

# National Board for Certification of Orthopaedic Technologists, Inc.



## Orthopaedic Technologist Certified Content Analysis Report 2012

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## Introduction

### ***Survey Overview: The Content Validation Model***

The foundation of a valid, reliable, and legally defensible professional licensing/certification program is a well-constructed job analysis study. The job analysis study establishes the link between test scores achieved on licensing exams and the competencies being tested; therefore, pass or fail decisions correlate to competent performance. When evidence of validity based on examination content is presented for a specific professional role, it is critical to consider the importance of the competencies being tested. The Joint Standards for Educational and Psychological Testing (AERA, APA, and NCME, 1999) state:

#### *Standard 14.10*

When evidence of validity based on test content is presented, the rationale for defining and describing a specific job content domain in a particular way (e.g., in terms of tasks to be performed or knowledge, skills, abilities, or other personal characteristics) should be stated clearly.

#### *Standard 14.14*

The content domain to be covered by a credentialing test should be defined clearly and justified in terms of the importance of the content for the credential-worthy performance in an occupation or profession. A rationale should be provided to support a claim that the knowledge or skills being assessed are required for credential-worthy performance in an occupation and are consistent with the purpose for which the licensing or certification program was instituted.

### ***Purpose of the Content Analysis Study***

In order to meet the aforementioned standards, it is essential that examination content be examined periodically to ensure that existing outlines continue to cover the knowledge, skills and abilities (KSAs) required for competent practice in the occupation or profession of interest. To this end, the National Board for Certification of Orthopaedic Technologists (NBCOT), worked with Schroeder Measurement Technologies, Inc. (SMT), to conduct a content analysis of the existing Orthopaedic Technologist Certified (OTC) examination.

The content analysis included establishing and implementing an online survey instrument that described the performance activities (task elements) and KSAs required of a competent orthopaedic technologist. Based on the results of the survey, NBCOT evaluated the need for a content update for the existing OTC examination. This report provides an overview of the survey design, analysis, and results. Survey results of demographic data are displayed graphically. In addition, the implications of these results on examination development are discussed.

# Survey Methodology

## *Survey Development*

The online survey was developed using task elements from the existing OTC examination blueprint. NBCOT and SMT developed the following survey parts:

1. Task element list
2. Survey rating scale
3. Demographic questions

A copy of the survey appears in Appendix A and the existing OTC examination blueprint appears in Appendix B.

## **Task Element List and Survey Rating Scale**

The following performance and importance rating scale for the job domains section of the survey were used:

### **Performance:**

0 = Not Performed

### **Importance:**

- 1 = Of No Importance
- 2 = Of Little Importance
- 3 = Moderately Important
- 4 = Very Important
- 5 = Extremely Important

The following instructions were provided to respondents:

*This survey should take approximately 30 minutes to complete. You may revisit your survey record at any time during the survey administration period of October 1 – November 18, 2012.*

*There are three sections in this survey:*

*Section 1. Demographic Questions: Demographic questions help us develop a profile of the OTC and the environment in which you practice.*

*Section 2. Job Domains: This section lists tasks and knowledge elements performed or used by an OTC in his or her work. You are asked to indicate whether or not you perform the element and the importance of each to competent practice and patient safety.*

*Section 3. Post-Survey Questionnaire: In this section, you are asked to consider the four job domains and assign the distribution of questions for the NBCOT OTC examination. You will also have the opportunity to specify any tasks or knowledge elements you feel may have been overlooked in this survey.*

### ***Rating Scale***

*How important is this task or knowledge element to the practice of an OTC? Please select "Not Performed" if you do NOT perform the element in your role as an OTC. For those elements you perform, provide an importance rating using the scale range from "Of No Importance" to "Extremely Important."*

### **Demographic Questions**

In order to evaluate whether the importance of task elements varies according to respondents' experience, region of practice, or other factors, a demographic questionnaire was included in the survey. These demographic questions gathered the following information:

1. How many years have you been practicing as an OTC?
2. In which geographic region do you currently practice?
3. Which of the following best describes your primary work setting as an OTC?
4. Which of the following best describes your primary role at your workplace?
5. What is your highest educational degree?
6. What professional designations do you currently hold?
7. What is your age?
8. What is your gender?
9. Which of the following best describes your race or ethnicity?

### ***Sampling Methodology, Data Collection and Analyses***

In October 2012, a call for participation in the online survey was made to 1317 certified OTCs. The online survey was available to respondents from October 1 to November 18, 2012, a period of approximately six weeks. After the close of the administration window, SMT collected the data and analyzed respondent demographics, task element importance ratings, and percentage of task elements not performed using SPSS<sup>®</sup> version 20.0 and Microsoft Excel<sup>®</sup> 2010 computer programs. A total of 263 individuals responded to the survey, yielding a response rate of approximately 20%; the responses of five individuals were removed due to incomplete data. Consequently, results are based on a sample of 258 respondents.

# Survey Results

Results are divided into the following three sections:

1. Survey adequacy and reliability information
2. Demographic results
3. Importance ratings

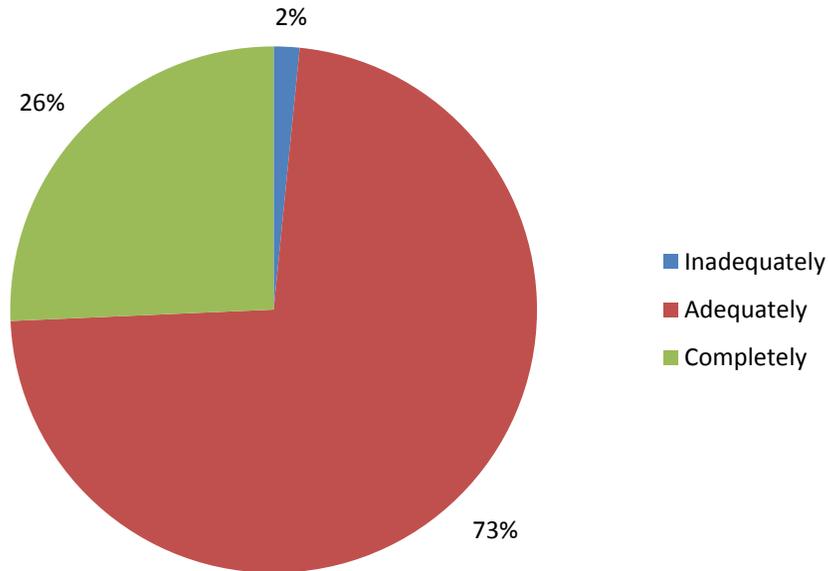
## *Survey Adequacy and Reliability Information*

### **Survey Adequacy**

At the end of the survey, respondents were asked to rate the effectiveness of the survey in identifying essential task elements performed by an OTC. Approximately 99% (249 of 253) of respondents indicated that the survey either adequately or completely covered the essential tasks performed by an OTC (Figure 1 and Table 1). Five respondents did not provide a response to this item.

*How well did this survey cover the essential elements of knowledge, skills, abilities, and tasks required of a competent OTC?*

Drop-down list:      *Completely*  
                                 *Adequately*  
                                 *Inadequately*



**FIGURE 1.** *Survey adequacy.*

**TABLE 1. Survey Adequacy**

<b>Adequacy</b>	<b>Frequency</b>	<b>Percent</b>
Inadequately	4	2%
Adequately	184	73%
Completely	65	26%

If survey respondents selected “Inadequately” for this question, they were asked to indicate why they selected that option. They were provided with a text field to provide comments. These free-text responses, without any edits, can be found in Appendix C.

### **Missing Task Elements and KSAs**

At the end of the survey, respondents were asked for feedback on task and knowledge elements that they felt were missing in the survey.

*In the space provided below, please specify the job tasks or competencies that are important for an OTC to perform or understand but you feel were not covered in this survey.*

These free-text responses, without any edits, can be found in Appendix D.

