

The Nuclear Medicine Technology Certification Board

Certified Nuclear Medicine Technologist Job Analysis Report

August, 2017

Performed for:

The Nuclear Medicine Technology Certification Board
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Executive Summary

In December of 2016, the Nuclear Medicine Technology Certification Board (NMTCB), (The Board), undertook a full-scale Job Analysis (JA) study of the role of the Certified Nuclear Medicine Technologist (CNMT), creating a survey of the knowledge elements required of competent entry level practice. The results of this survey provide support for the relevance, validity, and legal defensibility of the CNMT credentialing program by establishing a correlation between what is done on-the-job and successful examination performance. In support of these efforts, the board contracted with Schroeder Measurement Technologies, Inc. (SMT), to develop and conduct an online survey describing the minimally-competent, entry level Nuclear Medicine Technologist.

The survey was developed beginning in January 2017 with the performance of a literature search of the role and a series of interviews of practicing Technologists. The board assembled a Job Analysis Advisory Committee (the Committee) comprised of representatives from the board as well as other subject matter experts (SMEs). They represented diversity of practice, experience, geographic location, education, ethnic backgrounds, and high-level professional expertise. After a call for information was sent out (see Appendix A) the Job Analysis survey outline was developed.

The literature search findings were used to develop an exhaustive list of the skills required for competent practice. This list was presented to the SME Advisory Committee for review and approval at a two-day meeting in Georgia. A rating scale was adopted, providing a mechanism for measuring task criticality and frequency of practice. A demographic questionnaire was developed to gather confidential data describing the survey respondents, and the task list was converted into an online survey questionnaire. The survey was beta tested, and the first invitations to respondents were issued April 2017.

Over 99% of the respondents indicated that the survey either completely or adequately described the critical knowledge, skills, and abilities (KSAs) required for competent practice as a NMTCB. This supports a high degree of confidence that the survey depth was reflective of practice across geographic settings, and among various work-practice settings. The internal consistency of the survey ratings was evaluated using the Cronbach Alpha reliability estimate, calculated at 0.98. This statistic is bound between 0 and 1, with values closer to 1 indicating higher instrument reliability, and coefficients of 0.7 or higher deemed acceptable. The 0.98 calculation for this survey therefore indicates that the survey has very high internal consistency.

A second Advisory Committee meeting was held via webinar in June 2017, to consider and review the results of the survey analysis. The primary goal of this meeting was to establish task exclusion criteria to differentiate between the critical and non-critical tasks.

Once the outline was finalized, the content area weightings for the five main content areas were established. The final content outline was reviewed for syntax and readability, and adopted with recommended content area weighting. The final outline for the examination is found in Appendix I.

Introduction

Survey Overview: The Content Validation Model

The foundation of a valid, reliable, and legally defensible professional registration program is the performance of a well-constructed Job Analysis study. The Job Analysis establishes the link between test scores and competency, supporting the inference that the scores achieved on the registration examination are content valid, and therefore pass and 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 relative frequency, importance, and criticality of the elements. The *Standards for Educational and Psychological Testing (American Educational Research Association, American Psychological Association, and the National Council on Measurement in Education) 2014*, state:

Standard 11.3

When test content is a primary source of validity evidence in support of the interpretation for the use of a test for employment decisions or credentialing, a close link between test content and the job or professional/occupational requirements should be demonstrated.

Standard 11.13

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

Purpose of the Job Analysis Study

To support the Board's goal of maintaining a certification examination program that meets or exceeds international psychometric standards, a Job Analysis survey was launched in December of 2016. This report reflects data compiled from the performance of this survey. The NMTCB enlisted the services of Schroeder Measurement Technologies, Inc. (SMT), a full-service testing company, to establish and implement a survey instrument describing the knowledge, skills, and abilities (KSAs) required for competent, entry level practice as a Nuclear Medicine Technologist, practicing in a variety of settings in the U.S. Psychometric standards suggest that Job Analysis research, conducted in support of the development of content for certification, may be performed in a variety of ways. Professions with small numbers of practitioners find it practical to conduct focus-group reviews of the professional role. Professions with a large population of well-identified registrants, benefit from the range and focus provided by a large-scale survey model. The Advisory Committee felt that an adequate number of NMTCBs would be willing to participate in an online survey. Therefore, the model adopted for this study was an online task survey querying relative importance and frequency data (*How critical is the task? Is the task performed?*), providing content validity support to the design of the NMTCB CNMT examination.

It is well recognized that as professions change over time, the exhaustive nature of the listing becomes critical: only by describing *all* of the tasks that Nuclear Medicine Technologists perform do we establish confidence that the survey adequately describes the role. In support of this task, psychometric staff and content area specialists must work together to create a profile of today's

professional. In support of this goal the Board recruited twelve (12) subject matter experts (SME's) to serve as a Jobs Analysis Advisory Committee (appendix A, Table A1) made up of working staff technologists. Of those two (2) were also members of the Board. These experts made up a diverse group of Nuclear Medicine Technologists representing the various pathways to the profession, and diversity in areas of education, experience, practice settings, and geographical location reflective of practice today. The Advisory Committee members were asked to complete affidavits of nondisclosure, and to provide demographic information. The affidavits and demographic information are on file, but are not included in this report in deference to the sensitive nature of the data.

Survey Methodology

Content Review and Survey Design

In support of the development of the survey task listing, a full-scale literature search was performed, which included analysis of:

- The current Content Outline of the Certified Nuclear Medicine Technology (CNMT) certification examination;
- A comprehensive literature search including:
 - Curricula of Nuclear Medicine Technology educational programs;
 - Periodicals;
 - Federal rules and regulations;
 - Standards and scopes of practice;
 - Approved texts and training materials from training programs, secondary educators, and continuing education providers; and,
 - Board policy statements, procedures, and rules.

The resulting draft task listing was used by SMT staff and the SME Advisory Committee to develop the Job Analysis survey outline, and accomplish the following survey support tasks:

- Provide background information about the profession;
- Review and approve the draft task list;
- Develop a rating scale;
- Develop a demographic questionnaire; and,
- Establish a sampling protocol.

The Job Analysis meeting, held March 11-12, 2017 in Atlanta, GA, opened with the SME Advisory Committee Members receiving and participating in training concerning the role of the Job Analysis in the certification cycle (see Appendix A, Table A-1 for introduction materials and meeting agenda), and discussion addressing the following concepts:

1. *The Role of a Job Analysis in a Certification Program:* The Committee was provided with an overview of the tasks that make up the full cycle of research, development, application, examination, psychometric review, and continuing education. Discussion centered on exactly how,

why, and where the conduct of a Job Analysis fits into the cycle, and how a properly-executed and applied Job Analysis supports program content validity and legal defensibility.

2. *Entry Level, Minimal Competency:* In order to assess the meaningfulness of the task listing, and its inclusiveness of the knowledge, skills, and abilities (KSAs) describing competent practice, it was first necessary to fully develop the concept of the entry level, minimally-competent Nuclear Medicine Technologist. An important preamble to the discussion was an explanation that minimal competence does not mean low or poor levels of competence, but instead a high level of professionalism and skills representing the point of demarcation between the competent practitioner and those who are not. Likewise, entry level does not mean an entry level job, but the significant amount of training and practical experience that represents the competent Nuclear Medicine Technology practice.

To accomplish this task, the Committee discussed the relationship among skills that are common among practice settings (e.g., inpatient facility, hospital outpatient, research, etc.). The Committee also discussed the fact that the Nuclear Medicine Technology certification represents a comprehensive body of skills that are expected to represent transferable competency among practice settings and locations.

3. *Nuclear Medicine Technologist Certification Eligibility:* Germaine to the formulation of the profile of the minimally-competent entry level candidate was a review of the eligibility requirements for the CNMT. The information below describes those requirements and the different pathways to practice.

- I. Completion of a NMTCB recognized nuclear medicine technology program
- II. Completion of a certificate, associate degree or baccalaureate degree in nuclear medicine technology program from a regionally accredited academic institution.* Regionally accredited college and university programs must have structured clinical training sufficient to provide clinical competency in radiation safety, instrumentation, clinical procedures, and radiopharmacy. This should require approximately 1000 hours of clinical training supervised by program faculty. **Please note that beginning January 1, 2017, only graduates of programmatically accredited nuclear medicine education programs will be considered eligible to sit for the NMTCB examination. The NMTCB currently recognizes the following organizations responsible for programmatic oversight:**
 - o Joint Review Committee on Educational Programs in Nuclear Medicine Technology (JRCNMT)
 - o Armed Forces Military Training Commands
 - o Canadian Association of Medical Radiation Technologists (CAMRT)
 - o Australian and New Zealand Society of Nuclear Medicine (ANZSNM)
- III. Completion of a Master's degree program from a regionally accredited academic institution that leads to an entry level education in nuclear medicine technology.

