



# Keeping Up With the Orthopaedic In-Training Examination: National Survey on Orthopaedic Residency Training in Practice Management

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*The evolving health care environment warrants its physicians to be competent in basic practice management (PM) areas. A manifestation of this importance was reflected in the inaugural inclusion of a PM subsection on the 2017 Orthopaedic In-Training Examination. The purpose of this orthopaedic resident national survey study was to gain insight on the current state of formal residency education in PM. This study surveyed 500 orthopaedic residents nationwide in 2016. Resident participation was online, anonymous, and voluntary. Only complete survey responses were included, yielding a 49.2% (246/500) response rate. The majority of orthopaedic residents (72.4%, 178/246) reported no formal education in PM topics, and 86.2% (212/246) responded that they do not receive direct feedback on individual accuracy of Current Procedural Terminology (CPT) code case logging. Of the residents without formal education in PM, 87.1% (155/178) desire its implementation. The evolving health care system is becoming increasingly reliant on physicians to provide cost-effective, value-based health care to its patients. Consideration should be given to formally incorporating basic teaching elements on important PM topics at the residency training level. (Journal of Surgical Orthopaedic Advances 28(2):81–88, 2019)*

Key words: ACGME core competencies, CPT coding, documentation and coding, orthopaedic residency, residency curriculum, residency education

The contemporary health care environment is increasingly demanding that physicians be adequately trained in basic topics and concepts pertaining to practice management (PM). Over a decade ago, the American Academy of Orthopaedic Surgeons (AAOS) began to emphasize the inclusion of PM topics in orthopaedic resident education in conjunction with the simultaneous emergence of the Accreditation Council of Graduate Medical Education

(ACGME) core competencies (1). The ACGME considers systems-based practice as one of the six core competencies, emphasizing a resident's ability to appropriately use and allocate health care resources without compromising the quality of care provided (1). In 2007, Gill and Schutt emphasized the importance of the contemporary physician not only being concerned with his or her direct clinical practice, but attention should also be given to developing individual skillsets to facilitate and train physicians to interact with multiple health care entities and all levels of health care providers (1). These interactions include, but are not limited to, insurance companies, hospital personnel and administration, social workers, case management, and physical therapists (1).

One of the most basic concepts of all PM topics is clinical and operative coding. Furthermore, the ACGME relies on accurate resident-driven case logging by Current Procedural Terminology (CPT) codes being entered into its online system. As a result, the logging of CPT codes

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Received for publication April 22, 2018; accepted for publication July 16, 2018.

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1548-825X/19/2802-0081\$22.00/0

DOI: 10.3113/JSOA.2019.0081

becomes the standard for tracking orthopaedic residents' case volumes throughout the duration of training and serves as a major data tracking modality for resident milestone achievements (2, 3). Balla et al. recently reported the surprisingly low percentage (52.8%) of accurately entered CPT codes in a cohort of successive graduating classes from a single general surgery program. Furthermore, the report demonstrated an overall lack of improvement in the accuracy of CPT coding as residents progressed from junior- to senior-level residents (4). Varacallo and colleagues also recently demonstrated in a multi-institutional orthopaedic residency training program study that not only was the preassessment PM fund of knowledge for residents surprisingly low at both institutions, but there was no improvement between junior and senior levels of postgraduate training (2). Perhaps even the most significant manifestation of the importance of these PM topics for orthopaedic residency training was the inaugural inclusion of a dedicated subsection of questions on the 2017 Orthopaedic In-Training Examination (OITE).

On the national level, the Centers for Medicare and Medicaid Services (CMS) issued in its 2013 improper payments report that greater than 10% of Medicare dollars paid were secondary to incorrect or improper billing, documentation, and coding submissions (5). Before this report, a call to action was made to mitigate the effects of health care fraud and abuse, and the major modality of targeted improvement was training and education. As health care continues to evolve into a more cost-efficient, value-based delivery system, physicians are expected to be at the forefront of efforts to reduce wasteful spending and limit the inappropriate use of resources (6–10).