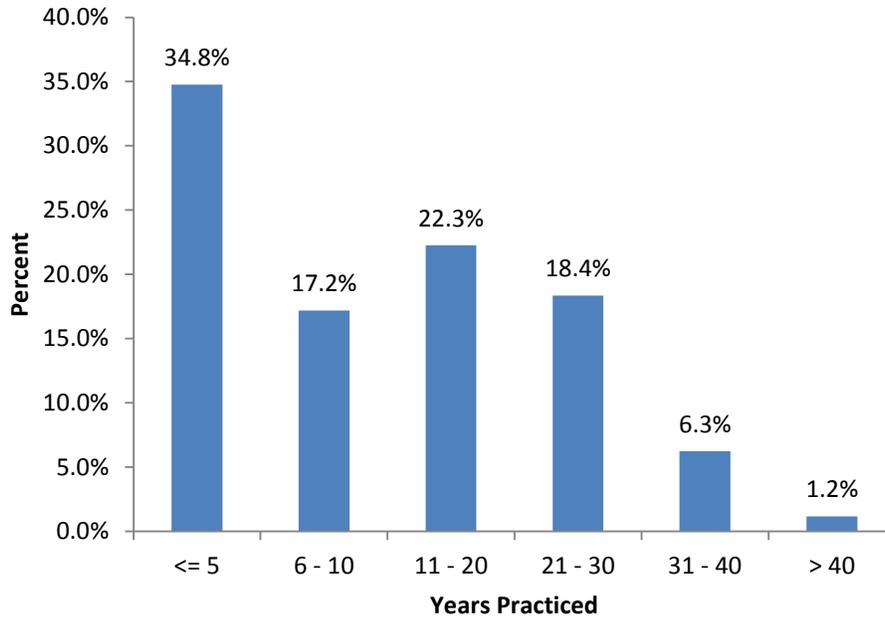
### **Reliability Estimate**

The Cronbach’s Alpha reliability estimate was calculated to evaluate the internal consistency of the task element ratings. This statistic is bound between 0 and 1, with higher values indicating higher reliability, meaning that ratings obtained from the survey are reliable and consistent. As a rule of thumb, reliability estimates above 0.7 are considered acceptable. For this survey, Cronbach’s Alpha was 0.89 for the importance ratings, indicating that the ratings obtained were reliable.

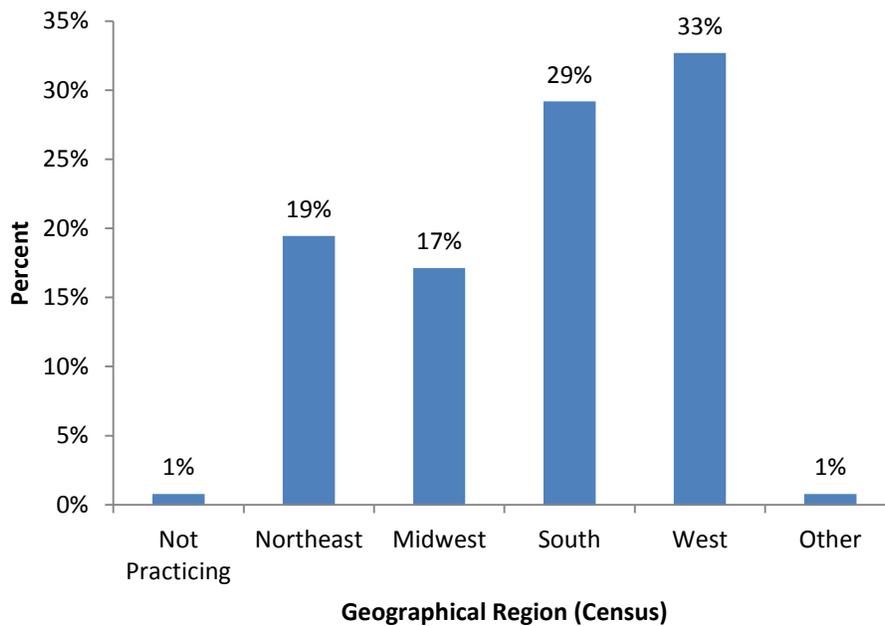
## ***Demographic Results***

### **Years of Experience**

The experience of respondents as OTCs ranged from 0 to 45 years, with an average of 13.21 years. Over half of the respondents (65%, 167 of 256) have more than 5 years of experience; Figure 2 shows a frequency distribution of the number of years of experience. Two respondents did not provide a response to this item.



**FIGURE 2. *Years of Experience as an OTC.***

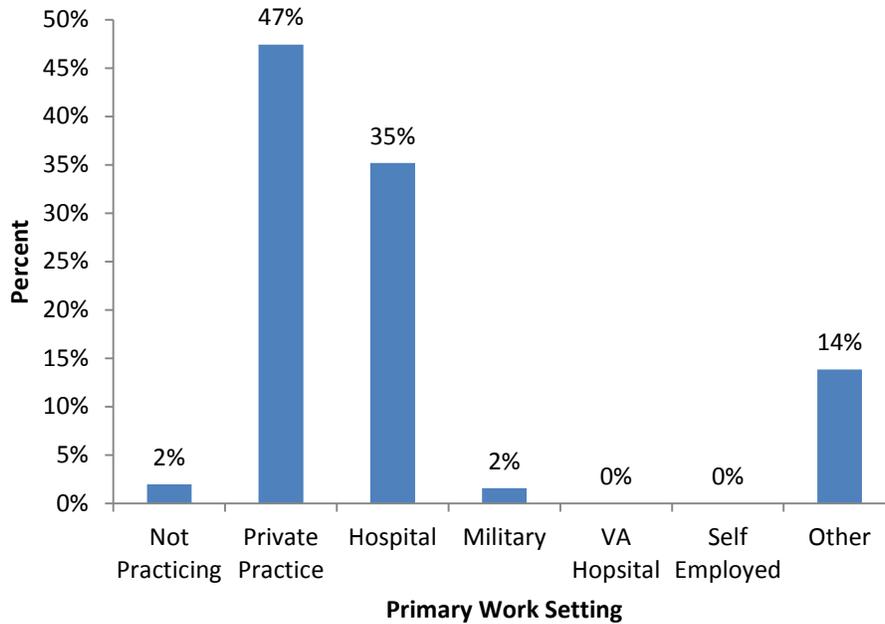


**FIGURE 3. *Geographical Region.***

### **Geographical Region**

Respondents were asked to indicate the state or U.S. territory in which they currently practice. Figure 3 shows a frequency distribution of the results grouped by the U.S. geographic census regions: *North, South, Midwest, and West*. One respondent did not provide a response to this

item. The majority of respondents (62%, 159 of 257) practice in the western and southern states. Other practice regions indicated by respondents are Canada and Puerto Rico.



