

ORTHOPEDICS PRACTICE ANALYSIS



**Practice Analysis Study for
Athletic Trainers Who Specialize in Orthopedics**

October 2020

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Report of Findings from the 2020 Practice Analysis Study for Athletic Trainers Who Specialize in Orthopedics

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PREFACE

The Board of Certification, Inc. (BOC) was incorporated in 1989 to provide a certification program for entry-level Athletic Trainers (ATs). The BOC establishes and regularly reviews both the standards for the practice of athletic training and the continuing education requirements for BOC Certified ATs. The BOC has the only accredited certification program for ATs in the United States. The BOC's mission is to "provide exceptional credentialing programs for health care professionals to assure protection of the public." Consistent with its mission, the BOC sponsors a Specialty Council to oversee specialty certification.

The BOC is updating a practice analysis study to ensure the certification exam to be developed for ATs who specialize in orthopedics is current and well-designed. The purpose of the study is to identify and validate the significant responsibilities that ATs who specialize in orthopedics have in their work, as well as the specialized knowledge and skill they must possess. Doing so maintains close alignment with best practices in certification. As the primary process for identifying the subject matter to be assessed in the specialty examination, practice analysis helps to establish content validity. Validation through systematic practice analysis study helps to support the claim that a certification exam bears a sound linkage to practice.

The practice analysis study began in early 2020 with the advice of a task force made up of individuals who have a deep understanding of plans for AT specialization in orthopedics. This group established guidelines for the composition of the Practice Analysis Panel, and it provided direction for the various study components. The Practice Analysis Panel approved by the advisory task force was made up of ATs who specialize in orthopedics from a variety of practice settings. Many members of the Practice Analysis Panel had completed an AT residency program in orthopedics and several had served as residency faculty. The panel also included an orthopedic surgeon who employs ATs in an orthopedic practice. ATs who specialize in orthopedics have specific post-professional education and training in orthopedics. Based on the training and testing required for orthopedic specialty certification, these ATs use advanced clinical decision-making to assist in the evaluation and management of patients.

The Practice Analysis Panel met with Scantron for a series of virtual meetings over three days (May 28-30, 2020) to define domains and tasks, as well as the knowledge and skills that ATs who specialize in orthopedics must have to perform tasks proficiently. The group delineated these elements through intense analysis of the practice of ATs who specialize in orthopedics, giving particular attention to the influence of different practice settings and patient conditions.

The practice analysis study examined the nature of harm that specialists' inability to perform the tasks competently might bring about (Importance), and how often they perform the tasks (Frequency). Ratings addressing these issues provided by participants in a nationwide survey played an important role in understanding the essential knowledge base and documenting its fidelity to practice. The ratings are also informative to decisions about the design of the specialty certification examination.

In preparation for the project, Scantron reviewed several documents addressing the practice of ATs who specialize in orthopedics, including "The Athletic Training Milestones" (2019), as well as the report of the 2017 practice analysis report published by the Specialty Council in 2017. Additionally, Scantron met with the Specialty Council as a whole and interviewed its members individually about the nature of the AT orthopedic specialty and goals for the program. The purpose of these activities was to acquaint Scantron with relevant background and the basic activities and terminology that pertain to ATs who specialize in orthopedics and to clarify the objectives for the practice analysis. Scantron then prepared a booklet of instructions for use with the Practice Analysis Panel.

The BOC desired to adhere to established standards for the conduct of job analysis studies, the family of methods to which practice analysis belongs. These guidelines have their foundation in logically sound and legally defensible procedures drawn from psychometric literature, case law and professional standards. Essential principles and procedures are outlined in federal regulation ("Uniform Guidelines on Employee Selection Procedures") and manuals, such as "Standards for Educational and Psychological Testing" (published by the American Educational Research Association, 2014). Scantron employed these standards as well as those of the National Commission for Certifying Agencies (NCCA, 2016) throughout the study.

The practice analysis study consisted of two major phases:

1. **Initial Development and Validation** - The advisory task force worked with Scantron to design and manage the study and to convene a panel of ATs who specialize in orthopedics and others with expertise in orthopedics to domains, tasks and knowledge and skill. To define specialty, the task force revised the scales proposed by Scantron for the survey. The revised scales helped to ensure that data collected in the validation study would support the Specialty Council's objectives for the program.
2. **Validation Study** - The BOC provided the names of ATs who are known to have completed an AT residency in orthopedics as well as other ATs whose background suggested they might specialize in orthopedics. Additionally, the sample included members of a special interest group focused on orthopedics as a specialty practice area for ATs. All of these individuals were invited to complete a validation survey based on the work of the panel. A qualified group of respondents provided data in this phase. The analysis of data collected in the validation survey is the major focus of this report.

The advisory task force provided overall guidance for the study, and the panel of experts in orthopedics defined the essential content framework for the practice analysis study. The advisory task force, Practice Analysis Panel and other project personnel are listed below.

Advisory Task Force Member	Employer	Location
Chandra Lovejoy, LAT, ATC	MultiCare Orthopedics and Sports Medicine	Tacoma, WA
Jefferson (JJ) Wetherington, MS, LAT, ATC	St Luke's Sports Medicine	Boise, ID
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Toby Harkins, ATC	University of Florida Health	Gainesville, FL
Laura Stewart, MS, LAT, ATC	Children's Hospital Colorado - Sports Medicine Center	Aurora, CO

Practice Analysis Panelist	Employer	Location
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Ken Takenaka, M.Ed., LAT, ATC, OTC	Orthopedic & Fracture Specialists	Portland, OR
Jennifer Wages, PhD, ATC, OTC	Colorado Orthopaedic Group	Colorado Springs, CO
Hollie Walusz, MA, ATC, PES	Boston University	Boston, MA
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INITIAL DEVELOPMENT AND EVALUATION

In pursuit of its mission, the BOC is planning to launch a new certification program through its Specialty Council for ATs who specialize in orthopedics. Accordingly, the BOC conducted a practice analysis study to evaluate and update the knowledge and skill that ATs who specialize in orthopedics must have in order to provide proficient services. The practice analysis study focused on relevant elements of responsibility that apply in the variety of settings in which ATs who specialize in orthopedics work. Of particular interest in the study was the degree to which ATs who specialize in orthopedics would be expected to be proficient in the domains and tasks, assuming a specialty certification program is developed.

At the time of the present study the Specialty Council was in the process of researching eligibility criteria for orthopedic specialty certification. Though they had not been decided at the time of the study, the requirements are likely to include completion of advanced professional education beyond what is required for the Certified Athletic Trainer (ATC®) credential. The advanced professional education requirement may be satisfied in a variety of ways, including completion of a Commission on Accreditation of Athletic Training Education (CAATE)-accredited AT residency program in orthopedics, but other ways in which ATs engage in study and experiential learning in the specialty may be acceptable, including non-accredited residencies, graduate AT curriculum (not entry-level) in orthopedics and on-the-job training. The eligibility criteria are also likely to include current BOC certification. Specialty certification will be contingent on passing the orthopedic specialty exam based on this practice analysis.

BOC specialty certification is a voluntary process by which an AT's mastery of advanced knowledge, skills and experience in a specialized area of clinical practice, exceeding what is required for entry-level AT certification, is demonstrated and measured against defined predetermined standards, such as completing post-professional education, training and/or experience (e.g. accredited residency) and achieving a passing score on a specialty certification exam. Such standards serve to enhance the quality of patient care, optimize clinical outcomes, increase cost-effectiveness and improve patients' health-related quality of life in specialized areas of athletic training practice.

The target audience for certification for ATs with an orthopedic specialty as developed for the study is as follows: "ATs who specialize in orthopedics and have specific post-professional education, training and experience in orthopedics. Based on the training and testing required for orthopedic specialty certification, these ATs use advanced clinical decision-making to evaluate and diagnose patients; manage comprehensive care; and promote, maintain and restore health."

Employers of ATs with an orthopedic specialty may include the following:

- Physician's practice (e.g., primary care sports medicine physician, osteopathic physician)
- Professional or collegiate sports team
- High school athletics department
- Educational institution (e.g., residency program)

First Phase of the Study

The first steps in conducting the practice analysis study included a preliminary review of sources about orthopedics, the preparation of instructional materials and a three-day meeting with a panel of experts whose members represented a broad range of orthopedic practice settings, regions and qualifications. The purpose of the preliminary analysis was to identify the role and responsibilities of ATs who specialize in orthopedics as well as key terminology that defines practice. Using information gathered from the preliminary analysis, Scantron prepared instructional materials that members of the expert panel used to inform their participation in the practice analysis meeting and that Scantron used to convey essential explanations. The objective of the meeting was to define the domains, tasks and knowledge and skill required for each task at a level commensurate with specialty certification ([Appendix A](#)).

Preliminary Analysis

To provide leadership for the practice analysis study, Scantron sought to become acquainted with the role and major responsibilities of ATs who specialize in orthopedics. Scantron reviewed relevant material provided by the BOC (see bibliography). These resources included the practice analysis that the BOC conducted in 2017 on behalf of the National Athletic Trainers Association Board of Athletic Training Specialties, which today is an arm of the BOC known as the Specialty Council. Scantron reviewed information about AT residency programs in orthopedics and read professional documents such as “The Athletic Training Milestones” (2019). Then Scantron met with the Specialty Council to clarify expectations and objectives. After meeting with the Specialty Council, Scantron interviewed each member of the council individually to gain insight into perceptions about the 2017 study, the demarcation between specialty practice in orthopedics and the work of ATs as it pertains to orthopedics. These activities were instrumental in building Scantron’s understanding of the variety of practice settings and patients seen by ATs specializing in orthopedics. The preliminary analysis enhanced Scantron’s familiarity with the terminology, major responsibilities and general scope of ATs in this practice area.

Armed with this background, Scantron prepared for a virtual meeting of the Practice Analysis Panel on May 28-30, 2020. Through discussions facilitated by Scantron, the panel of experts outlined domains, tasks and knowledge and skill that are essential to the work of ATs who specialize in orthopedics, given the variety of practice settings in which they work. A pilot validation study conducted in late July and early August 2020 provided information that was used to refine the validation survey, which was then used to collect data from qualified participants to assess the appropriateness of the domains, tasks and knowledge and skill as delineated by the panel of experts.

Instructional Materials

Essential to the success of the practice analysis meeting were the materials used to inform panelists about key concepts (Appendix B). The instruction booklet included a draft definition of AT specialty practice in orthopedics, other essential definitions and sample language for domains, tasks and knowledge and skill. The instruction booklet also included a set of validation scales that are commonly used in practice analysis studies as well as worksheets for the meeting.

Instructional materials were used during the meeting of the Practice Analysis Panel as a means of building understanding among participants about concepts and terms and to orienting their essential thought processes and activities.

Practice Analysis Meeting

Meeting virtually, the Practice Analysis Panel reviewed the draft target audience definition for ATs who specialize in orthopedics and then reached consensus on suggestions for its revision. After this discussion, panelists expressed a clear understanding that the level of proficiency expected for the program is high but appropriate for ATs who specialize in orthopedics at the time they would first qualify for specialty certification. The panel then focused on developing an outline of domains, tasks and required knowledge and skill, with the objective that the outline would be adequate for the present and foreseeable future and appropriate for ATs newly certified in the orthopedic specialty. The domains are as follows:

1. Medical Knowledge
2. Procedural Knowledge
3. Professional Practice

For each domain, panel experts worked in focus groups to draft tasks, which the whole group then reviewed and refined. The participants’ diversity led to discussions that challenged terminology, phrasing, and every aspect of the draft statements, with the resulting agreement on revisions representing statements that all members of the panel believed to be valid. The panel also developed a set of knowledge and skill statements for each task in the domains, making refinements and reaching consensus through whole-group discussion.

Members of the Practice Analysis Panel were challenged to think beyond their own practice settings to identify ways that the elements of practice could be phrased to maximize their meaning across all orthopedic specialty practice settings. The panel reached consensus through much discussion in all aspects of the outline but faced a challenge regarding a set of skills in Procedural Knowledge. These skills were reviewed and discussed in a follow-up meeting of the panel with the Specialty Council and the practice analysis task, with the decision ultimately to include the skills in the validation survey and make decisions about their relevance to practice and appropriateness for the outline based on survey data.

Given the work of the Practice Analysis Panel and in consultation with BOC staff, Scantron developed an electronic validation survey. The process of review for the survey involved a pilot test of the survey as well as editorial revisions that were incorporated. Data were then collected from a broad sample of ATs who specialize in orthopedics. The results of the validation survey are the major focus of this report.

VALIDATION STUDY

Survey Design and Use

Scantron developed an online survey to be completed by ATs who specialize in orthopedics. The purpose of the survey was to collect data on the domains, tasks and knowledge and skill statements as developed by the Practice Analysis Panel. The survey phase of the practice analysis study was important because any ATs who specialize in orthopedics should have an opportunity to contribute to the delineation of this work; that is, to assess the applicability of the practice analysis to their practice as ATs specializing in orthopedics. Broad-based input is critical because the Practice Analysis Panel, although highly qualified and representative in many ways, constituted only a small sample of the population. Evaluation by the larger professional community is essential to make well-founded generalizations. The survey made use of rating scales to collect information about the practice analysis, and it also solicited demographic information to document the qualifications of the respondents and describe them in detail.

Pilot Survey

In order to ensure that the draft survey was user friendly, clear and a reasonable time commitment, members of the Specialty Council, Orthopedic Practice Analysis Task Force and the Practice Analysis Panel were asked to participate in a pilot survey. The BOC sent all of these individuals an email informing them of the study and advising them of the launch date. Scantron then provided them with an invitation and access code. Altogether, 29 individuals received invitations to participate in the pilot survey on July 27, 2020, and of these, 19 completed it before it was closed on August 3. Participants were asked to respond to the entire survey and then to offer feedback by means of an additional set of questions at the end regarding the time required to complete the survey, their confidence in using the scales, and if there were technical problems. The questions were as follows:

1. How long did it take you to complete the survey? (Pulldown showed 15 minutes, 20 minutes, 25 minutes, etc., up to More than 75 minutes)
2. Were you confident in your understanding of how to apply the rating scales? (Yes/No. If No, please elaborate. Text Box)
3. Did you experience any technical difficulty in the survey? (Yes/No. If Yes, please elaborate. Text Box)
4. Additional feedback (Text Box)

The feedback collected in the pilot survey was reviewed by the advisory task force and a member of the Specialty Council to identify if changes were required. Three demographic questions were modified to add clarity, and one task in the domain of Procedural Knowledge was split into six so that the Specialty Council could get specific input on the effect of various practice settings on the care provided by ATs who specialize in orthopedics. The task as originally stated was: "Provide procedural and/or operative care (pre-, intra-, and/or post-) to ensure optimal patient outcomes."

The revision was as follows:

- Provide **pre-procedural** care to ensure optimal patient outcomes.
- Provide **intra-procedural** care to ensure optimal patient outcomes.
- Provide **post-procedural** care to ensure optimal patient outcomes.
- Provide **pre-operative** care to ensure optimal patient outcomes.
- Provide **intra-operative** care to ensure optimal patient outcomes.
- Provide **post-operative** care to ensure optimal patient outcomes.

For the same reason, one knowledge statement was divided into two, and one skill statement was divided into two. The knowledge statement concerning "Intra-procedural and surgical technique" became:

- Intra-procedural technique
- Intra-surgical technique

Finally, the skill statement on “Creating a sterile field by prepping the patient and/or draping in the procedure and surgical environment” was modified as well:

- Creating a sterile field by prepping the patient and/or draping in the procedure environment
- Creating a sterile field by prepping the patient and/or draping in the surgical environment

Once these modifications had been implemented, the survey was prepared for the full-scale validation study.

Sampling Strategy for National Survey

Given that no certification program for ATs who specialize in orthopedics had been established at the time of the study, the sampling strategy required the BOC to identify potentially qualified respondents from several sources. First, a targeted list was developed of individuals who could reasonably be considered ATs who specialize in orthopedics. This targeted list included the graduates of all CAATE-accredited AT residency programs in orthopedics, all members of the Athletic Trainers in Physician Practice Society and all members of the Athletic Trainers in the Orthopedic Physician Practice Setting Facebook group. After identifying and removing duplicates, 537 unique individuals remained on the targeted list. Given a desired sample size of 2,000 and the understanding that ATs who specialize in orthopedics often work as specialists in traditional and clinical settings, the BOC selected 1,463 additional ATs from its data bases, distributed as follows:

- 585 whose professional setting was identified as 'Univ/College/JC – AT' (40% of 1,463)
- 146 whose professional setting was identified as 'Secondary School – AT' (10% of 1,463)
- 732 whose professional setting was identified as 'Clinic/Hospital – AT' (50% of 1,463)

Once the sample had been populated according to this plan, the Specialty Council hosted a webinar on August 6, 2020, to which all individuals in the sample were invited. Of the 2,000, 618 registered for the webinar and 345 attended for at least a portion. The webinar provided an orientation to the practice analysis in the specialty, explained the importance of the survey and encouraged participants to complete it. The webinar lasted 87 minutes (from the arrival of the first participant to the departure of the last) and was recorded and made available to any members of the sample who could not attend it at the time it was held.

On August 12, 2020, Scantron distributed an invitation email ([Appendix C](#)) to participate in the survey to all 2,000 individuals in the sample, with a due date of September 8, 2020. Eighteen individuals opted out of the survey, leaving an effective sample of 1,982. The invitation included a link to the online survey and an access code. The survey driver allowed respondents to work on the survey for a time, close the survey if their schedule required, and resume work where they had left off using the link and reentering the access code. During the data collection period, Scantron sent four follow-up reminder emails to members of the sample who had not submitted the survey at the time the reminders were sent, and the BOC sent a reminder on September 2. On September 9, Scantron sent an email to members of the sample who had not submitted the survey to announce a one-week extension. All follow-up correspondence is included in Appendix C. Additionally, the BOC offered four \$100 gift cards to be given to randomly selected participants who submitted complete surveys. Scantron closed the survey on September 16.

At the conclusion of the survey, 383 respondents provided at least some of the ratings that had been requested; however, of these, 44 indicated at the end of the survey that they did not consider themselves to be ATs who specialize in orthopedics, and this group was dropped from the analysis, leaving 339 respondents who were qualified and included in the analysis. It is important in evaluating this level of participation to recognize that the size and other dimensions of the population of ATs who specialize in orthopedics are not known. For this reason, it is challenging to determine a valid response rate. Given 2,000 individuals in the sample and 383 providing useful data, a response rate of 17% can be computed; however, given that more than 70% of the sample were ATs not known to the BOC to specialize in orthopedics, the rate of participation among members of the target population is likely to be somewhat higher than 17%.

The survey was long and complex—up to 60 minutes were required to complete it. Not all individuals responded to every question, so the total number of responses per question varies.

Who Responded to the Survey?

The survey (Appendix D) included 12 demographic questions and five qualification questions. The qualification questions, which constituted the first section of the survey, were structured in such a way that responses might inform decisions about the eligibility criteria under consideration at the time of the study. The demographic questions were presented in the last section of the survey. Demographic data and responses to the qualification questions are summarized in the tables and graphs on the following pages. Generally, the order in which they appear in the summary aligns with the order of the demographic questions, but the qualification questions are interspersed where they have relevance. Because of attrition in the survey, it should be noted that the number of respondents answering demographic questions is smaller than the number who answered the qualification questions because of its placement at the end of the survey.

The first demographic question asked respondents to indicate the highest level of education they have achieved. About one-third of the respondents who answered the question have a master's degree in athletic training, and an equal portion have a master's degree in a field other than athletic training.

Table 1. What is your HIGHEST level of education?

Level of Education	Count	Percent
Bachelor's degree – AT major	35	16.1%
Bachelor's degree – Other major	4	1.8%
Some graduate study	12	5.5%
Entry-level master's degree in athletic training	10	4.6%
Master's degree – AT major	73	33.7%
Master's degree – Other major	73	33.7%
Doctoral degree – AT major	6	2.8%
Doctoral degree – Other major	4	1.8%
Total	217	

When asked about training focused on their specialty practice as ATs in orthopedics, respondents were directed to check all options that applied, so the total in Table 2 indicates that a large number of respondents received orthopedic specialty training from more than one source. Scantron reported on the number of instances that the options were selected; however, since all 339 qualified participants providing useful data answered the question, the percentage computations are based on that denominator. A considerable portion of respondents completed an AT residency in orthopedics, but by far the largest number received on-the-job training in an orthopedic physician practice setting. Many were enrolled a graduate athletic training curriculum (not entry-level) in orthopedics or on-the-job training in a different setting.

Table 2. In which of the following program types have you received additional training to work in an orthopedic practice after earning initial certification as an AT? Please select all that apply.

Program Type	Count	Percent
CAATE-accredited athletic training residency in orthopedics 2012 to present	55	16.3%
Non-accredited athletic training residency in orthopedics	37	10.9%
Graduate athletic training curriculum (not entry-level) in orthopedics	56	16.6%
On-the-job training in an orthopedic physician practice setting	266	78.6%
On-the-job training in a different setting	66	19.6%
Total	480	100.0%

Related to training in orthopedics was the second qualification question, which addressed the respondent's informal professional development in orthopedics. The majority of respondents reported less than 260 hours of professional development in orthopedics. Just over one-third report 260 or more hours.

Table 3. During the past six (6) years, how many hours of professional development (e.g., continuing education, grand rounds, journal reviews) in orthopedics have you completed?

Number of Hours	Count	Percent
Less than 150	94	27.7%
150 to 259	120	35.4%
260 to 349	48	14.2%
350 to 499	36	10.6%
500 or more hours of education in the past six years	41	12.1%
Total	339	100.0%

Also connected to preparation for an AT specialization in orthopedics, the next qualification question asked the number of hours of mentored practice in orthopedics the respondent has had. Nearly 64% of the respondents indicate they have had 1,200 or more hours of mentored practice in the specialty.

Table 4. During the past six (6) years, how many hours of mentored practice in orthopedics have you had?

Number of Hours	Count	Percent
Less than 600	82	24.2%
600 to 1,199	41	12.1%
1,200 to 1,799	35	10.4%
1,800 to 2,399	50	14.7%
2,400 or more	131	38.6%
Total	339	100.0%

The next several questions pertain to credentials, beginning with Table 5 on the next page. Just over half of the respondents have been certified in the range of two to 10 years. Almost half of the respondents have been certified for more than 10 years.

Table 5. How long have you been a Certified Athletic Trainer (ATC®)?

Years as ATC	Count	Percent
Less than two years	8	2.4%
2 to 5 years	85	25.1%
6 to 10 years	95	28.0%
11 to 15 years	65	19.2%
16 to 20 years	27	8.0%
21 to 25 years	29	8.6%
More than 25 years	30	8.8%
Total	339	100.0%

The next question asked about additional certification that respondents hold. Only 80 respondents answered the question, suggesting that the large majority held only the ATC credential. Twelve credentials with potential relevance to ATs who specialize in orthopedics were listed. Respondents could mark more than one response, so the total count may include several credentials for one person. Table 4 reports only the frequency (Count) for each response option.

Table 6. Please identify any additional certifications you have obtained. Please select all that apply.

