Coding and Billing in Surgical Education: A Systems-Based Practice Education Program

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OBJECTIVE: Despite increased emphasis on systems-based practice through the Accreditation Council for Graduate Medical Education core competencies, few studies have examined what surgical residents know about coding and billing. We sought to create and measure the effectiveness of a multifaceted approach to improving resident knowledge and performance of documenting and coding outpatient encounters.

DESIGN: We identified knowledge gaps and barriers to documentation and coding in the outpatient setting. We implemented a series of educational and workflow interventions with a group of 12 residents in a surgical clinic at a tertiary care center. To measure the effect of this program, we compared billing codes for 1 year before intervention (FY2012) to prospectively collected data from the post-intervention period (FY2013). All related documentation and coding were verified by study-blinded auditors.

SETTING: Interventions took place at the outpatient surgical clinic at Rhode Island Hospital, a tertiary-care center.

PARTICIPANTS: A cohort of 12 plastic surgery residents ranging from postgraduate year 2 through postgraduate year 6 participated in the interventional sequence.

RESULTS: A total of 1285 patient encounters in the preintervention group were compared with 1170 encounters in the postintervention group. Using evaluation and management codes (E&M) as a measure of documentation and coding, we demonstrated a significant and durable increase in billing with supporting clinical documentation after the intervention. For established patient visits, the monthly average E&M code level increased from 2.14 to 3.05 ($p < 0.01$); for new patients the monthly average E&M level increased from 2.61 to 3.19 ($p < 0.01$).

CONCLUSIONS: This study describes a series of educational and workflow interventions, which improved resident coding and billing of outpatient clinic encounters. Using externally audited coding data, we demonstrate significantly increased rates of higher complexity E&M coding in a stable patient population based on improved documentation and billing awareness by the residents. (J Surg Ed ▮:▮▮▮-▮▮▮. © 2016 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: resident education, systems-based practice, coding and billing, evaluation and management codes

COMPETENCIES: Systems-Based Practice, Practice-Based Learning and Improvement

INTRODUCTION

In the modern health care system, physicians are responsible for more than just the medical care of patients. Through the systems-based practice core competency, the Accreditation Council for Graduate Medical Education expects residents to "demonstrate an awareness of and a responsiveness to the larger context and system of health care."[1] Among other things, this includes documenting and coding for clinical encounters.

As part of routine practice, evaluation and management (E&M) codes are generated for billable patient encounters. These codes are based on the complexity of a patient's medical problems and the detail of documentation provided by the physician. E&M codes are then used to file charges for billing.[2] A successful clinical practice is dependent on accurate and timely billing, and failure to adhere to coding rules can lead to serious penalties.[3]

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Despite the importance of proper documentation and coding, educational programs for systems-based practice are not necessarily routine among training programs across the United States (U.S.).[3-6] In multiple studies, residents across various specialties have reported inexperience and uncertainty regarding clinical billing.[4,7,8] In a recent study, 82% of residents stated that they did not receive adequate training and 85% felt that they were "novices" at coding clinical encounters.[8] Previous surveys of general surgery program directors found that while 87% agreed residents should be trained in practice management, more than 70% believed their own residents were inadequately trained in business principles.[6,9]

In this report, we describe a study designed to improve resident knowledge and performance in documentation, coding, and billing in the outpatient setting. Based on a historical review of charts, auditing of documentation, and work-flow analysis, we identified 3 major barriers for coding by the residents in our program: knowledge, motivation (i.e., not salary dependent), and billing infrastructure (i.e., inefficient workflow). We hypothesized that interventions aimed at these barriers would lead to improved documentation and coding of patient encounters by residents.

MATERIALS AND METHODS

Following institutional review board approval, we implemented a series of interventions aimed at addressing the previously cited barriers. To address efficiency, a new electronic billing template was developed with the residents to clarify the level of E&M coding appropriate for the complexity of patient encounters. A cohort of 12 residents ranging from postgraduate year 2 through postgraduate year 6 (average 2 per postgraduate year) participated in the interventional sequence. The average case volume for residents graduating from the program is approximately 400 cases annually.

A total of 3 didactic sessions of 20 minutes each were used to educate and emphasize the importance of accurate and thorough documentation as well as medical decision-making in the justification of billing codes. We used clinical vignettes and interactive sessions to improve information recall. The didactics occurred at the beginning of resident conference periods; resident attendance was mandatory. Simultaneously, visual aid were placed throughout the clinic workspace to demonstrate the appropriate level of E&M based on the complexity, documentation, and medical decision-making involved in each encounter (Appendix A). Finally, attending physicians were asked to provide ongoing feedback to residents about documentation and coding during clinic sessions.

The primary outcome measure was a quantitative change in E&M codes. All coding in this study was performed by the residents. Documentation and coding was cosigned by the attending physician. All codes submitted for billing were verified by hospital-based (study-blinded) auditors. To avoid any potential "overbilling," coding (both in the preintervention and postintervention period) was only submitted if the clinical documentation (reviewed by hospital auditors) supported the level of service indicated by the resident. As a real-time clinical study, hospital auditing was completed throughout the study protocol to avoid any confounding.

Electronic E&M codes from 1 year before the intervention FY2012 were compared with data collected prospectively from FY2013. All data points from the preintervention and postintervention periods underwent auditing by hospital coders to verify appropriate documentation support for billing codes. The data were standardized to the total volume of patients seen by month. Independence of proportions was established using 2 sample of unequal variance *t*-test.

RESULTS

A total of 1285 E&M codes billed in the preintervention were compared with 1170 codes billed during the postintervention period (Table 1). An average monthly E&M complexity was generated for established patient and new patient codes in the preintervention and postintervention groups. Over the course of the intervention there was a 42.4% increase in coding complexity of established patients (2.14-3.05, $p < 0.01$) and a 22.2% increase for new patients (2.61-3.19, $p < 0.01$).

There was a 44.9% ($p < 0.01$) increase in intermediate established E&M codes (Level III) and a more modest, but significant increase in the higher complexity codes (Level IV and Level V) by 16.9% ($p = 0.02$) and 2.82% ($p = 0.04$), respectively. This increase in higher complexity codes corresponded to a 60.8% ($p < 0.01$) decrease in the lowest level code for established physician visits (Level II).

Among new patient billing, the number of high complexity (Level IV and Level V) codes increased by 14.2% with a

TABLE 1. Coding Distribution

Coding Level	Preintervention Period (2012)	Postintervention Period (April-January)	p Value
Established outpatients			
Level I	47 (4.9%)	8 (1.1%)	0.08
Level II	740 (76.4%)	110 (15.5%)	<0.01
Level III	181 (18.7%)	450 (63.6%)	<0.01
Level IV	1 (0.1%)	120 (16.9%)	0.02
Level V	0 (0.0%)	20 (2.8%)	0.04
TOTAL	969	708	
New outpatients			
Level I	4 (1.3%)	1 (0.6%)	0.41
Level II	138 (43.7%)	19 (12.2%)	<0.01
Level III	155 (49.1%)	96 (61.5%)	0.18
Level IV	16 (5.1%)	30 (19.2%)	0.05
Level V	3 (0.9%)	10 (6.4%)	0.10
TOTAL	316	156	