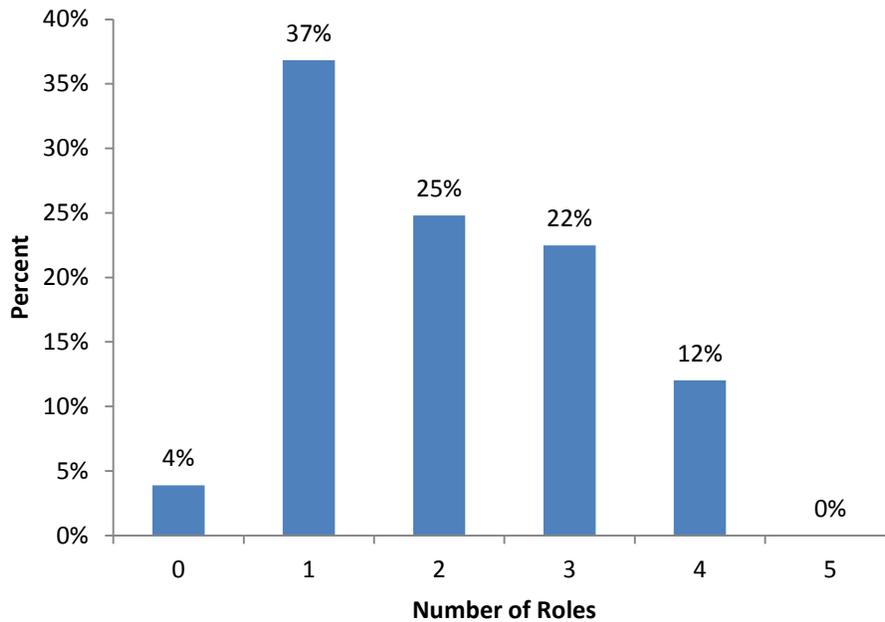
**FIGURE 4. Primary Work Setting.**

**Primary Work Setting**

Respondents could select from a list of seven options including “Other” to identify their primary work setting. The possible selections are listed below; the distribution of work settings is shown in Figure 4. Figure 4 shows that the majority of respondents (47%, 120 of 253) are private practitioners. Other practice settings are shown in Appendix E. Five respondents did not provide a response to this item.

*Which of the following best describes your primary work setting as an OTC?*

- Drop-down list:
- Not currently practicing*
  - Private Practice*
  - Hospital*
  - Military*
  - VA Hospital*
  - Self Employed*
  - Other (please specify)*



**FIGURE 5. *Number of Roles at Workplace.***

**TABLE 2. *Primary Role.***

<b>Primary Role</b>	<b>Frequency</b>
Not Practicing	6
Assessment	117
Casting	221
Assist OR	108
Traction	69
Other	65

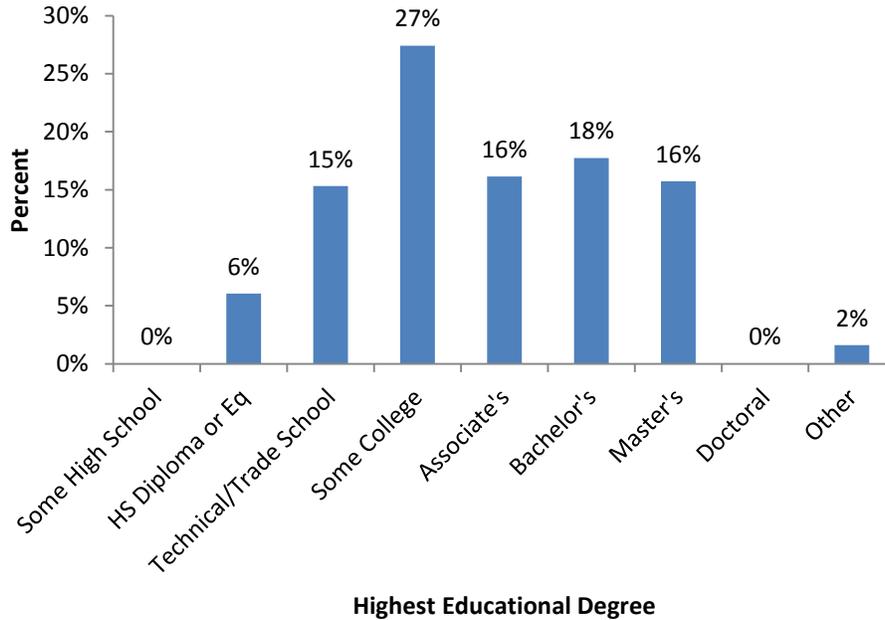
**Primary Role at Workplace**

The frequency of different types of primary roles is detailed in Table 2. From Table 2, it can be seen that the majority of respondents perform roles in assessment and casting. As respondents perform multiple roles in their workplaces, a distribution of the number of primary workplace roles is shown in Figure 5. The majority of respondents have at least 2 roles at their workplace (59%, 153 of 258). Other workplace roles are detailed in Appendix F.

*Which of the following best describes your primary role at your workplace?*

Drop-down list:      *Not currently practicing*

*Assessment*  
*Casting Splinting & Bracing*  
*Assist in the OR*  
*Apply Traction (Manual, Skin or Skeletal)*  
*Other (please specify)*



**FIGURE 6. Level of Education.**

**Level of Education**

Figure 6 shows a distribution of the education level of respondents (ten respondents did not provide a response). Other responses for education level include “RTR,” “LPN,” and “USAF.”

*What is your highest educational degree?*

- Drop-down list:
- Some high school*
  - High school diploma or equivalent*
  - Technical or trade school certificate/degree*
  - Some college*
  - Associate's degree*
  - Bachelor's degree*
  - Master's degree*
  - Doctoral degree (PhD or equivalent)*
  - Other (please specify)*

### Professional Designations

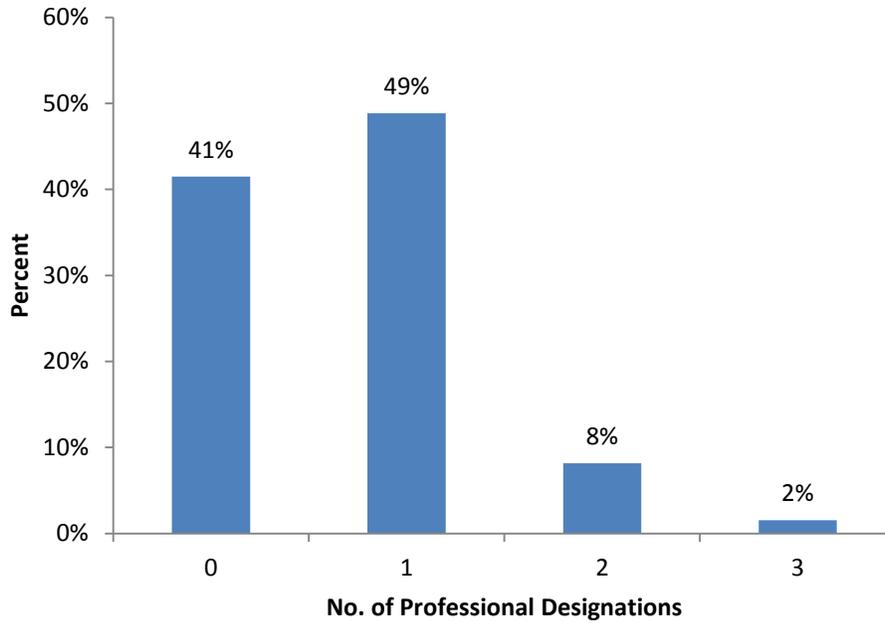
Table 3 shows the number of respondents holding a particular professional designation, while Figure 7 shows a distribution of the number of designations held by respondents. The majority of respondents hold at least one designation (59%, 151 of 258). Other designations are shown in Appendix G.