Given these aforementioned concerns, the purpose of this national survey was twofold. First, the authors wished to assess if the past decade has resulted in the incorporation of PM topics into the orthopaedic resident educational curriculum. Second, the authors sought to gain insight from current orthopaedic residents regarding the individual and collective opinions on the topic of theoretical implementation of a PM curriculum as well as self-rated scores for confidence in independent office and operative coding abilities.

## Methods

### Orthopaedic Resident Solicitation and Survey Participation

Orthopaedic residency coordinator contact e-mails were first obtained from the authors' own department coordinator. Next, the total number of orthopaedic residents contacted was determined on the basis of the known data for each residency program. A general e-mail was then sent to each program's coordinator, who was asked to forward the

e-mail to all individual residents in their respective programs. The e-mail contained specific instructions regarding optional and anonymous survey participation.

Details included the brevity required to participate and approximate time involved to answer all questions (10 questions, about 10 minutes). The e-mail stated the general nature of the survey concerning current experiences and personal opinions on formal education on various PM topics as well as education in documentation and coding.

After 2 weeks, a follow-up e-mail was sent indicating this would be the final e-mail sent to the programs for participation. A complete response was considered consent to participate. The design of the survey and website prevented repeat attempts and backward navigation. Incomplete responses were excluded from the study. No financial or any other incentive was offered to participate. The "open" period for survey completion began on January 1, 2016 and the survey was "closed" on April 1, 2016.

