view and sign. This electronic record of high digital quality is signed by the assessing clinicians and physician and is then available for coding and billing.

These workflow changes thus provide 4 separate time periods with distinctly different PI documentation processes: Period 1 - baseline, Period 2 - PI photodocumentation with paper and all paper charting, Period 3 - PI photodocumentation with paper and EMR for all other charting, Period 4 - all charting and documentation in the EMR.

Data Analysis

Data were entered into SPSS software (IBM SPSS Statistics v23) for analysis. A one-way ANOVA was used to analyze the differences among the mean number of PIs reported in each of the four documentation periods at the ACH and ARH. The specific periods analyzed are pre-NE1 WAT baseline, PI paper photodocumentation with all paper charting (Period 2-ACH and Period 2-ARH), PI paper photoducumetation with EMR charting (Period 3-ACH and Period 3-ARH), and all PI photodocumentation and charting directly in EMR (Period 4-ACH and Period 4-ARH). Post hoc analyses were done using a Bonferroni correction.

RESULTS

There was a statistically significant difference in the average number of PIs among the four different documentation periods at the ACH (Period 1-ACH Mean = 210, Period 2-ACH Mean = 298.5, SD = 4.9, Period 3-ACH Mean = 100.8, SD = 17.8, Period 4-ACH Mean = 139.0, SD = 26.1, $F(3) = 45.460$; $p < 0.001$).

We also found that there was a statistically significant difference in the average number of POA PIs among the four different documentation periods at the ACH (Period 1-ACH Mean = 180, Period 2-ACH Mean = 262.0, SD = 15.5, Period 3-ACH Mean = 95.7, SD = 16.4, Period 4-ACH Mean = 133.4, SD = 52.1, $F(3) = 34.136$; $p < 0.001$). In post hoc analysis of total PIs and POA PIs at the ACH, Period 2 was significantly greater than both Period 3 ($p < 0.001$) and Period 4 ($p < 0.001$) while Period 3-ACH was significantly less than Period 4-ACH ($p = 0.005$). Finally, in the ACH, there was a statistically significant difference in the average number of HAC PIs among the four different documentation periods. (Period 1-ACH Mean = 9, Period 2-ACH Mean = 1.5, SD = 0.7, Period 3-ACH Mean = 0.1, SD = 0.3, Period 4-ACH Mean = 0.6, SD = 0.9, $F(3) = 41.759$, $p < 0.001$). However, there were no significant differences in post hoc analysis between any two individual documentation periods. Average number of PIs, POA and HAC in the ACH are illustrated in Figure 1.