*What professional designations do you currently hold? (Select all that apply)*

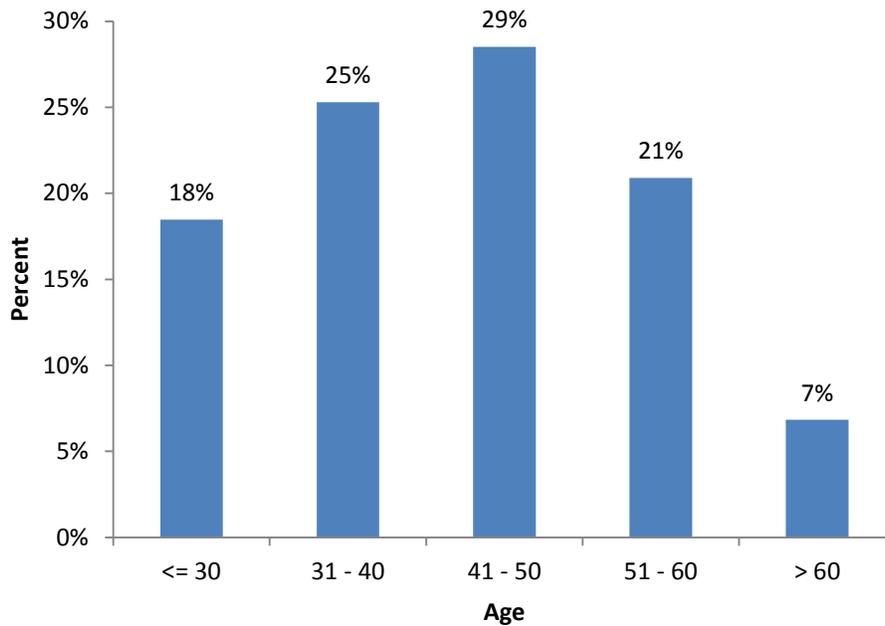
Selection list:            *Orthopaedic Technologist - Surgery Certified (OT-SC)*  
                                  *Certified Athletic Trainer (ATC)*  
                                  *X-ray Technician (RT)*  
                                  *Physician Assistant-Certified (PA-C)*  
                                  *Orthopaedic Physician Assistant-Certified (OPA-C)*  
                                  *Registered Nurse (RN)*  
                                  *Other (please specify)*

**TABLE 3. Professional Designations.**

<b>Professional Designation</b>	<b>Frequency</b>
Orthopaedic Technologist (OT-SC)	101
Certified Athletic Trainer (ATC)	51
X-ray Technician (RT)	13
Physician Assistant-Certified (PA-C)	2
Orthopaedic Physician Assistant-Certified (OPA-C)	13
Registered Nurse (RN)	1
Other	94



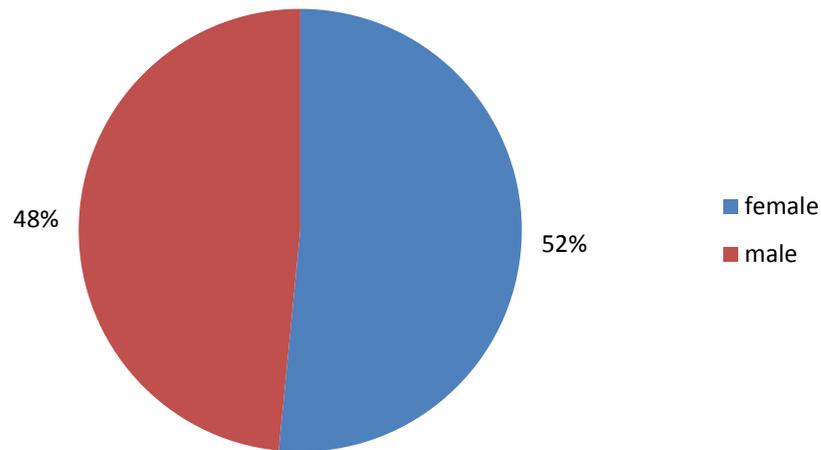
**FIGURE 7. Number of Professional Designations.**



**FIGURE 8. Age.**

**Age**

The age of respondents ranged from 21 to 70, with an average of 43 years of age. The majority of respondents were between the ages of 30 and 60 (75%, 186 of 249, Figure 8). Nine respondents did not respond to this item.



**FIGURE 9. Gender.**

**Gender**

The respondent group was almost evenly split between males (48%, 125 of 258) and females (52%, 133 of 258, Figure 9).

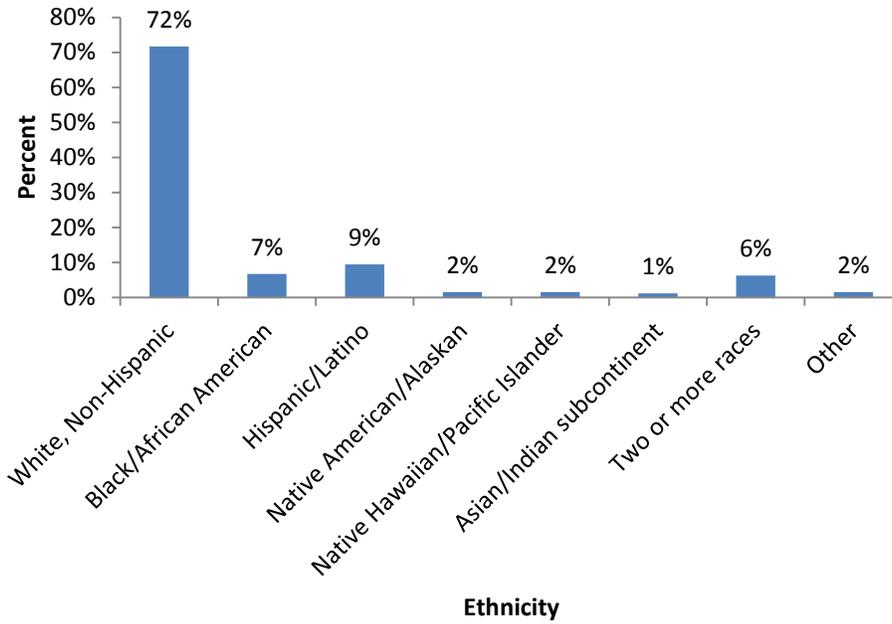
**Ethnicity**

72% (182 of 254) of respondents identified themselves as White and non-Hispanic. The next largest ethnic group was Hispanic/Latino, which comprised 9% (24 of 254) of the sample. Four respondents elected not to provide this information.

*Which of the following best describes your race or ethnicity?*

Drop-down list:

- White, Non-Hispanic*
- Black or African American*
- Hispanic or Latino*
- Native American or Native Alaskan*
- Native Hawaiian or other Pacific Islander*
- Asian or Indian subcontinent*
- Two or more races*
- Other (please specify)*



**FIGURE 10. *Ethnicity.***

### ***Demographic Summary***

The respondent group was approximately evenly divided between males and females, with the majority of respondents identifying themselves as white and non-Hispanic. Also, most respondents have more than 5 years of experience as OTCs. The results further show that most respondents operate as private practitioners and in hospitals.

## *Importance Ratings*

After answering the demographic section, survey respondents were asked to rate the importance of task elements to the role of an OTC. The importance scale ranged from 1 to 5 with a “1” indicating the task was “Of No Importance” and a “5” indicating the task element was “Extremely Important.” Respondents rated tasks they do not perform as “0.” Table 4 shows the number of respondents that responded to each task element, the number of respondents who do not perform each task element (non-performance rating, NP), and the mean importance rating for each element and its associated standard errors.

Of the four content domains considered in the survey, the task elements associated with the Traction domain had the highest non-performance ratings (over 50%). Task elements in the assessment and surgery domains also had relatively high non-performance ratings, which ranged from 14% to almost 40%. The task elements in the casting, splinting and orthopaedic appliances domain were performed by most respondents, with the exception of torso extremity casting/splinting, which had a non-performance rating of 38%.

All task elements had an average importance rating of at least 3.7 (“Moderately Important”) or higher; a total of 6 task elements had average importance ratings of less than 4.0 (“Very Important”). According to respondents, the least important task element was D3.1, “Traction: Obtain equipment in order to apply traction therapy to patient,” which had an average importance rating of 3.74.