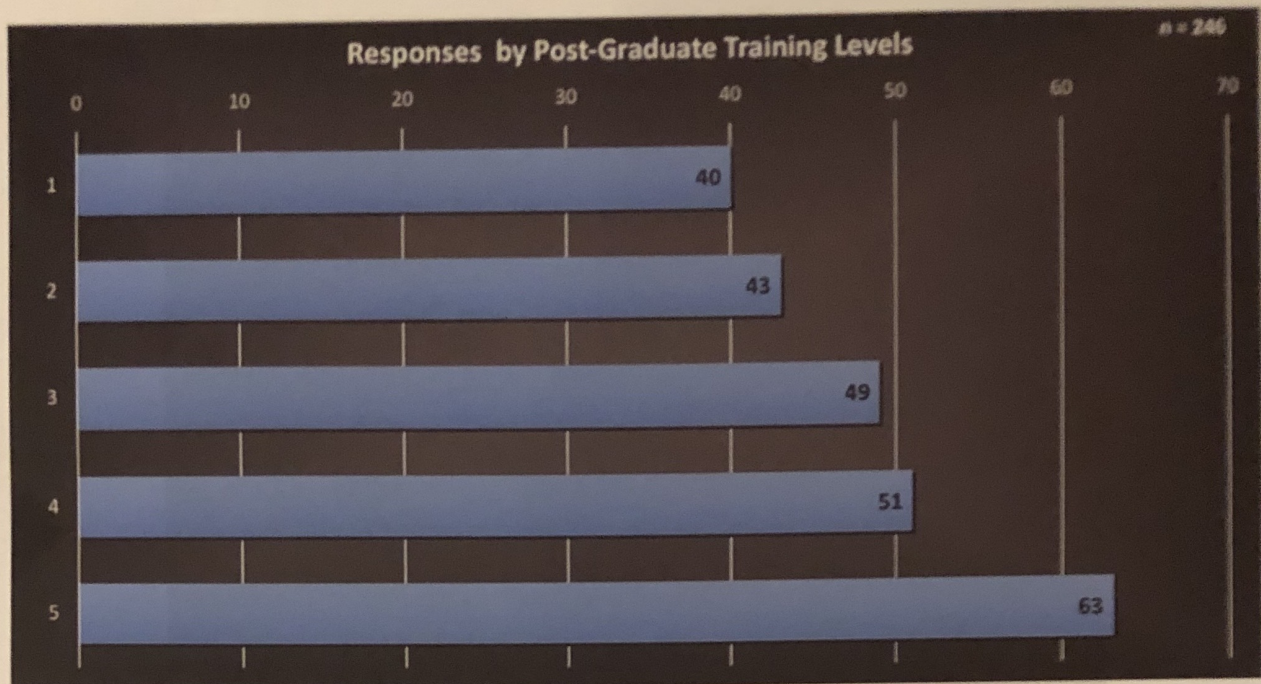
## Instrument

Data were collected for postgraduate year (PGY) of training on the presence or absence of formal education in various PM topics, including documentation and coding for both settings of practice (i.e., the clinic and the operating room). In addition, respondents were asked about the amount of teaching sessions provided by the program for the current year, total sessions since the individual started his or her residency training, and the resident's individual self-rating score for confidence in independent documentation and coding.

The survey was also designed to subdivide residents into two groups based on the presence or absence of a formal curriculum. For group 1 ("formal education or lectures = yes"), ensuing questions included lecture and training formats and personal views on the relevance and application to current and future practice. For group 2 ("formal education or lectures = no"), respondents were asked about their views and opinions about having a formal curriculum implemented.

## Data Analysis

Responses were collected online and electronically transferred into a computerized database (Microsoft Excel, Redmond, Washington). All responses were assessed as categorical variables and translated into frequency distributions. Pearson correlation coefficients were calculated for self-rated confidence in coding scores for incremental increasing PGY level of training and average self-rated scores for both clinic and operative coding. Data were analyzed using SPSS Statistical Software (IBM Corporation 2012, Somers, New York).



**FIGURE 1** Orthopaedic resident survey responses ( $n = 246$ ) by postgraduate training level (PGY-1 through PGY-5). Responses are listed as the total number of completed surveys ( $n$ ) in each PGY subgroup.

## Results

Five hundred orthopaedic residents were contacted by e-mail. By April 1, 2016, 246 complete responses were obtained, yielding a 49.2% response rate (246/500). Responses by PGY level of training are provided in Figure 1. Senior residents were considered PGY-4 and PGY-5 and collectively comprised 46.3% of total respondents (114/246). Table 1 includes a list of all potential PM topics and was adapted from a prior study on orthopaedic residency training in PM from 2007 (1). Over one-half of respondents (131/246, 53.3%) indicated no formal education, teaching, or lectures in any of the listed PM topics for the current training year (Fig. 2). The majority of respondents (178/246, 72.4%) attend orthopaedic surgery training programs that still lack any formal teaching or education with respect to CPT coding and clinical documentation (Fig. 3A). In addition, 86.2% (212/246) of orthopaedic residents reported never receiving direct feedback on CPT coding accuracy (Fig. 3B).

### Subgroup Analysis by General Training Educational Program Category

Group 1 ( $n = 68$ ) included only those respondents who also attend a program with an established formal curriculum in PM topics. About two-thirds of group 1 respondents reported the training as “useful” to their training as a future physician (Fig. 4A). Group 2 ( $n = 178$ ) was