List of Tasks and Knowledge, Skills, and Abilities (KSAs)

The Committee next reviewed the assembled KSA listing, identifying all knowledge elements associated with current practice. The Committee felt it was best to be as inclusive as possible of the range of practice, to enable the collection of responses across the importance and frequency scales.

Survey Rating Scales

The task listing was placed into a survey format that included a welcome and instructions. The survey also contained a demographic questionnaire and one survey query for each KSA that addressed both importance and frequency, along with instructions on how to rate tasks that were not performed (see Appendix B).

Demographic Questionnaire

After finalizing the content outline and survey questions, the Advisory Committee developed a list of demographic questions to pose to respondents in order to provide insight into respondent professional experience levels, practice settings, geographic influences, certifications held, gender, age, and ethnicity. The following demographic questions were approved for inclusion on the survey:

1. Pathway to becoming a Certified Nuclear Medicine Technologist;
2. Degree awarded when from Nuclear Medicine Technology education and training;
3. Highest Level of Formal Education;
4. Years as a Certified Nuclear Medicine Technologist;
5. Other Certifications Held;
6. Capacity of employment as a Nuclear Medicine Technologist;
7. Practice setting;
8. Focus of practice;
9. Primary position;
10. Geographic region of practice;
11. State;
12. Age;
13. Gender; and,
14. Racial/ethnic background.

Post-Survey Questions

In addition to the demographic questions, which appeared at the beginning of the survey, there were also several post-survey questions included to gather additional information. The first post-survey question asked respondents to rate the adequacy of the scope of the survey. A second question offered respondents the opportunity to identify any tasks they believed were left off the survey. Finally, respondents were asked to indicate content area weighting for the five content areas within the KSA listing, providing information to be used to establish content area weightings within the final examination outline. The full text of the survey may be found in Appendix B.

Sampling Methodology

The board decided on administration of an online survey. Use of the internet to issue invitations and run the survey ensured that the entire population of known CNMTs would receive invitations to participate.

Before the survey was posted and opened to general participation, a beta test was performed by members of the Committee who logged on and tested all aspects of the survey. Data collection results were confirmed and minor edits and changes were made to ensure that the survey was easy to use, the language understandable, and all selection choices and text box collections were functioning properly. The survey was posted live on April 20, 2017 and ran through June 4th, 2017; invitations were issued to approximately 21,000 NM practitioners. Reminder emails were sent out to encourage participation.

Survey Return Rate

During the 45-day period that the survey was active, approximately 21,000 invitations were issued. There were 2945 people who opened the survey and completed some portion of it, and 2280 respondents successfully completed the survey (i.e., provided data sufficient for analysis). This resulted in an initial return rate of 14%, with an adjusted return rate reflecting only complete responses of 11%. Both return rates are high for an unsolicited survey. Therefore, the response rate is adequate to support the data results.

Data Collection and Analyses

After the close of the survey administration window, data were collected and calculations were performed using both R and Microsoft Excel® 2016 computer programs. This report and Appendices E, F, G, and H provide the following analyses:

- Survey adequacy and reliability statistics;
- Summary statistics of demographic results;
- Mean frequency and importance ratings in survey order by task;
- Mean frequency ratings of tasks/KSAs not performed;
- Mean importance ratings of the tasks/KSAs; and,
- Mean importance ratings by experience and practice specialty subgroups.

Survey Results

On June 24, 2017, another SME Advisory Committee meeting was held as a webinar with the objective of reviewing and analyzing the survey results. The Committee members were provided with summary demographic data, survey response data, and a list of tasks left off the survey for consideration prior to the meeting.

The meeting was accomplished via webinar using computer-screen shared projection and PowerPoint® displays. Committee member feedback and discussion supported the performance of the following tasks:

1. Review of the sampling methodology, response rate, adequacy and reliability;
2. Review of the demographic data;
3. Establish the profile of the “typical” NMTCB Job Analysis respondent;
4. Develop the task exclusion criteria for importance;
5. Develop the task exclusion criteria for frequency/not performed;
6. Review comments concerning tasks left off the survey;
7. Review the respondent subgroup analyses for experience, geographic region of practice, practice setting and region type;
8. Determine the appropriateness of the task for assessment (*Can the task be assessed on a multiple-choice examination?*);
9. Develop and approve the examination final content outline describing the KSAs required for competent practice as a Certified Nuclear Medicine Technologist;
10. Establish the main content domain weightings;
11. Review the candidate eligibility and recertification requirements, linking those requirements to the Job Analysis results.
12. Establish future steps
 - a. Review the test question banks for fit with the new content outline
 - b. Write new questions to address new/updated content

The survey results are divided into the following three sections:

1. Survey adequacy and reliability information;
2. Demographic results; and,
3. Frequency, importance, and subgroup rating analyses.

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 a Certified Nuclear Medicine Technologist. Approximately 99.5% of respondents (2,241) indicated that the survey either adequately or completely covered the essential tasks performed by a Nuclear Medicine Technologist (Figure 1 and Table 1). Twenty-nine respondents did not provide a response to this question.

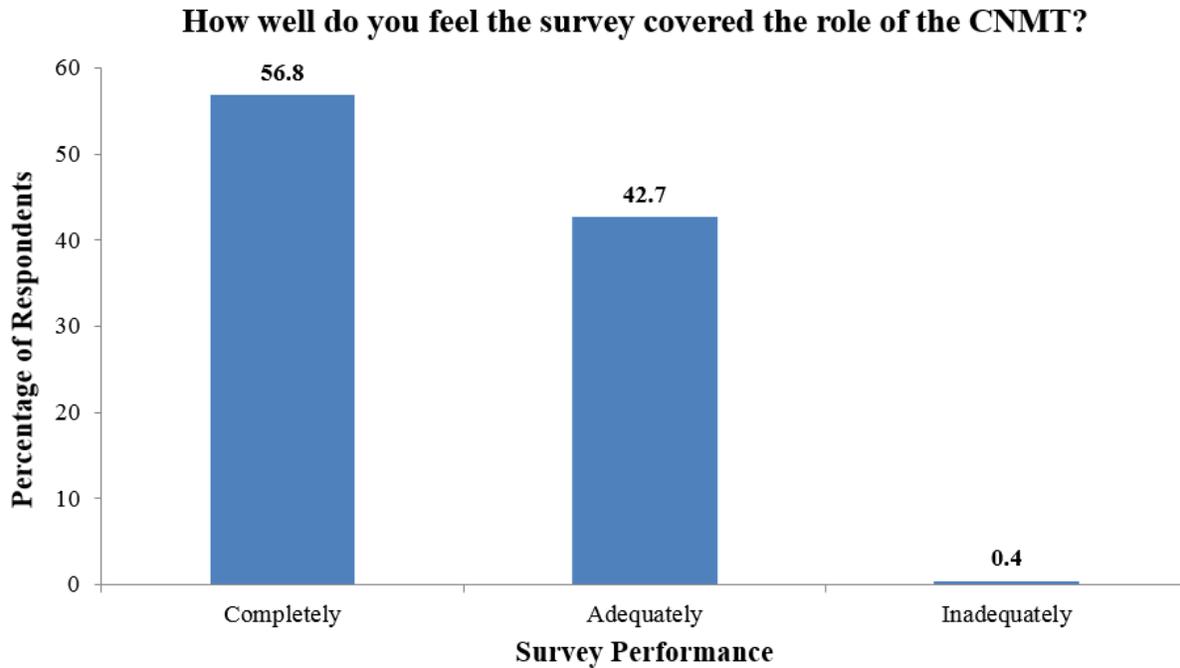


FIGURE 1. *Survey adequacy.*

TABLE 1. *Survey Adequacy*

Primary Focus	Frequency	Percent
Completely	1279	56.8
Adequately	962	42.7
Inadequately	10	0.4
Subtotal	2251	100.0
No Response	29	
Total	2280	

Missing Task Elements and KSAs

At the end of the survey, respondents were asked for feedback on tasks and knowledge elements they felt were missing in the survey. These free-text unedited responses may be found in Appendix C, Table C-1.

Reliability Estimate

The Cronbach's Alpha reliability estimate was calculated to evaluate the internal consistency of the importance 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 general rule, reliability estimates at or above 0.7 are considered acceptable. For this survey, Cronbach's Alpha was 0.998 for the importance ratings, indicating that the ratings obtained were highly reliable.