**Table 4. Task Element Importance Ratings.**

<b>No.</b>	<b>Task Element</b>	<b>n</b>	<b>Mean</b>	<b>SD</b>	<b>SE</b>	<b>NP</b>	<b>NP%</b>
D1.1	Interview patient and family	221	4.22	0.89	0.06	36	14.01
D1.2	Conduct physical examination of patient	186	3.82	1.09	0.08	69	27.06
D2.1	Apply upper extremity cast/splint	252	4.8	0.58	0.04	5	1.95
D2.2	Apply lower extremity cast/splint	255	4.79	0.58	0.04	2	0.78
D2.3	Apply torso extremity cast/splint	158	4	1.33	0.11	97	38.04
D2.4	Apply specialty extremity cast/splint	248	4.62	0.73	0.05	9	3.5
D2.5	Utilize cast/splint to patient	252	4.79	0.49	0.03	4	1.56
D2.6	Apply Orthopaedic devices to patient	252	4.71	0.59	0.04	4	1.56
D2.7	Apply pre-fabricated orthotics and Orthopaedic appliances	239	4.65	0.67	0.04	16	6.27
D3.1	Obtain equipment in order to apply traction therapy to patient	127	3.74	1.25	0.11	129	50.39
D3.2	Apply traction apparatus to bed	110	3.75	1.29	0.12	143	56.52
D3.3	Drape, scrub, and assist in the application of skeletal traction	112	3.9	1.18	0.11	143	56.08
D3.4	Apply skin traction therapy to patient	123	3.8	1.23	0.11	131	51.57
D3.5	Assist in discontinuing traction therapy	119	3.87	1.24	0.11	127	51.63
D4.1	Position, prep, and drape patient	154	4.49	0.94	0.08	100	39.37
D4.2	Apply and manage post-operative dressings on wounds	198	4.69	0.64	0.05	59	22.96
D4.3	Assist the surgeon during reductions	204	4.73	0.61	0.04	51	20
D4.4	Assist the surgeon by using accepted surgical practices	174	4.66	0.77	0.06	82	32.03

**D1** – Assessment; **D2** – Casting, Splinting and Orthopaedic Appliances; **D3** – Traction; **D4** – Surgery

## Domain Weights

Survey respondents were asked to assign a percentage to each of the four content domains of the OTC's job area, reflecting the proportion of examination content that should be written to each domain. Table 5 contains descriptive statistics of content domain weights. Six respondents did not provide domain weights.

**TABLE 5. Descriptive Statistics of Respondent Content Domain Weights.**

Domain	N	Minimum	Maximum	Mean (%)
Assessment	252	0	80	24.61
Casting, Splinting and Orthopaedic Appliances	252	5	100	47.13
Traction	252	0	40	8.86
Surgery	252	0	95	20.40

## Changes to Existing Examination Blueprint

SMT conducted a second job analysis (JA2) webinar on January 19, 2013, to present the survey results to an SME panel (Appendix H). The purpose of the meeting was to review the NBCOT OTC survey results, determine the weights for each content domain and its associated subdomains, and to finalize the examination blueprint.

After considering the performance frequencies and importance ratings of each KSA, the panel decided that none of the KSAs in the existing content outline should be removed; conversely, a review of respondent comments revealed a need to include a new KSA, “Radiographic Interpretation,” under the Assessment domain.

**TABLE 6. Changes in Content Distribution for OTC Examination.**

Domain	Task Element	Existing Weight	New Weight
Assessment	1. Interview patient and family	20%	15%
	2. Conduct physical examination of the patient	20%	20%
	3. Radiographic interpretation	-	5%
Casting, Splinting and Orthopaedic Appliances	1. Apply upper extremity cast/splint to patient	8%	9%
	2. Apply lower extremity cast/splint to patient	8%	9%
	3. Apply torso extremity cast/splint to patient	3%	1%
	4. Apply specialty extremity cast/splint to patient	7%	7%
	5. Utilize cast/splint to patient	3%	3%
	6. Apply Orthopaedic devices to patient	5%	5%
	7. Apply prefabricated orthotics and Orthopaedic appliances to patient	5%	5%
Traction	1. Obtain equipment in order to apply traction therapy to patient	2%	2%
	2. Apply traction apparatus to bed	2%	2%
	3. Drape, scrub, and assist in the application of skeletal traction	2%	2%
	4. Apply skin traction therapy to patient	2%	2%
	5. Assist in discontinuing traction therapy	2%	2%
Surgery	1. Position, prep, and drape patient	2%	2%
	2. Apply and manage post-operative dressings	3%	3%
	3. Assist the surgeon during reductions	3%	3%
	4. Assist the surgeon by using accepted surgical practices	3%	3%

With the addition of the new KSA, the panel made a number of modifications to the domain and subdomain weights of the OTC examination (Table 6). Changes in weights occurred only within the Assessment and Casting domains. Specifically, in the Assessment domain, five percent of content from “Assessment: Interview patient and family” is allocated to the new KSA “Assessment: Radiographic Interpretation”; in the Casting domain, two percent of content from “Casting: Apply torso extremity cast/splint to patient” is allocated equally to “Casting: Apply

upper extremity cast/splint to patient” and “Casting: Apply lower extremity cast/splint to patient.” The overall weights of the four domains remain unchanged in the OTC examination; also, the panel did not see a need to alter the length of the existing OTC examination. The content outline documented in the “**New Weight**” column in Table 6 will serve as the new updated OTC examination blueprint for the next administration cycle; the new updated OTC examination blueprint is shown in Appendix I.

## **Appendix A: NBCOT OTC Content Analysis Survey**

# NBCOT OTC Content Analysis Survey



## Welcome to the National Board for Certification of Orthopaedic Technologists (NBCOT) Orthopaedic Technologist Certified (OTC) Job Analysis Study

The purpose of this survey is to update the blueprint for the OTC examination.

Respondents must be NBCOT an OTC and currently working in the field.

If you know of one or more OTCs who are currently working in the field, please forward the link to this survey so they may have an opportunity to provide their feedback.

Next

Have questions? [Click here for our Frequently Asked Questions page.](#)

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This survey should take approximately 30 minutes to complete.

You may revisit your survey record at any time during the survey administration period of **October 1 - 31, 2012**.

There are three sections in this survey:

**Section 1: Demographic Questions:** Demographic questions help us develop a profile of the OTC and the environment in which you practice.

**Section 2: Job Domains:** This section lists tasks and knowledge elements performed or used by an OTC in his or her work. You are asked to indicate whether or not you perform the element and the importance of each to competent practice and patient safety.

**Section 3: Post-Survey Questionnaire:** In this section, you are asked to consider the four job domains and assign the distribution of questions for the NBCOT OTC examination. You will also have the opportunity to specify any tasks or knowledge elements you feel may have been overlooked in this survey.

All responses are strictly confidential. E-mail addresses will not be used for any reason other than those clearly expressed in this survey. Please answer **ALL** questions and sections completely. If you have any technical problems associated with taking the survey, please contact Schroeder Measurement Technologies (SMT) at (727) 738-8727 extension 2172 from 8:00 AM to 4:30 PM (EST), Monday - Friday, or contact by e-mail at [SMTSurveySupport@SMTTest.com](mailto:SMTSurveySupport@SMTTest.com).

Before starting the survey, you must be assigned an Access Code. You will need this Access Code if you wish to return to the survey in the future. If this is your first time accessing the survey, enter your e-mail address in the box provided for "New Users," then click the "Submit" button. Your access code will display. Write it down for reference in case you are interrupted before completing the survey, or if you wish to reenter at any time. (If so, use the e-mail address box for "Returning Users.")



**New User**

Email Address:

Submit



**Returning User**

Email Address:

Access Code:

Submit

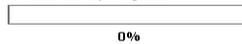
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On-line Survey Progress



**Section 1: Demographic Questions:** Presented below are general demographic questions used to help evaluate the role of the OTC. This basic demographic information is standard for the survey procedure. Factors such as age, years of experience, geographic region, and practice setting are regularly grouped and analyzed as a part of a rigorous sample validation process.