**TABLE 1** Topics within practice management that have been identified as important for residents

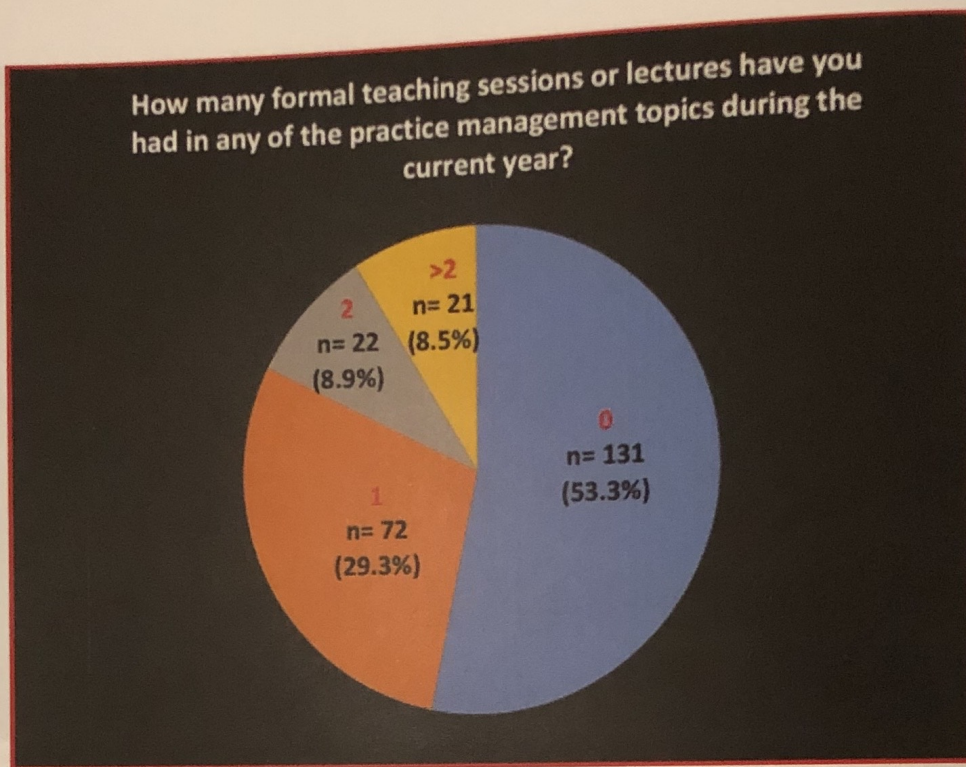
Coding and billing
Entry into medical practice
Leadership
Managed care
Marketing
Medicare and Medicaid (CMS)
Negotiating
Office management
Personnel issues
Regulatory environment
Reimbursement issues
Risk management
State and local laws
Third-party payers
Time management
Quality assurance

Modified table from Gill, J. B., Schutt, R. C. Practice management education in orthopaedic surgical residencies. *J. Bone Joint Surg. Am.* 89(1):216–219, 2007.

inclusive to those respondents without a formal curriculum in PM topics, and >80% desired PM implementation into their training curriculum (Fig. 4B).

### Resident Personal Opinions and Confidence Scores

Table 2 demonstrates self-rated confidence scores for independent documentation and coding abilities by PGY level. Pearson correlation coefficients were calculated



**FIGURE 2** Orthopaedic resident survey responses ( $n = 246$ ) quantifying the number of formal teaching sessions in PM topics (such as documentation and coding). Response categories included 0, 1, 2, or >2 for the current 2016–2017 training year. Responses regarding possible PM topics are listed in Table 1 for reference.

and demonstrated that incremental PGY training year increases resulted in increasing mean self-rated scores for independent clinic ( $p = .001$ ) and operative ( $p = .004$ ) coding.

Senior-level residents (PGY-4 and PGY-5) rarely reported individual confidence scores of “mostly confident” and no residents reported feeling “absolutely confident” in either coding setting. In total, only 1.8% (2/114) and 6.1% (7/114) of PGY-4 and PGY-5 residents reported that they were “mostly confident” in independent clinical (i.e., for evaluation and management, or “E/M”) and operative (i.e., CPT) coding, respectively.

