ORIGINAL REPORTS

Do Orthopaedic Resident and Fellow Case Logs Accurately Reflect Surgical Case Volume?

Kanu Okike, MD, MPH, Peter Z. Berger, B.A., Carrie Schoonover, B.A. and Robert V. O'Toole, MD

Department of Orthopaedics, University of Maryland School of Medicine, Baltimore, Maryland

OBJECTIVE: The purpose of this study is to determine whether orthopedic resident and fellow case logs accurately reflect trainee case volume.

DESIGN: For each orthopedic case performed at our institution between 7/1/14 and 10/31/14, the names of trainees who participated were obtained from the chart. The trainee Accreditation Council for Graduate Medical Education case logs were queried to determine if the procedure in question was logged and, if so, which current procedural terminology (CPT) codes were reported. The CPT codes reported by the trainees were compared to those reported by the attendings in the billing database. To ascertain the opinions of trainees regarding coding, a survey was conducted.

SETTING: University of Maryland Medical Center (Baltimore, MD), a tertiary and quaternary care center which features a state-wide trauma referral center as well as orthopedic residency and fellowship training programs.

PARTICIPANTS: All orthopedic surgery residents and fellows present at the institution during the study period.

RESULTS: Trainees failed to log their cases 24% of the time (465/1925), including 25% (283/1117) for residents and 23% (182/808) for fellows ($p = 0.16$). Among cases that were logged, CPT codes were missed 46% of the time (673/1460) and extra codes were added 28% of the time (412/1460) compared to the attendings. In the survey, most trainees stated that it was "extremely" or "very" important for them to be able to code correctly (83%; 29/35).

CONCLUSIONS: In this study of orthopedic trainee case logging practices, cases were not logged 24% of the time. Caution should be taken with activities which rely on trainee case logs given the potential for inaccuracy.

(J Surg Ed ▮:▮▮▮-▮▮▮. © 2017 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: surgical education, orthopedic surgery, residents, fellows

COMPETENCIES: Pactice-based learning and improvement, Patient Care and Procedural skills, Systems-based Practice, Professionalism

INTRODUCTION

Residents and fellows in orthopedics and other surgical fields are required to maintain case logs that document the surgical procedures that they have performed. These case logs are routinely reviewed by the program director, and used to assess trainees' progress through the training program. However, resident case logs are also used for a variety of other purposes. When accrediting training programs, the Residency Review Committee (RRC) examines trainee case logs to determine if there is sufficient volume to justify the requested number of residency or fellowship positions. Trainee case logs have also been used extensively for research purposes,[1-16] such as assessing for changes in surgical volume following the institution of resident work hours restrictions.[17-25]

Since the trainee case log system is based on self-reporting, however, there exists the potential for discrepancy and inaccuracy. In the field of orthopedics, Salazar et al.[26] recently surveyed a sample of residents and documented substantial variation in the cases that they thought should be logged, especially for procedures performed outside the operating room. Likewise, in a recent study of foot and ankle procedures, residents were found to log fewer codes than their attendings 47% of the time and more codes 28% of the time.[27]

The primary purpose of this study was to determine whether orthopedic resident and fellow case logs accurately

Investigation performed at the University of Maryland School of Medicine, Baltimore, MD.

Correspondence: Inquiries to Kanu Okike, MD, MPH, Department of Orthopaedic Surgery, University of Maryland School of Medicine, 22 South Greene Street, Baltimore, MD 21201; fax: +(410) 328-2893; e-mail: okike@post.harvard.edu

reflect trainee case volume. We also sought to assess the concordance between current procedural terminology (CPT) codes reported by trainees and those reported by their attendings in the billing database. Finally, we surveyed the residents and fellows to determine their opinions on a variety of topics related to coding.

METHODS

This study was conducted at the University of Maryland Medical Center (Baltimore, MD), a tertiary and quaternary care center which features a state-wide trauma referral center as well as accredited orthopedic surgery residency and fellowship training programs. For billing purposes, the details of each case are entered into an online database by the attending orthopedic surgeon including date, facility, patient identification, and procedure(s) performed in the form of CPT codes. Using this billing database, all orthopedic cases performed at the institution between 7/1/14 and 10/31/14 were identified ($n = 2210$), including those performed in the inpatient and outpatient settings. Duplicate entries ($n = 138$) were excluded, as were entries where the attending surgeon did not record one or more CPT codes ($n = 340$), leaving 1732 cases for further analysis. For each of these cases, the electronic medical record was queried to determine the names of all residents or fellows who were documented as participating in each procedure. A total of 288 cases had no trainees documented as participating and were excluded, leaving 1444 cases for analysis.

For each resident or fellow documented in the medical record as participating in these cases, their Accreditation Council for Graduate Medical Education (ACGME) case log was queried to determine if the procedure in question was logged by the trainee. In orthopedic surgery, residents and fellows are instructed to log all cases in which they participate. The case log query was performed in April 2015 (6 mo after the end of the study period) to allow for possible delays in case logging by the trainees. For each case that was found to be logged by the trainee, the CPT code(s) that he or she reported were recorded.

The CPT codes reported by the trainees were then compared to those reported by the attendings in the billing database. For the small number of codes which were similar but not an exact match, the trainee was given the "benefit of the doubt." For example, if a resident reported code 27507 ("Open treatment of femoral shaft fracture with plate/screws, with or without cerclage") and the attending reported code 27511 ("Open treatment of femoral supracondylar or transcondylar fracture without intercondylar extension, with or without internal or external fixation"), that was considered to be a match (concordant). Case log entries in which the trainee missed one or more CPT codes reported by the attending were categorized as having missed codes. Case log entries in which the trainee entered one or more codes that were not entered by the attending were categorized as having extra codes. (These 2 categories were not mutually exclusive, as some case log entries had missed as well as extra codes.)

Survey

To ascertain the opinions of the residents and fellows regarding coding, an 8-question online survey was conducted using the SurveyMonkey program. All residents and fellows who were at the institution during the study period (7/1/14-10/31/14) were invited to participate. The invitations were sent via email, and included an introductory cover letter as well as a link to the survey. Respondents were informed that their participation was voluntary, and that their responses would remain confidential and would be reported only in aggregate form.

Statistical analysis

Proportions were compared using logistic regression. Associations were estimated on the basis of odds ratios and 95% CIs. $p < 0.05$ was considered statistically significant, and all tests were 2-sided. Statistical analysis was performed using SAS (version 9; SAS, Cary, NC).

Institutional Review Board

All elements of the study were approved by the Institutional Review Board.

Source of Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

RESULTS

There were 1444 cases in the study sample, which were performed by 19 attendings. The trainees who participated in these cases included 25 residents and 12 fellows. Certain cases involved multiple trainees, resulting in a total of 1925

TABLE 1. Distribution of Cases, by Orthopedic Subspecialty

Procedure Subspecialty	Count
Adult reconstruction	94
Hand and wrist	76
Pediatric orthopedics	79
Sports medicine and arthroscopy	107
Shoulder and elbow	34
Spine	226
Trauma	812
Other	16
Total	1444