Please select the most appropriate response for each of the following background questions. These questions are used to establish a profile of the survey respondent group. As a result, some questions will be cross-tabulated and statistically analyzed. **ALL demographic information is held in confidence.** Please select only one option for each question unless otherwise noted.

1. How many years have you been practicing as an OTC?

2. In which geographic region do you currently practice?

3. Which of the following best describes your primary work setting as an OTC?

4. Which of the following best describes your primary role at your workplace? (Select all that apply)

- Not currently practicing
- Assessment
- Casting Splinting & Bracing
- Assist in the OR
- Apply Traction (Manual, Skin or Skeletal)
- Other (please specify)

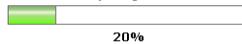
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On-line Survey Progress



**Section 1: Demographic Questions (continued.):**

5. What is your highest educational degree?

6. What professional designations do you currently hold? (Select all that apply)

- Orthopaedic Technologist - Surgery Certified (OT-SC)
- Certified Athletic Trainer (ATC)
- X-ray Technician (RT)
- Physician Assistant-Certified (PA-C)
- Orthopaedic Physician Assistant-Certified (OPA-C)
- Registered Nurse (RN)
- Other (please specify)

7. What is your age?

8. What is your gender?

9. Which of the following best describes your race or ethnicity?

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Section 2: Job Domains:

This section includes a list of competencies that may be required of an OTC. This list of tasks and knowledge elements is currently tested within the OTC examination and was developed by a diverse group of subject matter experts in the field.

Use the rating scale below to assess each component. First, please indicate if you do NOT perform an element ("Not Performed") as an OTC.

Next, if you perform the element, indicate how important each component is to patient safety and competent practice of an OTC.

There is space provided at the end of the survey to note any elements that are missing or any errors you may find.

Rating Scale

How important is this task or knowledge element to the practice of an OTC? Please select "Not Performed" if you do NOT perform the element in your role as an OTC. For those elements you perform, provide an importance rating using the scale range from "Of No Importance" to "Extremely Important."

IMPORTANCE	
0	Not Performed
1	Of No Importance
2	Of Little Importance
3	Moderately Important
4	Very Important
5	Extremely Important

Elements	0 Not Performed	1 Of No Importance	2 Of Little Importance	3 Moderately Important	4 Very Important	5 Extremely Important
<b>Domain I: Assessment</b>						
1. Interview patient and family in order to obtain a complete history of the patient's complaints/condition by using effective interviewing techniques.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Conduct physical examination of the patient in order to provide pertinent information to the surgeon by using standard examination techniques.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Domain II: Casting, Splinting and Orthopaedic Appliances</b>						
1. Apply upper extremity cast/splint to patient in order to comply with physician's orders by using accepted casting/splinting practices and techniques.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Apply lower extremity cast/splint to patient in order to comply with physician's orders by using accepted casting/splinting practices and techniques.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Apply torso extremity cast/splint to patient in order to comply with physician's orders by using accepted casting/splinting practices and techniques.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Apply specialty extremity cast/splint to patient in order to comply with physician's orders by using accepted casting/splinting practices and techniques.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Utilize cast/splint to patient in order to comply with physician's orders by using accepted practices and techniques.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Apply Orthopaedic devices to patient in order to comply with physician's order by ensuring proper fit/placement.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Apply pre-fabricated orthotics and Orthopaedic appliances to patient by ensuring proper fit in order to comply with physician's orders.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Not Performed	Of No Importance	Of Little Importance	Moderately Important	Very Important	Extremely Important

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**Section 2: Job Domains (continued):**

How important is this task or knowledge element to the practice of an OTC? Please select "Not Performed" if you do NOT perform the element in your role as a OTC. For those elements you perform, provide an importance rating using the scale range from "Of No Importance" to "Extremely Important."

IMPORTANCE
0 Not Performed
1 Of No Importance
2 Of Little Importance
3 Moderately Important
4 Very Important
5 Extremely Important

Elements	0 Not Performed	1 Of No Importance	2 Of Little Importance	3 Moderately Important	4 Very Important	5 Extremely Important
<b>Domain III: Traction</b>						
1. Obtain equipment in order to apply traction therapy to patient by selecting appropriate items for the traction apparatus.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Apply traction apparatus to bed in order to prepare for application of skin or skeletal traction by using accepted practices and techniques.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Drape, scrub, and assist in the application of skeletal traction therapy in order to comply with physician's orders by using accepted practices and techniques.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Apply skin traction therapy to patient in order to comply with physician's orders by using accepted practices and techniques.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Assist in discontinuing traction therapy in order to comply with physician's orders by using accepted practices and techniques.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Domain IV: Surgery</b>						
1. Position, prep, and drape patient by using accepted practices and techniques in order to prepare patient for surgery.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Apply and manage post-operative dressings on wounds following aseptic technique.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Assist the surgeon during reductions by supplying and applying the appropriate materials.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Assist the surgeon by using accepted surgical practices and techniques.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Not Performed	Of No Importance	Of Little Importance	Moderately Important	Very Important	Extremely Important



On-line Survey Progress



Section 3: Post Survey Questionnaire: In this section you are asked to assign a percentage to each domain according to importance to practice. These percentages represent the weight each domain would receive on the NBCOT OTC examination. In addition, you also have the opportunity to specify any tasks or knowledge elements you feel may have been overlooked in this survey.

Please consider the relative importance of the four (4) major job domains covered in this survey and the composition of the NBCOT OTC examination. Using the fields below, indicate what percentage of examination questions you would assign to each domain. (Sum must equal 100.) \*\*\*REQUIRED FIELD\*\*\*

Tip: Place your cursor over the green dot next to each domain for a list of topics covered within. Try it here:

Assessment	<input type="text"/>
Casting, Splinting and Orthopaedic Appliances	<input type="text"/>
Traction	<input type="text"/>
Surgery	<input type="text"/>
Total: Must sum to 100%	<input type="text"/>

In the space provided below, please specify the job tasks or competencies that are important for an OTC to perform or understand but you feel were not covered in this survey.

How well did this survey cover the essential elements of knowledge, skills, abilities, and tasks required of a competent OTC?

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The National Board for Certification of Orthopaedic Technologists (NBCOT) would like to thank you for your participation in the survey process.

Your participation in this survey is essential to maintaining a complete and accurate list of tasks and knowledge elements to be covered by the OTC examination.

(You will be redirected to the National Board for Certification of Orthopaedic Technologists website in 15 seconds).



## **Appendix B: Existing OTC Examination Blueprint**

**TABLE B. Existing OTC Examination Blueprint.**

<b>Domains</b>	<b>Percentage</b>
<b>1. Assessment</b>	<b>40%</b>
A. Interview patient and family in order to obtain a complete history of the patient’s complaints/condition by using effective interviewing techniques.	20%
B. Conduct physical examination of the patient in order to provide pertinent information to the surgeon by using standard examination techniques.	20%
<b>2. Casting, Splinting and Orthopaedic Appliances</b>	<b>40%</b>
A. Apply upper extremity cast/splint to patient in order to comply with physician’s orders by using accepted casting/splinting practices and techniques.	8%
B. Apply lower extremity cast/splint to patient in order to comply with physician’s orders by using accepted casting/splinting practices and techniques.	8%
C. Apply torso extremity cast/splint to patient in order to comply with physician’s orders by using accepted casting/splinting practices and techniques.	3%
D. Apply specialty extremity cast/splint to patient in order to comply with physician’s orders by using accepted casting/splinting practices and techniques.	7%
E. Utilize cast/splint to patient in order to comply with physician’s orders by using accepted practices and techniques.	3%
F. Apply Orthopaedic devices to patient in order to comply with physician’s order by ensuring proper fit/placement.	5%
G. Apply pre-fabricated orthotics and Orthopaedic appliances to patient by ensuring proper fit in order to comply with physician’s orders.	5%
<b>3. Traction</b>	<b>10%</b>
A. Obtain equipment in order to apply traction therapy to patient by selecting appropriate items for the traction apparatus.	2%
B. Apply traction apparatus to bet in order to prepare for application of skin or skeletal traction by using accepted practices and techniques.	2%
C. Drape, scrub, and assist in the application of skeletal traction therapy in order to comply with physician’s orders by using accepted practices and techniques.	2%
D. Apply skin traction therapy to patient in order to comply with physician’s orders by using accepted practices and techniques.	2%
E. Assist in discontinuing traction therapy in order to comply with physician’s orders by using accepted practices and techniques.	2%
<b>4. Surgery</b>	<b>10%</b>
A. Position, prep, and drape patient by using accepted practices and techniques in order to prepare patient for surgery.	2%
B. Apply and manage post-operative dressings on wounds following aseptic technique.	3%
C. Assist the surgeon during reductions by supplying and applying the appropriate	3%

materials.	
D. Assist the surgeon by using accepted surgical practices and techniques.	3%

## **Appendix C: Survey Inadequacies**

### **Survey Inadequacies – Respondent Comments**

Seemed outdated. A lot of emphasis was placed on techniques not used anymore.