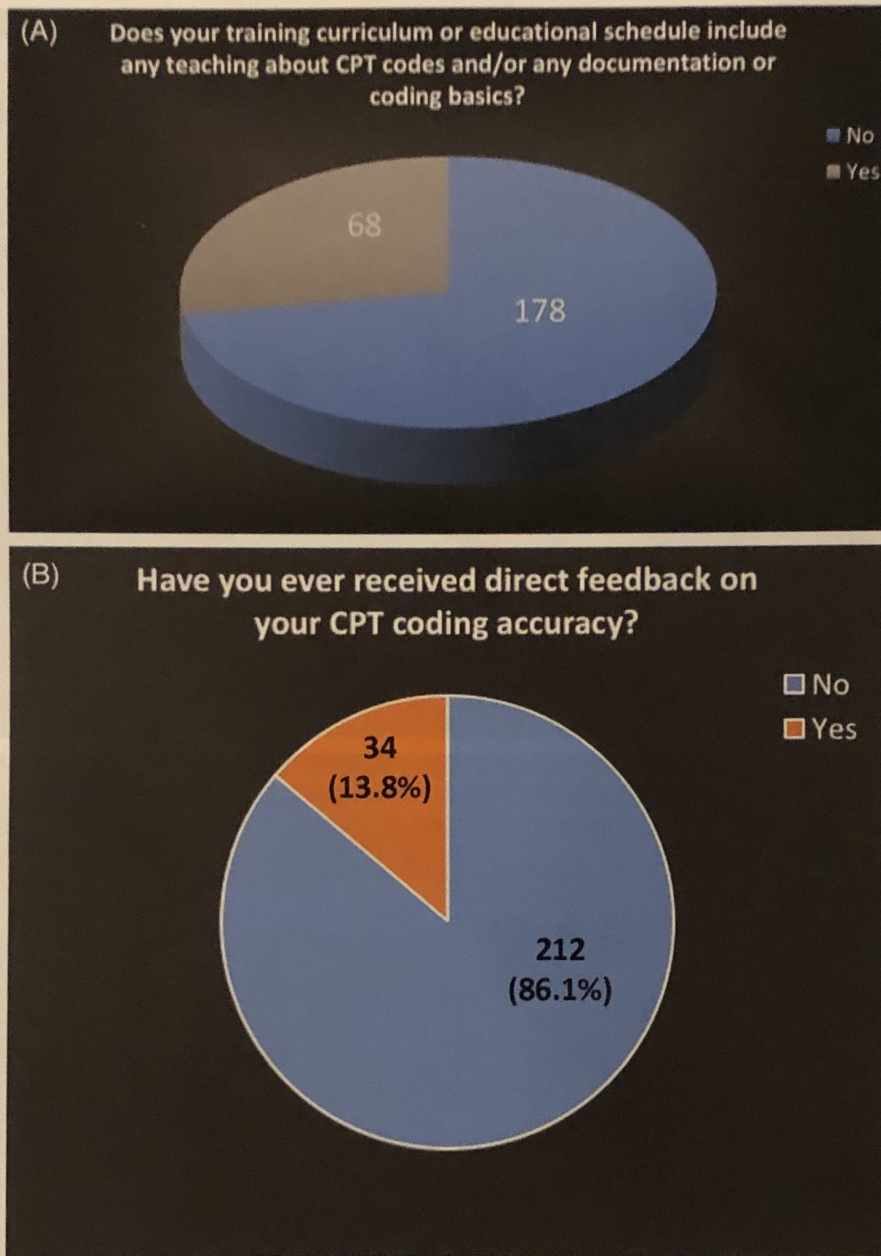
Table 3 displays the personal opinions about various statements related to general PM topics. The vast majority of residents stated “agree” or “strongly agree” to statements about implementation of PM topics to the educational curriculum. Over three-fourths of respondents (194/246, 78.9%) stated that direct feedback on clinical or operative coding feedback would be valuable to residency training.

## Discussion

The health care environment has undergone significant changes over the past decade. A concerted effort to emphasize the incorporation of PM topics into orthopaedic residency training programs has been advocated in the

orthopaedic literature since at least 2007 (1). This “three-pronged” desire has continued to synergistically converge over the past decade. The first arm represents the necessity of PM training from the external environment (i.e., the health care system itself). The second arm represents the educational necessity from the internal environment (i.e., the actual residency training programs) as delineated by the ACGME core competency of systems-based practice. This arm also encompasses the system’s reliance on each resident’s ability to accurately assign CPT codes for surgical cases to monitor surgical training progress and milestone competency. Finally, the third arm constitutes the desire of trainees to receive education in these basic PM topics. These arms of influence essentially have eventually culminated in the ultimate validation and the eventual inclusion of a PM subsection on the annual OITE in 2017.