Response	Count
OTC	66
OT-SC	5
OPA	5
PA	2
PT	1
PTA	0
OT	1
OTA	0
MD/DO	0
RN	0
LPN	0
APRN	0
Total	80

Respondents were asked how long they have worked as an AT. Over half reported nine or more years.

Table 7. Please identify the number of years (2,000 hours = one year of full-time work) you have worked as an AT. Please round up for fractions of a year.

Response	Count	Percent
0 to 1 year	5	1.5%
1 to 2 years	15	4.4%
3 to 5 years	79	23.3%
6 to 8 years	60	17.7%
9 or more years	180	53.1%
Total	418	100.0%

More than 58% of the respondents indicated that they practiced as an AT who specializes in orthopedics for five years or less. Almost one-fourth have specialized for nine or more years.

Table 8. Please identify the number of years you have worked as an AT who specializes in orthopedics (excluding residency program). Please round up for fractions of a year.

Response	Count	Percent
0 to 2 years	93	27.4%
3 to 5 years	105	31.0%
6 to 8 years	64	18.9%
9 or more years	77	22.7%
Total	339	100.0%

Just over half of the respondents reported that they work between 40 and 50 hours per week. The next largest group worked as specialists between 30 and 40 hours per week.

Table 9. On average, how many hours per week do you practice in your orthopedic specialty?

Response	Count	Percent
20 hours or fewer	11	5.1%
21 hours to 30 hours	15	6.9%
31 hours to 40 hours	55	25.5%
41 hours to 50 hours	114	52.8%
51 hours to 60 hours	18	8.3%
More than 60 hours	3	1.4%
Total	216	100.0%

The next question in the demographic survey concerned the number of patients seen in the respondent's AT specialty practice in orthopedics. The majority see from 51 to 150 patients per week.

Table 10. How many orthopedic patients do you serve in your orthopedic specialty practice on average each week?

Response	Count	Percent
50 or fewer	26	12.1%
51 to 100	61	28.4%
101 to 150	62	28.8%
151 to 200	31	14.4%
More than 200	35	16.3%
Total	215	100.0%

The survey then posed a question related to the percentage of the patients seen in the respondent's AT specialty practice in orthopedics in three age groups: pediatric, adult and geriatric. Respondents entered the percentage in each group as whole numbers, but Scantron grouped the responses into seven groups of 10 percent each, given that the largest percentage entered by a respondent was between 51 and 60 percent. Although many respondents work with pediatric patients, adults dominate the patient mix, and geriatric patients are also seen frequently. See Table 11 on the next page.

Table 11. Considering all of the orthopedic patients that you serve in your orthopedic specialty practice, what percentage are classified in the following age groups?

Patient Age Group	0 - 0	1 - 10	11 - 20	21 - 30	31 - 40	41 - 50	51 - 60
Pediatric (birth up to age 18)	13	63	65	35	14	3	1
Adult (18 to 65)	2	15	2	10	34	56	39
Geriatric (older than 65)	29	22	45	56	31	24	6

Respondents were asked to report the type of physician they work with, and to mark all physician types that applied to their practice. Given that there were just over 200 respondents and the total number answering this question, it is clear that many work with physicians of different types and that by far the largest number work in the practice of orthopedic surgeons. A large number work in the practice of primary care sports medicine physicians.

Table 12. What type of physician do you work with in your specialty in orthopedics? Please select all that apply.

Response	Count
Orthopedist	184
Primary care sports medicine physician	109
Primary care physician	10
Physiatrist	19
Podiatrist	22
Total	344

The next question in the demographic survey was about the practice setting for the respondent's AT specialty practice in orthopedics. Over two-thirds of the respondents worked in a physician's office, either in a private practice or a hospital-based physician practice. When combined with those indicating they practice in a hospital/health care facility, almost 90% of the respondents are accounted for. Seven other responses were received, most of which indicated multiple settings related to a physician practice, but one worked in an orthopedic urgent care center and one could be classified as a hospital/health care facility. Just over 10% of the respondents classified their practice setting as a traditional setting for athletic training; that is, high school and professional or collegiate sports team.

Table 13. Where does your orthopedic specialty practice take place primarily?

Practice Setting	Count	Percent
High school athletics department	10	4.6%
Hospital/health care facility	37	17.1%
Hospital-based physician office	71	32.7%
Operating room	1	0.5%
Private practice physician office	79	36.4%
Professional or collegiate sports team	12	5.5%
Other	7	3.2%
Total	217	100.0%

Practically 90% of the respondents indicated they work in the practice of an orthopedic physician over 50% of the normal workweek. See Table 14 on the next page.

Table 14. Do you spend 50% or more of your time working in an orthopedic physician practice?

Response	Count	Percent
Yes	193	88.9%
No	24	11.1%
Total	217	100.0%

The next question in the demographic survey asked respondents if they work in an administrative role in an orthopedic physician practice. The substantial majority said they do not.

Table 15. Do you work in an administrative role (e.g., practice manager, practice coordinator, director) in an orthopedic physician practice?

Response	Count	Percent
Yes	51	23.5%
No	166	76.5%
Total	217	100.0%

Over half of the respondents are in the age range of 25 to 34 years.

Table 16. What is your age?

Age Range	Count	Percent
Less than 25 years	7	3.3%
25 to 29 years	60	27.9%
30 to 34 years	62	28.8%
35 to 39 years	32	14.9%
40 to 44 years	17	7.9%
45 to 49 years	15	7.0%
50 or more years	22	10.2%
Total	215	100.0%

Scantron created four geographic regions accounting roughly for quadrants of the United States. All four regions were represented in the response to the survey, with the largest portions in the Midwest and South. No respondents lived in the U.S. territories.

Table 17. Please indicate the U.S. state or territory in which you are employed as a specialist in orthopedics.

Response	Count	Percent
Northeast (ME, NH, VT, MA, RI, CT, NY, NJ, PA)	30	14.0%
South (DE, MD, DC, VA, WV, NC, SC, GA, FL, KY, TN, AL, MS, LA)	66	30.9%
Midwest (IN, OH, MI, IL, WI, IA, NE, MN, SD, ND, MO, KS, AR, OK, TX)	79	36.9%
West (MT, ID, WY, CO, NM, AZ, UT, NV, WA, OR, CA, AK, HI)	39	18.2%
Total	214	100.0%

The last question asked respondents to consider the outline of domains, tasks and knowledge and skill statements and to mark “Yes” if they considered themselves an orthopedic specialist. If respondents marked “No,” Scantron deleted them from all analyses, they were not included in the above summary of qualified respondents who gave usable responses, and the ratings they gave in other parts of the survey were omitted from the analysis reported in the next section where ratings are summarized.

Based on the foregoing summary statistics, it is reasonable to conclude that respondents were diverse along many areas, but since the dimensions of the population are not known, it is not possible to assess alignment to established data. Comparison with the 2017 demographic summary indicates that many of the same questions were used, with results not unlike those obtained in 2020, but differences in the methods used to qualify respondents makes it difficult to draw direct parallels between the two studies. However, it is clear that the respondents to the practice analysis survey were qualified to participate by virtue of the demographic information they gave about their practice in the specialty.

VALIDATION OF THE DOMAINS AND TASKS

Validation Scales

Respondents were asked to evaluate each task by using scales for Importance and Frequency. The Importance scale employed four units (1 to 4), with a “4” indicating the potential for extreme harm. A five-point scale (1 to 5) was used for the Frequency scale, with a response of “5” representing the greatest frequency. The scales are listed below as a reference:

Importance: What level of harm would result (if any) if ATs with an orthopedic specialty were not proficient in the domain or task? (Harm may be physical, psychological, emotional, legal, financial, etc.)

- 1 = No harm at all
- 2 = Minimal harm
- 3 = Moderate harm
- 4 = Extreme harm

Frequency: How frequently do ATs with an orthopedic specialty perform the domain or task?

- 1 = Never
- 2 = Rarely (once per year)
- 3 = Sometimes (once per month)
- 4 = Often (once per week)
- 5 = Repeatedly (daily)

Scantron determined the number and percentage of respondents who selected the various options for Importance and Frequency and computed several descriptive statistics for the responses received. The descriptive statistics include means, which are the simple arithmetic average of the scale values given by the respondents. The standard errors of the mean describe the theoretical range within which the means of other samples drawn from this population would lie. Standard deviation statistics describe the spread of the response distributions, with small estimates indicating tight groupings and agreement among the respondents. Medians are the rating found in the center of the distribution of ratings when they are ranked from high to low. Because the ratings are ordinal in nature and means are subject to outliers, means should be interpreted with caution. Medians are generally seen as the appropriate statistics to use when evaluating respondents' endorsement.

Domain I: Medical Knowledge

The first domain, Medical Knowledge, includes six tasks. The tasks indicate the work ATs with an orthopedic specialty do when they are engaged in activities that involve knowledge in the domain. The tasks in this domain, which are abbreviated with key words in Tables 18, 19, 20 and 21, are presented in full below:

- I. Formulate differential diagnoses by interpreting a comprehensive history to determine an appropriate physical examination.
- II. Complete a focused physical examination using evidence-based methods to inform the differential diagnosis.
- III. Determine the need for appropriate diagnostic testing based on the history and physical examination to inform the differential diagnosis.
- IV. Synthesize evaluation findings and diagnostic studies consistent with best practice to determine the diagnosis and education the patient.
- V. Formulate the plan of care in collaboration with the interdisciplinary health care team and patient.
- VI. Analyze outcomes to optimize the continuum of patient-centered care.

As may be seen in Table 18, there was support for the hypothesis that tasks in Medical Knowledge must be performed proficiently (Importance scale). For the first five tasks, which involve direct interaction with patients, the Importance medians indicated moderate harm would result from poor performance, but the median for the sixth, outcomes evaluation, was associated with minimal harm. In Table 19 it was observed that well over half of respondents indicated moderate or severe harm would result if the first five tasks were performed poorly, but the modal response (1) for the sixth indicates minimal harm.

Table 18. Descriptive Statistics for Importance for Tasks in Medical Knowledge

Task (Key Words)	N	Median	Mean	SE Mean	SD
Formulate differential diagnosis	339	3	2.7	0.0	0.8
Complete physical examination	338	3	2.8	0.0	0.8
Determine the need for testing	338	3	2.7	0.0	0.8
Synthesize findings and studies	338	3	2.9	0.0	0.8
Formulate a plan of care	338	3	2.8	0.0	0.8
Analyze outcomes	338	2	2.4	0.0	0.8

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 19. Counts and Percentages for Importance for Tasks in Medical Knowledge

Task (Key Words)	1		2		3		4	
Formulate differential diagnosis	28	8.3%	99	29.2%	160	47.2%	52	15.3%
Complete physical examination	16	4.7%	92	27.2%	177	52.4%	53	15.7%
Determine the need for testing	19	5.6%	110	32.5%	167	49.4%	42	12.5%
Synthesize findings and studies	16	4.7%	74	21.9%	179	53.0%	69	20.4%
Formulate a plan of care	25	7.4%	89	26.4%	158	46.7%	66	19.5%
Analyze outcomes	41	12.1%	156	46.2%	118	34.9%	23	6.8%

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

The Frequency scale addressed the question of how often the tasks in Medical Knowledge are performed. Descriptive statistics as given in Table 20 indicate that all tasks have median responses of four or five on the five-point scale. The modal Frequency rating was five for of the six tasks, indicating that they are performed on a daily basis, though outcomes evaluation was performed a little less often, just under once per week.

Table 20. Descriptive Statistics for Frequency for Tasks in Medical Knowledge

Task (Key Words)	N	Median	Mean	SE Mean	SD
Formulate differential diagnosis	338	5	4.5	0.0	0.8
Complete physical examination	338	5	4.3	0.1	0.9
Determine the need for testing	337	4	4.1	0.1	1.0
Synthesize findings and studies	338	4	4.0	0.1	1.0
Formulate a plan of care	338	4	4.2	0.1	1.0
Analyze outcomes	335	4	3.8	0.1	1.0

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

Table 21. Counts and Percentages for Frequency for Tasks in Medical Knowledge

Task (Key Words)	1		2		3		4		5	
Formulate differential diagnosis	1	0.3%	15	4.5%	23	6.8%	65	19.2%	234	69.2%
Complete physical examination	3	0.9%	16	4.7%	49	14.5%	79	23.4%	191	56.5%
Determine the need for testing	6	1.8%	21	6.2%	55	16.3%	112	33.2%	143	42.5%
Synthesize findings and studies	5	1.5%	27	8.0%	63	18.6%	111	32.8%	132	39.1%
Formulate a plan of care	3	0.9%	23	6.8%	46	13.6%	104	30.8%	162	47.9%
Analyze outcomes	13	3.9%	23	6.9%	76	22.6%	130	38.8%	93	27.8%

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

Domain II: Procedural Knowledge

The second domain, Procedural Knowledge, included seven tasks that are presented in full here but are abbreviated in Tables 22, 23, 24 and 25.

1. Implement the established plan of care utilizing advanced clinical decision making to incorporate appropriate modifications and ensure optimal patient outcomes.
2. Provide **pre-procedural** care to ensure optimal patient outcomes.
3. Provide **intra-procedural** care to ensure optimal patient outcomes.
4. Provide **post-procedural** care to ensure optimal patient outcomes.
5. Provide **pre-operative** care to ensure optimal patient outcomes.
6. Provide **intra-operative** care to ensure optimal patient outcomes.
7. Provide **post-operative** care to ensure optimal patient outcomes.

The median responses for the Importance of tasks in Procedural Knowledge indicate that intra-operative care would result in extreme harm if performed poorly; however, all tasks in the domain are associated with at least moderately harmful consequences. The overwhelming majority of respondents view the tasks as resulting in moderate harm or extreme harm if ATs lack proficiency in their performance (Tables 22 and 23).

Table 22. Descriptive Statistics for Importance for Tasks in Procedural Knowledge

Task (Key Words)	N	Median	Mean	SE Mean	SD
Implement plan of care	309	3	3.0	0.0	0.8
Pre-procedural care	308	3	3.0	0.0	0.8
Intra-procedural care	307	3	3.3	0.0	0.8
Post-procedural care	308	3	3.1	0.0	0.8
Pre-operative care	307	3	3.0	0.0	0.8
Intra-operative care	309	4	3.4	0.0	0.8
Post-operative care	307	3	3.3	0.0	0.8

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 23. Counts and Percentages for Importance for Tasks in Procedural Knowledge

Task (Key Words)	1		2		3		4	
Implement plan of care	11	3.6%	58	18.8%	167	54.0%	73	23.6%
Pre-procedural care	9	2.9%	69	22.4%	144	46.8%	86	27.9%
Intra-procedural care	8	2.6%	44	14.3%	112	36.5%	143	46.6%
Post-procedural care	9	2.9%	44	14.3%	153	49.7%	102	33.1%
Pre-operative care	9	2.9%	75	24.5%	121	39.4%	102	33.2%
Intra-operative care	14	4.5%	29	9.4%	82	26.6%	184	59.5%
Post-operative care	8	2.6%	31	10.2%	134	43.6%	134	43.6%

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

The Frequency ratings presented in Tables 24 (below) and 25 (next page) indicate that ATs with a specialty in orthopedics perform all tasks in Procedural Knowledge every week except for intra-operative care, which is performed less often, on a monthly basis, and not at all by 13.4% of the respondents. The median response for all tasks except for intra-operative care was four (once a week), and it was three for that task. The modal response is five for four of the tasks (Implement the plan of care, Post-procedural care, Pre-operative care, and Post-operative care).

Table 24. Descriptive Statistics for Frequency for Tasks in Procedural Knowledge

Task (Key Words)	N	Median	Mean	SE Mean	SD
Implement plan of care	309	4	4.1	0.1	0.9
Pre-procedural care	307	4	4.1	0.0	0.9
Intra-procedural care	307	4	3.6	0.1	1.2
Post-procedural care	308	4	4.2	0.0	0.8
Pre-operative care	305	4	4.0	0.1	1.0
Intra-operative care	307	3	3.2	0.1	1.3
Post-operative care	308	4	4.2	0.1	0.9

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

Table 25. Counts and Percentages for Frequency for Tasks in Procedural Knowledge

Task (Key Words)	1		2		3		4		5	
Implement plan of care	4	1.3%	16	5.2%	46	14.9%	120	38.8%	123	39.8%
Pre-procedural care	2	0.7%	11	3.6%	52	16.9%	126	41.0%	116	37.8%
Intra-procedural care	15	4.9%	44	14.3%	73	23.8%	93	30.3%	82	26.7%
Post-procedural care	2	0.6%	7	2.3%	38	12.3%	128	41.6%	133	43.2%
Pre-operative care	8	2.6%	17	5.6%	56	18.4%	109	35.7%	115	37.7%
Intra-operative care	41	13.4%	59	19.2%	78	25.4%	68	22.1%	61	19.9%
Post-operative care	7	2.3%	6	1.9%	43	14.0%	117	38.0%	135	43.8%

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

Domain III: Professional Practice

There are three tasks in Professional Practice. They are presented in their entirety below and in abbreviated form in Tables 26, 27, 28 and 29.

- Establish patient-centered processes and quality care programs that promote value-based care, population health strategies and cost containment to improve patient outcomes.
- Collaborate as a leader of the interdisciplinary health care team using effective interpersonal and communication skills to ensure optimal patient care.
- Engage in professional development and reflective practice to support improvement in self and others to enhance patient care.

Survey data regarding respondents' view of the importance of tasks in Professional Practice suggest that these activities would result if a lower level of harm is performed inadequately. Descriptive statistics show medians of two and three, with means midway between minimal harm and moderate harm. The plurality of respondents view inability to perform the three tasks proficiently as resulting in minimal harm.

Table 26. Descriptive Statistics for Importance for Tasks in Professional Practice

Task (Key Words)	N	Median	Mean	SE Mean	SD
Establish processes & programs	304	2	2.4	0.0	0.8
Collaborate with health care team	304	3	2.5	0.0	0.8
Engage in professional development	304	2	2.3	0.1	0.9

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 27. Counts and Percentages for Importance for Tasks in Professional Practice

Task (Key Words)	1		2		3		4	
Establish processes & programs	35	11.5%	132	43.4%	112	36.9%	25	8.2%
Collaborate with health care team	33	10.9%	118	38.8%	117	38.5%	36	11.8%
Engage professional development	57	18.7%	121	39.8%	92	30.3%	34	11.2%

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Though seen as less consequential overall, the tasks in Professional Practice are performed often. Medians indicate that collaboration with the interdisciplinary health care team is a daily activity, where the other two tasks are performed at least monthly, but many respondents perform them on a weekly or daily basis.

Table 28. Descriptive Statistics for Frequency for Tasks in Professional Practice

Task (Key Words)	N	Median	Mean	SE Mean	SD
Establish processes & programs	303	4	3.8	0.1	1.0
Collaborate with health care team	303	4	4.1	0.1	0.9
Engage in professional development	302	4	4.1	0.0	0.9

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

Table 29. Counts and Percentages for Frequency for Tasks in Professional Practice

Task (Key Words)	1		2		3		4		5	
Establish processes & programs	5	1.7%	26	8.6%	88	29.0%	97	32.0%	87	28.7%
Collaborate with health care team	2	0.6%	15	5.0%	55	18.2%	97	32.0%	134	44.2%
Engage professional development	0	0.0%	16	5.3%	56	18.5%	124	41.1%	106	35.1%

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

DOMAIN RATINGS

Although respondents were informed of the domains early in the survey, they were asked to rate them as whole entities after providing ratings for the tasks within them. This approach helped to ensure the respondents were informed about the scope of activity associated with the domains when they rated the domain as a whole.

Importance ratings suggest that Medical Knowledge and Procedural Knowledge have moderate criticality. For Professional Practice, the harm that would result from the improper performance of ATs with a specialty in orthopedics is viewed as between minimal and moderate. Domain-level responses for Importance are summarized in Tables 30 and 31.

Table 30. Descriptive Statistics for Importance for Domains

Domain	N	Median	Mean	SE Mean	SD
Medical Knowledge	338	3	3.2	0.8	0.0
Procedural Knowledge	307	3	3.3	0.8	0.0
Professional Practice	303	2	2.5	0.8	0.0

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 31. Counts and Percentages for Importance for Tasks in Professional Practice

Domain	1		2		3		4	
Medical Knowledge	13	3.8%	45	13.3%	154	45.6%	126	37.3%
Procedural Knowledge	10	3.3%	27	8.8%	142	46.3%	128	41.6%
Professional Practice	30	9.9%	128	42.2%	112	37.0%	33	10.9%

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Ratings for Frequency (Tables 32 and 33) indicate that ATs who specialize in orthopedics engage in all three domains on a routine basis, at least weekly if not daily. The descriptive statistics bear this finding out, with medians of five and four, and means all greater than four.

Table 32. Descriptive Statistics for Frequency for Domains

Domain	N	Median	Mean	SE Mean	SD
Medical Knowledge	336	5	4.6	0.7	0.0
Procedural Knowledge	306	4	4.1	0.8	0.0
Professional Practice	302	4	4.0	0.9	0.0

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

Table 33. Counts and Percentages for Frequency for Tasks in Professional Practice

Domain	1		2		3		4		5	
Medical Knowledge	1	0.3%	3	0.9%	19	5.6%	90	26.8%	223	66.4%
Procedural Knowledge	0	0.0%	9	2.9%	51	16.7%	137	44.8%	109	35.6%
Professional Practice	1	0.3%	11	3.7%	69	22.8%	117	38.8%	104	34.4%

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

RELIABILITY ANALYSIS FOR DOMAINS AND TASKS

The reliability of the scales for domains and tasks was assessed to determine how consistently the tasks performed as measures. Reliability refers to the degree to which tests or surveys are free from measurement error. With inconsistency (i.e., unreliability), it would be difficult to interpret the results of the study. Reliability analysis expresses the adequacy of data reported for the Importance and Frequency ratings for each domain based on the tasks in that area of responsibility.

Reliability, reported in Table 34 for domains and Table 35 for tasks, was measured by estimating internal consistency (Cronbach's alpha) using the respondents' ratings for Importance and Frequency for the tasks in each domain. This procedure calculates the extent to which the task ratings within a domain consistently measure what other tasks within that domain measure. Reliability coefficients range from zero to one and should be at or above 0.70. The reliability coefficients obtained for this study were all above that threshold, and many were quite strong.

Table 34. Reliability of Domains

Domain	Importance	Frequency
Medical Knowledge	0.85	0.85
Procedural Knowledge	0.91	0.85
Professional Practice	0.86	0.75

Table 35. Reliability of Tasks

Domain	Importance	Frequency
Medical Knowledge, Task A	0.94	0.86
Medical Knowledge, Task B	0.95	0.92
Medical Knowledge, Task C	0.89	0.92
Medical Knowledge, Task D	0.88	0.88
Medical Knowledge, Task E	0.94	0.92
Medical Knowledge, Task F	0.93	0.90
Procedural Knowledge, Task A	0.94	0.91
Procedural Knowledge, Task B-G	0.97	0.96
Professional Practice, Task A	0.96	0.92
Professional Practice, Task B	0.97	0.93
Professional Practice, Task C	0.95	0.85

KNOWLEDGE AND SKILL

For each task, the Practice Analysis Panel developed a set of knowledge and skill that it believed are required if ATs who specialize in orthopedics are to perform that responsibility proficiently at entry to specialty practice.

