Billing and Coding Knowledge: A Comparative Survey of Professional Coders, Practicing Orthopedic Surgeons, and Orthopedic Residents

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Abstract

Medical knowledge and surgical skills are necessary to become an effective orthopedic surgeon. To run an efficient practice, the surgeon must also possess a basic understanding of medical business practices, including billing and coding.

In this study, we surveyed and compared the level of billing and coding knowledge among current orthopedic residents PGY3 and higher, academic and private practice attending orthopedic surgeons, and orthopedic coding professionals. According to the survey results, residents and fellows have a similar knowledge of coding and billing, regardless of their level of training or type of business education received in residency. Most residents would like formal training in coding, billing, and practice management didactics; this is consistent with data from previous studies.

Medical knowledge and surgical skills are necessary to become an effective orthopedic surgeon. Business management and billing knowledge, which are important for a successful and efficient practice, can also help avoid potential legal problems. Although orthopedic residents entering practice are expected to make many decisions about practice management and billing, most of their knowledge is gained through limited on-the-job experience. Coding can be a difficult part of the billing process because of frequent changes in coding systems, coding modifiers, and the total number of codes. As an example, there are 68,105 projected number codes for the new *International Classification of Diseases, Tenth Revision, Clinical Modification* (*ICD-10-CM*) and 86,916 codes for the *ICD-10-Procedure Classification System*.[1] It is important and necessary for orthopedic surgeons to learn the use of correct codes, bundling rules, appropriate use of modifiers, proper use of follow-up codes, and understanding the global period.[2]

Currently, the Accreditation Council for Graduate Medical Education (ACGME) and Residency Review Committee's (RRC) outline for residency program requirements on teaching practice management is not well defined. Coding and billing are connected to all components of the health care system as outlined in the ACGME's 6 core competencies. The RRC of the ACGME has established separate classifications to the 6 core competencies for orthopedic surgery.[3] Practice management, as reviewed by the RRC, is included in the systems-based practice core competency. Systems-based practice consists of interactions among many health care components, including employers, insurers, hospitals, physician networks, drug and medical device companies, providers, and patients. These core competencies, a constant topic of discussion in residency education, have sparked new ideas on how to evaluate residency training in practice management. Gill and Schutt,[4] who developed an informal survey to determine "the current trends among orthopedic residency programs with regard to how coding and billing issues are being taught," found that only 13% of those surveyed were confident in their coding abilities. Our study provides further qualitative and quantitative assessment of residents' knowledge of coding and billing.

In this study, we compared the level of billing and coding knowledge among current orthopedic residents PGY3 and higher, academic and private practice attending orthopedic surgeons, and orthopedic coding professionals. We hypothesized that orthopedic residents would have less knowledge than private practice attending orthopedic surgeons, and that private practice attending orthopedic surgeons would have a greater knowledge base than their academic counterparts.

Materials and Methods

To assess the knowledge of current procedural technology and ICD coding/billing, we developed a 20-item questionnaire (**Figure 1**) that was sent to orthopedic residents PGY3 and higher, practicing attending orthopedic surgeons in both private and academic practice, and professional coders. The 20-item questionnaire was derived from clinical experiences,

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Instructions

- Please answer these questions without referring to any source or reference.
- Please pick the most correct answer.
- Total Score will be based on (1) point for each correct answer, (0) points for a skipped question, and (-0.33) for a wrong answer. This is to discourage guessing.
- Please try to score your highest (Max Score is 20 points).

