

Inpatient Coding System and Opportunities for Documentation Optimization: An Interactive Session for Internal Medicine Residents

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Abstract

Introduction: The Inpatient Prospective Payment System, the framework for categorization of admissions, is based upon physician documentation leading to International Classification of Diseases, Tenth Revision code generation and Medical Severity Diagnosis-Related Group (MS-DRG) assignment. In this curriculum, we introduced internal medicine residents to this inpatient coding framework and its effects on hospital quality metrics and reimbursement. We focused on educating learners about the importance of physicians being proficient in providing thorough and specific clinical documentation to produce appropriate DRG assignment. **Methods:** Internal medicine residents participated in a 90-minute session that introduced the basic framework of inpatient coding, discussed effects of physician documentation on hospital quality metrics and reimbursement, and provided tips on opportunities for documentation improvement. In an interactive learning activity, residents were presented with clinical vignettes and earned reimbursement based on their documentation of appropriate diagnoses. Each scenario was followed by clinical definitions and actionable documentation recommendations for common diagnoses. Materials included a PowerPoint presentation, clinical vignettes, sample teaching points, and a rubric to calculate estimated reimbursement. **Results:** Prior to the session, 38% of learners were confident in their understanding of how documentation affects hospital reimbursement, which improved to 90% postsession. Learners reported improvement in their knowledge of documentation requirements for all targeted diagnoses. **Discussion:** This interactive curriculum improved resident knowledge of the inpatient coding system and documentation requirements for common diagnoses and addressed a deficiency in residency education on a topic of significant importance for the success of hospital systems.

Keywords

Clinical Documentation, Diagnosis-Related Group, Quality Improvement/Patient Safety, Systems-Based Practice

Educational Objectives

By the end of this activity, learners will be able to:

1. Articulate the importance of optimal clinical documentation during the care of the hospitalized patient.
2. Distinguish the basic components of the Medical Severity Diagnosis-Related Group (MS-DRG).
3. Describe the quality metrics derived from MS-DRG selection.
4. Analyze how variations in medical documentation affect hospital quality metrics and reimbursement.

5. Recognize the clinical indicators necessary to support the diagnoses of common conditions in hospitalized patients.

Introduction

In 1984, the Centers for Medicare & Medicaid Services released the framework for the Inpatient Prospective Payment System (IPPS) to classify hospital admissions and set reimbursement rates for facilities.¹ While this system has undergone many iterations and updates over the years, it remains the primary method through which hospitalizations are categorized. In this system, Medical Severity Diagnosis-Related Groups (MS-DRGs) collate admissions based on similar conditions to assign expected resource utilization.² This classification has numerous implications for hospital systems' quality metrics, including case mix index (CMI), mortality ratios, and expected length of stay. This assignment is also vital for the reimbursement and revenue streams of hospital systems.³ The selection of MS-DRGs is dependent upon the assignment of International

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Classification of Diseases, Tenth Revision codes,² which are populated based upon a physician's documentation. With this in mind, thorough and specific physician documentation is vital for appropriate coding, which then drives quality metrics and reimbursement.

In teaching hospitals across the country, resident trainees provide the bulk of clinical documentation in the inpatient setting. The ACGME has recognized in its core competencies that interprofessional communication skills and systems-based practices are vital domains of competence for residency training programs. Key competencies within these domains are "effective exchange of information," maintenance of comprehensive medical records, and "awareness and responsiveness to the larger health care system," which relate directly to clinical documentation skills.⁴ Despite this, there is limited curricular focus in graduate medical education on clinical documentation and subsequent coding. Multiple studies have shown that residents feel ill prepared in this regard.⁵⁻⁹ A study of surgical residents found that 85% felt they were novices at coding and billing and 82% stated they had not received adequate training.⁶

When coding and clinical documentation are included in residency education, they are overwhelmingly focused on physician reimbursement. There are numerous studies in both the outpatient and inpatient settings across multiple specialties showing that educational programs aimed at Current Procedural Terminology (CPT) and Evaluation and Management (E&M) codes have been successful in increasing resident comfort with these concepts⁶⁻⁹ and increasing physician billable income.¹⁰ While the data are less robust, studies have shown that educational programs targeting residents in surgical subspecialties and internal medicine focused on facility reimbursement and clinical documentation in hospitalized patients have resulted in improvements in facility reimbursement and quality metrics.¹¹⁻¹⁷ These education programs have shown significant improvements in facility CMI,^{10-14,16} complication/comorbidity (CC) code capture,^{11,15,16} risk-adjusted length of stay,¹²⁻¹⁴ risk-adjusted mortality,¹¹ and reimbursement.^{13,15}