Domain I: Medical Knowledge

The statements for the tasks in Medical Knowledge are presented in full below. They are coded in Tables 36, 37, 38 and 39, where responses collected in the survey are summarized.

A.	Formulate differential diagnoses by interpreting a comprehensive history to determine an appropriate physical examination.
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Knowledge of	
AK1	Components of a complete history for the patient
AK2	Medical conditions pertinent to orthopedic pathologies
AK3	Orthopedic conditions
AK4	Epidemiology of injury, illness and co-morbidities
AK5	Age-related factors
AK6	Socioeconomic and cultural considerations

Skills in	
AS1	Engaging in active dialogue with a patient to obtain pertinent information
AS2	Synthesizing comprehensive and pertinent patient history (e.g., orthopedic, non-orthopedic) to formulate relevant differential diagnoses

Table 36. Descriptive Statistics for Importance for Task A Knowledge and Skill in Medical Knowledge

Knowledge and Skill (Coded)	N	Median	Mean	SE Mean	SD
AK1	296	3	2.9	0.1	0.9
AK2	296	3	3.1	0.0	0.8
AK3	296	3	3.1	0.0	0.8
AK4	296	3	3.0	0.0	0.8
AK5	295	3	2.9	0.0	0.8
AK6	294	3	2.6	0.0	0.8
AS1	295	3	2.9	0.1	0.9
AS2	295	3	3.0	0.0	0.8

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 37. Counts and Percentages for Importance for Task A Knowledge and Skill in Medical Knowledge

Knowledge and Skill (Coded)	1		2		3		4	
AK1	17	5.7%	76	25.7%	121	40.9%	82	27.7%
AK2	11	3.7%	52	17.6%	126	42.6%	107	36.1%
AK3	11	3.7%	52	17.6%	136	45.9%	97	32.8%
AK4	10	3.4%	56	18.9%	151	51.0%	79	26.7%
AK5	10	3.4%	78	26.4%	152	51.5%	55	18.7%
AK6	16	5.4%	119	40.5%	123	41.9%	36	12.2%
AS1	22	7.5%	69	23.4%	122	41.3%	82	27.8%
AS2	17	5.7%	51	17.3%	143	48.5%	84	28.5%

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 38. Descriptive Statistics for Frequency for Task A Knowledge and Skill in Medical Knowledge

Knowledge and Skill (Coded)	N	Median	Mean	SE Mean	SD
AK1	295	5	4.8	0.0	0.5
AK2	296	5	4.7	0.0	0.6
AK3	295	5	4.8	0.0	0.5
AK4	295	5	4.5	0.0	0.7
AK5	295	5	4.4	0.0	0.7
AK6	294	4	4.1	0.1	1.0
AS1	293	5	4.9	0.0	0.4
AS2	295	5	4.7	0.0	0.6

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

Table 39. Counts and Percentages for Frequency for Task A Knowledge and Skill in Medical Knowledge

Knowledge and Skill (Coded)	1		2		3		4		5	
AK1	0	0.0%	2	0.7%	8	2.7%	38	12.9%	247	83.7%
AK2	0	0.0%	0	0.0%	17	5.7%	57	19.3%	222	75.0%
AK3	1	0.3%	0	0.0%	7	2.4%	39	13.2%	248	84.1%
AK4	0	0.0%	1	0.3%	24	8.2%	82	27.8%	188	63.7%
AK5	0	0.0%	5	1.7%	31	10.5%	88	29.8%	171	58.0%
AK6	1	0.3%	19	6.5%	65	22.1%	84	28.6%	125	42.5%
AS1	0	0.0%	0	0.0%	3	1.0%	35	12.0%	35	87.0%
AS2	0	0.0%	1	0.3%	20	6.8%	43	14.6%	43	78.3%

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

B.	Complete a focused physical examination using evidence-based methods to inform the differential diagnosis.
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Knowledge of	
BK1	Human anatomy and physiology applied to orthopedic pathologies
BK2	Orthopedic pathologies
BK3	Pathophysiology
BK4	Biomechanics
BK5	Specificity, sensitivity, methods and predictive value of tests and tools used in physical examinations for suspected orthopedic conditions
BK6	Indications and contraindications for the use of tests and tools
BK7	Considerations and strategies for conducting a physical examination

Skills in	
BS1	Recognizing and evaluating pertinent anatomical features through a variety of modalities
BS2	Distinguishing origin and signs of localized and systemic infections
BS3	Utilizing the appropriate tools during the physical examination
BS4	Determining and justifying which selective tissue tests are appropriate
BS5	Performing the identified selective tissue, neurovascular and dynamic tests proficiently
BS6	Analyzing biomechanics and recognizing movement pattern dysfunction
BS7	Recognizing abnormal findings during the physical examination

Table 40. Descriptive Statistics for Importance for Task B Knowledge and Skill in Medical Knowledge

Knowledge and Skill (Coded)	N	Median	Mean	SE Mean	SD
BK1	285	3	3.2	0.0	0.8
BK2	285	3	3.2	0.0	0.8
BK3	284	3	2.9	0.0	0.8
BK4	284	3	2.8	0.0	0.8
BK5	285	3	2.6	0.0	0.8
BK6	285	3	3.2	0.0	0.8
BK7	285	3	2.9	0.0	0.8
BS1	282	3	2.9	0.1	0.9
BS2	282	4	3.5	0.0	0.7
BS3	282	3	2.9	0.0	0.8
BS4	282	3	2.9	0.0	0.8
BS5	282	3	3.0	0.0	0.8
BS6	282	3	2.6	0.0	0.8
BS7	282	3	3.3	0.0	0.8

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 41. Counts and Percentages for Importance for Task B Knowledge and Skill in Medical Knowledge

Knowledge and Skill (Coded)	1		2		3		4	
BK1	10	3.5%	43	15.1%	110	38.6%	122	42.8%
BK2	8	2.8%	47	16.5%	122	42.8%	108	37.9%
BK3	10	3.5%	81	28.5%	132	46.5%	61	21.5%
BK4	14	4.9%	91	32.0%	122	43.0%	57	20.1%
BK5	22	7.7%	102	35.8%	125	43.9%	36	12.6%
BK6	8	2.8%	40	14.0%	134	47.0%	103	36.2%
BK7	11	3.9%	78	27.4%	127	44.5%	69	24.2%
BS1	14	5.0%	77	27.3%	116	41.1%	75	26.6%
BS2	4	1.4%	21	7.4%	97	34.4%	160	56.8%
BS3	12	4.3%	74	26.2%	129	45.7%	67	23.8%
BS4	10	3.5%	72	25.6%	139	49.3%	61	21.6%
BS5	10	3.5%	55	19.5%	132	46.8%	85	30.2%
BS6	18	6.4%	109	38.6%	126	44.7%	29	10.3%
BS7	7	2.5%	35	12.4%	116	41.1%	124	44.0%

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 42. Descriptive Statistics for Frequency for Task B Knowledge and Skill in Medical Knowledge

Knowledge and Skill (Coded)	N	Median	Mean	SE Mean	SD
BK1	284	5	4.8	0.0	0.5
BK2	282	5	4.8	0.0	0.5
BK3	283	4	4.2	0.1	0.9
BK4	284	5	4.3	0.0	0.8
BK5	285	4	3.9	0.1	1.1
BK6	284	4	4.2	0.1	0.9
BK7	284	5	4.4	0.1	0.9
BS1	283	4	4.1	0.1	1.0
BS2	283	4	3.7	0.1	1.0
BS3	282	4	4.1	0.1	1.0
BS4	283	4	4.0	0.1	1.1
BS5	281	4	4.0	0.1	1.2
BS6	283	4	3.9	0.1	1.1
BS7	279	5	4.5	0.1	0.9

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

Table 43. Counts and Percentages for Frequency for Task B Knowledge and Skill in Medical Knowledge

Knowledge and Skill (Coded)	1		2		3		4		5	
BK1	0	0.0%	1	0.4%	8	2.8%	33	11.6%	242	85.2%
BK2	0	0.0%	1	0.4%	10	3.5%	42	14.9%	229	81.2%
BK3	0	0.0%	13	4.6%	49	17.3%	89	31.4%	132	46.7%
BK4	0	0.0%	10	3.5%	39	13.7%	92	32.4%	143	50.4%
BK5	9	3.2%	24	8.4%	59	20.7%	87	30.5%	106	37.2%
BK6	4	1.4%	11	3.9%	37	13.0%	99	34.9%	133	46.8%
BK7	2	0.7%	13	4.6%	22	7.7%	86	30.3%	161	56.7%
BS1	6	2.1%	13	4.6%	56	19.8%	77	27.2%	131	46.3%
BS2	2	0.7%	26	9.2%	90	31.8%	88	31.1%	77	27.2%
BS3	5	1.8%	15	5.3%	52	18.5%	83	29.4%	127	45.0%
BS4	9	3.2%	29	10.2%	42	14.8%	76	26.9%	127	44.9%
BS5	12	4.3%	24	8.5%	49	17.4%	73	26.0%	123	43.8%
BS6	5	1.8%	29	10.2%	61	21.6%	89	31.4%	99	35.0%
BS7	3	1.1%	8	2.9%	25	9.0%	66	23.6%	177	63.4%

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

- C. Determine the need for appropriate diagnostic testing based on the history and physical examination to inform the differential diagnosis.**

Knowledge of	
CK1	Indications and contraindications for recommending and/or ordering diagnostic studies
CK2	Specificity, sensitivity, methods and predictive values of diagnostic studies
CK3	Mechanics, physiology and other technical differences of diagnostic studies
Skills in	
CS1	Selecting the appropriate diagnostic studies
CS2	Recognizing normal and abnormal findings
CS3	Interpreting diagnostic studies

Table 44. Descriptive Statistics for Importance for Task C Knowledge and Skill in Medical Knowledge

Knowledge and Skill (Coded)	N	Median	Mean	SE Mean	SD
CK1	277	3	3.1	0.0	0.8
CK2	277	3	2.5	0.0	0.8
CK3	277	3	2.6	0.0	0.8
CS1	277	3	3.0	0.0	0.8
CS2	277	3	3.2	0.0	0.7
CS3	276	3	3.2	0.0	0.8

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 45. Counts and Percentages for Importance for Task C Knowledge and Skill in Medical Knowledge

Knowledge and Skill (Coded)	1		2		3		4	
CK1	10	3.6%	52	18.8%	127	45.8%	88	31.8%
CK2	26	9.4%	111	40.1%	112	40.4%	28	10.1%
CK3	20	7.2%	104	37.5%	128	46.2%	25	9.0%
CS1	9	3.2%	64	23.1%	124	44.8%	80	28.9%
CS2	6	2.2%	31	11.2%	129	46.6%	111	40.1%
CS3	10	3.6%	43	15.6%	118	42.8%	105	38.1%

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 46. Descriptive Statistics for Frequency for Task C Knowledge and Skill in Medical Knowledge

Knowledge and Skill (Coded)	N	Median	Mean	SE Mean	SD
CK1	278	4	4.0	0.1	1.0
CK2	277	3	3.4	0.1	1.1
CK3	276	4	3.5	0.1	1.1
CS1	277	4	3.8	0.1	1.1
CS2	278	4	3.9	0.1	1.0
CS3	278	4	3.5	0.1	1.2

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

Table 47. Counts and Percentages for Frequency for Task C Knowledge and Skill in Medical Knowledge

Knowledge and Skill (Coded)	1		2		3		4		5	
CK1	9	3.2%	13	4.7%	46	16.5%	115	41.4%	95	34.2%
CK2	10	3.6%	45	16.2%	93	33.6%	72	26.0%	57	20.6%
CK3	12	4.3%	39	14.2%	79	28.6%	96	34.8%	50	18.1%
CS1	15	5.4%	21	7.6%	50	18.1%	100	36.1%	91	32.8%
CS2	9	3.2%	20	7.2%	40	14.4%	116	41.7%	93	33.5%
CS3	21	7.6%	34	12.2%	72	25.9%	76	27.3%	75	27.0%

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

- D. Synthesize evaluation findings and diagnostic studies consistent with best practice to determine the diagnosis and educate the patient.**

Knowledge of

- DK1 Relationship between evaluations and diagnostic studies
- DK2 Recognition and differentiation of severity of injury and illness (e.g., fracture classification)
- DK3 Case presentation methods
- DK4 Impact of all components of the patient history on the plan of care

Skills in

- DS1 Assimilating findings to determine a diagnosis
- DS2 Correlating the physical examination and diagnostic studies to disseminate essential information to the patient and others

Table 48. Descriptive Statistics for Importance for Task D Knowledge and Skill in Medical Knowledge

Knowledge and Skill (Coded)	N	Median	Mean	SE Mean	SD
DK1	271	3	2.8	0.0	0.8
DK2	270	3	3.3	0.0	0.7
DK3	270	2	2.4	0.0	0.8
DK4	269	3	3.0	0.0	0.7
DS1	268	3	3.1	0.0	0.7
DS2	268	3	3.1	0.0	0.7

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 49. Counts and Percentages for Importance for Task D Knowledge and Skill in Medical Knowledge

Knowledge and Skill (Coded)	1		2		3		4	
DK1	17	6.3%	69	25.4%	133	49.1%	52	19.2%
DK2	7	2.6%	24	8.9%	119	44.1%	120	44.4%
DK3	34	12.6%	129	47.8%	85	31.5%	22	8.1%
DK4	7	2.6%	51	19.0%	145	53.9%	66	24.5%
DS1	6	2.2%	48	17.9%	138	51.5%	76	28.4%
DS2	6	2.2%	38	14.2%	141	52.6%	83	31.0%

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 50. Descriptive Statistics for Frequency for Task D Knowledge and Skill in Medical Knowledge

Knowledge and Skill (Coded)	N	Median	Mean	SE Mean	SD
DK1	271	4	4.1	0.1	0.9
DK2	271	4	4.0	0.1	0.9
DK3	270	4	3.8	0.1	1.2
DK4	268	4	4.2	0.1	0.9
DS1	269	4	4.1	0.1	1.0
DS2	266	4	4.1	0.1	1.0

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

Table 51. Counts and Percentages for Frequency for Task D Knowledge and Skill in Medical Knowledge

Knowledge and Skill (Coded)	1		2		3		4		5	
DK1	4	1.5%	13	4.8%	47	17.3%	99	36.5%	108	39.9%
DK2	5	1.8%	14	5.2%	47	17.4%	112	41.3%	93	34.3%
DK3	17	6.3%	28	10.4%	57	21.1%	69	25.5%	99	36.7%
DK4	4	1.5%	10	3.8%	43	16.0%	89	33.2%	122	45.5%
DS1	9	3.3%	13	4.8%	39	14.5%	90	33.5%	118	43.9%
DS2	6	2.3%	15	5.6%	37	13.9%	86	32.3%	122	45.9%

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

E.	Formulate the plan of care in collaboration with the interdisciplinary health care team and patient.
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Knowledge of	
EK1	Evidence-based and/or best practices for the treatment of injuries and illnesses
EK2	Therapeutic interventions and their integration into the plan of care (e.g., pharmacology, nutrition, sleep, exercise)
EK3	Tissue healing principles, indications and complications
EK4	Cognitive, social, psychological, physiological and cultural barriers
EK5	Circumstances that indicate the need for consultation or referral
EK6	Specialized referral sources in and outside of orthopedics
Skills in	
ES1	Integrating all elements of the patient's condition into the plan of care
ES2	Identifying barriers to treatment
ES3	Recognizing the need for consultation and/or referral
ES4	Applying best practices to the plan of care
ES5	Collaborating with interdisciplinary teams and patients
ES6	Communicating expectations and the plan of care to patients and interdisciplinary teams

Table 52. Descriptive Statistics for Importance for Task E Knowledge and Skill in Medical Knowledge

Knowledge and Skill (Coded)	N	Median	Mean	SE Mean	SD
EK1	264	3	3.0	0.0	0.8
EK2	264	3	3.0	0.0	0.7
EK3	264	3	3.2	0.0	0.7
EK4	264	3	2.8	0.0	0.8
EK5	264	3	3.2	0.0	0.7
EK6	263	3	2.9	0.0	0.7
ES1	265	3	3.1	0.0	0.8
ES2	265	3	2.9	0.0	0.8
ES3	265	3	3.1	0.0	0.8
ES4	265	3	3.0	0.0	0.7
ES5	265	3	2.8	0.0	0.8
ES6	265	3	3.0	0.0	0.8

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 53. Counts and Percentages for Importance for Task E Knowledge and Skill in Medical Knowledge

Knowledge and Skill (Coded)	1		2		3		4	
EK1	9	3.4%	50	18.9%	132	50.0%	73	27.7%
EK2	5	1.9%	56	21.2%	138	52.3%	65	24.6%
EK3	5	1.9%	39	14.8%	131	49.6%	89	33.7%
EK4	12	4.5%	72	27.3%	132	50.0%	48	18.2%
EK5	6	2.3%	38	14.4%	128	48.5%	92	34.8%
EK6	8	3.0%	68	25.9%	138	52.5%	49	18.6%
ES1	7	2.6%	48	18.1%	133	50.2%	77	29.1%
ES2	7	2.6%	76	28.7%	128	48.3%	54	20.4%
ES3	8	3.0%	38	14.3%	134	50.6%	85	32.1%
ES4	7	2.6%	44	16.6%	144	54.4%	70	26.4%
ES5	11	4.2%	81	30.6%	126	47.5%	47	17.7%
ES6	8	3.0%	60	22.7%	124	46.8%	73	27.5%

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 54. Descriptive Statistics for Frequency for Task E Knowledge and Skill in Medical Knowledge

Knowledge and Skill (Coded)	N	Median	Mean	SE Mean	SD
EK1	262	4	4.2	0.1	0.9
EK2	262	4	4.1	0.1	0.9
EK3	263	4	4.2	0.1	0.9
EK4	264	4	3.8	0.1	1.0
EK5	263	4	3.9	0.1	0.9
EK6	262	4	3.8	0.1	1.0
ES1	266	5	4.3	0.1	0.9
ES2	266	4	4.0	0.1	0.9
ES3	266	4	4.0	0.1	0.9
ES4	266	5	4.3	0.0	0.8
ES5	264	4	4.2	0.1	0.9
ES6	264	5	4.3	0.1	0.8

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

Table 55. Counts and Percentages for Frequency for Task E Knowledge and Skill in Medical Knowledge

Knowledge and Skill (Coded)	1		2		3		4		5	
EK1	0	0.0%	14	5.3%	33	12.6%	93	35.5%	122	46.6%
EK2	2	0.8%	13	5.0%	47	17.9%	104	39.7%	96	36.6%
EK3	2	0.8%	11	4.2%	35	13.3%	105	39.9%	110	41.8%
EK4	7	2.7%	13	4.9%	76	28.8%	99	37.5%	69	26.1%
EK5	1	0.4%	15	5.7%	71	27.0%	89	33.8%	87	33.1%
EK6	6	2.3%	14	5.3%	72	27.5%	93	35.5%	77	29.4%
ES1	2	0.8%	13	4.9%	26	9.8%	81	30.4%	144	54.1%
ES2	1	0.4%	13	4.9%	61	22.9%	104	39.1%	87	32.7%
ES3	3	1.1%	6	2.3%	73	27.4%	85	32.0%	99	37.2%
ES4	1	0.4%	7	2.6%	26	9.8%	96	36.1%	136	51.1%
ES5	0	0.0%	10	3.8%	51	19.3%	82	31.1%	121	45.8%
ES6	0	0.0%	11	4.2%	28	10.6%	83	31.4%	142	53.8%

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

F. Analyze outcomes to optimize the continuum of patient-centered care.

Knowledge of	
FK1	Population and patient outcome tools, methods and technologies
FK2	Health-related quality of life factors
FK3	Return to activity determination based on physical and psychological factors
FK4	Evaluation of a patient's unique response to care
FK5	Techniques for adapting plans of care and treatment paradigms based on previous measures
Skills in	
FS1	Analyzing patient and population outcome data
FS2	Recognizing age-related, socioeconomic and cultural considerations
FS3	Incorporating data to modify a patient-centered care plan
FS4	Presenting data and findings for further study to the interdisciplinary health care team

Table 56. Descriptive Statistics for Importance for Task F Knowledge and Skill in Medical Knowledge

Knowledge and Skill (Coded)	N	Median	Mean	SE Mean	SD
FK1	256	2	2.3	0.0	0.8
FK2	256	3	2.6	0.0	0.8
FK3	256	3	3.2	0.0	0.8
FK4	256	3	2.8	0.0	0.7
FK5	256	3	2.7	0.0	0.8
FS1	256	2	2.2	0.0	0.8
FS2	256	3	2.5	0.0	0.7
FS3	256	2	2.4	0.0	0.7
FS4	256	2	2.2	0.0	0.8

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 57. Counts and Percentages for Importance for Task F Knowledge and Skill in Medical Knowledge

Knowledge and Skill (Coded)	1		2		3		4	
FK1	32	12.5%	128	50.0%	81	31.6%	15	5.9%
FK2	15	5.9%	96	37.5%	113	44.1%	32	12.5%
FK3	7	2.7%	34	13.3%	118	46.1%	97	37.9%
FK4	11	4.3%	73	28.5%	134	52.4%	38	14.8%
FK5	13	5.1%	92	35.9%	121	47.3%	30	11.7%
FS1	44	17.2%	134	52.3%	66	25.8%	12	4.7%
FS2	15	5.9%	111	43.3%	109	42.6%	21	8.2%
FS3	19	7.4%	125	48.9%	91	35.5%	21	8.2%
FS4	41	16.0%	126	49.2%	76	29.7%	13	5.1%

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 58. Descriptive Statistics for Frequency for Task F Knowledge and Skill in Medical Knowledge

Knowledge and Skill (Coded)	N	Median	Mean	SE Mean	SD
FK1	256	3	3.3	0.1	0.9
FK2	257	4	3.6	0.1	0.9
FK3	257	4	4.2	0.1	0.8
FK4	257	4	4.0	0.1	0.9
FK5	256	4	3.8	0.1	0.9
FS1	257	3	3.0	0.1	1.0
FS2	257	4	3.5	0.1	0.9
FS3	257	3	3.3	0.1	1.0
FS4	257	3	3.1	0.1	1.2

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

Table 59. Counts and Percentages for Frequency for Task F Knowledge and Skill in Medical Knowledge

Knowledge and Skill (Coded)	1		2		3		4		5	
FK1	8	3.1%	34	13.3%	114	44.6%	71	27.7%	29	11.3%
FK2	3	1.2%	23	8.9%	88	34.2%	94	36.6%	49	19.1%
FK3	1	0.4%	8	3.1%	43	16.7%	100	38.9%	105	40.9%
FK4	2	0.8%	10	3.9%	58	22.6%	108	42.0%	79	30.7%
FK5	2	0.8%	19	7.4%	82	32.0%	88	34.4%	65	25.4%
FS1	21	8.2%	60	23.3%	104	40.5%	50	19.4%	22	8.6%
FS2	3	1.2%	30	11.7%	91	35.4%	90	35.0%	43	16.7%
FS3	13	5.1%	36	14.0%	95	36.9%	76	29.6%	37	14.4%
FS4	25	9.7%	53	20.6%	84	32.7%	56	21.8%	39	15.2%

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

Domain II: Procedural Knowledge

Procedural Knowledge was the second domain, and the knowledge and skill statements associated with procedural tasks are presented below. They are coded in Tables 60, 61, 62, and 63, where responses collected in the survey are summarized.