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Demographic Results

Under each question, graphics represent the results of survey participant answers to the survey questions.

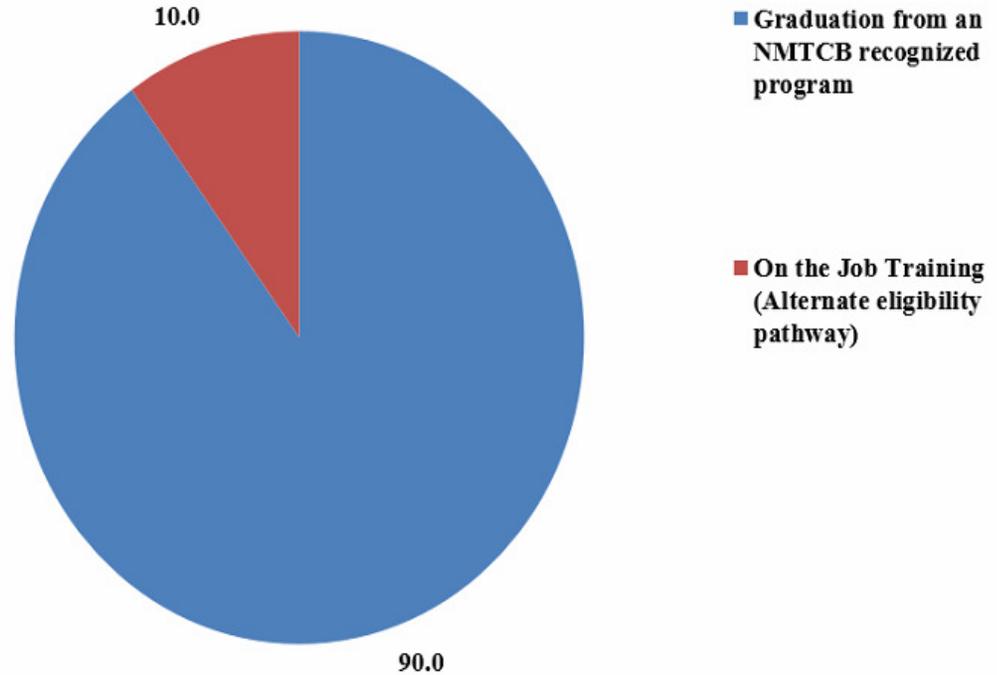
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Question 1. What was your pathway to becoming a Certified Nuclear Medicine Technologist?

What was your pathway to becoming a Certified Nuclear Medicine Technologist?

CMT Pathway	Frequency	Percent
Graduation from an NMTCB recognized program	2051	90.0
On the Job Training (Alternate eligibility pathway)	228	10.0
Subtotal	2279	100.0
No response	1	
Total	2280	

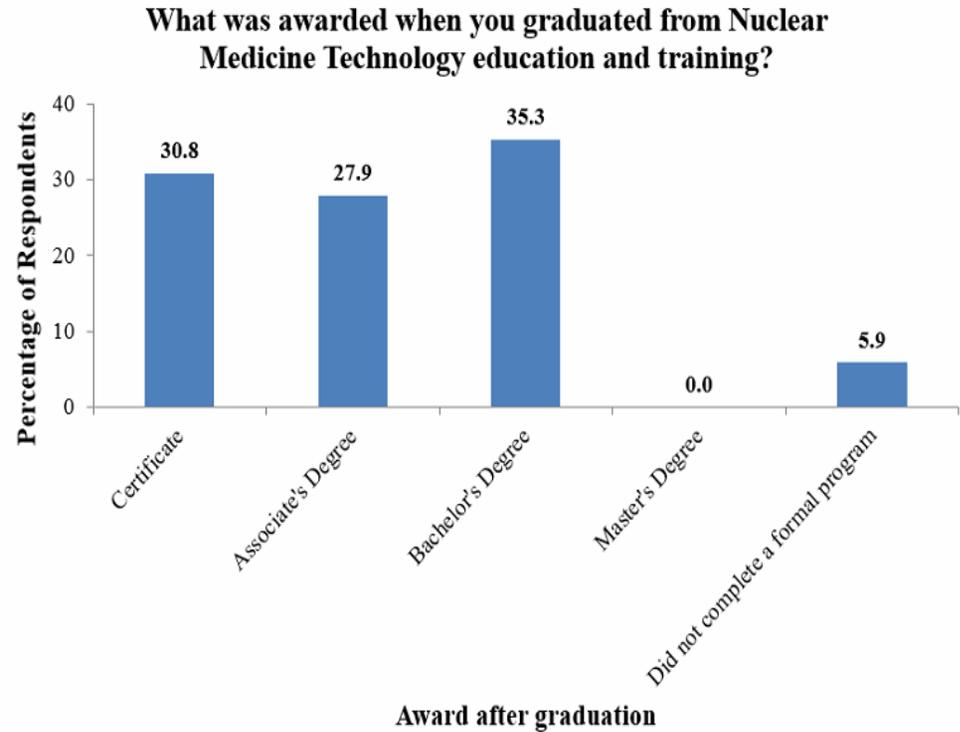
What was your pathway to becoming a Certified Nuclear Medicine Technologist?



Question 2. What was awarded when you graduated from Nuclear Medicine Technology education and training?

What was awarded when you graduated from Nuclear Medicine Technology education and training?

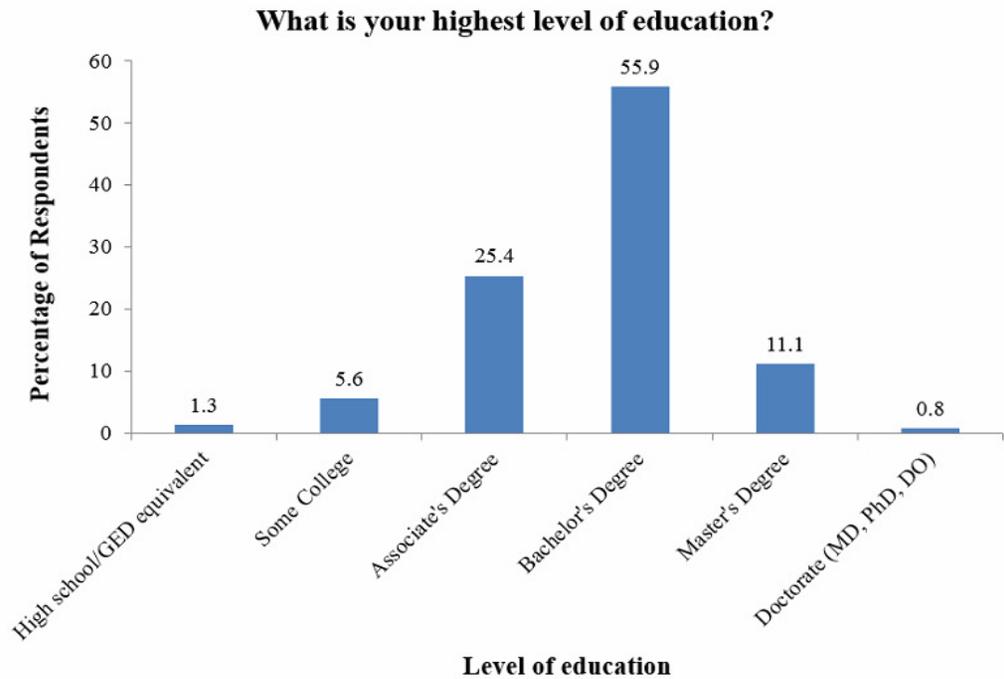
Award	Frequency	Percent
Certificate	701	30.8
Associate's Degree	635	27.9
Bachelor's Degree	803	35.3
Master's Degree	0	0.0
Did not complete a formal program	135	5.9
Subtotal	2274	100.0
No response	6	
Total	2280	



Question 3. What is your highest level of education?

What is your highest level of education?