MedEdPORTAL has published curricula on improvement in documentation and coding for physician reimbursement and on CPT and E&M codes for internal medicine and emergency medicine residents.^{6-8,18-20} These curricula use multiple teaching strategies, including didactics, self-paced online modules, small-group review of sample notes, and simulated patient encounters in the electronic medical record. Our curriculum is novel in that it is the first published curriculum for residents on the inpatient coding system that is used to determine hospital

facility reimbursement and quality metrics. It is also the only curriculum that identifies opportunities for documentation improvement and provides clinical criteria for conditions commonly encountered in the inpatient setting. The gamification aspect of our documentation and coding curriculum is also a novel aspect distinguishing it from currently published curricula. This curriculum is targeted for internal medicine residents at all levels of training but could be easily adapted for internal medicine fellows or trainees from other medical specialties.

Methods

We created a 90-minute interactive inpatient coding and documentation improvement session for internal medicine PGY 1-3 residents. Three of the authors of this publication were experienced hospitalists with prior knowledge of inpatient documentation and coding. The authors had been involved with the hospital's clinical documentation integrity (CDI) department to educate hospital staff and trainees, as well as with the facilitation of meetings between attending physicians, residents, and coding staff. It would be helpful for future course facilitators to have some baseline knowledge about clinical documentation improvement and the basic structure of the inpatient coding system. For facilitators who are less knowledgeable regarding the system, we have created an overview schematic of the components of MS-DRG assignment along with a glossary of important terms (Appendix A). A review of this information along with the other curricular content (including the provided teaching notes) will provide the baseline knowledge necessary to successfully lead the session. The Association of Clinical Documentation Integrity Specialists (ACDIS), a national organization that provides educational material and a physician boot camp related to clinical documentation, may be another useful resource. We advise future facilitators to partner with the coding departments at their local hospitals for an additional source of expertise and to ensure the content is in line with their institution's guidelines. Six months prior to this session, the CDI department at one of our affiliate hospitals distributed a poster to trainees with high-yield documentation tips and a listing of diagnoses considered major CCs; this poster was created by two of the authors of this publication (Appendix B).

We met eight times to develop the curriculum. We brainstormed the optimal strategies to teach residents the basics of inpatient coding and provide documentation tips for high-yield diagnoses. We established the 10 most high-yield opportunities for documentation optimization and developed clinical vignettes to demonstrate the specific diagnoses and clinical criteria. These were made into two PowerPoint presentations that were used

in the session. For each clinical case, we formulated a rubric of likely diagnoses that the learners might select and determined the MS-DRG, case weight, expected length of stay, and estimated reimbursement for each option. We then used an online platform, Formative, to set up an audience response system to use during the session. This platform allowed for free-response entry of principal and secondary diagnoses for each clinical vignette, but any similar platform could be used. Pre- and postsession assessments were developed to evaluate residents' self-reported knowledge regarding inpatient coding fundamentals and their knowledge of documentation requirements for various diagnoses. The evaluation of the curriculum was approved by the Baylor College of Medicine Institutional Review Board.

Implementation

The interactive curriculum was presented to internal medicine residents during their weekly didactic session over a period of 8 weeks. The session could be led by one facilitator with up to 20 residents, ideally with variable levels of training. For the small-group portions of the curriculum, it was ideal to have up to four small groups with no more than five learners in each group to maintain active participation by all. We provide full details for implementation in the facilitator guide (Appendix C).

Equipment and delivery: The equipment required to implement this curriculum included a computer connected to an audiovisual system, an online audience response platform, and internet or cellular connectivity for the audience. If internet connectivity was not available for the audience, the facilitator could use flip charts for individuals to write out diagnoses instead of an online system. Additionally, if content needed to be delivered remotely, a teleconferencing platform could be employed with the use of a breakout room feature to allow for small-group collaboration, with a return to the large group for report-out and didactic content.