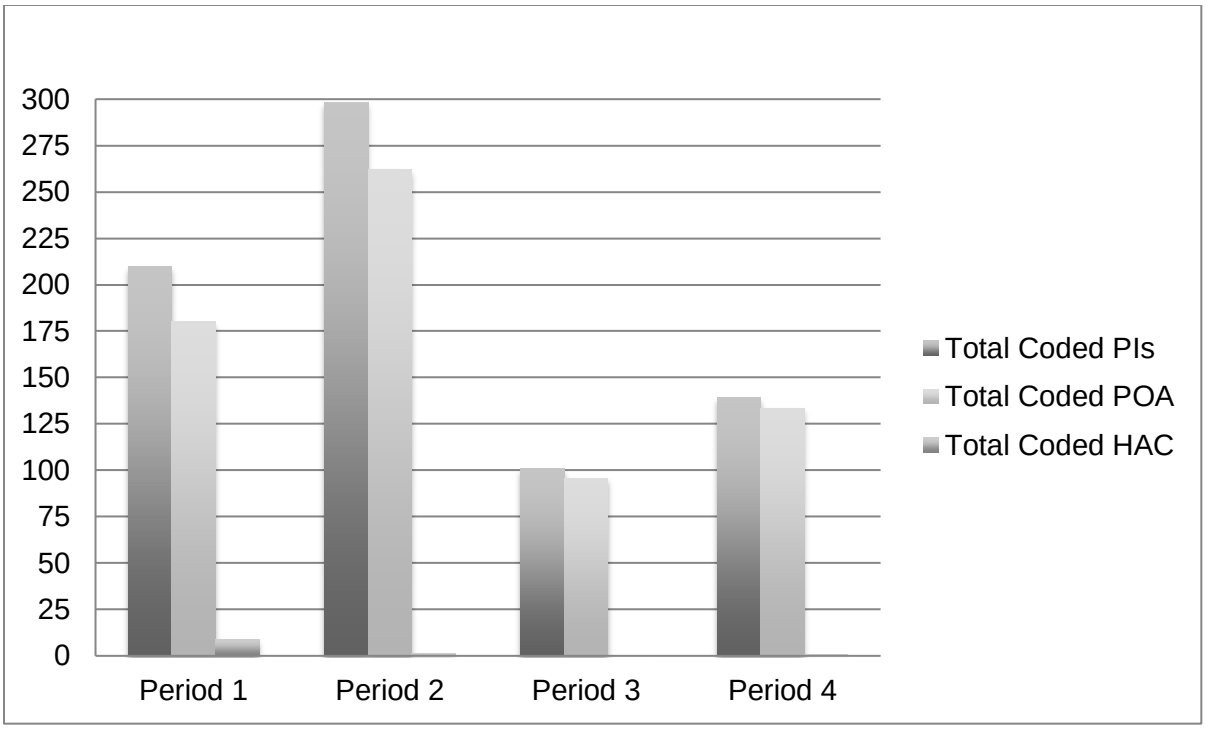

FIGURE 1: AVERAGE NUMBER OF CODED PIs IN ACH THROUGH 4 PERIODS

In the ARH, there was a statistically significant difference in the average number of PIs among the four different documentation periods (Period 1-ARH Mean = 56, Period 2-ARH Mean = 31, SD = 11.3, Period 3-ARH Mean = 36.1, SD = 14.4, Period 4-ARH Mean = 58.7, SD = 11.3, F(3) = 5.994; p = 0.006). In post hoc analysis a significant difference between Period 2-ARH and Period 4-ARH (p = 0.036), as well as between Period 3-ARH and Period 4-ARH (p = 0.005) was observed. We also found a statistically significant difference in the average number of reported POA PIs among the four different documentation periods at the ARH (Period 1-ARH Mean = 55, Period 2-ARH mean = 28.5, SD = 7.7, Period 3-ARH Mean = 35.3, SD = 13.9, Period 4-ARH Mean = 55.9, SD = 11.6, F(3) = 5.501; p = 0.008). POA PIs in Period 2-ARH (p = 0.034) and Period 3-ARH (p =0.009) were both found to be significantly less than Period 4-ARH. Finally, no statistically significant difference was found in the average number of HAC PIs among the four different documentation periods at the ARH (Period 1-ARH Mean = 0, Period 2-ARH Mean =

0.5, SD = 0.7, Period 3-ARH Mean = 0.1, SD = 0.3, Period 4-ARH Mean = 0.1, SD = 0.3, F(3) = .738; p = 0.544). Average number of PIs, POA and HAC in the ARH are illustrated in Figure 2.