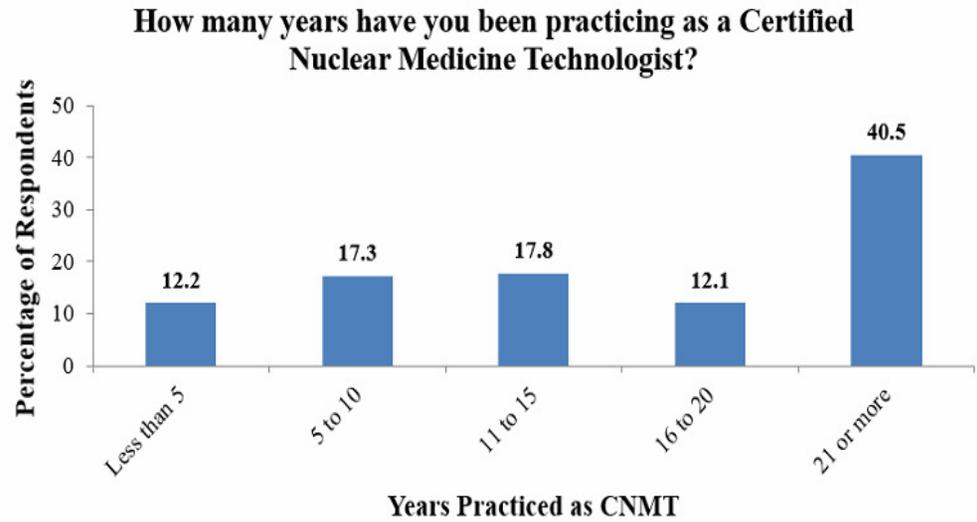
Education	Frequency	Percent
High school/GED equivalent	29	1.3
Some College	126	5.6
Associate's Degree	575	25.4
Bachelor's Degree	1266	55.9
Master's Degree	252	11.1
Doctorate (MD, PhD, DO)	18	0.8
Subtotal	2266	100.0
No response	14	
Total	2280	



Question 4. How many years have you been practicing as a Certified Nuclear Medicine Technologist?

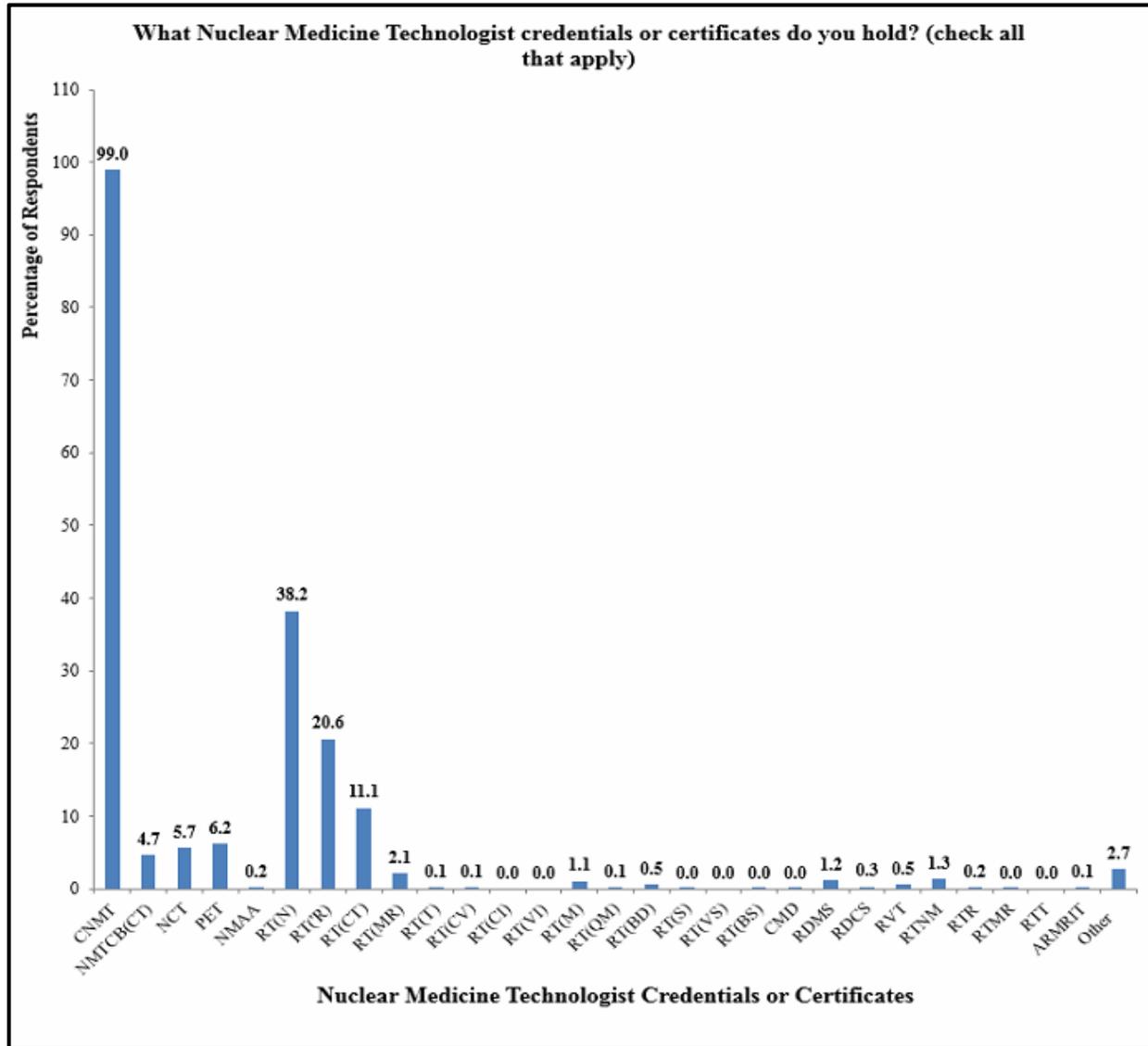
How many years have you been practicing as a Certified Nuclear Medicine Technologist?

Years Worked as CNMT	Frequency	Percent
Less than 5	278	12.2
5 to 10	395	17.3
11 to 15	406	17.8
16 to 20	277	12.1
21 or more	924	40.5
Subtotal	2280	100.0
No response	0	
Total	2280	



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Question 5. What Nuclear Medicine Technologist credentials or certificates do you hold?



What Nuclear Medicine Technologist credentials or certificates do you hold? (check all that apply)

NMT Credentials or Certificates	Acronym	Frequency	Percent
NMTCB - Certified Nuclear Medicine Technologist - CNMT	CNMT	2257	99.0
NMTCB - Computed Tomography Technologist - NMTCB(CT)	NMTCB(CT)	107	4.7
NMTCB - Nuclear Cardiology Technologist - NCT	NCT	129	5.7
NMTCB - PET Technologist - PET	PET	141	6.2
NMTCB - Nuclear Medicine Advanced Associate - NMAA	NMAA	5	0.2
ARRT - Nuclear Medicine Technology - RT(N)	RT(N)	872	38.2
ARRT - Radiography - RT(R)	RT(R)	470	20.6
ARRT - Computed Tomography - RT(CT)	RT(CT)	254	11.1
ARRT - Magnetic Resonance Imaging - RT(MR)	RT(MR)	49	2.1
ARRT - Radiation Therapy - RT(T)	RT(T)	2	0.1
ARRT - Cardiovascular-Interventional Radiography - RT(CV)	RT(CV)	3	0.1
ARRT - Cardiac-Interventional Radiography - RT(CI)	RT(CI)	0	0.0
ARRT - Vascular-Interventional Radiography - RT(VI)	RT(VI)	0	0.0
ARRT - Mammography - RT(M)	RT(M)	25	1.1
ARRT - Quality Management - RT(QM)	RT(QM)	2	0.1
ARRT - Bone Densitometry - RT(BD)	RT(BD)	12	0.5
ARRT - Sonography - RT(S)	RT(S)	1	0.0
ARRT - Vascular Sonography - RT(VS)	RT(VS)	0	0.0
ARRT - Breast Sonography - RT(BS)	RT(BS)	1	0.0
MDCB - Medical Dosimetrist - CMD	CMD	1	0.0
ARDMS - Diagnostic Medical Sonography - RDMS	RDMS	27	1.2
ARDMS - Diagnostic Cardiac Sonography - RDCS	RDCS	7	0.3
ARDMS - Vascular Sonography - RVT	RVT	12	0.5
CAMRT - Nuclear Medicine Technology - RTNM	RTNM	30	1.3