A.	Implement the established plan of care utilizing advanced clinical decision making to incorporate appropriate modifications and ensure optimal patient outcomes.
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Knowledge of	
AK1	A broad range of current and emerging interventions, both operative and nonoperative, that may be called for in plans of care for orthopedic patients
AK2	Indications and contraindications of biomechanical devices considering long term sequelae
AK3	Physiologic impact of the timing and techniques for application and removal of biomechanical devices
AK4	Custom fitting, fabricating and molding techniques
AK5	Assessment and management of post-application complications
AK6	Appropriate management of urgency and necessity of interventions within the plan of care
AK7	Appropriate interdisciplinary collaboration throughout the plan of care
AK8	Pain management

Skills in	
AS1	Performing and/or assisting with current and emerging interventions
AS2	Performing and/or assisting with modalities
AS3	Creating and performing rehabilitative or performance enhancement protocols
AS4	Implementing specialized biomechanical devices (e.g., durable medical equipment such as external fixators, prosthetics/orthotics, casting, splinting, traction)
AS5	Facilitating appropriate pain management strategies
AS6	Educating patients on broad range of current and emerging interventions, both operative and nonoperative
AS7	Communicating treatment protocols surrounding biomechanical devices to patients and families
AS8	Completing plan of care in the most effective and efficient manner

Table 60. Descriptive Statistics for Importance for Task A Knowledge and Skill in Procedural Knowledge

Knowledge and Skill (Coded)	N	Median	Mean	SE Mean	SD
AK1	234	3	2.9	0.1	0.8
AK2	234	3	2.9	0.0	0.7
AK3	234	3	2.9	0.0	0.7
AK4	234	3	3.0	0.0	0.7
AK5	234	3	3.1	0.0	0.8
AK6	233	3	3.2	0.0	0.7
AK7	234	3	2.8	0.0	0.7
AK8	234	3	3.1	0.0	0.7
AS1	236	3	3.0	0.0	0.8
AS2	236	3	3.0	0.1	0.8
AS3	236	3	2.9	0.1	0.8
AS4	236	3	3.3	0.0	0.7
AS5	236	3	3.1	0.0	0.8
AS6	236	3	2.8	0.0	0.7
AS7	236	3	2.8	0.1	0.8
AS8	235	3	2.8	0.1	0.8

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 61. Counts and Percentages for Importance for Task A Knowledge and Skill in Procedural Knowledge

Knowledge and Skill (Coded)	1		2		3		4	
AK1	6	2.6%	62	26.5%	108	46.1%	58	24.8%
AK2	5	2.1%	66	28.2%	120	51.3%	43	18.4%
AK3	4	1.7%	64	27.4%	118	50.4%	48	20.5%
AK4	5	2.1%	44	18.8%	125	53.4%	60	25.7%
AK5	6	2.6%	37	15.8%	118	50.4%	73	31.2%
AK6	5	2.1%	24	10.3%	123	52.8%	81	34.8%
AK7	11	4.7%	67	28.6%	123	52.6%	33	14.1%
AK8	5	2.1%	36	15.4%	124	53.0%	69	29.5%
AS1	9	3.8%	44	18.6%	128	54.3%	55	23.3%
AS2	8	3.4%	51	21.6%	105	44.5%	72	30.5%
AS3	11	4.7%	56	23.7%	122	51.7%	47	19.9%
AS4	3	1.2%	25	10.6%	96	40.7%	112	47.5%
AS5	3	1.3%	48	20.3%	105	44.5%	80	33.9%
AS6	8	3.4%	74	31.4%	119	50.4%	35	14.8%
AS7	8	3.4%	70	29.6%	113	47.9%	45	19.1%
AS8	15	6.4%	63	26.8%	115	48.9%	42	17.9%

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 62. Descriptive Statistics for Frequency for Task A Knowledge and Skill in Procedural Knowledge

Knowledge and Skill (Coded)	N	Median	Mean	SE Mean	SD
AK1	235	4	3.9	0.1	1.0
AK2	234	4	3.5	0.1	1.0
AK3	235	3	3.5	0.1	1.1
AK4	234	4	3.8	0.1	1.1
AK5	235	4	3.8	0.1	1.0
AK6	235	4	3.8	0.1	0.9
AK7	235	4	3.9	0.1	0.9
AK8	235	4	3.9	0.1	1.0
AS1	237	4	3.7	0.1	1.0
AS2	237	4	3.6	0.1	1.1
AS3	237	4	3.6	0.1	1.2
AS4	235	4	4.0	0.1	1.0
AS5	237	4	3.6	0.1	1.1
AS6	237	4	4.1	0.1	0.9
AS7	237	4	3.9	0.1	1.0
AS8	235	4	4.3	0.1	0.9

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

Table 63. Counts and Percentages for Frequency for Task A Knowledge and Skill in Procedural Knowledge

Knowledge and Skill (Coded)	1		2		3		4		5	
AK1	2	0.8%	18	7.7%	55	23.4%	79	33.6%	81	34.5%
AK2	6	2.6%	30	12.8%	76	32.5%	77	32.9%	45	19.2%
AK3	8	3.4%	34	14.5%	82	34.9%	63	26.8%	48	20.4%
AK4	7	3.0%	17	7.3%	70	29.9%	64	27.3%	76	32.5%
AK5	5	2.1%	14	6.0%	79	33.6%	72	30.6%	65	27.7%
AK6	4	1.7%	10	4.3%	66	28.1%	96	40.8%	59	25.1%
AK7	1	0.4%	16	6.8%	55	23.4%	89	37.9%	74	31.5%
AK8	5	2.1%	21	9.0%	46	19.6%	92	39.1%	71	30.2%
AS1	4	1.7%	22	9.3%	76	32.1%	84	35.4%	51	21.5%
AS2	11	4.6%	35	14.8%	59	24.9%	76	32.1%	56	23.6%
AS3	8	3.4%	40	16.9%	52	21.9%	69	29.1%	68	28.7%
AS4	6	2.6%	11	4.7%	48	20.4%	83	35.3%	87	37.0%
AS5	9	3.8%	30	12.7%	66	27.8%	81	34.2%	51	21.5%
AS6	2	0.8%	9	3.8%	46	19.4%	95	40.1%	85	35.9%
AS7	5	2.1%	14	5.9%	49	20.7%	94	39.7%	75	31.6%
AS8	3	1.3%	8	3.4%	24	10.2%	87	37.0%	113	48.1%

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

As noted above, the second task in Procedural Knowledge as developed by the Practice Analysis Panel was divided into six separate tasks so that a more nuanced understanding of that work could be developed. However, the knowledge and skill statements for that original task were retained as one group. As a result, tasks B through G are presented in full followed by the combined tables.

B.	Provide pre-procedural care to ensure optimal patient outcomes.
C.	Provide intra-procedural care to ensure optimal patient outcomes.
D.	Provide post-procedural care to ensure optimal patient outcomes.
E.	Provide pre-operative care to ensure optimal patient outcomes.
F.	Provide intra-operative care to ensure optimal patient outcomes.
G.	Provide post-operative care to ensure optimal patient outcomes.

Knowledge of	
BGK1	Applied procedure and surgical anatomy
BGK2	Procedural and surgical risks, benefits and potential complications
BGK3	Pre- and post-procedure and surgical rehabilitation protocols
BGK4	Appropriate patient positioning techniques
BGK5	Sterile technique
BGK6	Interdisciplinary team member roles and responsibilities
BGK7	Procedure and surgical instrumentation, materials and methods including ultrasound and fluoroscopy
BGK8	Orthopedic injection techniques, indications and contraindications
BGK9	Wound closure materials and methods
BGK10	Joint manipulation and fracture reduction techniques, indications and contraindications
BGK11	Phlebotomy and intravenous insertion techniques, indications and contraindications
BGK12	Intra-procedural technique
BGK13	Intra-surgical technique
BGK14	Post-procedural and operative dressing and equipment
BGK15	Post-procedural and operative observation and management
BGK16	Pain management strategies
BGK17	Emergency policies and procedures
BGK18	Legal and regulatory considerations (e.g., practice act)
BGK19	Specialized adaptation of rehabilitation techniques and therapeutic interventions

Skills in	
BGS1	Preparing appropriate dosage and volume of injectable medications using sterile technique
BGS2	Preparing devices for image-guided injections
BGS3	Positioning patients in accordance with the requirements of specific procedures
BGS4	Demonstrating proper sterile technique throughout procedures and surgeries
BGS5	Creating a sterile field by prepping the patient and/or draping in the procedure environment
BGS6	Creating a sterile field by prepping the patient and/or draping in the surgical environment
BGS7	Performing intra-procedural assistance in a safe and effective manner
BGS8	Performing surgical assistance in a safe and effective manner
BGS9	Administering orthopedic injections within the limits of legal and regulatory considerations
BGS10	Performing phlebotomy within the limits of legal and regulatory considerations
BGS11	Acquiring intravenous access within the limits of legal and regulatory considerations
BGS12	Applying and modifying appropriate post-procedural and surgical dressings and equipment.
BGS13	Applying and modifying appropriate post-procedural and surgical durable medical equipment, casting, splinting, prosthetics and orthotics
BGS14	Communicating peri-procedural and peri-operative knowledge and expectations with patients and families appropriately
BGS15	Maintaining post-procedural and post-surgical site care including dressing changes and wound closure material removal

Table 64. Descriptive Statistics for Importance for Task B Knowledge and Skill in Procedural Knowledge

Knowledge and Skill (Coded)	N	Median	Mean	SE Mean	SD
BGK1	223	3	3.3	0.1	0.8
BGK2	223	4	3.4	0.0	0.7
BGK3	222	3	3.3	0.0	0.7
BGK4	221	3	3.2	0.1	0.8
BGK5	220	4	3.7	0.0	0.6
BGK6	220	3	2.7	0.1	0.8
BGK7	221	3	3.2	0.1	0.8
BGK8	221	3	3.3	0.1	0.8
BGK9	221	4	3.4	0.0	0.7
BGK10	221	4	3.6	0.0	0.7
BGK11	221	3	3.3	0.1	0.8
BGK12	220	3	3.3	0.1	0.8
BGK13	219	4	3.4	0.1	0.8
BGK14	219	3	3.2	0.0	0.7
BGK15	219	3	3.2	0.0	0.7
BGK16	219	3	3.1	0.1	0.8
BGK17	219	4	3.6	0.0	0.7
BGK18	219	3	3.3	0.1	0.8
BGK19	219	3	2.9	0.1	0.7
BGS1	221	4	3.5	0.0	0.7
BGS2	221	3	2.9	0.1	0.9
BGS3	221	3	2.9	0.1	0.8
BGS4	221	4	3.6	0.0	0.7
BGS5	221	4	3.4	0.1	0.8
BGS6	221	4	3.5	0.1	0.7
BGS7	221	3	3.3	0.1	0.8
BGS8	220	4	3.5	0.1	0.8
BGS9	221	4	3.5	0.1	0.8
BGS10	221	4	3.3	0.1	0.8
BGS11	221	4	3.4	0.1	0.8
BGS12	221	3	3.0	0.1	0.8
BGS13	221	3	3.2	0.0	0.7
BGS14	221	3	2.9	0.1	0.8
BGS15	221	3	3.2	0.1	0.7

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 65. Counts and Percentages for Importance for Task B Knowledge and Skill in Procedural Knowledge

Knowledge and Skill (Coded)	1		2		3		4	
BGK1	5	2.3%	27	12.1%	85	38.1%	106	47.5%
BGK2	6	2.7%	16	7.2%	84	37.7%	117	52.4%
BGK3	3	1.4%	25	11.3%	106	47.7%	88	39.6%
BGK4	6	2.7%	33	14.9%	90	40.7%	92	41.7%
BGK5	4	1.8%	6	2.8%	43	19.5%	167	75.9%
BGK6	11	5.0%	79	35.9%	90	40.9%	40	18.2%
BGK7	10	4.5%	34	15.4%	89	40.3%	88	39.8%
BGK8	6	2.7%	25	11.3%	95	43.0%	95	43.0%
BGK9	4	1.8%	22	10.0%	80	36.2%	115	52.0%
BGK10	3	1.4%	12	5.4%	57	25.8%	149	67.4%
BGK11	8	3.6%	27	12.2%	80	36.2%	106	48.0%
BGK12	9	4.1%	20	9.1%	82	37.3%	109	49.5%
BGK13	12	5.5%	14	6.4%	69	31.5%	124	56.6%
BGK14	3	1.4%	32	14.6%	107	48.8%	77	35.2%
BGK15	3	1.4%	33	15.0%	106	48.4%	77	35.2%
BGK16	5	2.3%	39	17.8%	103	47.0%	72	32.9%
BGK17	3	1.4%	12	5.5%	60	27.4%	144	65.7%
BGK18	9	4.2%	30	13.7%	75	34.2%	105	47.9%
BGK19	7	3.2%	50	22.9%	117	53.4%	45	20.5%
BGS1	7	3.2%	9	4.1%	76	34.4%	129	58.3%
BGS2	10	4.5%	64	29.0%	86	38.9%	61	27.6%
BGS3	8	3.6%	63	28.5%	88	39.8%	62	28.1%
BGS4	6	2.7%	5	2.3%	62	28.0%	148	67.0%
BGS5	7	3.2%	15	6.8%	71	32.1%	128	57.9%
BGS6	7	3.2%	13	5.9%	67	30.3%	134	60.6%
BGS7	8	3.6%	21	9.5%	84	38.0%	108	48.9%
BGS8	8	3.6%	13	5.9%	62	28.2%	137	62.3%
BGS9	8	3.6%	13	5.9%	69	31.2%	131	59.3%
BGS10	9	4.1%	25	11.3%	74	33.5%	113	51.1%
BGS11	9	4.1%	21	9.5%	73	33.0%	118	53.4%
BGS12	4	1.8%	51	23.1%	99	44.8%	67	30.3%
BGS13	4	1.8%	32	14.5%	104	47.1%	81	36.6%
BGS14	7	3.2%	60	27.1%	98	44.4%	56	25.3%
BGS15	4	1.8%	31	14.0%	101	45.7%	85	38.5%

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 66. Descriptive Statistics for Frequency for Task B Knowledge and Skill in Procedural Knowledge

Knowledge and Skill (Coded)	N	Median	Mean	SE Mean	SD
BGK1	221	4	3.8	0.1	1.2
BGK2	221	4	3.9	0.1	1.1
BGK3	221	4	4.2	0.1	1.0
BGK4	221	4	3.7	0.1	1.2
BGK5	219	4	3.9	0.1	1.1
BGK6	220	4	4.0	0.1	1.0
BGK7	221	3	3.4	0.1	1.3
BGK8	221	4	3.6	0.1	1.3
BGK9	220	4	3.5	0.1	1.2
BGK10	222	3	3.1	0.1	1.2
BGK11	222	2	2.3	0.1	1.2
BGK12	221	3	3.1	0.1	1.3
BGK13	219	3	2.9	0.1	1.4
BGK14	220	4	3.8	0.1	1.1
BGK15	221	4	3.7	0.1	1.2
BGK16	221	4	3.6	0.1	1.1
BGK17	221	3	3.5	0.1	1.1
BGK18	220	4	3.7	0.1	1.3
BGK19	221	4	3.5	0.1	1.1
BGS1	222	4	3.9	0.1	1.3
BGS2	222	3	3.4	0.1	1.4
BGS3	222	4	3.7	0.1	1.2
BGS4	221	4	3.8	0.1	1.2
BGS5	222	4	3.5	0.1	1.3
BGS6	221	3	3.3	0.1	1.4
BGS7	221	3	3.5	0.1	1.3
BGS8	221	3	3.1	0.1	1.5
BGS9	221	2	2.4	0.1	1.4
BGS10	222	2	2.2	0.1	1.2
BGS11	222	2	2.0	0.1	1.2
BGS12	221	4	3.8	0.1	1.1
BGS13	222	4	4.0	0.1	1.1
BGS14	222	4	3.7	0.1	1.2
BGS15	222	4	4.0	0.1	1.0

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

Table 67. Counts and Percentages for Frequency for Task B Knowledge and Skill in Procedural Knowledge

Knowledge and Skill (Coded)	1		2		3		4		5	
BGK1	14	6.3%	19	8.6%	43	19.5%	73	33.0%	72	32.6%
BGK2	9	4.1%	17	7.7%	44	19.9%	71	32.1%	80	36.2%
BGK3	7	3.2%	4	1.8%	35	15.8%	69	31.2%	106	48.0%
BGK4	17	7.7%	21	9.5%	49	22.2%	61	27.6%	73	33.0%
BGK5	8	3.7%	20	9.1%	45	20.5%	54	24.7%	92	42.0%
BGK6	7	3.2%	10	4.5%	44	20.0%	72	32.8%	87	39.5%
BGK7	23	10.4%	33	15.0%	56	25.3%	56	25.3%	53	24.0%
BGK8	22	10.0%	20	9.0%	47	21.3%	59	26.7%	73	33.0%
BGK9	16	7.3%	34	15.5%	56	25.4%	62	28.2%	52	23.6%
BGK10	24	10.8%	49	22.1%	69	31.1%	40	18.0%	40	18.0%
BGK11	64	28.8%	69	31.1%	53	23.9%	20	9.0%	16	7.2%
BGK12	33	14.9%	40	18.1%	57	25.8%	46	20.8%	45	20.4%
BGK13	47	21.5%	47	21.5%	43	19.6%	40	18.2%	42	19.2%
BGK14	12	5.5%	16	7.3%	48	21.8%	71	32.2%	73	33.2%
BGK15	14	6.3%	27	12.2%	52	23.5%	57	25.8%	71	32.2%
BGK16	11	5.0%	22	10.0%	63	28.5%	73	33.0%	52	23.5%
BGK17	6	2.7%	41	18.6%	67	30.3%	50	22.6%	57	25.8%
BGK18	14	6.4%	28	12.7%	47	21.4%	51	23.2%	80	36.3%
BGK19	8	3.6%	32	14.5%	63	28.5%	72	32.6%	46	20.8%
BGS1	20	9.0%	21	9.5%	22	9.9%	52	23.4%	107	48.2%
BGS2	29	13.0%	35	15.8%	48	21.6%	49	22.1%	61	27.5%
BGS3	13	5.9%	19	8.5%	65	29.3%	52	23.4%	73	32.9%
BGS4	15	6.8%	20	9.1%	52	23.5%	52	23.5%	82	37.1%
BGS5	19	8.6%	27	12.2%	58	26.1%	50	22.5%	68	30.6%
BGS6	32	14.5%	36	16.3%	48	21.7%	44	19.9%	61	27.6%
BGS7	23	10.4%	25	11.3%	66	29.9%	43	19.5%	64	28.9%
BGS8	45	20.4%	33	14.9%	46	20.8%	39	17.6%	58	26.3%
BGS9	84	38.0%	48	21.7%	33	15.0%	25	11.3%	31	14.0%
BGS10	83	37.4%	66	29.7%	37	16.7%	19	8.5%	17	7.7%
BGS11	96	43.3%	62	27.9%	36	16.2%	14	6.3%	14	6.3%
BGS12	8	3.6%	16	7.3%	55	24.9%	71	32.1%	71	32.1%
BGS13	9	4.0%	11	5.0%	43	19.4%	78	35.1%	81	36.5%
BGS14	12	5.4%	21	9.5%	62	27.9%	51	23.0%	76	34.2%
BGS15	5	2.3%	12	5.4%	44	19.8%	75	33.8%	86	38.7%

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

Domain III: Professional Practice

There were three tasks in Professional Practice, the third domain. The knowledge and skill statements associated with each of the tasks are presented in full, followed by the statistics summarizing respondents' ratings.

- A. Establish patient-centered processes and quality care programs that promote value-based care, population health strategies and cost containment to improve patient outcomes.**

Knowledge of	
AK1	Valued-based care
AK2	Quality improvement programs and standards (e.g., PlanDoStudyAct cycle, fish-bones model)
AK3	Population health strategies (e.g., risk stratification, social determinants)
AK4	Cost containment methods (e.g., referral timing, patient care planning)
AK5	Reimbursement principles and rules
AK6	Outcome metrics (e.g., patient-rated outcomes, clinician-rated outcomes, quality, process)
Skills in	
AS1	Collecting appropriate data (informatics) to improve patient care and contain costs
AS2	Interpreting outcome metrics
AS3	Using analytics to improve value and to contain cost
AS4	Implementing quality improvement programs
AS5	Using coding and billing systems
AS6	Performing multi-cycle quality improvement initiatives

Table 68. Descriptive Statistics for Importance for Task A Knowledge and Skill in Professional Practice

Knowledge and Skill (Coded)	N	Median	Mean	SE Mean	SD
AK1	216	2	2.5	0.1	0.9
AK2	214	2	2.1	0.1	0.8
AK3	215	2	2.2	0.1	0.8
AK4	215	2	2.3	0.1	0.8
AK5	215	2	2.2	0.1	0.9
AK6	215	2	2.2	0.1	0.8
AS1	216	2	2.1	0.1	0.9
AS2	216	2	2.1	0.1	0.8
AS3	216	2	2.0	0.1	0.8
AS4	216	2	2.1	0.1	0.8
AS5	216	2	2.3	0.1	0.9
AS6	216	2	2.0	0.1	0.7

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 69. Counts and Percentages for Importance for Task A Knowledge and Skill in Professional Practice

Knowledge and Skill (Coded)	1		2		3		4	
AK1	25	11.6%	89	41.2%	75	34.7%	27	12.5%
AK2	52	24.3%	106	49.5%	46	21.5%	10	4.7%
AK3	39	18.1%	102	47.4%	64	29.8%	10	4.7%
AK4	32	14.9%	99	46.0%	66	30.7%	18	8.4%
AK5	51	23.7%	89	41.4%	59	27.5%	16	7.4%
AK6	42	19.6%	95	44.2%	65	30.2%	13	6.0%
AS1	57	26.4%	92	42.6%	54	25.0%	13	6.0%
AS2	57	26.4%	99	45.8%	49	22.7%	11	5.1%
AS3	61	28.3%	104	48.1%	43	19.9%	8	3.7%
AS4	54	25.0%	104	48.1%	51	23.6%	7	3.3%
AS5	52	24.1%	81	37.5%	60	27.8%	23	10.6%
AS6	60	27.8%	110	50.9%	41	19.0%	5	2.3%

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 70. Descriptive Statistics for Frequency for Task A Knowledge and Skill in Professional Practice

Knowledge and Skill (Coded)	N	Median	Mean	SE Mean	SD
AK1	217	4	3.9	0.1	1.0
AK2	214	3	2.8	0.1	1.1
AK3	215	3	2.8	0.1	1.1
AK4	213	3	3.2	0.1	1.1
AK5	216	3	2.9	0.1	1.1
AK6	216	3	3.2	0.1	1.1
AS1	217	3	2.9	0.1	1.2
AS2	217	3	2.7	0.1	1.1
AS3	217	3	2.5	0.1	1.1
AS4	217	3	2.7	0.1	1.1
AS5	217	3	3.3	0.1	1.3
AS6	217	3	2.5	0.1	1.0

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

Table 71. Counts and Percentages for Frequency for Task A Knowledge and Skill in Professional Practice

Knowledge and Skill (Coded)	1		2		3		4		5	
AK1	5	2.3%	10	4.6%	55	25.3%	72	33.2%	75	34.6%
AK2	34	15.9%	45	21.0%	83	38.8%	39	18.2%	13	6.1%
AK3	27	12.6%	47	21.9%	94	43.7%	30	13.9%	17	7.9%
AK4	16	7.5%	37	17.4%	73	34.3%	65	30.5%	22	10.3%
AK5	22	10.2%	58	26.9%	75	34.7%	40	18.5%	21	9.7%
AK6	15	6.9%	34	15.8%	85	39.4%	55	25.5%	27	12.5%
AS1	32	14.7%	43	19.8%	82	37.8%	39	18.0%	21	9.7%
AS2	37	17.1%	47	21.7%	79	36.4%	42	19.3%	12	5.5%
AS3	45	20.7%	57	26.3%	77	35.5%	30	13.8%	8	3.7%
AS4	33	15.2%	51	23.5%	87	40.1%	37	17.1%	9	4.1%
AS5	24	11.0%	41	18.9%	56	25.8%	47	21.7%	49	22.6%
AS6	46	21.2%	57	26.3%	85	39.2%	24	11.0%	5	2.3%

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

B. Collaborate as a leader of the interdisciplinary health care team using effective interpersonal and communication skills in order to ensure optimal patient care.