1. CPT stands for?
A. Common Procedural Terminology
B. Common Procedures & Tests
C. Current Procedural Terminology
D. Current Procedures & Tests

2. ICD: How often is the International Classification of Disease system revised?
A. around every 10 years
B. every year
C. when necessary

3. Which code can be used for an annual screening or for identifying a risk factor?
A. CPT code
B. HCPCS code
C. V code
D. -25 modifier
E. ICD-9 Diagnosis code

4. Healthcare Common Procedure Coding System (HCPCS) is used to bill for additional services that physicians perform.
A. True
B. False

5. All of the following are required to bill a consultation E&M code EXCEPT
A. A request for the consultation must be present in writing
B. The referring service must ask the consulting service to render an opinion regarding care
C. The consultant must provide written communication back to the referring physician
D. The consultant must arrange follow-up for management of care based on their opinion

6. You see a patient in the ER and decide the patient has a nonemergent surgical injury and send him home. You operate on the patient the next day. How will you bill this patient?
A. ER visit as a consult only
B. ER visit as a consult, operative care as a surgical procedure
C. Operative care as a surgical procedure only

7. An established patient returns to clinic after 4 years. You did his left knee replacement 7 years ago. He is here to have his right knee evaluated and potentially replaced. This patient is considered a New Patient in regards to your coding for that day?
A. True
B. False

8. Your group opens a satellite location 55 miles from your main location. This new location had to go through its own credentialing process (i.e., new address and tax ID), and by all your insurance carriers and Medicare is considered to be a separate facility. An established patient seen in this facility for the first time is considered a New Patient in regards to coding practices.
A. True
B. False

9. A patient is seen in clinic the day before a scheduled surgery. Questions and concerns are addressed, as well as a history and physical performed as part of the preoperative paperwork. The physician can bill for this visit.
A. True
B. False

10. A patient is seen in clinic and receives a local injection of steroid (i.e., intra-articular injection). The global period for these procedures is usually
A. 0-10 days
B. 0-90 days

11. An evaluation and management encounter comprises which of the following components?
A. History, physical exam, counseling, coordination of care
B. History, physical exam, decision making
C. Counseling, coordination of care, nature of presenting problem, time
D. History, physical exam, decision making, counseling, coordination of care, nature of presenting problem, time

12. When billing multiple CPT codes
A. the order does not matter, since reimbursement is averaged
B. the order does matter, since reimbursement is determined by the order
C. the order does matter, but reimbursement is not determined by the order, it is averaged

13. You are part of a subspecialty orthopedic group and your spine partner refers a patient to your clinic. You happen to be a hand surgeon, and the patient has carpal tunnel. You have never seen the patient before, therefore had to do a new patient work up, yet bill the patient as an established patient. Is that correct?
A. Yes
B. No

14. A large hospital system hires you to work as an employee of the system. You will work 40 hours/week and take call when scheduled. You will be compensated for that time, and any time over the contract, you will receive additional reimbursement. The system will code and bill for your services that you provide. In this process you have transferred the liability for proper coding to the hospital system.
A. True
B. False

15. What is the major justification of medical necessity?
A. CPT code
B. HCPCS code
C. ICD-9 code
D. Modifiers
E. V code

16. When billing an outpatient encounter for an established patient, the level of the code (i.e., 99213 or 99214) is determined by 2 of the 3 key components.
A. True
B. False

17. When billing an outpatient encounter for an established patient, the level of the code (i.e., 99213 or 99214) is determined by the lowest of the 3 key components.
A. True
B. False

18. Your group hires a Physical Therapist for ancillary revenue. According to Medicare you can send all of your Medicare patients to your therapist.
A. True
B. False

19. Your group purchased an MRI 3 months ago, and at your quarterly business meeting you notice that your sports partner is exclusively using the groups' MRI. You are worried that the group has committed a Stark Law violation according to Medicare & Medicaid Rules. Has your group committed a violation?
A. Yes
B. No

20. A patient is seen in clinic for an acute inflammatory process (i.e., rotator cuff impingement, trochanteric bursitis, or trigger finger). The patient is evaluated and an appropriate E & M code is billed. The surgeon documents in his note that if the patient does not get better after a trial of physical therapy, an injection will be tried. The patient returns 2 weeks later with no improvement. This visit should be billed as
A. An established E & M code + injection code
B. No charge
C. **Injection code only**
D. An established E & M code only

Figure 1. Distributed questionnaire.