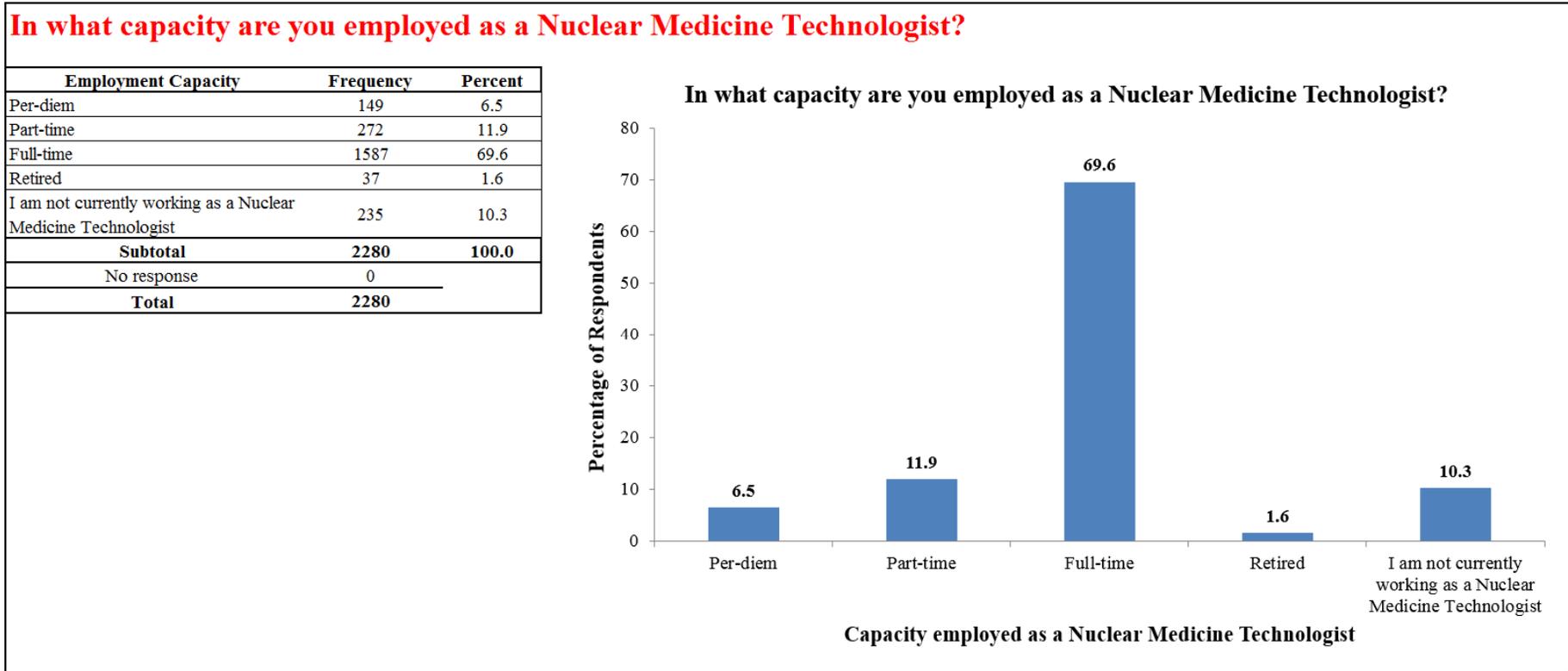
CAMRT - Radiological Technology - RTR	RTR	4	0.2
CAMRT - Magnetic Resonance - RTMR	RTMR	1	0.0
CAMRT - Radiation Therapy - RTT	RTT	0	0.0
ARMRIT - Magnetic Resonance - ARMRIT	ARMRIT	2	0.1
Other	Other	62	2.7

Other Role	Frequency
ACMDTT - Nuclear Medicine Technologist - MRT(NM)	1
AMT (American Medical Technologist), Registered Nurse (Philippines)	1
ANZSNM Accreditation; MRPBA registration (Australia)	1
ardms breast	1
Arizona State Nuclear License	1
Arkansas State Licenses for NM and CT	1
ARRT	1
ASCP	1
ascp (nm)	1
ASCP NM/MT	1
ASCP Nuclear Medicine	1
Ascp(n)	3
ASCP-NM	1
ASCP-Nuclear Medicine	1
BSN	1
CA State	1
California State certification for Bone Densitometry	1
California State Licensure as CTNM with venipuncture	1
CBDT - DEXA Technologist by the ISCD	1

Other Role	Frequency
CBDT (from ISCD) dexa	1
CBT-cert.bone densitometrist since 2001	1
CCI- Registered Cardiac Sonographer -RCS	1
CCI-RVS	1
CCRP	1
CCT	1
Certified NM Specialist by Saudi commission for Health specialties	1
CIIP	1
CPT (Certified Phlebotomy Technician)	1
CRA	1
CRA Certified Radiology Administrator through AHRA	1
CRA-certified radiology administrator	1
CRLS certified renal lithotripsy specialist	1
CRT - Florida Licensed Nuclear Technologist	1
CRT, ARRT (F)	1
DABSNM	1
FL Dept. of Health state license	1
GXMO DEXA	1
LNMT, NY	1
LPN	1
Maryland State License	1
medical technologist lab	1
MT (ASCP)	1
NJ State	1
NMASCP	1
NY State Licensed NMT	1
Radiation Safety Officer	2

Other Role	Frequency
RDMS	1
Registered Nurse	1
Registered Nurse - Texas	1
RN, BSN	2
RPA/RA CBRPA	1
RSO	1
RSO - Radiation Safety Officer	1
SNM RTNM	1
State	1
state license- bone density, state license Nuclear Medicine	1
state of California license Nuclear Medicine, Radiologic Technologist	1
State of Texas RT	1
Total	62

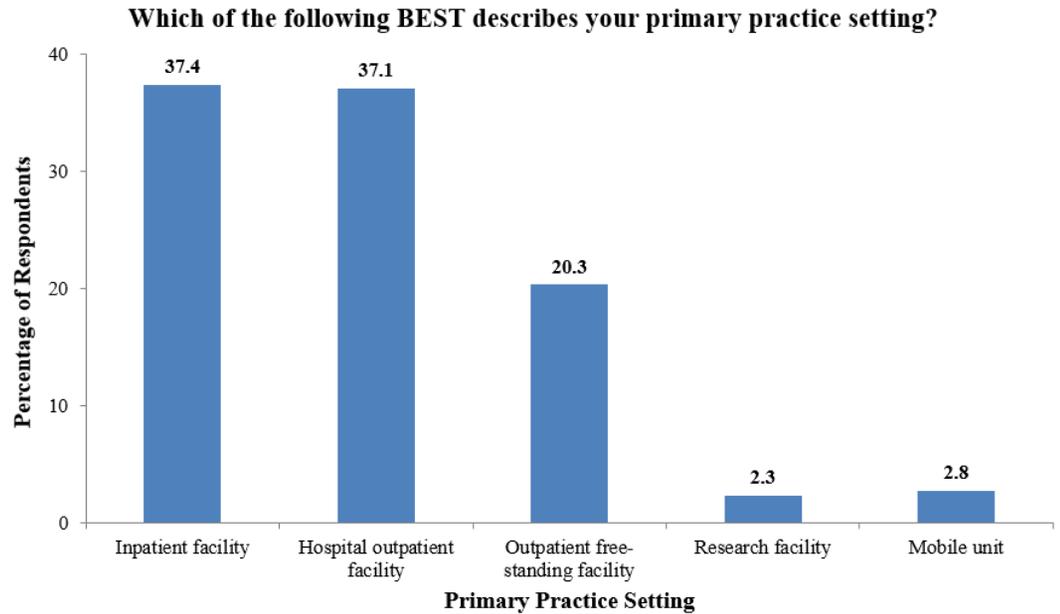
Question 6. In what capacity are you employed as a Nuclear Medicine Technologist?