Knowledge of

BK1	Interdisciplinary collaboration and influence on the patient experience
BK2	Quality and safety programs (e.g., critical review, M & Ms)
BK3	Impact of organizational culture on the patient experience
BK4	Leadership theory and practice
BK5	Contribution of interdisciplinary specialties on the health care team
BK6	Strategies for managing communication among members of the interdisciplinary team

Skills in

BS1	Applying the principles of patient-centered care
BS2	Directing care within an interprofessional team
BS3	Communicating efficiently and effectively with the interdisciplinary team and patients (e.g., emotional intelligence, empathy)
BS4	Teaching and mentoring peers, colleagues and collaborators
BS5	Modeling culturally competent communication
BS6	Modeling ethical behavior and decision making

Table 72. Descriptive Statistics for Importance for Task B Knowledge and Skill in Professional Practice

Knowledge and Skill (Coded)	N	Median	Mean	SE Mean	SD
BK1	214	2	2.4	0.1	0.9
BK2	213	2	2.5	0.1	0.9
BK3	214	2	2.4	0.1	0.8
BK4	213	2	2.1	0.1	0.8
BK5	213	2	2.4	0.1	0.8
BK6	212	2	2.4	0.1	0.9
BS1	214	3	2.6	0.1	0.9
BS2	214	3	2.5	0.1	0.8
BS3	214	3	2.7	0.1	0.9
BS4	214	2	2.4	0.1	0.9
BS5	214	3	2.6	0.1	0.9
BS6	214	3	2.9	0.1	1.0
BS7	214	2	2.4	0.1	0.9

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 73. Counts and Percentages for Importance for Task B Knowledge and Skill in Professional Practice

Knowledge and Skill (Coded)	1		2		3		4	
BK1	36	16.8%	73	34.1%	86	40.2%	19	8.9%
BK2	30	14.1%	79	37.1%	77	36.1%	27	12.7%
BK3	31	14.5%	88	41.1%	77	36.0%	18	8.4%
BK4	52	24.4%	99	46.5%	51	23.9%	11	5.2%
BK5	34	16.0%	85	39.9%	78	36.6%	16	7.5%
BK6	32	15.1%	79	37.3%	78	36.8%	23	10.8%
BS1	23	10.8%	76	35.5%	73	34.1%	42	19.6%
BS2	19	8.9%	87	40.6%	81	37.9%	27	12.6%
BS3	21	9.8%	65	30.4%	88	41.1%	40	18.7%
BS4	30	14.0%	90	42.1%	71	33.2%	23	10.7%
BS5	25	11.7%	77	36.0%	79	36.9%	33	15.4%
BS6	24	11.2%	43	20.1%	87	40.7%	60	28.0%
BS7	41	19.2%	78	36.5%	69	32.2%	26	12.1%

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 74. Descriptive Statistics for Frequency for Task B Knowledge and Skill in Professional Practice

Knowledge and Skill (Coded)	N	Median	Mean	SE Mean	SD
BK1	214	4	3.7	0.1	1.1
BK2	214	3	3.1	0.1	1.1
BK3	214	3	3.4	0.1	1.2
BK4	214	3	3.2	0.1	1.1
BK5	213	4	3.5	0.1	1.1
BK6	213	4	3.7	0.1	1.1
BS1	215	5	4.3	0.1	0.9
BS2	215	4	3.9	0.1	1.0
BS3	215	4	4.2	0.1	0.9
BS4	215	4	3.9	0.1	0.9
BS5	215	4	4.0	0.1	1.0
BS6	215	5	4.4	0.1	0.9
BS7	214	4	4.2	0.1	0.8

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

Table 75. Counts and Percentages for Frequency for Task B Knowledge and Skill in Professional Practice

Knowledge and Skill (Coded)	1		2		3		4		5	
BK1	11	5.1%	16	7.5%	53	24.8%	70	32.7%	64	29.9%
BK2	19	8.9%	41	19.2%	78	36.4%	49	22.9%	27	12.6%
BK3	15	7.0%	30	14.0%	68	31.8%	55	25.7%	46	21.5%
BK4	15	7.0%	30	14.0%	90	42.1%	51	23.8%	28	13.1%
BK5	11	5.1%	20	9.4%	69	32.4%	73	34.3%	40	18.8%
BK6	10	4.7%	15	7.1%	61	28.6%	66	31.0%	61	28.6%
BS1	2	0.9%	8	3.7%	29	13.5%	68	31.7%	108	50.2%
BS2	4	1.9%	18	8.4%	47	21.9%	79	36.7%	67	31.1%
BS3	3	1.4%	7	3.3%	25	11.6%	79	36.7%	101	47.0%
BS4	1	0.5%	10	4.6%	66	30.7%	67	31.2%	71	33.0%
BS5	4	1.9%	11	5.1%	46	21.4%	66	30.7%	88	40.9%
BS6	2	0.9%	7	3.3%	26	12.1%	56	26.0%	124	57.7%
BS7	0	0.0%	6	2.8%	33	15.4%	79	36.9%	96	44.9%

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

- C. Engage in professional development and reflective practice to support improvement in self and others to enhance patient care.**

Knowledge of

CK1	Value of continuous learning and professional growth in the specialty
CK1	Continuing education opportunities to improve knowledge of evidence-based medicine in the specialty
CK1	Productivity metrics and their effects on value
CK1	Practice based learning and improvement principles

Skills in

CS1	Taking advantage of opportunities to gain specialty knowledge
CS1	Disseminating new research and technology related to orthopedic practice

Table 76. Descriptive Statistics for Importance for Task C Knowledge and Skill in Professional Practice

Knowledge and Skill (Coded)	N	Median	Mean	SE Mean	SD
CK1	215	3	2.7	0.1	1.0
CK2	214	3	2.6	0.1	1.0
CK3	214	2	2.2	0.1	0.9
CK4	215	2	2.4	0.1	0.9
CS1	215	2	2.4	0.1	1.0
CS2	214	2	2.3	0.1	0.9

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 77. Counts and Percentages for Importance for Task C Knowledge and Skill in Professional Practice

Knowledge and Skill (Coded)	1		2		3		4	
CK1	31	14.4%	57	26.5%	80	37.2%	47	21.9%
CK2	29	13.6%	62	29.0%	78	36.4%	45	21.0%
CK3	50	23.4%	90	42.0%	61	28.5%	13	6.1%
CK4	34	15.8%	78	36.3%	81	37.7%	22	10.2%
CS1	44	20.5%	68	31.6%	67	31.2%	36	16.7%
CS2	48	22.4%	83	38.8%	62	29.0%	21	9.8%

Ratings: 1 = No harm, 2 = Minimal harm, 3 = Moderate harm, 4 = Extreme harm

Table 78. Descriptive Statistics for Frequency for Task C Knowledge and Skill in Professional Practice

Knowledge and Skill (Coded)	N	Median	Mean	SE Mean	SD
CK1	216	4	4.2	0.1	0.8
CK2	216	4	4.2	0.1	0.8
CK3	215	3	3.3	0.1	1.0
CK4	215	4	3.7	0.1	1.0
CS1	216	4	4.1	0.1	0.7
CS2	214	4	3.6	0.1	0.9

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

Table 79. Counts and Percentages for Frequency for Task C Knowledge and Skill in Professional Practice

Knowledge and Skill (Coded)	1		2		3		4		5	
CK1	2	0.9%	2	0.9%	37	17.1%	87	40.3%	88	40.8%
CK2	1	0.5%	4	1.8%	31	14.4%	96	44.4%	84	38.9%
CK3	12	5.6%	29	13.5%	80	37.2%	66	30.7%	28	13.0%
CK4	3	1.4%	21	9.8%	57	26.5%	85	39.5%	49	22.8%
CS1	0	0.0%	2	0.9%	40	18.5%	98	45.4%	76	35.2%
CS2	1	0.5%	20	9.3%	76	35.5%	76	35.5%	41	19.2%

Ratings: 1 = Never, 2 = Rarely (once per year), 3 = Sometimes (once per month), 4 = Often (once per week), 5 = Repeatedly (daily)

CONCLUSION

Through its Specialty Council, the BOC conducted the practice analysis study to determine the role and responsibilities of ATs who specialize in orthopedics. The Specialty Council will use the study to establish the basis for the validity of the exam. Because there is no database that contains all ATs who specialize in orthopedics, the BOC solicited the names and email addresses of individuals who completed an AT residency in orthopedics to identify qualified individuals to respond to the survey. This group was augmented by other individuals whose background indicated that they may specialize in orthopedics. Given the question at the end of the survey asking respondents if they believe they are ATs who specialize in orthopedics and the elimination of those answering “No,” Scantron is confident that the 339 usable responses were provided by qualified respondents who practice in the specialty. Responses to items in the demographic portion of the survey support the conclusion that participants constitute a reasonable and qualified sample.

Tasks and domains were evaluated using scales for Importance and Frequency. Frequency (how often) and Importance (potential for harm) supplied information about the relevance of the domains, tasks, and knowledge and skill statements, which should be considered when designing the certification exam. Because there is not currently a certification program for ATs who specialize in orthopedics, the scales were worded without specific reference to assumptions about the completion of training. Thus, it is possible that respondents may have applied the scales differently.

Data collected in the validation study are reliable and validate that the domains, tasks, and knowledge and skill statements are appropriate elements of responsibility in the practice of ATs who specialize in orthopedics. Of particular interest was the set of skill statements addressing the responsibility of ATs who specialize in orthopedics in the operating room during surgery. Data for those skills indicate that respondents endorsed them to the same degree they did other skills in Procedural Knowledge. These skills are relevant to practice and should be assessed in the examination.

Several specific recommendations may be useful to BOC:

- I. The content outline for the certification exam should be based on the practice analysis.
- II. A multiple-choice exam may be developed in accordance with psychometric and test development principles as an effective assessment of knowledge required by ATs who specialize in orthopedics.
- III. A single exam program is appropriate.

BIBLIOGRAPHY

National Athletic Trainers Association. (2016). Physician Practice Survey Results. Dallas, TX: NATA.

National Commission for Certifying Agencies. (2016). Standards for the Accreditation of Certification Programs. Washington, DC: Institute for Credentialing Excellence.

APPENDIX A

CONTENT OUTLINE FOR BOC ORTHOPEDIC PRACTICE ANALYSIS

Content Outline for **BOC ORTHOPEDIC PRACTICE ANALYSIS**

UPDATED October 2020

Athletic Trainers (ATs) are health care professionals who render service or treatment under the direction of or in collaboration with a physician, in accordance with their education and training and state statutes, rules and regulations. As part of the health care team, services provided by ATs include injury and illness prevention, wellness promotion and education, emergent care, examination and clinical diagnosis, therapeutic intervention and rehabilitation of injuries and medical conditions. Individuals become eligible for BOC certification through an athletic training program (bachelor's or entry-level master's) accredited by the Commission on Accreditation of Athletic Training Education (CAATE). Athletic training students engage in rigorous classroom study and clinical education in a variety of practice settings such as high schools, colleges/universities, hospitals, emergency rooms, physician offices and health care clinics over the course of the degree program.

BOC specialty certification is a voluntary process by which an AT's mastery of advanced knowledge, skills and experience in a specialized area of clinical practice, exceeding what is required for entry-level AT certification, is demonstrated and measured against defined predetermined standards, such as completing post-professional education, training and/or experience (e.g., accredited residency) and achieving a passing score on a specialty certification examination. This demonstration serves to enhance the quality of patient care, optimize clinical outcomes, increase cost-effectiveness and improve patients' health-related quality of life in specialized areas of athletic training practice.

The purpose of an orthopedic specialization is to provide formal recognition to specialty-trained ATs who have advanced education or experience in musculoskeletal conditions to improve the health and welfare of the public. The specialized practitioner will optimize outcomes for orthopedic patients by demonstrating a level of advanced knowledge, skill and experience which is identified in the "BOC Orthopedic Practice Analysis." The BOC Orthopedic Specialty Exam is being developed with the highest standards, validity and reliability. The BOC will be seeking third-party accreditation from the National Commission on Certifying Agencies for this exam.

TARGET AUDIENCE

ATs who specialize in orthopedics have specific post-professional education, training and experience in orthopedics. Based on the training and testing required for the orthopedic specialty certification, these ATs use advanced clinical decision making to evaluate and diagnose patients, manage comprehensive care and promote, maintain and restore health.

DOMAINS

Domains are the major responsibilities or duties that characterize orthopedic specialty practice for ATs.

Domain I: Medical Knowledge

Domain II: Procedural Knowledge

Domain III: Professional Practice

DOMAIN I: MEDICAL KNOWLEDGE

Tasks

- Formulate differential diagnoses by interpreting a comprehensive history to determine an appropriate physical examination.
- Complete a focused physical examination using evidence-based methods to inform the differential diagnosis.
- Determine the need for appropriate diagnostic testing based on the history and physical examination to inform the differential diagnosis.
- Synthesize evaluation findings and diagnostic studies consistent with best practice to determine the diagnosis and educate the patient.
- Formulate the plan of care in collaboration with the interdisciplinary health care team and patient.
- Analyze outcomes to optimize the continuum of patient-centered care.

DOMAIN II: PROCEDURAL KNOWLEDGE

Tasks

- Implement the established plan of care utilizing advanced clinical decision making to incorporate appropriate modifications and ensure optimal patient outcomes.
- Provide **pre-procedural** care to ensure optimal patient outcomes.
- Provide **intra-procedural** care to ensure optimal patient outcomes.
- Provide **post-procedural** care to ensure optimal patient outcomes.
- Provide **pre-operative** care to ensure optimal patient outcomes.
- Provide **intra-operative** care to ensure optimal patient outcomes.
- Provide **post-operative** care to ensure optimal patient outcomes.

DOMAIN III: PROFESSIONAL PRACTICE

Tasks

- Establish patient-centered processes and quality care programs that promote value-based care, population health strategies and cost containment to improve patient outcomes.
- Collaborate as a leader of the interdisciplinary health care team using effective interpersonal and communication skills to ensure optimal patient care.
- Engage in professional development and reflective practice to support improvement in self and others to enhance patient care.

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This document provides domain and task level information only. The full practice analysis identifies knowledge and skills for each task and an in-depth look at the study and process.

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APPENDIX B

INSTRUCTION BOOKLET



Practice Analysis Study for Orthopedic Specialty Certification

INSTRUCTION BOOKLET

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Facilitator: James P. Henderson, Ph.D.

Agenda

Day 1

- 9:00 a.m. CDT Session 1 [10:00 a.m. EDT; 8:00 a.m. MDT; 7:00 a.m. PDT]**
- Introduce participants
 - Review practice analysis processes and objectives
 - Discuss specialty practice as a concept and the objectives of the practice analysis for orthopedic specialty certification
 - Discuss the target audience

11:00 a.m. CDT Morning break

- 12:00 a.m. CDT Session 2 [1:00 p.m. EDT; 11:00 a.m. MDT; 10:00 a.m. PDT]**
- Review sample domains and reach consensus on domains
 - Review procedures and considerations for writing task statements

2:00 p.m. CDT Midday break

- 3:00 p.m. CDT Session 3 [4:00 p.m. EDT; 2:00 p.m. MDT; 1:00 p.m. PDT]**
- Draft task statements in small groups

- 5:00 p.m. CDT Session 4 [6:00 p.m. EDT; 4:00 p.m. MDT; 3:00 p.m. PDT]**
- Wrap up before adjourning for the day

Day 2

- 9:00 a.m. CDT Session 1 [10:00 a.m. EDT; 8:00 a.m. MDT; 7:00 a.m. PDT]**
- Review draft task statements as a whole group

11:00 a.m. CDT Morning break

- 12:00 a.m. CDT Session 2 [1:00 p.m. EDT; 11:00 a.m. MDT; 10:00 a.m. PDT]**
- Continue reviewing draft task statements as a whole group
 - Receive instruction on knowledge and skill statements

2:00 p.m. CDT Midday break

- 3:00 p.m. CDT Session 3 [4:00 p.m. EDT; 2:00 p.m. MDT; 1:00 p.m. PDT]**
- Draft knowledge and skill statements in small groups

- 5:00 p.m. CDT Session 4 [6:00 p.m. EDT; 4:00 p.m. MDT; 3:00 p.m. PDT]**
- Wrap up before adjourning for the day

Practice Analysis Study for Orthopedic Specialty Certification

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Day 3	
9:00 a.m. CDT	Session 1 [10:00 a.m. EDT; 8:00 a.m. MDT; 7:00 a.m. PDT] ○ Review knowledge and skill statements as a whole group
11:00 a.m. CDT	Morning break
12:00 a.m. CDT	Session 2 [1:00 p.m. EDT; 11:00 a.m. MDT; 10:00 a.m. PDT] ○ Continue reviewing knowledge and skill statements as a whole group
2:00 p.m. CDT	Midday break
3:00 p.m. CDT	Session 3 [4:00 p.m. EDT; 2:00 p.m. MDT; 1:00 p.m. PDT] ○ Continue reviewing knowledge and skill statements as a whole group ○ Wrap up before adjourning the meeting

OVERVIEW OF MEETING ACTIVITIES

The Board of Certification, Inc. (BOC) was incorporated in 1989 to provide a certification program for entry-level Athletic Trainers (ATs). The BOC establishes and regularly reviews both the standards for the practice of athletic training and the continuing education requirements for BOC Certified ATs. The BOC has the only accredited certification program for ATs in the United States. The BOC's mission is to provide exceptional credentialing programs for healthcare professionals to assure protection of the public. Consistent with its mission, the BOC formed its Specialty Council to oversee specialty certification. Maintaining close alignment with best practices, the BOC is updating the 2017 orthopedic practice analysis.

We anticipate a substantial amount of group interaction and activity. It is important for each member of the panel to be realistic, cooperative, and focused on teamwork. We hope panelists will appreciate the common goal of collaboration concerning the various elements of the study.

DEFINITION OF TERMS

Target Audience Statement

Target audience statements describe the basic characteristics of the group that is expected to seek certification in the orthopedic specialty. The characteristics include the prerequisites and other qualifications that distinguish ATs with an orthopedic specialty from certified athletic trainers. Below is the target audience developed as part of the 2017 practice analysis.

Target Audience

ATs who specialize in orthopedics have specific post-professional education and training in orthopedics. Based on the training and testing required for orthopedic specialty certification, these ATs use advanced clinical decision making to assist in the evaluation and management of patients.

Domains

Domains are the major responsibilities or duties that characterize orthopedic specialty practice. Domains are denoted as major headings in an outline format and may include brief behavioral descriptions. The domains and behavioral descriptions listed below provide the organizational framework for the BOC's 2017 Orthopedic practice analysis. The domains are illustrative of the scope and generality intended for the current study. In considering new domains during the meeting, you may adapt any from this list, if they are appropriate, or devise your own.

- **Medical Knowledge;**
- **Procedural Knowledge;** and
- **Practice Management.**

Practice Analysis Study for Orthopedic Specialty Certification

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Task Statements

A task statement defines an activity that elaborates on a domain. The set of task statements for a domain offers a comprehensive and detailed description of the domain. In particular, task statements should answer the following questions:

- What activity is performed? (active verb)
- To whom or to what is the activity directed? (direct object or another phrase clarifying who or what receives the activity or how it is performed)
- How is the activity performed? (if helpful)
- Why is the activity performed? (if helpful)

Selected Task Statements from the 2017 Orthopedic Practice Analysis

1. Determine the need for imaging based on the location and mechanism of injury to ensure appropriate imaging utilization.
2. Implement appropriate Durable Medical Equipment, Prosthetics/Orthotics, and Supplies (DMEPOS) in accordance with the patient management plan to ensure optimal patient care.
3. Formulate a patient-centered quality program by developing processes that promote value-based care, population health strategies, and cost containment to help improve patient outcomes.
4. Present findings on medical history, social history, physical examination, imaging, injury classification, laboratory results, and medication use to the interdisciplinary healthcare team and/or patient to administer patient care.
5. Provide pre-procedural, intra-procedural, and post-procedural care under the guidance of the physician to ensure optimal patient care.

How to Write Task Statements

1. Make sure that the task statements are complete.
 1. What? 2. To whom/what? 3. How (if helpful)? 4. Why (if helpful)?
- 2. Begin the task statements with active verbs: assess, collect, identify, diagnose, document, plan, manage, collaborate, consult, etc.
3. Avoid the use of verbs that are not definitive. Some examples to avoid are be responsible for, help, assist, keep, participate, or handle.
4. Record task statements on the worksheet provided in this manual or a word processing document.
5. Develop approximately 5 to 12 task statements for each domain.

Practice Analysis Study for Orthopedic Specialty Certification

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Knowledge and Skill Statements

For each domain, it is valuable to understand what knowledge and skill are required for proficient performance. The set of knowledge and skill statements clarifies what is expected of the AT in an orthopedic specialty. Each knowledge or skill statement will be coded to the task(s) to which it pertains most closely.