American Academy of Orthopaedic Surgeons (AAOS) newsletters, Internet message boards, and medical economics articles. Questions included definitions and case examples, and focused on understanding basic concepts; no specific codes were queried. Institutional Review Board permission was granted for this study.

The Web-based program KwikSurveys.com[5] was used to distribute the questionnaire by e-mail. Initially, the questionnaire was sent to orthopedic coders to determine the validity and accuracy of the questions. Then it was distributed internally within our institution to residents who were PGY3 or higher, faculty, adjunct private faculty, and peers at other programs. Finally, we identified program coordinators and directors in the United States from the FREIDA[6] and AAOS[7] websites and asked them to distribute the questionnaire to orthopedic surgeons, attendings, and residents/fellows who were PGY3 and higher. A brief explanation about purpose and confidentiality was provided with each questionnaire. All responses were anonymous, and KwikSurveys provided data storage.

A standard rubric/grading scale was used to assess each questionnaire. The maximum possible score was 20 points; 1 point was awarded for each correct answer, and zero points for a skipped question. A score of -0.33 points was assessed for a wrong answer to discourage guessing. Participants were instructed to answer questions without outside sources or references.

Statistical Analysis

The Fisher exact and χ^2 tests were used to analyze survey scores based on the frequency of coders' certification and setting of employment (academic or private practice), and scores based on the frequency of surgeons who received formal training or played an active role in their practices' billing and coding. Continuous measures were expressed by means and standard deviations; categorical data were summarized by counts and percentages.

The independent t test was used to compare resident and fellow survey results based on whether they received formal training and teaching from their attendings, and scores based on the number of responses of surgeons in academic or private practice. Analysis of variance (ANOVA) was used to determine significant interaction between formal training and whether residents were taught by their attendings. ANOVA was also used to ascertain significant interaction between formal training and all respondents' role (active or not) in their practices' billing and coding. ANOVA using a Student-Newman-Keuls multiple comparison test assessed the significance of mean survey results among coders, practicing surgeons, and residents/fellows.

Results

A total of 254 surveys were completed by 13 coders, 112 practicing private practices and academic attending orthopedic surgeons, and 129 residents and fellows. We were unable to record or calculate the response rate or the number of institutions represented because of the anonymous nature of KwikSurveys.

Table I. Resident and Fellow Responses to Questionnaire

Do you receive formal training at your institution?		
	No. of Responses	%
Yes	49	37.98
No	80	62.02
Do Attendings teach coding at your institution?		
	No. of Responses	%
Yes	71	55.04
No	58	44.96
Do you think coding/billing should be taught in residency?		
	No. of Responses	%
Yes	127	98.45
No	2	1.55

Coders scored significantly higher than practitioners (76.5%, SD = 9.4; and 62.1%, SD = 12.6, respectively) with residents finishing at a mean of 54.1% (SD = 10.8, $P < .0001$). Certified coders scored 77.8% (SD = 8.3), similar to uncertified coders who scored 73.8% (SD = 12.5; $P = .571$). Academic coders scored higher (82.5%, SD = 2.9) than private practice coders (73.9%, SD = 10.2; $P = .134$), but this was not statistically significant.

Almost all residents and fellows (98.45%) responded that they would like coding and billing taught during their training. Residents and fellows (37.98%) also reported receiving some formal training; 55.04% received informal training from their attendings (**Table I**). Among residents and fellows, 28.68% received both formal and attending training; 9.30% received formal training; 26.36% received attending training; and 35.66% received no formal or attending training.

Table II highlights resident and fellow survey results based on the type(s) of training they received. There was no notable improvement in score by residents based on their level of training from PGY3 through fellowship. A statistically significant difference was observed between those receiving formal training versus those who did not. Also, we noted no statistically significant difference based on whether or not residents were taught by an attending. However, there was a trend toward improved scores with some training versus no training (**Table II**). The type of formal training and description of attending involvement was not obtained from residents or faculty.