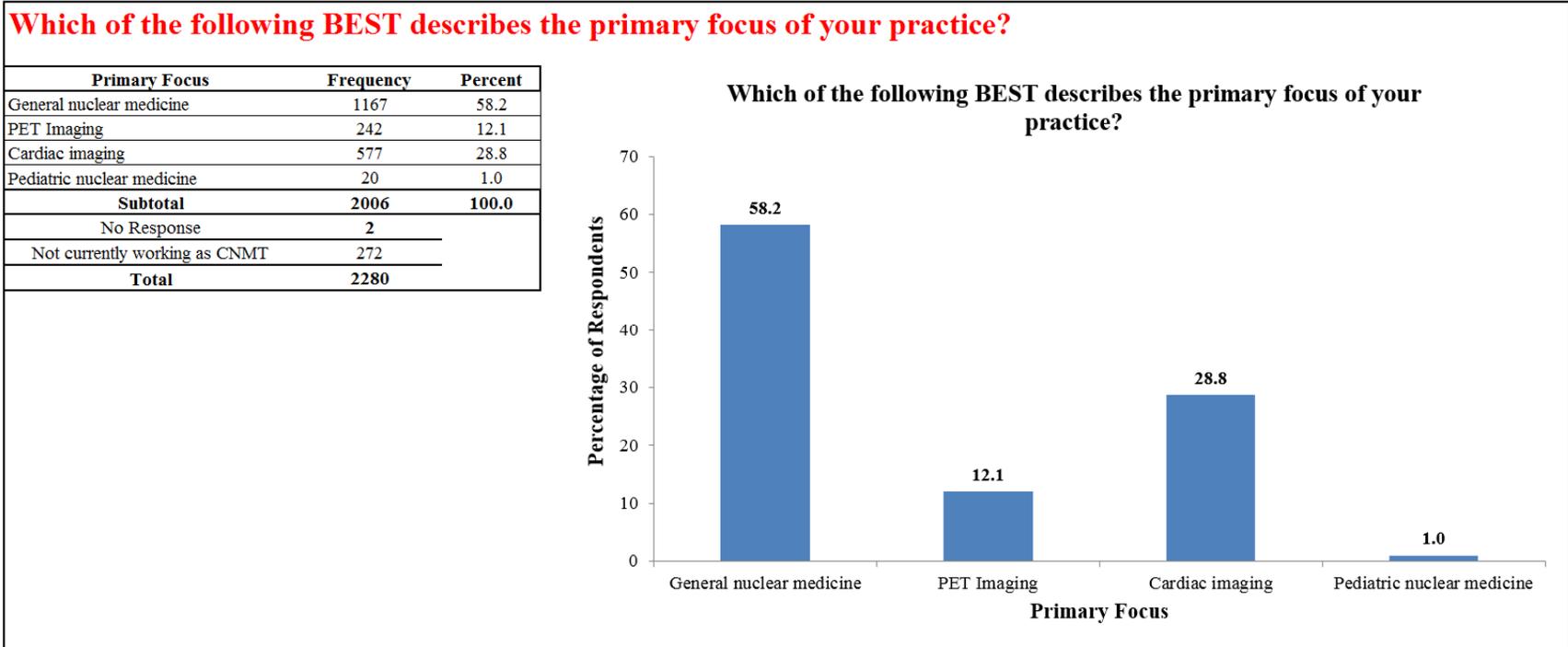
Question 7. Which of the following BEST describes your primary practice setting? *

Which of the following BEST describes your primary practice setting?

Practice Setting	Frequency	Percent
Inpatient facility	751	37.4
Hospital outpatient facility	744	37.1
Outpatient free-standing facility	408	20.3
Research facility	47	2.3
Mobile unit	56	2.8
Subtotal	2006	100.0
No Response	2	
Not currently working as CNMT	272	
Total	2280	



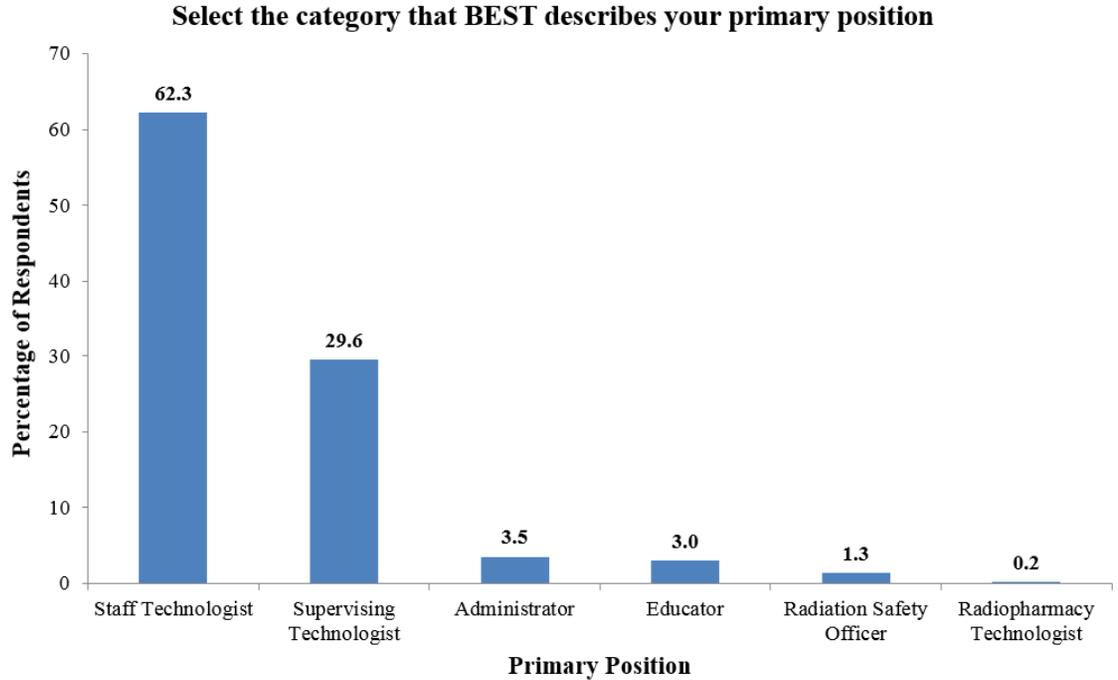
Question 8. Which of the following BEST describes the primary focus of your practice? *



Question 9. Select the category that BEST describes your primary position? *

Select the category that BEST describes your primary position

Primary Position	Frequency	Percent
Staff Technologist	1249	62.3
Supervising Technologist	593	29.6
Administrator	71	3.5
Educator	61	3.0
Radiation Safety Officer	27	1.3
Radiopharmacy Technologist	5	0.2
Subtotal	2006	100.0
No Response	2	
Not currently working as CNMT	272	
Total	2280	

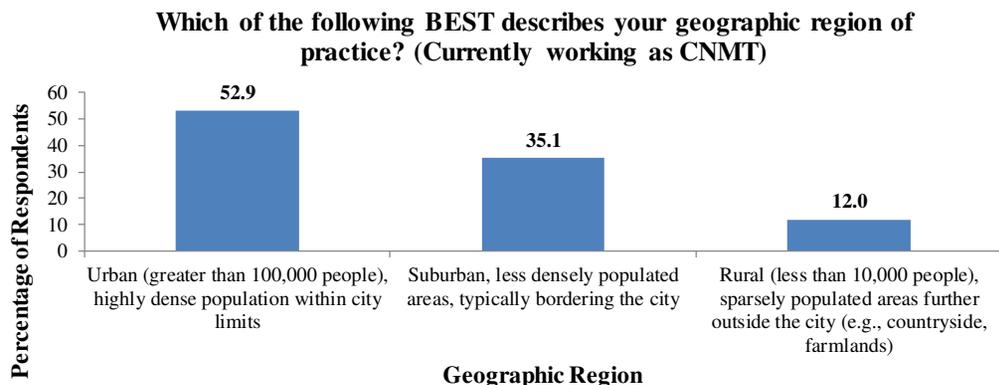


Question 10. Which of the following BEST describes your geographic region of practice?

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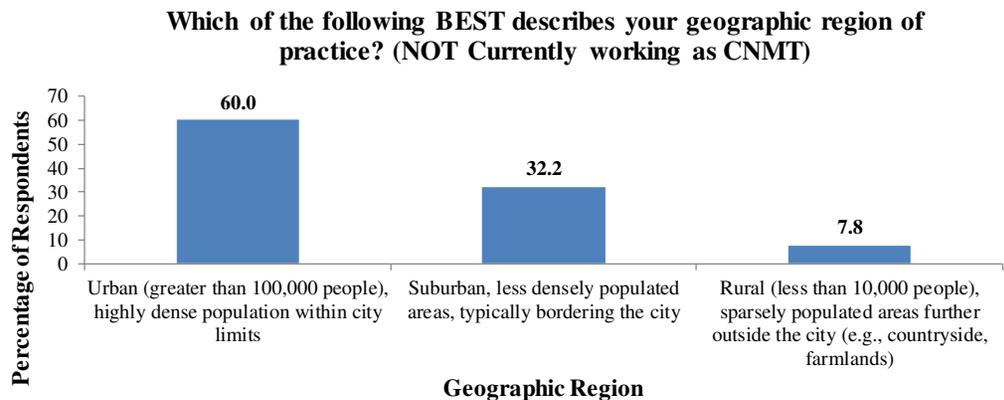
Which of the following BEST describes your geographic region of practice? (Currently working as CNMT)

Geographic Region of Practice	Frequency	Percent
Urban (greater than 100,000 people), highly dense population within city limits	1056	52.9
Suburban, less densely populated areas, typically bordering the city	700	35.1
Rural (less than 10,000 people), sparsely populated areas further outside the city (e.g., countryside, farmlands)	239	12.0
Subtotal	1995	100.0
No Response	13	
Total	2008	