Selected Knowledge Statements from the 2017 Orthopedic Practice Analysis

1. Medication reconciliation and methods for its integration into the plan of care
2. Methods for performing tests and using the tools of a focused physical examination based on a comprehensive history
3. Strategies for communicating with patients, caregivers, and other members of the interdisciplinary team to ensure understanding and compliance
4. Timing and technique for removal of casts and splints, including cast saw education
5. Joint and fracture reduction techniques, indications, and contraindications
6. Health insurance and Centers for Medicare and Medicaid Services requirements (e.g., authorization, limitations, utilization management)

Selected Skill Statements from the 2017 Orthopedic Practice Analysis

1. Abiding by the policies and procedures of governmental and private insurance plans
2. Preparing appropriate dosage and volume of injectable medications using sterile technique
3. Maintaining post-operative surgical site care, including dressing changes and wound closure material removal
4. Positioning patients in accordance with the requirements of specific procedures
5. Applying the findings of imaging studies to the plan of care
6. Selecting tests and tools to be used in the physical examination

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VALIDATION RATING SCALES

Please consider certified athletic trainers who specialize in orthopedics when evaluating the domains and tasks using the following scales.

Performance Expectation: At what point in time are certified athletic trainers who specialize in orthopedics first expected in most settings to perform the domain or task?

- 0 = Not at all
 - 1 = Within the first six months of specialty certification
 - 2 = After the first six months of specialty certification
-

Consequence: To what degree would the inability of certified athletic trainers who specialize in orthopedics perform duties in each domain or task be seen as causing harm to stakeholders? (Harm may be seen as physical, psychological, emotional, legal, financial, etc.)

- 0 = No harm
 - 1 = Minimal harm
 - 2 = Moderate harm
 - 3 = Substantial harm
 - 4 = Extreme harm
-

Frequency: Frequency refers to how often certified athletic trainers who specialize in orthopedics perform duties in each of the domains or tasks, considering a one-year period. The following scale is used to record frequency:

- 0 = Never
- 1 = Rarely (once per year)
- 2 = Sometimes (once per month)
- 3 = Often (once per week)
- 4 = Repeatedly (daily)

**ORTHOPEDIC SPECIALTY IN ATHLETIC TRAINING CONTENT OUTLINE
VALIDATED IN 2017**

Medical Knowledge

- A. Initiate a differential diagnosis by interpreting a focused history to determine an appropriate physical examination.

Knowledge of:

1. Components of a complete history for the orthopedic patient
2. Methods for taking a history with the orthopedic patient
3. Major medical conditions pertinent to orthopedic and other musculoskeletal pathologies
4. Epidemiology of injury, illness, and co-morbidities
5. Medication reconciliation and methods for its integration into the plan of care
6. Impact of all components of the patient history on the plan of care
7. Age-related factors
8. Socioeconomic and cultural considerations

Skill in:

1. Tailoring the history interview based on information as it is gathered
2. Interpreting history to develop the differential diagnosis
3. Integrating history into the plan of care

- B. Complete a focused physical examination using evidence-based methods to inform the differential diagnosis.

Knowledge of:

1. Human anatomy and physiology applied to orthopedic pathologies
2. Pathology
3. Pathophysiology
4. Biomechanics
5. Specificity, sensitivity, and predictive value of procedures, tests, and tools used in physical examinations for suspected orthopedic conditions
6. Methods for performing tests and using the tools of a focused physical examination based on a comprehensive history
7. Contraindications for the use of tests and tools
8. Communication pertaining to the conduct of a physical examination
9. Considerations and strategies for managing a physical examination

Skill in:

1. Identifying pertinent anatomical structures
2. Recognizing signs of infection
3. Selecting tests and tools to be used in the physical examination
4. Performing instability tests
5. Performing special tests
6. Performing neurovascular examinations
7. Conducting dynamic testing
8. Analyzing biomechanics and recognizing movement pattern dysfunction
9. Recognizing abnormal findings during the physical examination
10. Measuring and interpreting vital signs
11. Using standard and emergency medical equipment

Practice Analysis Study for Orthopedic Specialty Certification

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- C. Determine the need for imaging based on the location and mechanism of injury to ensure appropriate imaging utilization.

Knowledge of:

1. Procedures and requirements for recommending and/or ordering imaging studies including indications and contraindications under the direction of an attending physician
2. Purpose, method, process, precautions, and use of imaging techniques
3. Process of reading and interpreting imaging studies

Skill in:

1. Applying the findings of imaging studies to the plan of care
2. Recognizing normal and abnormal findings
3. Recognizing orthopedic emergencies

- D. Present findings on medical history, social history, physical examination, imaging, injury classification, laboratory results, and medication use to the interdisciplinary healthcare team and/or patient to administer patient care.

Knowledge of:

1. Pertinent normal and abnormal findings
2. Recognition and differentiation of severity of injury and illness (e.g., fracture classification)
3. Case presentation methods

Skill in:

1. Organizing findings
2. Anticipating patient response
3. Communicating efficiently and effectively

- E. Assist the physician in formulating and implementing the management plan by developing patient-specific educational strategies, incorporating evidence-based strategies, and recognizing the need for referral to other specialists to optimize patient care.

Knowledge of:

1. Cognitive, social, physiological, and cultural barriers
2. Pharmacology
3. Evidence-based and/or best practices for the treatment of injuries and illnesses
4. Circumstances that indicate the need for consultation or referral
5. Strategies for communicating with patients, caregivers, and other members of the interdisciplinary team to ensure understanding and compliance
6. Documentation of patient encounters

Skill in:

1. Collaborating with interdisciplinary teams and caregivers
2. Integrating all elements of the patient's condition into the plan of care
3. Recognizing the need for consultation and/or referral
4. Communicating expectations and the plan of care to patients, caregivers, other members of interdisciplinary teams
5. Implementing best practices
6. Identifying barriers to treatment
7. Documenting patient care

Practice Analysis Study for Orthopedic Specialty Certification

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Procedural Knowledge

- A. Provide pre-operative, intra-operative, and post-operative care under the guidance of the physician to ensure optimal patient care.

Knowledge of:

1. Applied surgical anatomy
2. Surgical procedures, risks, benefits, and potential complications
3. Pre- and post-operative rehabilitation protocols
4. Appropriate patient positioning techniques
5. Sterile technique
6. Operating room customs
7. Operating room instrumentation
8. Intra-operative assistance
9. Wound closure materials and methods
10. Post-operative dressing and equipment
11. Post-operative observation and management
12. Pain management strategies
13. Interdisciplinary team member roles and responsibilities
14. Routine and emergency policies and procedures in the operating rooms
15. Legal and regulatory considerations (e.g., practice act)

Skill in:

1. Positioning patients in accordance with specific surgical procedures
2. Maintaining sterility within the operating room (e.g., proper garbing, hand hygiene, gowning)
3. Creating a sterile field through proper prepping of the patient and draping of the surgical environment
4. Performing intra-procedural assistance, such as retraction, cauterization, and maintaining hemostasis in a safe and effective manner
5. Selecting and preparing graft tissue prior to implementation during a surgical procedure
6. Performing wound closure using appropriate techniques and standards
7. Applying appropriate post-procedural dressings and equipment following a surgical procedure
8. Communicating peri-operative knowledge and expectations with patients and families appropriately
9. Maintaining post-operative surgical site care, including dressing changes and wound closure material removal
10. Scheduling and order entry

- B. Implement appropriate Durable Medical Equipment, Prosthetics/Orthotics, and Supplies (DMEPOS) in accordance with the patient management plan to ensure optimal patient care.

Knowledge of:

1. DMEPOS indications and contraindications
2. Applied bracing anatomy
3. Appropriate selection, function, and treatment protocols
4. Off-the-shelf and custom devices
5. Custom fitting and custom fabrication techniques

Skill in:

1. Selecting appropriate DMEPOS items
2. Fitting of DMEPOS items to include off-the-shelf or customization (e.g., trimming, heating, bending, molding, assembling) to ensure appropriate placement and fit
3. Custom fabricating DMEPOS items to include creating, measuring, furnishing, sizing, and dispensing appropriate products
4. Applying and adjusting DMEPOS items when appropriate
5. Communicating treatment protocols surrounding DMEPOS items to patients and families

Practice Analysis Study for Orthopedic Specialty Certification

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- C. Implement appropriate casting and splinting techniques in accordance with the patient management plan to ensure optimal patient care.

Knowledge of:

1. Casting and splinting materials
2. Casting and splinting indications and contraindications
3. Applied casting and splinting anatomy
4. Appropriate molding techniques
5. Timing and technique for removal of casts and splints, including cast saw education

Skill in:

1. Applying casting and splinting materials
2. Removing casting and splinting materials
3. Communicating treatment protocols concerning casting and splinting products to patients and families

- D. Provide pre-procedural, intra-procedural, and post-procedural care under the guidance of the physician to ensure optimal patient care.

Knowledge of:

1. Applied procedural anatomy
2. Procedures, risks, benefits, and potential complications
3. Pre- and post-procedural rehabilitation protocols
4. Appropriate patient positioning techniques
5. Sterile technique
6. Procedure room customs
7. Procedure instrumentation, materials, and methods, including ultrasound and fluoroscopy
8. Orthopedic injection techniques, indications, and contraindications
9. Joint and fracture reduction techniques, indications, and contraindications
10. Phlebotomy and intravenous insertion techniques, indications, and contraindications
11. Intra-procedural assistance
12. Post-procedural dressing and equipment
13. Post-procedural observation and management
14. Pain management strategies
15. Interdisciplinary team member roles and responsibilities
16. Routine and emergency policies and procedures
17. Legal and regulatory considerations (e.g., practice act)

Skill in:

1. Preparing appropriate dosage and volume of injectable medications using sterile technique
2. Preparing devices for image-guided injections
3. Positioning patients in accordance with the requirements of specific procedures
4. Maintaining sterility through procedures
5. Creating a sterile field by prepping the patient and/or draping in the procedure environment
6. Performing intra-procedural assistance in a safe and effective manner
7. Administering orthopedic injections within the limits of legal and regulatory considerations
8. Performing phlebotomy within the limits of legal and regulatory considerations
9. Acquiring intravenous access within the limits of legal and regulatory considerations
10. Applying appropriate post-procedural dressings and equipment following a procedure
11. Communicating peri-procedural knowledge and expectations with patients and families appropriately
12. Maintaining post-procedural site care, including dressing changes
13. Scheduling and order entry

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Practice Management

- A. Document patient care using electronic health records and appropriate billing and coding processes consistent with organizational, legal, and compliance standards resulting in reduced risk.

Knowledge of:

1. Role and capabilities of Electronic Health Records (EHR) systems
2. Health informatics systems (e.g., scheduling systems, Picture Archiving and Communication System, Health Information Exchanges)
3. Billing and coding
4. Health insurance and Centers for Medicare and Medicaid Services requirements (e.g., authorization, limitations, utilization management)
5. Risk management
6. Accreditation requirements
7. Regulatory, legal, and organization standards

Skill in:

1. Abiding by the policies and procedures of governmental and private insurance plans
2. Using the EHR to document and manage care
3. Adapting to change (e.g., legal, regulatory, risk, insurance)

- B. Formulate a patient-centered quality program by developing processes that promote value-based care, population health strategies, and cost containment to help improve patient outcomes.

Knowledge of:

1. Valued-based care
2. Quality programs and standards
3. Population health strategies (e.g., risk stratification, addiction, social determinants)
4. Cost containment
5. Outcome metrics (e.g., patients, quality, process)

Skill in:

1. Interpreting outcome metrics
2. Collecting appropriate data to improve patient care and contain costs
3. Using analytics to improve value and to contain cost
4. Communicating to improve the patient experience

- C. Create a positive patient experience through care coordination, clinical efficiencies, and interdisciplinary collaboration to ensure patient satisfaction and quality.

Knowledge of:

1. Service lines
2. Clinical operations (e.g., scheduling, authorizations, patient flow)
3. Interdisciplinary collaboration and influence on the patient experience
4. Patient satisfaction surveys
5. Quality and safety programs
6. Impact of organizational culture and behavior norms on the patient experience

Skill in:

1. Developing workflows (clinical, practice, and informatics)
2. Applying the principles of patient-centered care
3. Coordinating care (e.g., referral management, patient portals)
4. Using emotional intelligence to promote a positive patient experience

Practice Analysis Study for Orthopedic Specialty Certification

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- D. Analyze the effectiveness and efficiency of practice operations using continuous improvement principles and productivity metrics to ensure high-quality patient care.

Knowledge of:

1. Continuous improvement principles and processes
2. Patient throughput management
3. Key performance indicators
4. Productivity metrics and their effects on value

Skill in:

1. Applying continuous improvement principles
2. Using analytics
3. Identifying and managing barriers to patient throughput
4. Managing and analyzing scheduling templates

DMEPOS = DURABLE MEDICAL EQUIPMENT, PROSTHETICS/ORTHOTICS, AND SUPPLIES

PACS = PICTURE ARCHIVING AND COMMUNICATION SYSTEM

HIE = HEALTH INFORMATION EXCHANGES

CMS = CENTERS FOR MEDICARE AND MEDICAID SERVICES

APPENDIX C

BOC SURVEY INVITATION

Use the following subject line: Help shape athletic training specialization in orthopedics — and have a chance to win a \$100 Visa gift card.

Dear James Henderson:

The Board of Certification, Inc., (BOC) has identified you as an Athletic Trainer (AT) who may have a specialty practice in orthopedics. *ATs who specialize in orthopedics have specific post-professional education, training, and experience in orthopedics, and they use advanced clinical decision-making to evaluate and diagnose patients; manage comprehensive care; and promote, maintain, and restore health.* If you are an AT who fits this definition, we would appreciate your participation in this survey. The BOC is conducting the national, specialty practice survey on behalf of the BOC Specialty Council.

The purpose of the survey is to get your feedback on the BOC's Orthopedic Practice Analysis to be used in development of the orthopedic specialty certification exam. Completing the survey should take about 45 minutes. **Your participation in this effort is an invaluable part of defining the practice of ATs who specialize in orthopedics.** You do not need to finish the survey in one sitting, and you can return to the survey multiple times. Please complete the survey by **September 8** to be entered in the drawing to win a \$100 Visa gift card.

To begin the survey, go to xxx and enter the code: yyy.

The survey is being administered with the assistance of Scantron, a global technology and services-driven company that provides comprehensive assessment solutions. If you encounter any issues with this survey, please contact the survey administrator XXX.

The URL and code provided above are unique to your invitation. **Please do not forward this message to others.** If the survey link is inactive, please contact the survey administrator.

Thank you for your participation.

Anne Minton, MBA
Chief Executive Officer
Board of Certification

James P. Henderson, Ph.D.
Senior Psychometrician
Scantron

APPENDIX D

BOC SURVEY

BOC Orthopedic Athletic Trainer**Log In**

* Please enter the access code found at the bottom of your invitation.

Please complete this survey by **September 15, 2020**.

We estimate the survey should take approximately 45 minutes. Thank you in advance for making this important contribution to the orthopedic specialty program.

If you experience technical problems, please contact the survey administrator at research@scantron.com.

BOC Orthopedic Athletic Trainer

Introduction

The Board of Certification, Inc. (BOC) was incorporated in 1989 as a not-for-profit credentialing agency to provide a certification program for the entry-level athletic training profession. The BOC establishes both the standards for the practice of athletic training and the continuing education requirements for BOC Certified Athletic Trainers (ATs). The BOC also works with state regulatory agencies to provide credential information, professional conduct guidelines and regulatory standards on certification issues. The BOC has the only accredited certification program for ATs in the United States and has a mutual recognition agreement with Ireland. The BOC exists so that health care professionals worldwide have access to globally recognized standards of competence and credentialing programs that support them in the protection of the public and the provision of excellent patient care. The BOC's mission is to provide exceptional credentialing programs for health care professionals to assure protection of the public.

Consistent with its mission and plan to establish specialty certification, the BOC's Specialty Council is conducting a study to form the content basis for athletic training specialty certification in orthopedics. The practice analysis study began in May 2020 with a meeting of ATs who specialize in orthopedics and an orthopedic physician who employs ATs in practice.

The study will define the significant responsibilities that ATs who specialize in orthopedics have in their work and what specialized knowledge and skill they must possess. The practice analysis study will work to ensure that the program bears a strong relationship to current practice. Doing so maintains close alignment with best practices in certification.

We ask you now to participate in the study by completing this very important survey.

You are not required to complete the survey in one sitting. You can save your results and return to complete the survey. To save your completed responses, click "Next" at the bottom of the page, then "Exit Survey" at the top right corner. With your emailed access link, you can re-enter the survey at any time, prior to the survey close date.

Please only use the survey navigation buttons at the bottom of each page. DO NOT use your browser navigation buttons to advance or return to a previous survey question because your responses will not be saved.

If you experience technical problems, please contact the survey administrator at research@scantron.com.

BOC Orthopedic Athletic Trainer

Introduction

The practice analysis survey is divided into three sections.

Section 1 Task Statement and Domain Evaluation: In this section, you will be asked to review 11 task statements, organized into three primary groups, or domains. The domains are as follows:

- I. Medical Knowledge
- II. Procedural Knowledge
- III. Professional Practice

We ask that you provide ratings for each task statement, group-by-group. Then, after you have reviewed and provided ratings for the task statements within a domain, we will ask you to give summative ratings for the domain as a whole.

Section 2 Knowledge and Skill Statement Evaluation: In this section, you will be asked to review the knowledge and skill statements, organized by task.

Section 3 Demographics: In this final section, you will be asked to provide brief background information about yourself.

If you experience technical problems, please contact the survey administrator at research@scantron.com.

BOC Orthopedic Athletic Trainer

Definitions

Athletic Trainers: Athletic Trainers (ATs) are health care professionals who collaborate with physicians. The services provided by ATs comprise prevention, emergency care, clinical diagnosis, therapeutic intervention and rehabilitation of injuries and medical conditions. Athletic training is recognized by the American Medical Association (AMA) as a health care profession. Individuals become eligible for BOC certification through an athletic training program (bachelor's or entry-level master's) accredited by the Commission on Accreditation of Athletic Training Education (CAATE). While students, ATs engage in rigorous classroom study and clinical education in a variety of practice settings such as high schools, colleges/universities, hospitals, emergency rooms, physician offices and health care clinics over the course of the degree program.

ATs Who Specialize in Orthopedics: ATs who specialize in orthopedics have specific post-professional education, training and experience in orthopedics. Based on the training and testing required for orthopedic specialty certification, these ATs use advanced clinical decision making to evaluate and diagnose patients, manage comprehensive care and promote, maintain and restore health.

BOC specialty certification is a voluntary process by which an AT's mastery of advanced knowledge, skills and experience in a specialized area of clinical practice, exceeding what is required for entry-level AT certification, is demonstrated and measured against defined predetermined standards, such as competing post-professional education, training and/or experience (e.g. accredited residency) and achieving a passing score on a specialty certification exam. This demonstration serves to enhance the quality of patient care, optimize clinical outcomes, increase cost-effectiveness and improve patients' health-related quality of life in specialized areas of athletic training practice.

Employers of ATs with an orthopedic specialty may include the following:

- Physician's practice (i.e. primary care sports medicine physician, osteopathic physician, etc.)
- Professional or collegiate sports team
- High school athletics department
- Educational institution (e.g., residency program)

If you experience technical problems, please contact the survey administrator at research@scantron.com.

BOC Orthopedic Athletic Trainer

Qualifications

Please provide the following information about your background as an AT who specializes in orthopedics.

1. In which of the following program types have you received additional training to work as an orthopedic specialist **after earning initial certification** as an AT? (Please select all that apply.)

- ☐ CAATE Accredited athletic training residency in orthopedics 2012 to present
- ☐ Nonaccredited athletic training residency in orthopedics
- ☐ Graduate athletic training curriculum (not entry-level) in orthopedics
- ☐ On-the-job training in an orthopedic physician practice setting
- ☐ On-the-job training in orthopedics in a different setting

Other (please specify)

2. During the past six (6) years, how many hours of professional development (e.g., continuing education, grand rounds, journal reviews) **in orthopedics** have you completed?

- ☐ Less than 150
- ☐ 150 to 259
- ☐ 260 to 349
- ☐ 350 to 499
- ☐ 500 or more hours of education in the past six years

3. During the past six (6) years, how many hours of mentored practice **in orthopedics** have you had?

- ☐ Less than 600
- ☐ 600 to 1199
- ☐ 1200 to 1799
- ☐ 1800 to 2399
- ☐ 2400 or more

4. How long have you been a Certified Athletic Trainer (ATC®)?

- ☐ Less than two years
- ☐ 2 to 5 years
- ☐ 6 to 10 years
- ☐ 11 to 15 years
- ☐ 16 to 20 years
- ☐ 21 to 25 years
- ☐ More than 25 years

5. Please identify the number of years (2000 hours = one year of full time work) you have worked as an AT. Please round up for fractions of a year.

- ☐ 0 to 1 year
- ☐ 1 to 2 years
- ☐ 3 to 5 years
- ☐ 6 to 8 years
- ☐ 9 or more years

6. Please identify the number of years you have worked as an AT who specializes in orthopedics (excluding residency program). Please round up for fractions of a year.

- ☐ 0 to 2 years
- ☐ 3 to 5 years
- ☐ 6 to 8 years
- ☐ 9 or more years

If you experience technical problems, please contact the survey administrator at research@scantron.com.

Please continue to the next part of the survey.

BOC Orthopedic Athletic Trainer

Instructions for Completing the Survey

Please consider only ATs who specialize in orthopedics when evaluating the domains and tasks, using the following scales. The ratings you provide will help to determine if the domains and tasks pertain to ATs who specialize in orthopedics.

Throughout the survey we ask that you rate the various items using the following scales for Importance and Frequency, using the pull-down selectors beside them. The scale definitions as seen here will appear at the top of each page for your reference in completing the survey.

Importance

What level of harm would result (if any) if ATs with an orthopedic specialty were not proficient in the domain or task? (Harm may be physical, psychological, emotional, legal, financial, etc.)

- No harm at all
- Minimal harm
- Moderate harm
- Extreme harm

Frequency

How frequently do ATs with an orthopedic specialty perform the domain or task?

- Never
- Rarely (once per year)
- Sometimes (once per month)
- Often (once per week)
- Repeatedly (daily)

If you experience technical problems, please contact the survey administrator at research@scantron.com.

BOC Orthopedic Athletic Trainer

Domain I - Medical Knowledge

Section 1 Task Statement and Domain Evaluation

The first group of tasks in the practice analysis is **Medical Knowledge**. Please rate the Importance and Frequency of each of the task statements in this group.

Please consider only ATs who specialize in orthopedics when evaluating the domain and tasks, using the following scales. The ratings you provide will help to determine if the domain and tasks pertain to ATs who specialize in orthopedics.

- **Importance:** What level of harm would result (if any) if ATs with an orthopedic specialty were not proficient in the domain or task? (Harm may be physical, psychological, emotional, legal, financial, etc.)
- **Frequency:** How frequently do ATs with an orthopedic specialty perform the domain or task?

Medical Knowledge

	Importance	Frequency
A. Formulate differential diagnoses by interpreting a comprehensive history to determine an appropriate physical examination.		
B. Complete a focused physical examination using evidence-based methods to inform the differential diagnosis.		
C. Determine the need for appropriate diagnostic testing based on the history and physical examination to inform the differential diagnosis.		
D. Synthesize evaluation findings and diagnostic studies consistent with best practice to determine the diagnosis and educate the patient.		
E. Formulate the plan of care in collaboration with the interdisciplinary health care team and patient.		
F. Analyze outcomes to optimize the continuum of patient-centered care.		