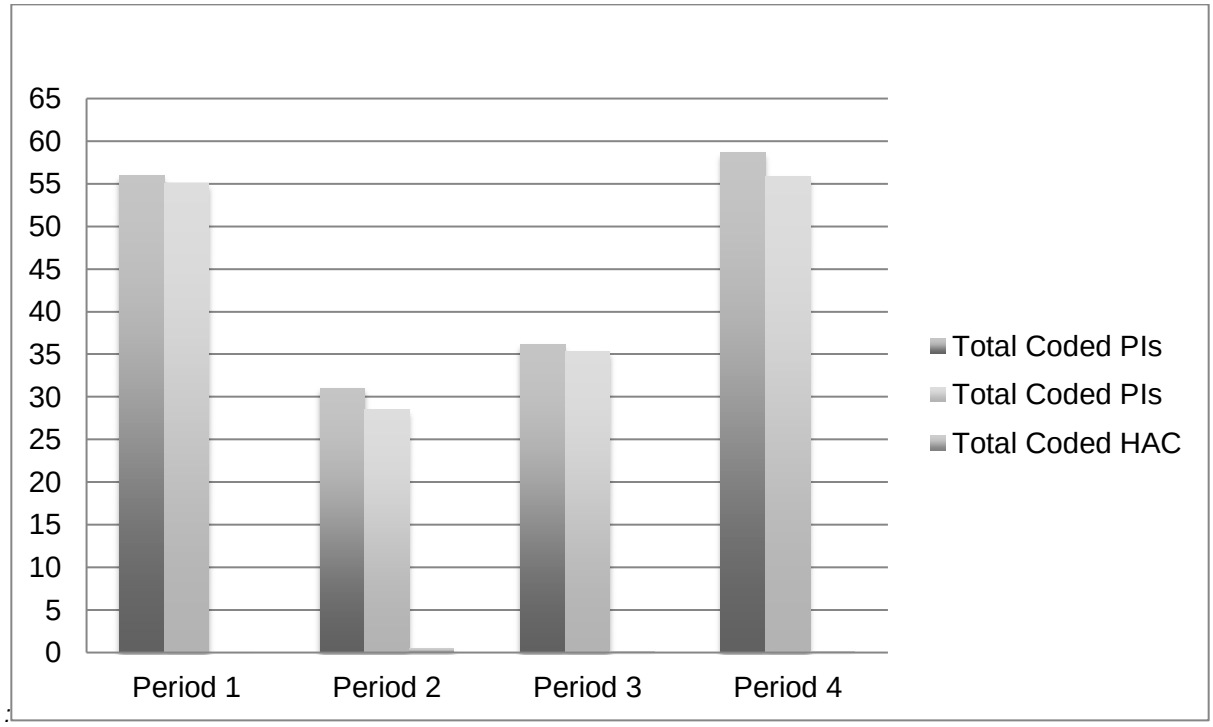

FIGURE 2: AVERAGE NUMBER OF CODED PIs IN ARH THROUGH 4 PERIODS

DISCUSSION

This study examined the effects of implementing different documentation procedures, specifically photodocumentation and EMRs, on the number of coded PIs. Data was collected from two hospital settings over the span of 6 years. Throughout this time, 4 different documentation practices were implemented and total number of coded PIs, total number of POA coded PIs, and total number of HAC coded PIs were collected from both an ACH and ARH. We observed that changes in documentation practice coincided with significant changes in the number of PIs being coded in all scenarios except for total number of coded HAC PIs in the ARH. During the time period of data collection at both facilities, no changes in patient care were made, only changes in documentation procedure were implemented. Therefore, it is likely that the true number of PI occurrences did not change during the study, rather it was the changes in documentation procedures that led to a change in the number of coded PIs. If PIs are failing to be coded, hospitals will not be properly reimbursed for services needed to care for such injuries. In the long run, these errors in coding have the potential to result in missed payment for the wound care that is provided by the facility, costing the facility thousands of dollars.

The greatest number of total PIs and POA PIs at the ACH were coded during the quarters that the NE1 WAT photos were added to the paper chart (Period 2). This may have been due to heightened awareness and motivation of the staff with the first new implementation of documentation procedures. In the ACH, the lowest number of PIs were coded in the period when photodocumentation of wounds was uploaded to the EMR after the patient had been discharged (Period 3). During Period 3, patient information was kept in two different places while the patient was admitted, (paper photodocumentation of PIs and EMR for all other charting) and physicians were spending more time with EMR than paper photodocumentation. Therefore, it is likely that physicians were more likely to miss singing off on these paper forms since they were not part of the rest of the EMR during the time

of patients' stay. The ARH did not see the same drop in reported PIs from documentation Period 2 to Period 3 that was seen in the ACH. This may be due to the fact that this smaller setting with smaller staff size allowed the supervisor to more closely monitor the team and make efforts to ensure that the physician did not miss the paper photodocumentation that was being collected for every PI.

Future studies could further dive into the different documentation periods to determine if the number of coded PIs changed from the beginning to the end of each documentation period. This may give insight to the possibility of a learning curve that accompanies implementation of a new documentation procedure. Another study may look at the possible benefits to implementing a formal and standardized program to establish and educate therapists, nurses, and physicians on the proper protocol for PI documentation that would allow all providers to know each others specific role in the documentation procedure, potentially leading to a more efficient workflow.

Limitations

Our data only included one quarter of data for the baseline number of PIs prior to changes in the documentation practice (Period 1). This did not allow us to statistically compare Period 1 from the ACH or Period 1 from the ARH to any other documentation periods. This study collected data from two facilities that were both part of a single medical center serving the greater Las Vegas, NV area. According to the 2010 census, Las Vegas households had a median income of $56,258, and primarily consisted of residents of White, Hispanic, or Latino origin. This particular hospital served a wide variety of clientele offering the following services and treatment specialties: stroke, oncology, trauma, diabetes, digestive health, emergency care, neurology, orthopedic and spine program, wound care. Because the data gathered comes from only 2 separate but related facilities, results may not be generalizable to other facilities serving varying populations, offering different services, and/or using other wound documentation protocols

besides the NE1-WAT. The size of the facilities can also be considered a limitation, especially the smaller sized ARH. A smaller facility allows for closer monitoring of staff and enforcement of protocols such as documentation practice. This was not as easy to do in the larger ACH, which may explain differences seen in our results. Finally, in the ARH, PI assessment is done by physical therapists trained in assessing wounds whereas in the ACH, wounds may be assessed by a nurse or other care provider who may have differing levels of expertise in wound assessment.

CONCLUSION

With the large number of PIs and growing costs associated with health care, there is a need to identify and correct coding errors and determine if procedures like photodocumentation and EMRs make a difference in reducing these coding errors. Therefore, the purpose of this study was to determine how different types of documentation procedures, specifically the use of photodocumentation and EMRs, affect the number of coded PIs. Our findings demonstrate that changes in photodocumentation procedure leads to differences in number of total PIs coded. In both the ACH and ARH, we observed significant differences between total number of coded PIs and total number of coded POA PIs between period 2, 3, and 4. Although there was a significant difference in the number of coded HAC PIs throughout periods 2, 3, and 4 in the ACH, there was no significant difference in the total number of HAC PIs throughout periods 2, 3, and 4 in the ARH.

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