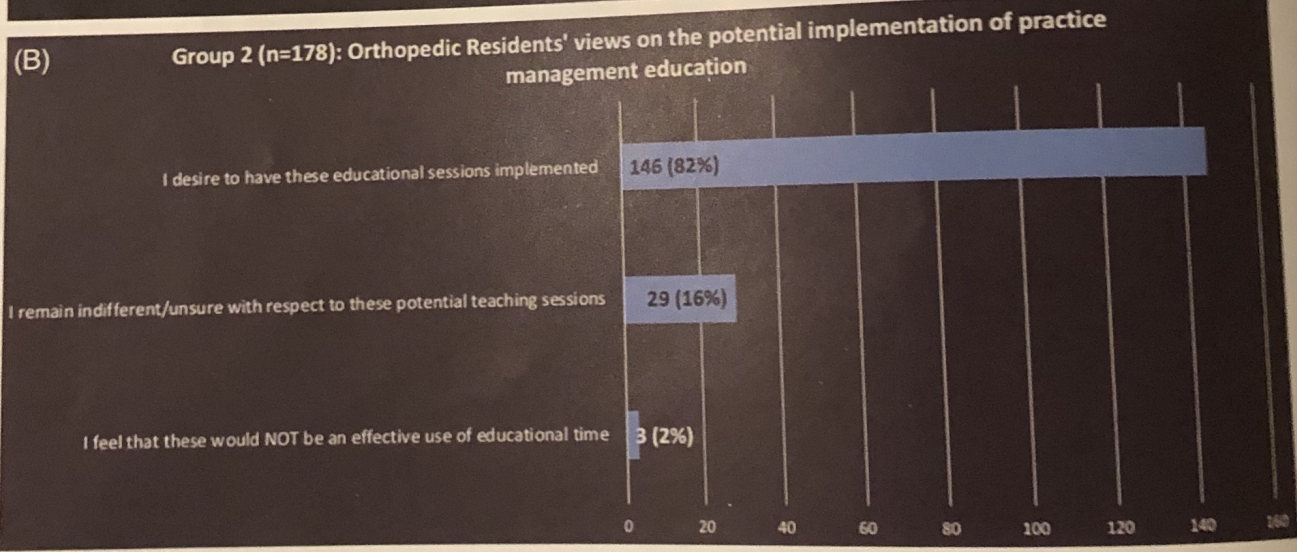
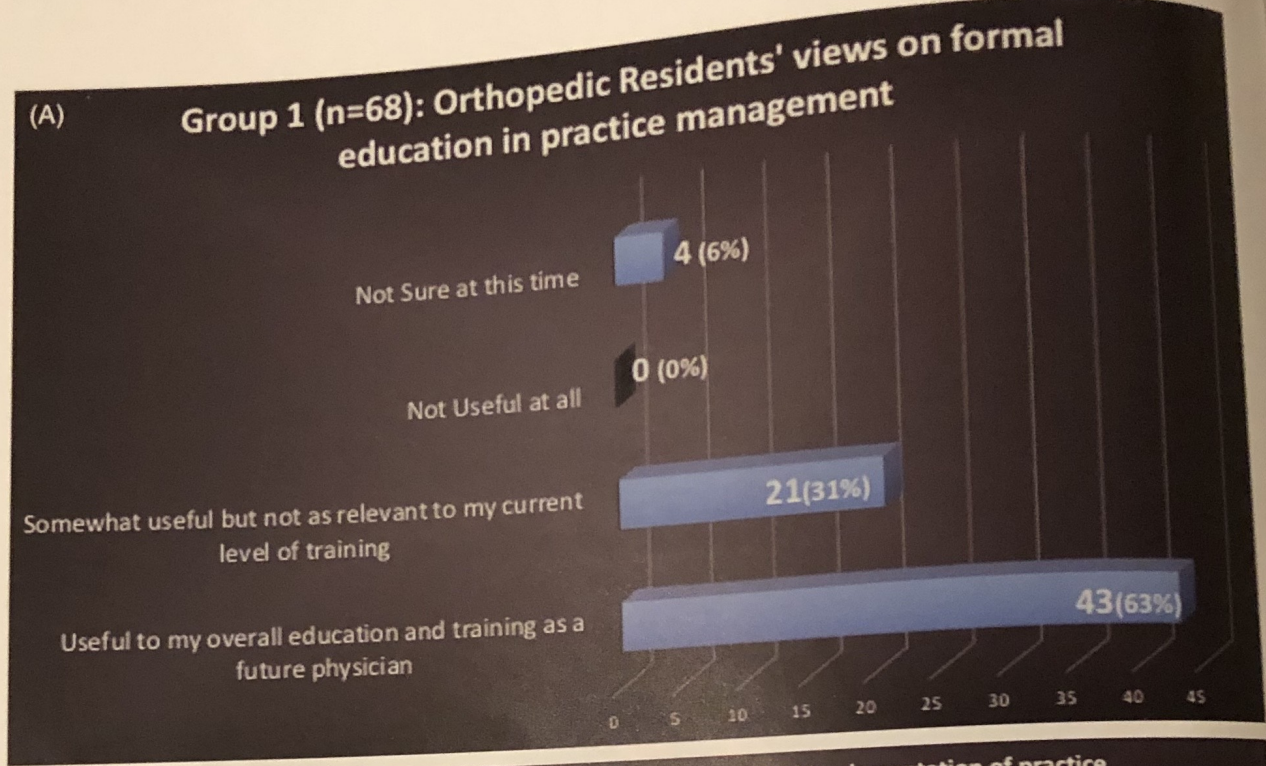
The results of this 2016 national survey are somewhat concerning given the continued reported paucity of training on these topics in many orthopaedic residency programs. Varacallo et al. recently emphasized, in a multi-institutional baseline assessment of orthopaedic residents’ knowledge across various PM topics, that although the self-reported confidence scores in these areas increased from PGY-1 to PGY-5 year, the corresponding mean baseline PM assessment score of PGY-1 residents was actually higher than the average score from PGY-3