Now that you have reviewed and rated the task statements included under **Medical Knowledge**, please provide overall ratings for the domain **Medical Knowledge** as a whole.

	Importance	Frequency
Medical Knowledge		

If you believe there are additional tasks that should be included in **Medical Knowledge**, please note them in the box below.

BOC Orthopedic Athletic Trainer

Domain II - Procedural Knowledge

The second group of tasks in the practice analysis is **Procedural Knowledge**. Please rate the Importance and Frequency of each of the task statements in this group.

Please consider only ATs who specialize in orthopedics when evaluating the domain and tasks, using the following scales. The ratings you provide will help to determine if the domain and tasks pertain to ATs who specialize in orthopedics.

- **Importance:** What level of harm would result (if any) if ATs with an orthopedic specialty were not proficient in the domain or task? (Harm may be physical, psychological, emotional, legal, financial, etc.)
- **Frequency:** How frequently do ATs with an orthopedic specialty perform the domain or task?

Procedural Knowledge

	Importance	Frequency
A. Implement the established plan of care utilizing advanced clinical decision making to incorporate appropriate modifications and ensure optimal patient outcomes.		
B. Provide pre-procedural care to ensure optimal patient outcomes.		
C. Provide intra-procedural care to ensure optimal patient outcomes.		
D. Provide post-procedural care to ensure optimal patient outcomes.		
E. Provide pre-operative care to ensure optimal patient outcomes.		
F. Provide intra-operative care to ensure optimal patient outcomes.		
G. Provide post-operative care to ensure optimal patient outcomes.		

Now that you have reviewed and rated the task statements included under **Procedural Knowledge**, please provide overall ratings for the domain **Procedural Knowledge** as a whole.

	Importance	Frequency
Procedural Knowledge		

If you believe there are additional tasks that should be included in **Procedural Knowledge**, please note them in the box below.

BOC Orthopedic Athletic Trainer

Domain III - Professional Practice

The third group of tasks in the practice analysis is **Professional Practice**. Please rate the Importance and Frequency of each of the task statements in this group.

Please consider only ATs who specialize in orthopedics when evaluating the domain and tasks, using the following scales. The ratings you provide will help to determine if the domain and tasks pertain to ATs who specialize in orthopedics.

- **Importance:** What level of harm would result (if any) if ATs with an orthopedic specialty were not proficient in the domain or task? (Harm may be physical, psychological, emotional, legal, financial, etc.)
- **Frequency:** How frequently do ATs with an orthopedic specialty perform the domain or task?

Professional Practice

	Importance	Frequency
A. Establish patient-centered processes and quality care programs that promote value-based care, population health strategies and cost containment to improve patient outcomes.		
B. Collaborate as a leader of the interdisciplinary health care team using effective interpersonal and communication skills to ensure optimal patient care.		
C. Engage in professional development and reflective practice to support improvement in self and others to enhance patient care.		

Now that you have reviewed and rated the task statements included under **Professional Practice**, please provide overall ratings for the domain **Professional Practice** as a whole.

	Importance	Frequency
Professional Practice		

If you believe there are additional tasks that should be included in **Professional Practice**, please note them in the box below.

BOC Orthopedic Athletic Trainer

Domain I - Medical Knowledge

Section 2 Knowledge and Skill Statement Evaluation

The first group of knowledge and skill statements in the practice analysis is in **Medical Knowledge**. Please rate the Importance and Frequency of each of the knowledge and skill statements for the task below.

Please consider only ATs who specialize in orthopedics when evaluating the knowledge and skill, using the following scales. The ratings you provide will help to determine if the knowledge and skill pertain to ATs who specialize in orthopedics.

- **Importance:** What level of harm would result (if any) if ATs with an orthopedic specialty were not proficient in the knowledge and skill? (Harm may be physical, psychological, emotional, legal, financial, etc.)
- **Frequency:** How frequently do ATs with an orthopedic specialty perform the knowledge and skill?

Task A. Formulate differential diagnoses by interpreting a comprehensive history to determine an appropriate physical examination.

Knowledge of:

	Importance	Frequency
1. Components of a complete history for the patient		
2. Medical conditions pertinent to orthopedic pathologies		
3. Orthopedic conditions		
4. Epidemiology of injury, illness and comorbidities		
5. Age-related factors		
6. Socioeconomic and cultural considerations		

Skill in:

	Importance	Frequency
1. Engaging in active dialogue with a patient to obtain pertinent information		
2. Synthesizing comprehensive and pertinent patient history (e.g., orthopedic, non-orthopedic) to formulate relevant differential diagnoses		

If you believe there are additional knowledge and skills that should be included in this task, please note them in the box below.

BOC Orthopedic Athletic Trainer

Domain I - Medical Knowledge *continued*

Please rate the Importance and Frequency of each of the knowledge and skill statements for the task below.

Please consider only ATs who specialize in orthopedics when evaluating the knowledge and skill, using the following scales. The ratings you provide will help to determine if the knowledge and skill pertain to ATs who specialize in orthopedics.

- **Importance:** What level of harm would result (if any) if ATs with an orthopedic specialty were not proficient in the knowledge and skill? (Harm may be physical, psychological, emotional, legal, financial, etc.)
- **Frequency:** How frequently do ATs with an orthopedic specialty perform the knowledge and skill?

Task B. Complete a focused physical examination using evidence-based methods to inform the differential diagnosis.

Knowledge of:

	Importance	Frequency
1. Human anatomy and physiology applied to orthopedic pathologies		
2. Orthopedic pathologies		
3. Pathophysiology		
4. Biomechanics		
5. Specificity, sensitivity, methods, and predictive value of tests and tools used in physical examinations for suspected orthopedic conditions		
6. Indications and contraindications for the use of tests and tools		
7. Considerations and strategies for conducting a physical examination		

Skill in:

	Importance	Frequency
1. Recognizing and evaluating pertinent anatomical features through a variety of modalities		
2. Distinguishing origin and signs of localized and systemic infections		
3. Utilizing the appropriate tools during the physical examination		
4. Determining and justifying which selective tissue tests are appropriate		
5. Performing the identified selective tissue, neurovascular and dynamic tests proficiently		
6. Analyzing biomechanics and recognizing movement pattern dysfunction		
7. Recognizing abnormal findings during the physical examination		

If you believe there are additional knowledge and skills that should be included in this task, please note them in the box below.

BOC Orthopedic Athletic Trainer

Domain I - Medical Knowledge *continued*

Please rate the Importance and Frequency of each of the knowledge and skill statements for the task below.

Please consider only ATs who specialize in orthopedics when evaluating the knowledge and skill, using the following scales. The ratings you provide will help to determine if the knowledge and skill pertain to ATs who specialize in orthopedics.

- **Importance:** What level of harm would result (if any) if ATs with an orthopedic specialty were not proficient in the knowledge and skill? (Harm may be physical, psychological, emotional, legal, financial, etc.)
- **Frequency:** How frequently do ATs with an orthopedic specialty perform the knowledge and skill?

Task C. Determine the need for appropriate diagnostic testing based on the history and physical examination to inform the differential diagnosis.

Knowledge of:

	Importance	Frequency
1. Indications and contraindications for recommending and/or ordering diagnostic studies		
2. Specificity, sensitivity, methods and predictive values of diagnostic studies		
3. Mechanics, physiology and other technical differences of diagnostic studies		

Skill in:

	Importance	Frequency
1. Selecting the appropriate diagnostic studies		
2. Recognizing normal and abnormal findings		
3. Interpreting diagnostic studies		

If you believe there are additional knowledge and skills that should be included in this task, please note them in the box below.

BOC Orthopedic Athletic Trainer

Domain I - Medical Knowledge *continued*

Please rate the Importance and Frequency of each of the knowledge and skill statements for the task below.

Please consider only ATs who specialize in orthopedics when evaluating the knowledge and skill, using the following scales. The ratings you provide will help to determine if the knowledge and skill pertain to ATs who specialize in orthopedics.

- **Importance:** What level of harm would result (if any) if ATs with an orthopedic specialty were not proficient in the knowledge and skill? (Harm may be physical, psychological, emotional, legal, financial, etc.)
- **Frequency:** How frequently do ATs with an orthopedic specialty perform the knowledge and skill?

Task D. Synthesize evaluation findings and diagnostic studies consistent with best practice to determine the diagnosis and educate the patient.

Knowledge of:

	Importance	Frequency
1. Relationship between evaluations and diagnostic studies		
2. Recognition and differentiation of severity of injury and illness (e.g., fracture classification)		
3. Case presentation methods		
4. Impact of all components of the patient history on the plan of care		

Skill in:

	Importance	Frequency
1. Assimilating findings to determine a diagnosis		
2. Correlating the physical exam and diagnostic studies to disseminate essential information to the patient and others		

If you believe there are additional knowledge and skills that should be included in this task, please note them in the box below.

BOC Orthopedic Athletic Trainer

Domain I - Medical Knowledge *continued*

Please rate the Importance and Frequency of each of the knowledge and skill statements for the task below.

Please consider only ATs who specialize in orthopedics when evaluating the knowledge and skill, using the following scales. The ratings you provide will help to determine if the knowledge and skill pertain to ATs who specialize in orthopedics.

- **Importance:** What level of harm would result (if any) if ATs with an orthopedic specialty were not proficient in the knowledge and skill? (Harm may be physical, psychological, emotional, legal, financial, etc.)
- **Frequency:** How frequently do ATs with an orthopedic specialty perform the knowledge and skill?

Task E. Formulate the plan of care in collaboration with the interdisciplinary health care team and patient.

Knowledge of:

	Importance	Frequency
1. Evidence-based and/or best practices for the treatment of injuries and illnesses		
2. Therapeutic interventions and their integration into the plan of care (e.g., pharmacology, nutrition, sleep, exercise)		
3. Tissue healing principles, indications and complications		
4. Cognitive, social, psychological, physiological and cultural barriers		
5. Circumstances that indicate the need for consultation or referral		
6. Specialized referral sources in and outside of orthopedics		

Skill in:

	Importance	Frequency
1. Integrating all elements of the patient's condition into the plan of care		
2. Identifying barriers to treatment		
3. Recognizing the need for consultation and/or referral		
4. Applying best practices to the plan of care		
5. Collaborating with interdisciplinary teams and patients		
6. Communicating expectations and the plan of care to patients and interdisciplinary teams		

If you believe there are additional knowledge and skills that should be included in this task, please note them in the box below.

BOC Orthopedic Athletic Trainer

Domain I - Medical Knowledge *continued*

Please rate the Importance and Frequency of each of the knowledge and skill statements for the task below.

Please consider only ATs who specialize in orthopedics when evaluating the knowledge and skill, using the following scales. The ratings you provide will help to determine if the knowledge and skill pertain to ATs who specialize in orthopedics.

- **Importance:** What level of harm would result (if any) if ATs with an orthopedic specialty were not proficient in the knowledge and skill? (Harm may be physical, psychological, emotional, legal, financial, etc.)
- **Frequency:** How frequently do ATs with an orthopedic specialty perform the knowledge and skill?

Task F. Analyze outcomes to optimize the continuum of patient-centered care.

Knowledge of:

	Importance	Frequency
1. Population and patient outcome tools, methods and technologies		
2. Health-related quality of life factors		
3. Return to activity determination based on physical and psychological factors		
4. Evaluation of a patient's unique response to care		
5. Techniques for adapting plans of care and treatment paradigms based on previous measures		

Skill in:

	Importance	Frequency
1. Analyzing patient and population outcome data		
2. Recognizing age-related, socioeconomic and cultural considerations		
3. Incorporating data to modify a patient-centered care plan		
4. Presenting data and findings for further study to the interdisciplinary health care team		

If you believe there are additional knowledge and skills that should be included in this task, please note them in the box below.

BOC Orthopedic Athletic Trainer

Domain II - Procedural Knowledge

The second group of knowledge and skill statements in the practice analysis is in **Procedural Knowledge**. Please rate the Importance and Frequency of each of the knowledge and skill statements for the task below.

Please consider only ATs who specialize in orthopedics when evaluating the knowledge and skill, using the following scales. The ratings you provide will help to determine if the knowledge and skill pertain to ATs who specialize in orthopedics.

- **Importance:** What level of harm would result (if any) if ATs with an orthopedic specialty were not proficient in the knowledge and skill? (Harm may be physical, psychological, emotional, legal, financial, etc.)
- **Frequency:** How frequently do ATs with an orthopedic specialty perform the knowledge and skill?

Task A. Implement the established plan of care utilizing advanced clinical decision making to incorporate appropriate modifications and ensure optimal patient outcomes.

Knowledge of:

	Importance	Frequency
1. A broad range of current and emerging interventions, both operative and nonoperative, that may be called for in plans of care for orthopedic patients		
2. Indications and contraindications of biomechanical devices considering long term sequelae		
3. Physiologic impact of the timing and techniques for application and removal of biomechanical devices		
4. Custom fitting, fabricating and molding techniques		
5. Assessment and management of post-application complications		
6. Appropriate management of urgency and necessity of interventions within the plan of care		
7. Appropriate interdisciplinary collaboration throughout the plan of care		
8. Pain management		

Skill in:

	Importance	Frequency
1. Performing and/or assisting with current and emerging interventions		
2. Performing and/or assisting with modalities		
3. Creating and performing rehabilitative or performance enhancement protocols		
4. Implementing specialized biomechanical devices (e.g., durable medical equipment such as external fixators, prosthetics/orthotics, casting, splinting, traction)		
5. Facilitating appropriate pain management strategies		
6. Educating patients on broad range of current and emerging interventions, both operative and nonoperative		
7. Communicating treatment protocols surrounding biomechanical devices to patients and families		
8. Completing plan of care in the most effective and efficient manner		

If you believe there are additional knowledge and skills that should be included in this task, please note them in the box below.

BOC Orthopedic Athletic Trainer**Domain II - Procedural Knowledge *continued***

Please rate the Importance and Frequency of each of the knowledge and skill statements for the tasks below.

Please consider only ATs who specialize in orthopedics when evaluating the knowledge and skill, using the following scales. The ratings you provide will help to determine if the knowledge and skill pertain to ATs who specialize in orthopedics.

- **Importance:** What level of harm would result (if any) if ATs with an orthopedic specialty were not proficient in the knowledge and skill? (Harm may be physical, psychological, emotional, legal, financial, etc.)
- **Frequency:** How frequently do ATs with an orthopedic specialty perform the knowledge and skill?

Tasks B-G Inclusive:

B. Provide pre-procedural care to ensure optimal patient outcomes.

C. Provide intra-procedural care to ensure optimal patient outcomes.

D. Provide post-procedural care to ensure optimal patient outcomes.

E. Provide pre-operative care to ensure optimal patient outcomes.

F. Provide intra-operative care to ensure optimal patient outcomes.

G. Provide post-operative care to ensure optimal patient outcomes.

Knowledge of:

	Importance	Frequency
1. Applied procedure and surgical anatomy		
2. Procedural and surgical risks, benefits, and potential complications		
3. Pre- and post-procedure and surgical rehabilitation protocols		
4. Appropriate patient positioning techniques		
5. Sterile technique		
6. Interdisciplinary team member roles and responsibilities		
7. Procedure and surgical instrumentation, materials and methods, including ultrasound and fluoroscopy		
8. Orthopedic injection techniques, indications and contraindications		
9. Wound closure materials and methods		
10. Joint manipulation and fracture reduction techniques, indications and contraindications		
11. Phlebotomy and intravenous insertion techniques, indications and contraindications		
12. Intra-procedural technique		
13. Intra-surgical technique		
14. Post-procedural and operative dressing and equipment		
15. Post-procedural and operative observation and management		
16. Pain management strategies		
17. Emergency policies and procedures		
18. Legal and regulatory considerations (e.g., practice act)		
19. Specialized adaptation of rehabilitation techniques and therapeutic interventions		

Skill in:

	Importance	Frequency
1. Preparing appropriate dosage and volume of injectable medications using sterile technique		
2. Preparing devices for image-guided injections		
3. Positioning patients in accordance with the requirements of specific procedures		
4. Demonstrating proper sterile technique throughout procedures and surgeries		
5. Creating a sterile field by prepping the patient and/or draping in the procedure environment		
6. Creating a sterile field by prepping the patient and/or draping in the surgical environment		
7. Performing intra-procedural assistance in a safe and effective manner		
8. Performing surgical assistance in a safe and effective manner		
9. Administering orthopedic injections within the limits of legal and regulatory considerations		
10. Performing phlebotomy within the limits of legal and regulatory considerations		
11. Acquiring intravenous access within the limits of legal and regulatory considerations		
12. Applying and modifying appropriate post-procedural and surgical dressings and equipment.		
13. Applying and modifying appropriate post-procedural and surgical durable medical equipment, casting, splinting, prosthetics and orthotics		
14. Communicating peri-procedural and peri-operative knowledge and expectations with patients and families appropriately		
15. Maintaining post-procedural and post-surgical site care, including dressing changes and wound closure material removal		

If you believe there are additional knowledge and skills that should be included in this task, please note them in the box below.

BOC Orthopedic Athletic Trainer

Domain III - Professional Practice

The third group of knowledge and skill statements in the practice analysis is in **Professional Practice**. Please rate the Importance and Frequency of each of the knowledge and skill statements for the task below.

Please consider only ATs who specialize in orthopedics when evaluating the knowledge and skill, using the following scales. The ratings you provide will help to determine if the knowledge and skill pertain to ATs who specialize in orthopedics.

- **Importance:** What level of harm would result (if any) if ATs with an orthopedic specialty were not proficient in the knowledge and skill? (Harm may be physical, psychological, emotional, legal, financial, etc.)
- **Frequency:** How frequently do ATs with an orthopedic specialty perform the knowledge and skill?

Task A. Establish patient-centered processes and quality care programs that promote value-based care, population health strategies and cost containment to improve patient outcomes.

Knowledge of:

	Importance	Frequency
1. Valued-based care		
2. Quality improvement programs and standards (e.g., Plan-Do-Study-Act cycle, fish-bones model)		
3. Population health strategies (e.g., risk stratification, social determinants)		
4. Cost containment methods (e.g., referral timing, patient care planning)		
5. Reimbursement principles and rules		
6. Outcome metrics (e.g., patient-rated outcomes, clinician-rated outcomes, quality, process)		

Skill in:

	Importance	Frequency
1. Collecting appropriate data (informatics) to improve patient care and contain costs		
2. Interpreting outcome metrics		
3. Using analytics to improve value and to contain cost		
4. Implementing quality improvement programs		
5. Using coding and billing systems		
6. Performing multi-cycle quality improvement initiatives		

If you believe there are additional knowledge and skills that should be included in this task, please note them in the box below.

BOC Orthopedic Athletic Trainer

Domain III - Professional Practice *continued*

Please rate the Importance and Frequency of each of the knowledge and skill statements for the task below.

Please consider only ATs who specialize in orthopedics when evaluating the knowledge and skill, using the following scales. The ratings you provide will help to determine if the knowledge and skill pertain to ATs who specialize in orthopedics.

- **Importance:** What level of harm would result (if any) if ATs with an orthopedic specialty were not proficient in the knowledge and skill? (Harm may be physical, psychological, emotional, legal, financial, etc.)
- **Frequency:** How frequently do ATs with an orthopedic specialty perform the knowledge and skill?

Task B. Collaborate as a leader of the interdisciplinary health care team using effective interpersonal and communication skills to ensure optimal patient care.

Knowledge of:

	Importance	Frequency
1. Interdisciplinary collaboration and influence on the patient experience		
2. Quality and safety programs (e.g., critical review, M & Ms)		
3. Impact of organizational culture on the patient experience		
4. Leadership theory and practice		
5. Contribution of interdisciplinary specialties on the health care team		
6. Strategies for managing communication among members of the interdisciplinary team		

Skill in:

	Importance	Frequency
1. Applying the principles of patient-centered care		
2. Directing care within an interprofessional team		
3. Communicating efficiently and effectively with the interdisciplinary team and patients (e.g., emotional intelligence, empathy)		
4. Teaching and mentoring peers, colleagues and collaborators		
5. Modeling culturally competent communication		
6. Modeling ethical behavior and decision making		
7. Demonstrating leadership		

If you believe there are additional knowledge and skills that should be included in this task, please note them in the box below.

BOC Orthopedic Athletic Trainer

Domain III - Professional Practice *continued*

Please rate the Importance and Frequency of each of the knowledge and skill statements for the task below.

Please consider only ATs who specialize in orthopedics when evaluating the knowledge and skill, using the following scales. The ratings you provide will help to determine if the knowledge and skill pertain to ATs who specialize in orthopedics.

- **Importance:** What level of harm would result (if any) if ATs with an orthopedic specialty were not proficient in the knowledge and skill? (Harm may be physical, psychological, emotional, legal, financial, etc.)
- **Frequency:** How frequently do ATs with an orthopedic specialty perform the knowledge and skill?

Task C. Engage in professional development and reflective practice to support improvement in self and others to enhance patient care.

Knowledge of:

	Importance	Frequency
1. Value of continuous learning and professional growth in the specialty		
2. Continuing education opportunities to improve knowledge of evidence-based medicine in the specialty		
3. Productivity metrics and their effects on value		
4. Practice-based learning and improvement principles		

Skill in:

	Importance	Frequency
1. Taking advantage of opportunities to gain specialty knowledge		
2. Disseminating new research and technology related to orthopedic practice		

If you believe there are additional knowledge and skills that should be included in this task, please note them in the box below.

BOC Orthopedic Athletic Trainer

Demographics

Section 3 Demographics

Please answer all questions according to the instructions given.

1. What is your HIGHEST level of education?

- ☐ Bachelor's degree – AT major
- ☐ Bachelor's degree – Other major
- ☐ Some graduate study
- ☐ Entry-level master's degree in athletic training
- ☐ Master's degree – AT major
- ☐ Master's degree – Other major
- ☐ Doctoral degree – AT major
- ☐ Doctoral degree – Other major

If you answered "Other major" above, please specify your major:

2. Please identify any additional certifications and/or licenses you have that are current. (Please select all that apply.)

- | | |
|--------------------------------|--------------------------------|
| ☐ OTC | ☐ OT |
| ☐ OT-SC | ☐ OTA |
| ☐ OPA | ☐ MD/DO |
| ☐ PA | ☐ RN |
| ☐ PT | ☐ LPN |
| ☐ PTA | ☐ APRN |

Other (please specify)

3. On average, how many hours per week do you practice in your orthopedic specialty?

- ☐ 20 hours or fewer
- ☐ 21 hours to 30 hours
- ☐ 31 hours to 40 hours
- ☐ 41 hours to 50 hours
- ☐ 51 hours to 60 hours
- ☐ More than 60 hours

4. How many orthopedic patients do you serve in your orthopedic specialty practice on average each week?

- ☐ 50 or fewer
- ☐ 51 to 100
- ☐ 101 to 150
- ☐ 151 to 200
- ☐ More than 200

5. Considering all of the orthopedic patients that you serve in your orthopedic specialty practice, what percentage are classified in the following age groups?