Presession survey—5 minutes: Participants first completed a paper presession survey (Appendix D) that assessed their confidence with the basics of inpatient coding and documentation. We evaluated learners' self-reported knowledge on appropriate documentation requirements for specific diagnoses including respiratory failure, sepsis, heart failure, functional quadriplegia, pneumonia, nutritional status, anemia, altered mental status, and acute kidney injury/acute tubular necrosis.

Inpatient coding summary—15 minutes: Facilitators then presented a PowerPoint to introduce IPPS, the MS-DRG system, and values assigned based upon DRG assignment (Appendix E). Facilitators discussed how these values affect

hospital quality metrics including CMI, length of stay, mortality, and reimbursement. Teaching scripts and key points were included in the notes section of the PowerPoint.

Team assignments—5 minutes: Facilitators next divided residents into small groups with equal distribution based upon level of training. Small groups selected a team name and logged into the online response system (or gathered at the prepared flip chart for each group).

Clinical vignettes and documentation pearls—60 minutes: After all small groups were assembled, facilitators presented the seven clinical case vignettes (Appendix F) to all small groups. At the end of each case, teams documented their principal and secondary diagnoses into the online system. The facilitators then displayed each group's response for the entire audience to see and reviewed the assigned DRG, case weight, length of stay, and reimbursement associated with the various potential principal and secondary diagnoses. Facilitators used the rubric to assign reimbursement to each team based on the selected diagnoses (Appendix G). If the team selected a diagnosis that was not supported by clinical data, the facilitators declined the claim, and the team was fined \$1,000. Facilitators also provided clinical definitions and actionable documentation tips for the targeted diagnoses.

Wrap-up and postsession survey—5 minutes: At the end of the session, learners completed a paper postsession survey to reassess knowledge and confidence with inpatient coding and documentation requirements for targeted diagnoses and to offer feedback on the content delivery method (Appendix H). While learners completed this survey, the facilitators calculated each team's total reimbursement using the rubric in Appendix C and announced the winning team. We provided all learners with a copy of the documentation improvement tip sheet at the conclusion of the session for future reference (Appendix B).

Evaluation

We compared the anonymous pre- and postsession surveys to assess significance of the change in learner confidence using the chi-square test. We used the Wilcoxon test for unpaired data to analyze changes in learners' self-reported knowledge of appropriate documentation of the diagnoses targeted in the session. Learners self-reported their knowledge on a 5-point Likert scale (1 = *very poor*; 5 = *excellent*).

Results

A total of 67 PGY 1-3 internal medicine residents participated in the educational session from June to August 2017. Of participating residents, 66 completed the presession survey,

and 67 completed the postcurriculum survey. One resident arrived late to the session and only completed the postcurriculum survey. Since the surveys were anonymous, we were unable to exclude the late-arriving resident's postcurriculum survey. Prior to this curriculum, 13% of residents stated that they had never had a lecture on coding, 59% had received one lecture on coding, and 27% had received two lectures on coding. Despite some residents having prior exposure to coding and documentation, confidence in self-reported knowledge of coding and documentation, DRGs, case severity index, and understanding how documentation affects hospital reimbursement all improved significantly ($p < .05$; Figure 1). Furthermore, 86% of the residents either agreed or strongly agreed on the postsession survey that this information would be important for their residency training and education.

Self-reported knowledge of appropriate documentation, assessed on 5-point Likert scale (1 = *very poor*, 5 = *excellent*), significantly improved for all nine diagnoses covered in the session ($p < .05$). Residents reported the most improvement for nutrition (2.6 to 3.7), altered mental status (2.7 to 3.8), and acute kidney injury/acute tubular necrosis (2.8 to 3.9; Figure 2). In addition, postsession survey comments indicated that learners enjoyed the interactive elements and felt they were an effective method for delivery of the curriculum. Learner comments included the following:

- “Great way to teach this topic; reinforced the important aspects of how to code.”

- “Was fun seeing how much hospitals would earn based on documentation.”
- “Interactive slides are the way to go!”
- “Awesome teaching modality; makes an important topic fun and engaging.”
- “Nice range of cases of commonly encountered cases.”
- “This was a very useful and informative presentation about coding.”
- “Really well designed lecture with interactive components.”
- “Very helpful! Good to know the nuances for appropriate documentation.”
- “Fun interactive lecture.”
- “Enjoyed the course and interactive nature.”
- “Excellent talk, engaging and helpful.”
- “Great lecture, good interactivity.”