Which of the following BEST describes your geographic region of practice? (NOT Currently working as CNMT)

Geographic Region of Practice	Frequency	Percent
Urban (greater than 100,000 people), highly dense population within city limits	162	60.0
Suburban, less densely populated areas, typically bordering the city	87	32.2
Rural (less than 10,000 people), sparsely populated areas further outside the city (e.g., countryside, farmlands)	21	7.8
Subtotal	270	100.0
No Response	2	
Total	272	



Total Respondents	2280
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Question 11. In which State/territory or country is your primary practice? *

In which U.S. state or territory is your primary practice?					
U.S. State	Currently Working as CNMT		Not Currently Working as CNMT		Region
	Frequency	Percent	Frequency	Percent	
AK	3	0.2%	1	0.4%	West
AL	41	2.1%	5	1.9%	South
AR	28	1.4%	2	0.7%	South
AZ	40	2.0%	4	1.5%	West
CA	120	6.1%	12	4.5%	West
CO	28	1.4%	0	0.0%	West
CT	39	2.0%	4	1.5%	Northeast
DC	4	0.2%	1	0.4%	South
DE	9	0.5%	0	0.0%	Northeast
FL	129	6.5%	31	11.6%	South
GA	57	2.9%	4	1.5%	South
HI	5	0.3%	0	0.0%	West
IA	36	1.8%	3	1.1%	Midwest
ID	8	0.4%	2	0.7%	West
IL	69	3.5%	9	3.4%	Midwest
IN	54	2.7%	5	1.9%	Midwest
KS	24	1.2%	1	0.4%	Midwest
KY	42	2.1%	3	1.1%	South
LA	18	0.9%	1	0.4%	South
MA	40	2.0%	3	1.1%	Northeast
MD	48	2.4%	8	3.0%	South
ME	10	0.5%	1	0.4%	Northeast

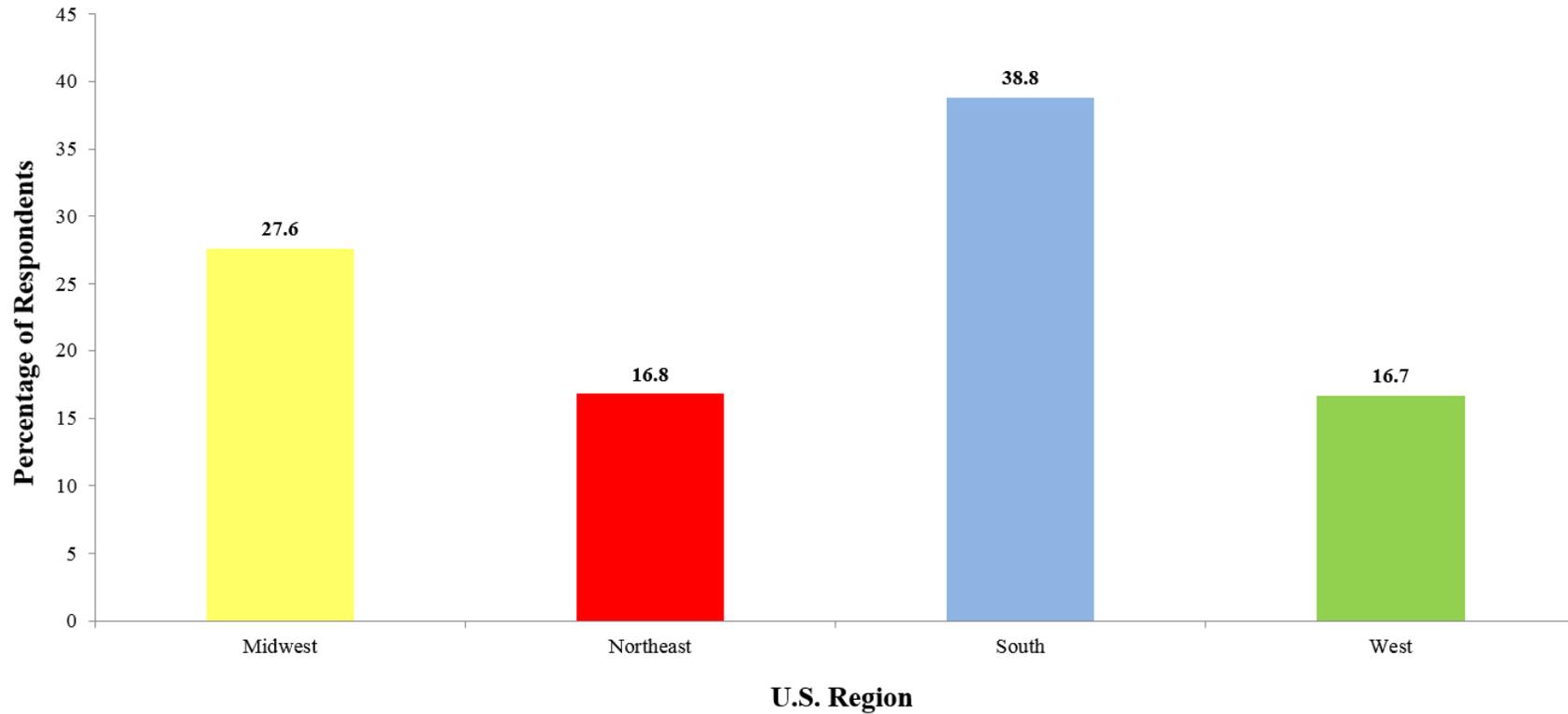
MI	78	3.9%	12	4.5%	Midwest
MN	51	2.6%	13	4.9%	Midwest
MO	47	2.4%	11	4.1%	Midwest
MS	15	0.8%	1	0.4%	South
MT	6	0.3%	2	0.7%	West
NC	51	2.6%	10	3.7%	South
ND	6	0.3%	1	0.4%	Midwest
NE	18	0.9%	0	0.0%	Midwest
NH	13	0.7%	0	0.0%	Northeast
NJ	34	1.7%	3	1.1%	Northeast
NM	10	0.5%	3	1.1%	West
NV	12	0.6%	4	1.5%	West
NY	83	4.2%	15	5.6%	Northeast
OH	71	3.6%	14	5.2%	Midwest
OK	22	1.1%	3	1.1%	South
OR	27	1.4%	1	0.4%	West
PA	97	4.9%	14	5.2%	Northeast
PR	14	0.7%	1	0.4%	South
RI	3	0.2%	2	0.7%	Northeast
SC	29	1.5%	4	1.5%	South
SD	8	0.4%	2	0.7%	Midwest
TN	60	3.0%	10	3.7%	South
TX	140	7.1%	19	7.1%	South
UT	16	0.8%	0	0.0%	West
VA	52	2.6%	7	2.6%	South
VT	6	0.3%	0	0.0%	Northeast
WA	52	2.6%	4	1.5%	West
WI	86	4.3%	10	3.7%	Midwest
WV	20	1.0%	1	0.4%	South

WY	4	0.2%	1	0.4%	West
Subtotal	1983	100.0%	268	100.0%	
No response	2		0		
Outside U.S.	23		4		
Total	2008		272		2280