**FIGURE 3** (A) Orthopaedic resident survey responses indicating the presence or absence of a formal component for documentation and coding teaching sessions in the curriculum. (B) Orthopaedic resident survey responses to ever receiving direct feedback on individual CPT coding accuracy for case logging of surgical procedures.

residents, and surprisingly the PGY-1 average score was essentially no different when compared with the average score of the PGY-4 residents (2). The current study suggests that while nearly every orthopaedic resident responding to the survey indicated an appreciation for the relevance of these topics, including almost 80% (194/246) stating that they would value direct feedback on individual coding practices, 212 of the 246 respondents reported never receiving individual direct feedback with respect to individual CPT coding accuracy.

While the consensus remains that the ACGME milestones and orthopaedic resident case volumes are critical to overall training, these results further highlight the concern in standardizing these milestones in the setting of these well-known, inherent variabilities in case logging procedures across training institutions (11). The literature has many recent reports on the current discordant coding practices between not only junior- and senior-level residents, but also between residents and attendings with respect to both clinical and operative settings (3,12–21).



**FIGURE 4** (A) Group 1 ( $n = 68$ ) orthopaedic residents' personal views applicable to the existing PM training or teaching sessions. Orthopaedic resident responses were allocated to group 1 only if the individual responded "yes" to the presence of formal teaching and/or training in PM topics. (B) Group 2 ( $n = 178$ ) orthopaedic residents' personal views applicable to the potential implementation of PM training or teaching sessions. Orthopaedic resident responses were allocated to group 2 only if the individual responded "no" to the presence of formal teaching and/or training in PM topics.

To the authors' knowledge, this survey is the first national survey of orthopaedic residents that has not only been inclusive to residents at all stages of training, but also incorporates the personal opinions on PM-related topics in these areas from the perspective of residents with and without a formal PM curriculum component. This study is also larger in total response size and relative response rate for any surveys reported on PM topics in residency

training. Finally, this is the first survey of orthopaedic residents reporting the paucity of direct feedback on individual CPT coding accuracy.