Discussion

Our educational session to introduce medical residents to the basics of inpatient hospital reimbursement was novel, innovative, and well received. We were able to improve residents' self-reported knowledge of how hospitals are reimbursed for inpatient care and how physician documentation is vital to optimization of quality metrics and facility reimbursement. At the conclusion of the session, learners reported increased knowledge of the inpatient coding process and the documentation requirements for common high-yield diagnoses. Residents felt that this material was important to their medical training, and they enjoyed the interactive and gamification components of this curriculum.

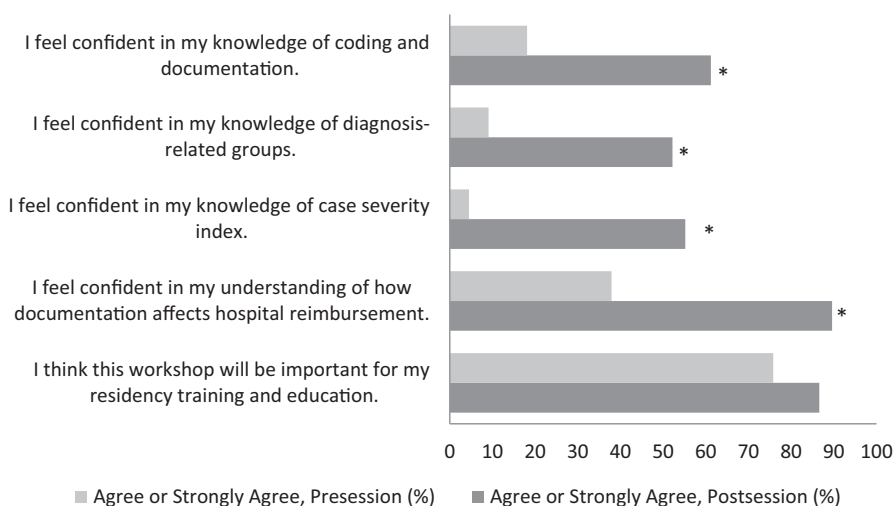


Figure 1. Percentage of residents who selected *agree* or *strongly agree* in response to questions about confidence in specific objectives. Asterisk indicates significance at $p < .05$.

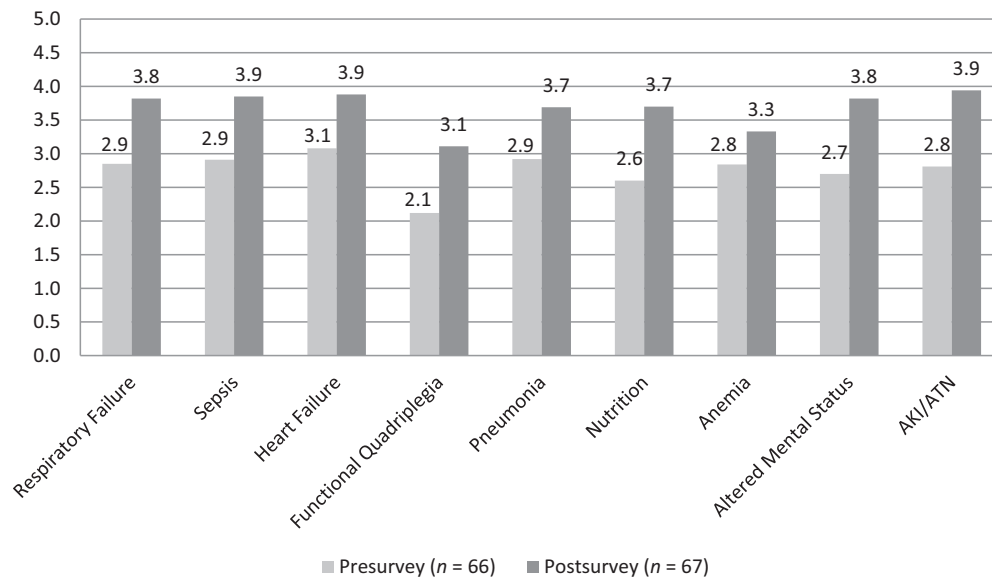


Figure 2. Difference in resident self-reported knowledge in documenting diagnoses from pre- to postsurvey. Diagnoses were rated on a 5-point Likert scale (1 = very poor, 5 = excellent). All differences were significant at $p < .05$. Abbreviation: AKI/ATN, acute kidney injury/acute tubular necrosis.