Of 112 practicing attending orthopedic surgeons surveyed, 65.18% reported some formal training, and 87.50% stated they play an active role in their coding and billing process. Most practicing attending orthopedic surgeons from our study (92.86%) stated that coding and billing should be taught in residency. The practicing attending orthopedic surgeon survey results about formal training or active role in coding and

billing are summarized in **Table III**. Surgeons who played an active role in coding and billing scored statistically higher ($P = .0393$) than those who did not. There was no significant correlation between attending surgeons who received formal training and their role in coding and billing. Data on whether practitioners employed professional coders were not obtained.

Table II. Mean Percentage Correct for Residents/Fellows by Training Received

	No.	Mean Correct (%)	SD	*P*
Formal Training				
Yes	49	57.2	10.9	.0086[a]
No	80	52.1	10.4	
Attending Teaching				
Yes	71	55.3	10.7	.1601[a]
No	58	52.6	10.9	
Training/Teaching				
+ Training, + Attending	37	57.6	10.8	.0650[b]
+ Training, – Attending	12	56.3	11.3	
– Training, + Attending	34	52.8	10.1	
– Training, – Attending	46	51.6	10.7	
Training Year				
PGY3	46	54.5	10.3	.6119[b]
PGY4	50	52.7	11.4	
PGY5	24	56.3	11.2	
Fellow	9	53.9	9.9	

Abbreviations: SD, standard deviation.
[a]Independent *t* test [b]Analysis of variance
Note: No significant interaction between formal training and whether taught by attending.

Table III. Mean Percentage Correct for Attending Surgeons by Practice Setting, Formal Training, Role in Billing/Coding, and Years in Practice

	No.	Mean Correct (%)	SD	*P*
Formal Training				
Yes	73	64.6	11.7	.0514[a]
No	39	59.7	13.8	
Active Role in Billing/ Coding				
Yes	98	63.8	12.1	.0393[a]
No	14	56.4	14.5	
Practice Setting				
Academic	71	62.8	11.2	.8834[a]
Private	41	63.2	15.0	
Years in Practice				
0-2	19	62.1	6.9	.1443[b]
2-5	16	57.5	15.6	
5+	77	64.2	12.9	

Abbreviations: SD, standard deviation.
[a]Independent *t* test [b]Analysis of variance
Note: No significant interaction between formal training and role in billing and coding.

Discussion

Learning appropriate practice management skills, including billing and coding, is an important aspect to becoming a successful orthopedic surgeon. Mastery of complex coding and billing systems is essential to maximize efficiency and profitability, and to protect from overcoding penalties. Our study provides insight into the complexity of coding and an example comparison of residents with practicing orthopedic surgeons and coders. The survey results show that residents and fellows scored similarly regardless of their level of training (PGY3 versus fellow), but formal training will help improve their coding and billing knowledge.

In addition, our results, which show that most residents would like formal training in coding and billing practices and practice management during residency, are consistent with other studies.[4,8,9] Coding and billing is a necessary and required skill, along with surgical training, to practice independently. According to Black and colleagues,[10] residency should be designed to generate surgeons who are capable of practicing and acting independently in their first weeks in practice.[10] Patel and colleagues[8] surveyed program directors in otorhinolaryngology, finding that correct coding was the most important business topic for residents to learn. The overall focus of this study was to provide a qualitative and quantitative assessment of residents' knowledge of coding and billing through a survey in order to compare residents, fellows, practicing orthopedic surgeons, and coders.

There are many options for training residents about coding and billing. Two established courses, which are used by some residency programs, are the AAOS Resident Prac-

tice Management Lecture Series[11] and the Zupko AAOS course.[12] Some residencies also provide attending- and course-specific training and lecture series.[4,13] Because orthopedic residents will work in many fields, including hospital-based practices, academic and military settings, and as solo practitioners, a basic level of coding and billing knowledge is necessary. As legal penalties become more of an issue, surgeons will need to be more involved in their billing.

The data presented in this paper provide a new way to evaluate the education of residents in coding and billing. As programs begin to develop methods of teaching this topic, our survey can be a template to prospectively analyze the effectiveness of practice management education programs.

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This paper will be judged for the Resident Writer's Award.