I have never seen any certified orthopedic technician work in a hospital I heard stories of the previous generations of ortho techs but now its EMT/ ER Techs in the ER and Scrub Techs in the OR. And me Im mostly an X-Ray Tech with special knowledge of orthopedic injuries and anatomy

Testing always covers the orthopedic tech. A lot of techs are used in other fields, like Podiatry making the tests too hard. Need to go back to basic questions covered in school

Again, i feel its imperative that for an otc they need to know how to position a fracture or an extremity to insure proper healing. And its extremely important in aiding in the comfort of the patient. I dont feel it focuses enough on those issues

## **Appendix D: Respondent Suggestions for Missing Task Elements**

### Missing Task Elements – Respondent Comments

Proper molding for different types of fractures, terminology (ex. Volar, dorsal, posterior, anterior, etc).
DME Knowledge
Radiographic interpretation
Wound Care, Ethics
QA
Office management; inventory control
Reading x-rays
The function of the OT-C is to take physician orders and apply them to the patient to the letter
Understanding orthopedic test for injury and disorders
Suture removal, dressing and wound care
Supply management; Patient interaction
All covered
Anatomy Orthopedic Pathology Insurance Basics Practice Management
Must be able to interpret xrays; More education regarding diabetes
Training other health care professional about orthopedic in general
C.P.M. Machines, application and usage.
Xray interpretation and finding fractures and knowing how each is treated.
None
Clinical procedures, special test reading (x-ray / mri / ct scan) which series of films need to be ordered for each condition, suture removal
Record keeping insurance issues Fraud
Reading Imaging
Currently Medical Assistants are taking our jobs because we do not have anyone that is willing to fight for legislation in all states, mas are not qualified to do our jobs and we need support from our organizations.
Ordering Xrays
Proper charting. Ie ensuring test results are signed/dated before charted, Phone messages, etc. With emr and meaningful use here to stay some may encounter it
Wound care
You must obtain people skills. To remain calm under pressure as you provide customer service.
Ability to read xrays, to name fracture patterns
Wound Care; Coding - - Civilian
Wound Care
Strong need for terminology
Radiology, common views and orders
Stocking and supplies
None
Giving patient instructions.
UNDERSTANDING ORDERS AND MECHANISMS OF FRACTURES

None
Supply management
Will get back to yiul
ASSESSING PAIN MANAGEMENT AND EMDICATIONS. IN OUR PRACTICE THAT IS ONE OF MY DUTYS
HCPCS Coding
SCHEDULING SX POST-OP CALLS TEST SCHEDULING
Surgery
Casting Techniques
Coding, billing, inventory mgmt., charting
Special dressing (unna booth)
Because I work mainly in surgery, of course I think that is important
Communication skills and professional conduct
Infection control sterile techn. Wound care
NA
Understanding what cast materials that are available to use and how to use them. For instance, why use plaster for some situations(reductions) and when to use synthetics(strength/weight).
Ordering and maitaining orthopedic supplies
Reading x-rays-very important, knowing how to manage all emergent fxs. Most ER docs dont know fx mgment
Keep up with new technologies and ideas thru reps and continueing education
Recognizing typical fracture patterns like a dorsally angulated radius fracture and where you would put your hands on the cast to appropriately mold it. These types of questions were not on the exam when I took it in February 2012. There were too many questions on spinal orthosis and femur fracture patterns and their surnames that I feel are not relevant. I feel like questions should be directed more towards what we encounter on a daily basis and what someone applying for the test should know
Most all were covered
ACCURACY,CLARITY OBTAINING CONSENTS FOR PROCEDURES
Working well as a team
Post cast instructions and post surgery follow up care
This is a waste of money and time. I have been an ortho tech for 41 years and certified for the past 6 years. 35 years with kaiser, it cost me money to certify, i got no raise for being certified, got no extra for it. And could not expand what i know. Basically this is just a ploy for NBCOT, NAOT to make a money and justify existence, also for the employers. I speak from experience. I know i have over 3000
Wound care; suture/staple removal; bandage changes
Assessment doesnt cover what is required for private practice. Working back office includes some history taking but also requires dressings ,suture removal, casting bracing, problem solving ,some front office ,,sx scheduling ,billing etc. And ,I would think, be dependent on your Drs needs. I work any where from 10-16 hrs per day and alot of that is in sx.
Castroom managment and coding
Obtaining vital signs; medications reconciliation; assisting physicians in understanding types of casts/braces that would be most useful for certain patients/patient education

Suture, staple removal, you must be an experienced ma to do this job as well
None
Should explain the importance of proper application skills
Number of techs needed to run a successful practice
Wound care
Age based communication/education, coding, insurance practices, medical fraud, and healing science
I feel an otcs skill set and knowledge base vary greatly depending on practice, doctor preference, patient demographic, job description, etc. Therefore, it will be hard to cover ALL important competencies that are across the board for ALL otcs...
All covered
None
Product evaluations. R&D
Podiatric duties
Patient education, some knowledge of pain management ie. Types of meds, effects of meds.
Insurance Ethics
Stock & Inventory
Reacting to emergency situations, such as patient fainting.
Xray interpretation
Suture and staple removal, Diabetic Wound care
Detail
Documentation. Severely important.
Patient education
Exercise programs, gait training crutch fitting.
Suture removal, postop visits, lab work monitor
NA
Casting/splinting/bracing, reading & understanding xrays, pt teaching, dme, softgoods
Understand anatomy
Insurance pre-cert to schedule to tests
I feel that as an otc, you should have a general knowledge of xray interpretation and the ability to describe a fracture in detail.
Coding
PREPING INJECTIONS AND PREPING PATIENTS FOR INJECTIONS
Assist surgeon with clinical duties
I always felt that there is a lots of people getting certified, but don't know how to properly apply cast. On these examinations there should be a hands on portion. This will help in a great deal I feel.
For me personally, it is important to know some of the coding aspects both ICD and CPT and HCPCS. General knowledge of outpatient practice and HIPPA would be worth knowing.
Coding both ICD9 and CPT. Product ordering, price negotiation, inventory control, electronic medical records (EMR) documentation, OR equipment identification, communication skills both patient and family, competency such as knowing when NOT to remove staples/stitches or NOT to cover a wound when appears infected (things that keep your MD from being sued by stupid things caused by a tech)
Knowledge of all casting types and procedures. All sterile technique and OR cases

Patient preparation for fx.reductions and surgical procedures
Basic nursing and computer skills.
Interpreting radiographs
Everything was covered.
I feel its very important for an otc to be able to assess an xray and apply splinting/casting accordingly. And i believe positioning of the extremity is of the utmost importance for healing and comfort to the patient
None
Documentation, Proper Reductions
Critical thinking. Injury mechanism recognition.