Feedback from leadership at our affiliate institution about how documentation practices of our trainees were not meeting the needs of the hospital system created the initial impetus to develop and implement this curriculum. We knew very little regarding the inpatient coding system and had to embark on extensive self-directed learning to become subject matter experts. Through the resources provided in this publication, we were able to understand the structure and importance of the inpatient coding system and develop this session. It is likely that other institutions face similar challenges with resident documentation and a lack of faculty with expertise in this area. For institutions wishing to implement this curriculum, it may be necessary to recruit physician champions in this field. The materials offered in this curriculum are meant to provide the sufficient baseline knowledge necessary for facilitators without experience to successfully lead this session. Facilitators may want to get involved with national organizations like ACDIS that provide continuing education to maintain and expand their knowledge base. We also advise facilitators to partner with coding and documentation staff at their hospitals. However, we feel strongly that involvement of core teaching faculty is critical for obtaining additional buy-in from trainees.

A major limitation of this study is that we depended on self-reported outcomes of knowledge gain instead of objective assessment. Following implementation of this curriculum, we recommend longitudinal assessment of learners' knowledge

retention and continual feedback for documentation improvement. We currently do this informally during coding huddles where trainees join two of the authors of this curriculum serving as physician advisors, along with attending physicians and coding staff, to review clinical documentation for active inpatients. This setting provides an opportunity for real-world and real-time feedback on individual trainees' performance and suggestions for documentation clarification and improvement. Another caveat is that through CDI involvement at our partner hospitals, many of our learners had received some exposure to inpatient coding and documentation improvement prior to our session, which may not be the case in all training programs. Despite the baseline exposure of our learners, we were able to show significant self-reported improvement in knowledge. Therefore, we feel that this can be a stand-alone session for trainees who do not have prior coding or documentation experience.

We learned many lessons while implementing a clinical documentation optimization session in our program. In initial attempts to deliver this content to learners, we focused on the diagnostic criteria for each diagnosis and often faced resistance since trainees did not feel that this was important for patient care. When we taught trainees why their documentation practices were vital to their hospital systems, we were able to obtain more engagement. This led us to alter our approach and develop this session, which has the dual focus of providing education on clinical indicators for diagnoses and demonstrating

how documentation of these diagnoses affects hospital reimbursement and quality metrics. Some residents expressed concerns regarding the potential for fraud and the legal and ethical ramifications regarding documentation optimization. To address this, we intentionally included cases where a diagnosis might be documented without appropriate clinical indicators and demonstrated how this would result in claim denial and penalty. We plan to expand this in future iterations of this curriculum, with an added focus on the differentiation between appropriate coding and the potential for overcoding and fraud. Another lesson that we learned was the need for continual updates and modifications to the curriculum as clinical definitions and coding regulations change. Lastly, this is a very broad and nonintuitive process for physicians, so frequent reeducation and repetitive exposure to this material are crucial for retention and sustainability. Potential opportunities for additional integration into training programs include real-time feedback on clinical documentation and documentation feedback during regularly scheduled clinical case conferences.

Medical residents spend a substantial amount of time documenting in the medical record but are not always aware of the diverse implications and utilizations of these records. Educating trainees on these implications and opportunities for optimization will make them more likely to engage in educational sessions and integrate this into their daily and future practice. With this interactive curriculum, we were able to improve residents' confidence and knowledge of the inpatient coding system and documentation requirements of common inpatient diagnoses. Multiple studies have shown that educational programs with this focus can have significant effects on quality metrics and reimbursement at facilities where residents train. With this in mind, hospital systems should be willing and excited to partner with training programs and provide resources for implementation. This novel curriculum addresses a current deficiency in residency education on a topic of significant importance for hospital systems.

Appendices

- A. MS-DRG Components and Glossary.pdf
- B. Documentation Improvement Tip Sheet.pdf
- C. Facilitator Guide.docx
- D. Presession Survey.docx
- E. Inpatient Coding Summary.pptx
- F. Clinical Vignettes and Documentation.pptx

G. Score Sheet.docx

H. Postsession Survey.docx

All appendices are peer reviewed as integral parts of the Original Publication.

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Ethical Approval

The Baylor College of Medicine and Affiliated Hospitals Institutional Review Board approved this project.

Disclaimer

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