With the adoption of the Electronic Medical Record, the increased transparency and scrutiny of a physician's documentation and coding practices becomes an easy target for hospitals and insurance companies (15). Moreover, overbilling and underbilling are viewed as fraudulent

**TABLE 2 Orthopaedic resident self-rating scores for ability to independently document and code office(E/M) and operative (CPT) codes**

PGY Level	Self-Rated Scores								Mean Scores by PGY Level			
	1 = "Not at all"		2 = "Somewhat"		3 = "Mostly"		4 = "Absolutely"		Clinic Coding	p Value*	Operative Coding	p Value**
	Clinic Coding	Operative Coding	Clinic Coding	Operative Coding	Clinic Coding	Operative Coding	Clinic Coding	Operative Coding				
1 (n = 40)	38 (95.0)	40 (100.0)	2 (5.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1.1	.001	1.0	.004
2 (n = 43)	35 (81.4)	39 (90.7)	8 (18.6)	4 (9.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1.2		1.1	
3 (n = 49)	33 (67.3)	25 (51.0)	15 (30.6)	24 (49.0)	1 (2.0)	0 (0.0)	0 (0.0)	0 (0.0)	1.3		1.5	
4 (n = 51)	20 (39.2)	19 (37.3)	31 (60.8)	32 (62.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1.6		1.6	
5 (n = 63)	15 (23.8)	18 (28.6)	41 (65.2)	44 (68.3)	7 (11.1)	2 (3.2)	0 (0.0)	0 (0.0)	1.9		1.8	

NOTE: Self-rated confidence scores represented by a rating of 1 to 4 with increasing comfort levels for office (evaluation/management, E/M) and operative (current procedural terminology, CPT) codes. Values are presented as categorical proportions with percentages listed in parentheses.

\*/\*\*pvalue represents calculated Pearson correlation statistics for increasing PGYlevel of training and increasing self-rated scores for both clinic(\*) and operative (\*\*) coding.

**TABLE 3 Orthopaedic resident responses to documentation, billing, and coding statements**

Statement	How True Is Each Statement? <sup>a</sup>				
	Strongly Disagree	Disagree	Indifferent	Agree	Strongly Agree
Practice management should be an essential part of the educational curriculum.	1 (0.4)	3 (1.2)	23 (9.3)	97 (39.4)	122 (49.6)
Incorrect documentation/coding contributes to a large component of wasted health care costs, time, and resources.	2 (0.8)	7 (2.8)	23 (9.3)	104 (42.3)	109 (44.3)
I would value direct feedback on my own performance in documentation/coding while in training.	3 (1.2)	10 (4.1)	39 (15.9)	87 (35.4)	107 (43.5)

<sup>a</sup>Responses are presented as frequency distribution and proportions (n = 246).

practices by Medicare and are subject to legal ramifications (5). Physicians are expected to be pivotal leaders during this critical era in health care, which necessitates an increase in the overall practice of high-quality, cost-effective medicine (9). To some extent, this will require a shift in perspective away from the once tabooed nature of physicians' mastering the business side of medicine (18–23). Over the past decade, many reports endorsed by CMS have called to action the necessity of incorporating education and training on health care fraud and abuse (5). While the training and educational level are identified as a major target, the results of this survey suggest little has changed in the training curriculum over the past decade.

There are some key limitations that should be kept in mind when interpreting the results of this study. First, there is a potential selection bias when conducting a national survey on PM topics in medicine. Second, the authors chose to forego incorporating the opinions and feedback from orthopaedic program directors (PDs).

While this topic can be a focus of future studies or surveys, obtaining these data and feedback could have potentially strengthened the conclusions when comparing the PD opinions and views with that of junior-level and senior-level residents.

### Conclusion

The results of this national survey of orthopaedic residents reflect that most respondents still demonstrate a strong desire for education in basic PM topics. Overall, the national survey results suggest that little has changed with respect to formally teaching these basic concepts in orthopaedic residency. The authors have highlighted that with the emergence of PM topic subsections now incorporated on the annual OITE as of the year 2017, consideration should certainly be further heightened to the incorporation of formal education in at least the most basic PM topics.

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