## **Appendix E: Other Primary Work Settings**

### Other Primary Work Settings

Outpatient hospital and cover inpatient also on call
Combination of hospital clinics, private clinic, OR and ER
Kaiser Permanente (inpatient and outpatient)
Clinic model - between office and hospital
Clinic & Hospital
Education
Educator
Clinic
HMO Kaiser permanente
Clinical setting
Military Hospital DOD
Clinic
Big group practice
Multi specialty clinic in Orthopaedic Department with 30 physicians
Medical clinic
Clinic/hospital
Hospital clinic
Orthopedic practice owned by hospital
Clinic
Hospital clinic
Hospital based outpatient practice
Outpatient Ortho Clinic, satelite office, for hospital
Orthopedic Clinic/hospital owned
Medical Clinic
HMO Clinical Urgent Care
Medical DME company
Civilian employed by military hospital
Ortho Clinic 24 surgeons
Clinic
Medical fpondation
Medical clinic
Ambulatory Outpatient setting
Clinic
Medical Clinic
Large Orthopaedic clinic

## **Appendix F: Other Primary Roles at Workplace**

**Other Primary Roles at Workplace**

Administrative
Education
Supervisor
Pre-op and post-op care
Club foot clinic
Teacher
Opa-c
Office Manager
Bracing and Orthotics Manager
Orthopedic office
Clinical manager
Ortho Tech Instructor
Teaching
Wound care
Teaching, Wound Care(wound VAC),MSDS, Inservices, Podiatry procedures
Wound Care
Radiological Technologist
Clubfoot casting
Medical assistant
DME Coordinator
Back office float
Director of DME/Practice Management
ATC
Billing, coding, inventory
Back office
Educational regarding surgical procedures
Wound care
Radiologic technician
Fracture reduction, wound care, ekgs, suture sterilization, stock, obtaining vitals
BACK OFFICE,WOUND DEBRIDEMENTS, SX SCHEDULING, SX BILLING
Wound care/other pt care/facilitating patients thru out patient setting
Medical Assistant - rooming patients
Supervisor
Manager
Suturing custom casting/ bracing
Supply chain manager/ Safety / hadardous waste coordinator
Athletic Trainer
Acting as medical assistant; rooming patients, etc.
Back office, steralization,supply ordering

Wound Care
Patient education, post op patient care, insurance authorization
Providing rehabilitation equipment and custom and off the shelf bracing
Surgery planner
Prepare and assist joint injections; coordinate surgery
Lead
Post op (suture/staple removal)
Supervisor
Research Coordinator for the FAITH hip project
Running patient hours/exercise programs/drawing up injections/H&P
Nursing duties
Physician extender
Inventory and ordering
Certified Fitter Orthotics
Back Office, Surgery Scheduler
MA duties
Clinical assistant
Lead Ortho Tech/ Lead Medical Assistant/ Most aspects of outpatient care
Product ordering, pricing, coding office tickets & OR charge tickets
Clinic and OR assisting
Ordering supplies, weekly work schedules, removing sutures, staples, dressing changes, preparing injections.
Cell saver operator
Surgery scheduling and MA duties
Office manager
Medical clinic
Im also a CMA(AAMA) & CST Certified Surg Tech.

## **Appendix G: Other Professional Designations**

**Other Professional Designations**

Emt
Pta
Otc, ma
Emt-b
Registered respiratory therapsit
Nct
Certified orthopedic technologist
Orthopedic technologist 1 - certified
Otc, emt-b
Boc-of
Rma
Limited scope x-ray
Otc, ma and paramedic
Certified medical assistant
Rot
Dialysis tech, lvn
Cma
Otc and lpn
Emt
Physical therapy technician
Specialist in strength & cond. & ot-c
Lpn, bsbm
Orthopedic technologist - otc
Qualified 1st surgical assistant
St, otc
Ortho tech certified and ccma
Certified medical assistant
Lpn
Cna
Cma and rot, registered orthopedic technichian
Emt
Cst
Cma, otc
Certified orthotic fitter
Orthopaedic technologist
Atc, cfo
Seinor ortho tech
Medical assistant
Otc non-surgical

Surg tech
Certified medical assistant
Orthopedic assistant certified
Certified pedorthist (c.ped.) And orthotic fitter certified (cfo)
Nbotc
C.ped , boco
Cma(aama), cst

## **Appendix H: Content Analysis Participants**

**TABLE H. Content Analysis Participants.**

Name	Location	Years of Experience	Meeting Attended
Jeff Virgo	Peekskill, NY	30+	JA2
Rick Zamora	San Diego, CA	32	JA2
Paul Ziemba	Round Lake, IL	12 (ATC), 3 (OTC)	JA2
Peter Solan	San Francisco, CA	34	JA2
Charles Rogers	Bloomington, IL	28	JA2
Richard Woodbeck	Grand Forks, ND	37	JA2
Karen Smith	E Hampstead, NH	33	JA2
Susan Turcotte	Goffstown, NH	20	JA2
Tim Gilbert	Modesto, CA	23	JA2
Erik Duke	La Mesa, CA	22	JA2
David Cyr	Cumberland, ME	22+	JA2

**Note:** Demographic Worksheets and Affidavits of NBCOT SMEs were not provided in this report due to the confidential and private nature of these materials. This information is on file at Schroeder Measurement Technologies, Inc.

# **Appendix I: New Updated OTC Examination Blueprint**

**TABLE I. New Updated OTC Examination Blueprint.**

<b>Domains</b>		<b>Percentage</b>
<b>1. Assessment</b>		<b>40%</b>
A. Interview patient and family in order to obtain a complete history of the patient's complaints/condition by using effective interviewing techniques.		15%
B. Conduct physical examination of the patient in order to provide pertinent information to the surgeon by using standard examination techniques.		20%
C. Radiographic interpretation		5%
<b>2. Casting, Splinting and Orthopaedic Appliances</b>		<b>40%</b>
A. Apply upper extremity cast/splint to patient in order to comply with physician's orders by using accepted casting/splinting practices and techniques.		9%
B. Apply lower extremity cast/splint to patient in order to comply with physician's orders by using accepted casting/splinting practices and techniques.		9%
C. Apply torso extremity cast/splint to patient in order to comply with physician's orders by using accepted casting/splinting practices and techniques.		1%
D. Apply specialty extremity cast/splint to patient in order to comply with physician's orders by using accepted casting/splinting practices and techniques.		7%
E. Utilize cast/splint to patient in order to comply with physician's orders by using accepted practices and techniques.		3%
F. Apply Orthopaedic devices to patient in order to comply with physician's order by ensuring proper fit/placement.		5%
G. Apply pre-fabricated orthotics and Orthopaedic appliances to patient by ensuring proper fit in order to comply with physician's orders.		5%
<b>3. Traction</b>		<b>10%</b>
A. Obtain equipment in order to apply traction therapy to patient by selecting appropriate items for the traction apparatus.		2%
B. Apply traction apparatus to bet in order to prepare for application of skin or skeletal traction by using accepted practices and techniques.		2%
C. Drape, scrub, and assist in the application of skeletal traction therapy in order to comply with physician's orders by using accepted practices and techniques.		2%
D. Apply skin traction therapy to patient in order to comply with physician's orders by using accepted practices and techniques.		2%
E. Assist in discontinuing traction therapy in order to comply with physician's orders by using accepted practices and techniques.		2%
<b>4. Surgery</b>		<b>10%</b>
A. Position, prep, and drape patient by using accepted practices and techniques in order to prepare patient for surgery.		2%
B. Apply and manage post-operative dressings on wounds following aseptic technique.		3%

C. Assist the surgeon during reductions by supplying and applying the appropriate materials.	3%
D. Assist the surgeon by using accepted surgical practices and techniques.	3%