Please enter only whole numbers from 0-100 for each age group with no decimals or other non-numeric characters. Please ensure the total equals 100.

Pediatric (birth up to age 18)

Adult (18 to 65)

Geriatric (older than 65)

6. What type of physician do you work with in your specialty in orthopedics? (Please select all that apply.)

- ☐ Orthopedist
- ☐ Primary care sports medicine physician
- ☐ Primary care physician
- ☐ Physiatrist
- ☐ Podiatrist
- ☐ Other

7. Where does your orthopedic specialty practice take place primarily?

- ☐ High school athletics department
- ☐ Hospital/health care facility
- ☐ Hospital-based physician office
- ☐ Operating room
- ☐ Private practice physician office
- ☐ Professional or collegiate sports team
- ☐ Other (please specify)

8. Do you spend 50% or more of your time working in an orthopedic physician practice?

- ☐ Yes
- ☐ No

9. Do you work in an administrative role (e.g., practice manager, practice coordinator, director) in an orthopedic physician practice?

- ☐ Yes
- ☐ No

10. What is your age?

- ☐ Less than 25 years
- ☐ 25 to 29 years
- ☐ 30 to 34 years
- ☐ 35 to 39 years
- ☐ 40 to 44 years
- ☐ 45 to 49 years
- ☐ 50 or more years

11. Please indicate the U.S. state or territory in which you are employed as a specialist in orthopedics.

12. Based on the orthopedic practice outline that you just reviewed (domains, tasks, knowledge and skill statements), do you consider yourself an "orthopedic specialist?"

- ☐ Yes
- ☐ No

Thank you for participating in this survey.

Clicking "Done" will record your responses and redirect you to the BOC website.

APPENDIX E

WEIGHTING OF DOMAINS

BOARD OF CERTIFICATION SPECIALTY COUNCIL
PRACTICE ANALYSIS STUDY FOR ATHLETIC TRAINERS WITH AN ORTHOPEDIC SPECIALTY
EXECUTIVE SUMMARY, NOVEMBER 2020

The Board of Certification, Inc. (BOC) was incorporated in 1989 to provide a certification program for entry-level Athletic Trainers (ATs). The BOC establishes and regularly reviews both the standards for the practice of athletic training and the continuing education requirements for BOC Certified ATs. The BOC has the only accredited certification program for ATs in the United States. The BOC's mission is to *provide exceptional credentialing programs for healthcare professionals to assure protection of the public*. Consistent with its mission, the BOC sponsors a Specialty Council to oversee specialty certification.

The BOC is updating a practice analysis study to ensure the certification examination to be developed for ATs who specialize in orthopedics is current and well-designed. The purpose of the study is to identify and validate the significant responsibilities that ATs who specialize in orthopedics have in their work, and as well as the specialized knowledge and skill they must possess. Doing so maintains close alignment with best practices in certification. As the primary process for identifying the subject matter to be assessed in the specialty examination, practice analysis helps to establish content validity. Validation through systematic practice analysis study helps to support the claim that a certification examination bears a sound linkage to practice.

The practice analysis study began in early 2020 with the advice of a task force made up of individuals who have a deep understanding of plans for AT specialization in orthopedics. This group established guidelines for the composition of the practice analysis panel, and it provided direction for the various components of the study. The practice analysis panel approved by the advisory task force was made up of ATs who specialize in orthopedics from a variety of practice settings. With the exception of one orthopedic surgeon, all members of the panel were ATs who specialize in orthopedics.

The practice analysis study consisted of two major phases:

1. Initial Development and Validation. The advisory task force worked with Scantron to design and manage the study and to convene a panel of ATs who specialize in orthopedics and others with expertise in orthopedics to delineate domains, tasks, and knowledge and skill. The task force revised the scales that Scantron had proposed for the survey. Using the revised scales, the panel selected and refined scales to use in the survey to ensure that data collected in the validation study would support the objectives for the program.
2. Validation Study. The BOC provided the names of ATs who are known to have completed an AT residency in orthopedics as well as other ATs whose background suggested they might specialize in orthopedics. Additionally, the sample included members of a special interest group focused on orthopedics as a specialty practice area for ATs. All of these individuals were invited to complete a validation survey based on the work of the panel. A qualified group of respondents provided data in this phase. The analysis of data collected in the validation survey is the major focus of this report.

The practice analysis validation study examined the nature of harm that an inability to perform the tasks competently might bring about (Importance) and how often ATs who specialize in orthopedics perform the tasks (Frequency). Ratings addressing these issues and provided by participants in the nationwide survey play an important role in understanding the essential knowledge base and documenting its fidelity to practice.

Given that no certification program for ATs who specialize in orthopedics had been established at the time of the study, the sampling strategy required the BOC to identify potentially qualified respondents from several sources. First, a targeted list was developed of individuals who could reasonably be considered ATs who specialize in orthopedics. This targeted list included the graduates of all CAATE-accredited AT residency programs in orthopedics, all members of the Athletic Trainers in Physician Practice Society, and all members of the Athletic Trainers in the Orthopedic Physician Practice Setting Facebook group. After identifying and removing duplicates,

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Executive Summary: Practice Analysis Study for Athletic Trainers Who Specialize in Orthopedics

537 unique individuals remained on the targeted list. Given a desired sample size of 2,000 and the understanding that ATs who specialize in orthopedics often work as specialists in traditional and clinical setting, the BOC selected 1,463 additional ATCs from its databases, distributed as follows:

- 585 whose professional setting was identified as “Univ/College/JC – AT” (40% of 1,463)
- 146 whose professional setting was identified as “Secondary School – AT” (10% of 1,463)
- 732 whose professional setting was identified as “Clinic/Hospital – AT” (50% of 1463)

Once the sample had been populated according to this plan, the Specialty Council hosted a webinar on August 6, 2020 to which all individuals in the sample were invited. On August 12, 2020, Scantron distributed an invitation email to participate in the survey to all 2,000 individuals in the sample, with a due date of September 8, 2020. Eighteen individuals opted out of the survey, leaving an effective sample of 1,982. The invitation included a link to the online survey and an access code. The survey driver allowed respondents work on the survey for a time, close the survey if their schedule required, and resume work where they had left off using the link and reentering the access code. During the data collection period, Scantron sent four follow-up reminder emails to members of the sample who had not submitted the survey at the time the reminders were sent, and the BOC sent a reminder on September 2. On September 9, Scantron sent an email to members of the sample who had not submitted the survey to announce a one-week extension. Scantron closed the survey on September 16.

At the conclusion of the survey, 383 respondents provided at least some of the ratings that had been requested; however, of these, 44 indicated at the end of the survey that they did not consider themselves to be ATs who specialize in orthopedics, and they were dropped from the analysis, leaving 339 respondents who were qualified and included in the analysis. It is important in evaluating this level of participation to recognize that the size and other dimensions of the population of ATs who specialize in orthopedics are not known. For this reason, it is challenging to determine a valid response rate. Given 2,000 in the sample and 383 people providing useful data, a response rate of 17% can be computed; however, given that more than 70% of the sample were ATCs not known to the BOC to specialize in orthopedics, the rate of participation among members of the target population is likely to be somewhat higher than 17%.

Respondents were asked to evaluate each task by using scales for Importance, and Frequency. The Importance scale employed four units (1 to 4), with a “4” indicating the potential for extreme harm. A 5-point scale (1 to 5) was used for the Frequency scale, with a response of “5” representing the greatest frequency. The scales are listed below as a reference:

Importance: What level of harm would result (if any) if ATs with an orthopedic specialty were not proficient in the domain or task? (Harm may be physical, psychological, emotional, legal, financial, etc.)

- 1 = No harm at all
- 2 = Minimal harm
- 3 = Moderate harm
- 4 = Extreme harm

Frequency: How frequently do ATs with an orthopedic specialty perform the domain or task?

- 1 = Never
- 2 = Rarely (once per year)
- 3 = Sometimes (once per month)
- 4 = Often (once per week)
- 5 = Repeatedly (daily)

Data collected in the validation study, summarized in Table 1, but presented in substantial detail in the full report, are reliable (i.e., substantially free from measurement error) and validate that the domains, tasks, and knowledge and skill statements are appropriate elements of responsibility in the practice of ATs with a specialty in orthopedics. All elements of the outline achieve sufficient endorsement from respondents. As a result, several specific recommendations may be useful to BOC:

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Executive Summary: Practice Analysis Study for Athletic Trainers Who Specialize in Orthopedics

1. The content outline for the certification examination should be based on the practice analysis.
2. A multiple-choice examination may be developed in accordance with psychometric and test development principles as an effective assessment of knowledge required by ATs who specialize in orthopedics.
3. A single examination program is appropriate.

Test Specifications

The design of and specifications for the specialty certification examination in orthopedics are based on the practice analysis and involve a set of decisions made by the BOC in consultation with Scantron. These decisions are summarized in the Examination Specifications Document prepared by Scantron.

Several approaches may be used to determine appropriate weighting by domain for items on a multiple-choice examination: a top-down approach with the Importance and Frequency averages multiplied, and a bottom-up approach with the Importance and Frequency averages multiplied. Because the rating scales presented a different number of options and measured respondents' endorsement in different ways, Scantron standardized the average ratings for the domains and tasks so they would be on the same scale, a step that enhances their utility in the computation of weights. The top-down approach used the standardized Importance and Frequency data from the domains only to calculate the appropriate weights, whereas the bottom-up approaches first evaluated Importance and Frequency standardized data for each task, and then sum the tasks in a domain to arrive at the weight for that domain.

Table 1 and Table 2 summarize the weights by domain and task for each approach. The top-down approach assigns weights based on the domain ratings and the bottom-up approach used the task level. Either of these approaches would result in a classification system and examination that effectively assess the knowledge required by ATs who specialize in orthopedics. It is important to keep in mind that expert judgment applied by the Practice Analysis Task Force may alter the recommendation to ensure the test samples the universe of specialty knowledge optimally for certification purposes, given the possibility that continuing education and other policies may be used to ensure proficiency on all three domains over time.

Recognizing that the computed weights are arithmetically derived from the ratings of qualified respondents in the validation survey, the Practice Analysis Task Force desired to adhere as closely as possible to them while at the same time ensuring an appropriate balance among the domains. They believed the best weighting structure would be to weight Medical Knowledge and Procedural Knowledge equally. They also found that much of the Professional Practice domain was measured in the entry-level ATC program and that a small amount of weight would be appropriate. Scantron confirmed that the accrediting bodies for certification programs permit judgment on the part of the policy-making body. Consequently, the Practice Analysis Task Force and Specialty Council recommend the following weights for domains:

Medical Knowledge	46%
Procedural Knowledge	46%
Professional Practice	8%

Given approval of the Practice Analysis Task Force recommendation, Scantron will compute weights for the tasks using the mean Importance and Frequency ratings from the survey, prorated within the domain-level percentages.

Table 1: Domain Weights Determined from Survey Data Using Two Approaches

Domain	Importance	Imp_Std	Frequency	Freq_Std	TopDown	BottomUp
Medical Knowledge	3.2	19.7	4.6	23.9	50.1%	39.3%
Procedural Knowledge	3.3	21.2	4.1	15.8	35.5%	50.1%
Professional Practice	2.5	9.6	4.0	14.18	14.4%	10.6%
Total					100.0%	100.0%

Table 2: Task Weights Determined from Survey Data Using Two Approaches

Task	Importance	Imp_Std	Frequency	Freq_Std	TopDown	BottomUp
Formulate differential diagnosis	2.7	12.5	4.5	22.3	10.8%	8.5%
Complete physical examination	2.8	13.9	4.3	19.0	10.3%	8.1%
Determine the need for testing	2.7	12.5	4.1	15.8	7.7%	6.0%
Synthesize findings and studies	2.9	15.4	4	14.1	8.5%	6.6%
Formulate a plan of care	2.8	13.9	4.2	17.4	9.4%	7.4%
Analyze outcomes	2.4	8.2	3.8	10.9	3.5%	2.7%
Implement plan of care	3	16.8	4.1	15.8	5.7%	8.1%
Pre-procedural care	3	16.8	4.1	15.8	5.7%	8.1%
Intra-procedural care	3.3	21.2	3.6	7.7	3.5%	4.9%
Post-procedural care	3.1	18.3	4.2	17.4	6.9%	9.7%
Pre-operative care	3	16.8	4	14.1	5.1%	7.3%
Intra-operative care	3.4	22.6	3.2	1.2	0.6%	0.8%
Post-operative care	3.3	21.2	4.2	17.4	7.9%	11.2%
Establish processes & programs	2.4	8.2	3.8	10.9	3.7%	2.7%
Collaborate with health care team	2.5	9.6	4.1	15.8	6.3%	4.6%
Engage in professional development	2.3	6.7	4.1	15.8	4.4%	3.3%
Total					100.0%	100.0%

APPENDIX F

COMPARISON REPORT

Appendix 5. Between-Group Comparisons for All Tasks and for Skills in Procedural Knowledge, Tasks B through G, Pertaining to Surgery and Injection

The tables below compare the mean responses from five groups of examinees based on where they got their advanced AT education and training in orthopedics. Though respondents could indicate as many of the five program types as they found appropriate, for the purpose of this analysis Scantron established a hierarchy: CAATE-accredited residency (Res_CAATE), Non-accredited residency (Res_NON), Graduate AT curriculum in orthopedics (Graduate), On-the-job training in an orthopedic physician practice (OJT_Phys), and On-the-job Training in a Different Setting (OJT_Oth). For example, if a respondent who completed a CAATE-accredited residence also marked on-the-job training in an orthopedic physician practice, he or she was included in the CAATE-accredited program group.

The method for testing the statistical significance of differences in means for these groups was the Kruskal-Wallis one-way analysis of variance. This non-parametric method is appropriate for the analysis because the data formed a negatively skewed distribution, given the nature and purpose of the validation study. For each of the six tasks in Medical Knowledge, Table 5.1 presents the number of the 339 respondents for each group, along with the mean, the degrees of freedom (DF), Mean Square among groups (MS Among), the Mean Square error term (MS Error), the F statistic obtained, and the probability of between-group differences as accounted for by the F statistic. Three tasks have significant between-group differences ($\alpha \leq 0.01$) for Frequency, but the means indicate the tasks are performed on close to a weekly basis or more often by all groups, so the statistical significance does not have programmatic importance.

Table 5.1. Tasks in Medical Knowledge

Scale	Task	Res_CAATE		Res_NON		Graduate		OJT_Phys		OJT_Oth		DF	MS Among	MS Error	F	Prob F
		N	Mean	N	Mean	N	Mean	N	Mean	N	Mean					
Importance	1	55	2.764	37	2.595	38	2.868	195	2.636	14	3.071	4	1.110	0.680	1.631	0.166
Frequency	1	55	4.745	37	4.703	37	4.622	195	4.415	14	4.500	4	1.634	0.678	2.411	0.049
Importance	2	55	2.836	37	2.865	37	3.081	195	2.682	14	3.143	4	1.869	0.560	3.335	0.011
Frequency	2	55	4.655	37	4.378	37	4.541	195	4.103	14	4.786	4	5.046	0.843	5.988	0.000*
Importance	3	55	2.782	37	2.838	37	2.892	195	2.569	14	3.000	4	1.741	0.564	3.088	0.016
Frequency	3	55	4.291	37	4.135	36	4.417	195	3.959	14	4.000	4	2.396	0.976	2.454	0.046
Importance	4	55	2.800	37	3.135	37	3.000	195	2.846	14	2.929	4	0.878	0.599	1.466	0.212
Frequency	4	55	4.364	37	4.108	37	4.135	195	3.831	14	4.286	4	3.777	1.000	3.778	0.005*
Importance	5	55	2.836	37	2.946	37	2.784	195	2.723	14	3.000	4	0.625	0.711	0.878	0.477
Frequency	5	55	4.491	37	4.378	37	4.378	195	4.010	14	4.286	4	3.501	0.907	3.860	0.004*
Importance	6	55	2.345	37	2.297	37	2.486	195	2.338	14	2.643	4	0.489	0.613	0.796	0.528
Frequency	6	55	3.964	37	3.784	36	4.056	193	3.668	14	4.286	4	2.619	1.072	2.443	0.047

There was statistical significance for the Frequency ratings provided for Task 6 in Procedural Knowledge ($\alpha \leq 0.01$); however, the means for all groups indicate this task is performed about once per month or more often, but not as often as weekly. Given this finding, the statistical significance does not indicate programmatic significance.

Table 5.2. Tasks in Procedural Knowledge

		Res_CAATE		Res_NON		Graduate		OJT_Phys		OJT_Oth		MS		MS		Prob	
Scale	Task	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	DF	Among	Error	F	F	F
Importance	1	50	2.920	35	3.000	35	3.029	176	2.926	13	3.692	4	1.845	0.551	3.350	0.011	
Frequency	1	50	4.280	35	4.057	35	4.400	176	3.972	13	4.615	4	2.794	0.837	3.340	0.011	
Importance	2	51	2.882	35	2.914	33	3.242	176	3.000	13	3.000	4	0.725	0.621	1.168	0.325	
Frequency	2	51	4.020	35	4.371	33	4.152	175	4.086	13	4.154	4	0.744	0.738	1.009	0.403	
Importance	3	51	3.176	35	3.314	33	3.455	175	3.257	13	3.231	4	0.422	0.645	0.654	0.625	
Frequency	3	51	3.529	35	3.886	33	3.455	175	3.560	13	3.923	4	1.360	1.359	1.001	0.407	
Importance	4	51	3.216	35	3.029	33	3.242	176	3.097	13	3.231	4	0.370	0.579	0.639	0.635	
Frequency	4	51	4.176	35	4.457	33	4.303	176	4.216	13	4.154	4	0.546	0.649	0.841	0.500	
Importance	5	51	3.118	35	3.029	33	3.182	175	2.971	13	3.077	4	0.445	0.699	0.638	0.636	
Frequency	5	51	4.098	34	4.000	33	4.152	174	3.966	13	3.769	4	0.536	1.030	0.521	0.721	
Importance	6	51	3.451	35	3.543	34	3.588	176	3.358	13	3.154	4	0.778	0.703	1.107	0.353	
Frequency	6	51	3.647	35	3.600	34	3.088	174	2.948	13	3.077	4	6.735	1.656	4.066	0.003*	
Importance	7	51	3.412	35	3.086	34	3.412	174	3.253	13	3.385	4	0.766	0.561	1.366	0.246	
Frequency	7	51	4.392	35	4.143	33	4.303	176	4.136	13	4.000	4	0.890	0.826	1.078	0.368	

None of the task means in Professional Practice showed that any of the between-group differences were significant ($\alpha \leq 0.01$).

Table 5.3. Tasks in Professional Practice

		Res_CAATE		Res_NON		Graduate		OJT_Phys		OJT_Oth		MS	MS			
Scale	Task	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	DF	Among	Error	F	Prob F
Importance	1	51	2.314	35	2.343	33	2.667	173	2.393	12	2.750	4	1.056	0.635	1.664	0.158
Frequency	1	51	3.627	35	3.886	33	4.152	172	3.715	12	3.917	4	1.769	1.012	1.747	0.140
Importance	2	51	2.529	35	2.514	33	2.606	173	2.474	12	2.750	4	0.309	0.711	0.435	0.784
Frequency	2	51	4.216	35	4.343	32	4.000	173	4.121	12	3.917	4	0.754	0.865	0.872	0.481
Importance	6	51	2.431	35	2.200	33	2.515	173	2.283	12	2.667	4	0.990	0.823	1.203	0.310
Frequency	6	51	4.039	35	4.171	33	4.000	171	4.047	12	4.167	4	0.185	0.755	0.246	0.912

Finally, it was important in the study to evaluate if there were significant differences in the Importance or Frequency of the skills related to surgery and injections that pertained to tasks B through G in Procedural Knowledge. Observing significant differences in these skills might indicate that practice is different for the ATs specializing in orthopedics but receiving their advanced education and training in orthopedics by completing the different program types. None of the skills related to surgery and injections had mean between-group differences that were significant at $\alpha \leq 0.01$.

Table 5.4. Surgery and Injection Skills in Procedural Knowledge

Scale	Skill	Res_CAATE N Mean	Res_NON N Mean	Graduate N Mean	OJT_Phys N Mean	OJT_Oth N Mean	MS DF Among	MS Error	F	Prob F
Importance	1	44 3.341	23 3.565	26 3.692	120 3.450	8 3.750	4 0.720	0.520	1.386	0.240
Frequency	1	44 3.682	23 3.826	26 3.577	121 4.174	8 2.875	4 5.568	1.702	3.271	0.013
Importance	2	44 2.841	23 2.913	26 3.000	120 2.883	8 3.000	4 0.132	0.750	0.176	0.951
Frequency	2	44 2.818	23 3.435	26 3.192	121 3.587	8 3.000	4 5.255	1.823	2.883	0.024
Importance	3	44 2.909	23 3.217	26 3.000	120 2.833	8 3.250	4 0.994	0.702	1.415	0.230
Frequency	3	44 3.591	23 3.739	26 3.500	121 3.769	8 3.500	4 0.616	1.415	0.435	0.783
Importance	4	44 3.500	23 3.652	26 3.692	120 3.592	8 3.625	4 0.181	0.457	0.397	0.810
Frequency	4	44 3.750	23 4.000	25 3.400	121 3.777	8 3.750	4 1.147	1.531	0.749	0.560
Importance	5	44 3.364	23 3.565	26 3.577	120 3.425	8 3.500	4 0.287	0.581	0.493	0.741
Frequency	5	44 3.500	23 3.826	26 3.346	121 3.579	8 3.125	4 1.120	1.634	0.686	0.603
Importance	6	44 3.477	23 3.609	26 3.462	120 3.467	8 3.500	4 0.103	0.568	0.181	0.948
Frequency	6	44 3.500	23 3.870	25 3.000	121 3.174	8 3.375	4 3.363	1.939	1.734	0.144
Importance	7	44 3.250	23 3.435	26 3.500	120 3.292	8 3.250	4 0.374	0.633	0.591	0.669
Frequency	7	44 3.500	23 3.783	25 3.200	121 3.446	8 3.125	4 1.266	1.693	0.748	0.561
Importance	8	44 3.591	23 3.522	26 3.500	119 3.471	8 3.125	4 0.396	0.593	0.668	0.615
Frequency	8	44 3.455	23 3.826	26 2.846	120 2.967	8 3.125	4 5.257	2.122	2.477	0.045
Importance	9	44 3.409	23 3.522	26 3.615	120 3.433	8 3.500	4 0.232	0.593	0.391	0.815
Frequency	9	44 2.455	23 2.739	26 2.654	120 2.267	8 2.750	4 1.877	2.084	0.900	0.465
Importance	10	44 3.409	23 3.435	26 3.308	120 3.250	8 3.500	4 0.375	0.696	0.539	0.707
Frequency	10	44 2.136	23 2.348	26 2.038	121 2.198	8 2.500	4 0.518	1.560	0.332	0.856
Importance	11	44 3.386	23 3.435	26 3.462	120 3.317	8 3.250	4 0.187	0.676	0.277	0.893
Frequency	11	44 1.909	23 2.217	26 2.038	121 2.025	8 2.625	4 1.059	1.425	0.743	0.563