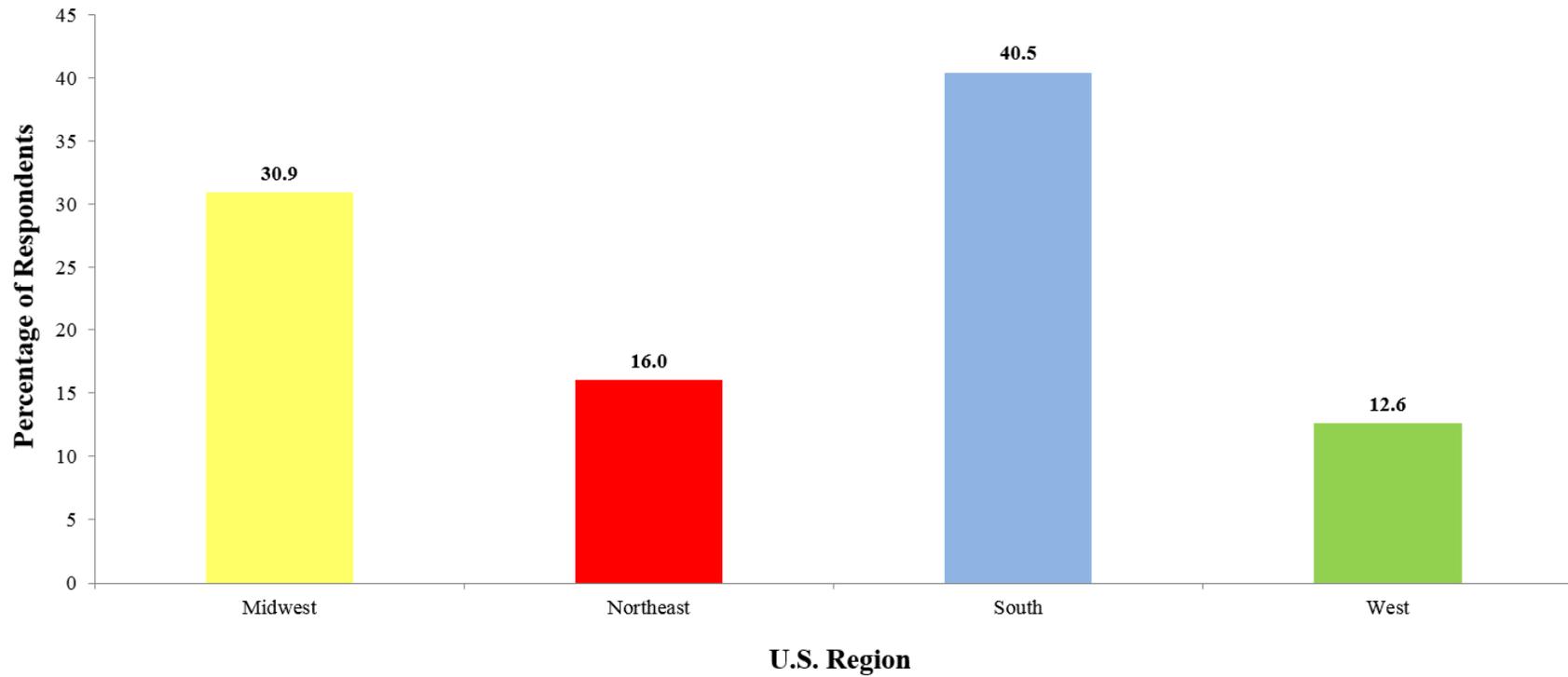
Currently Working as CNMT		
U.S. Region	N	%
Midwest	548	27.6
Northeast	334	16.8
South	770	38.8
West	331	16.7
Total	1983	100.0

Not Currently Working as CNMT		
U.S. Region	N	%
Midwest	81	30.9
Northeast	42	16.0
South	106	40.5
West	33	12.6
Total	262	100.0

In which U.S. state or territory is your primary practice? (Currently Working as CNMT)



In which U.S. state or territory is your primary practice? (NOT Currently Working as CNMT)

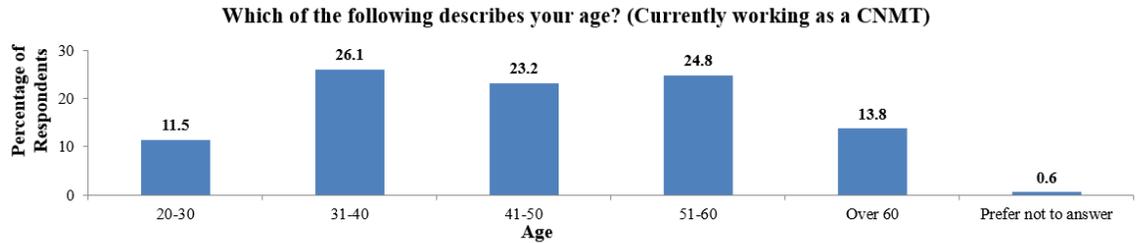


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Question 12. Which of the following describes your age?

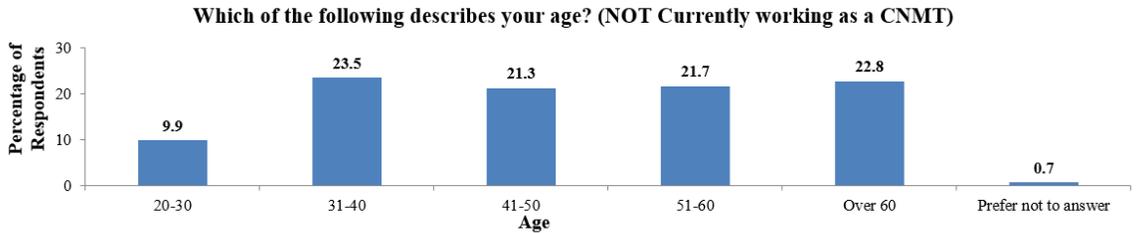
Which of the following describes your age? (Currently working as a CNMT)

Age	Frequency	Percent
20-30	229	11.5
31-40	519	26.1
41-50	462	23.2
51-60	495	24.8
Over 60	275	13.8
Prefer not to answer	12	0.6
Subtotal	1992	100.0
No response	16	
Total	2008	



Which of the following describes your age? (NOT Currently working as a CNMT)

Age	Frequency	Percent
20-30	27	9.9
31-40	64	23.5
41-50	58	21.3
51-60	59	21.7
Over 60	62	22.8
Prefer not to answer	2	0.7
Subtotal	272	100.0
No response	0	
Total	272	



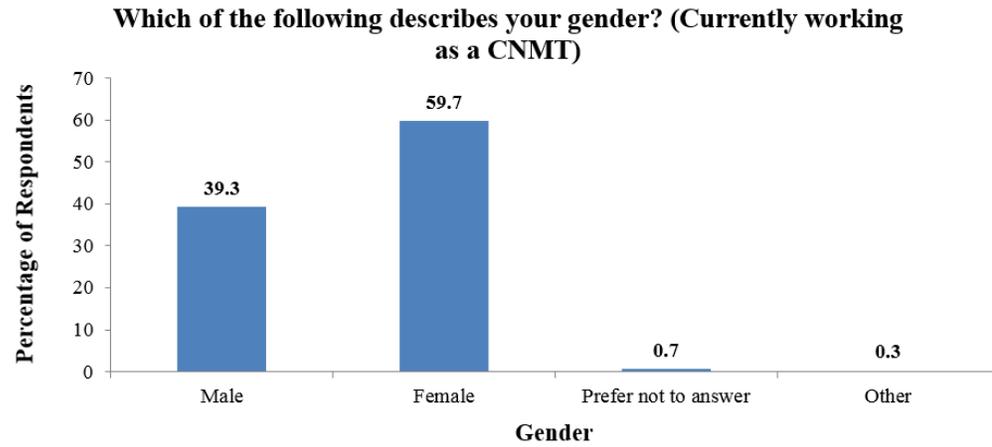
Total Respondents	2280
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Question 13. Which of the following describes your gender?

Which of the following describes your gender? (Currently working as a CNMT)

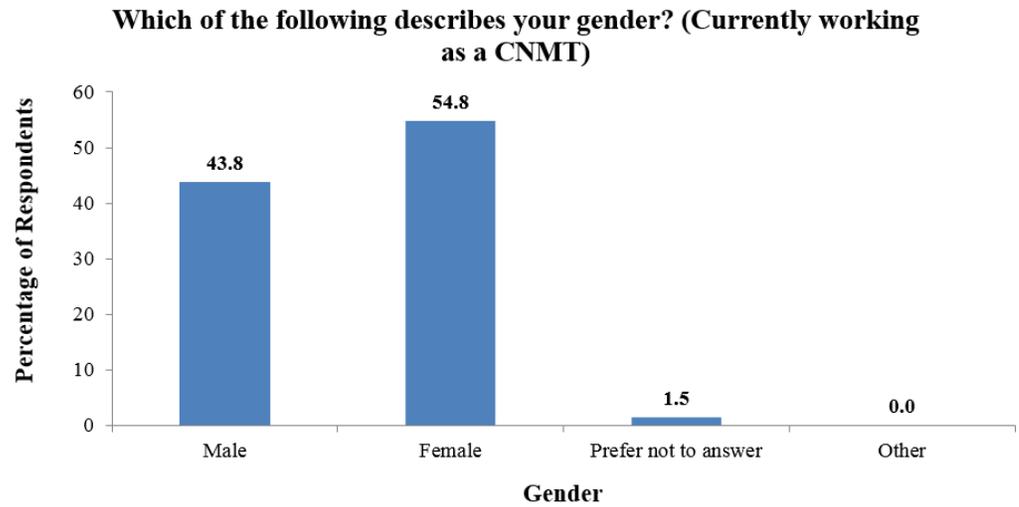
Gender	Frequency	Percent
Male	783	39.3
Female	1190	59.7
Prefer not to answer	14	0.7
Other	5	0.3
Subtotal	1992	100.0
No response	16	
Total	2008	



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Which of the following describes your gender? (NOT Currently working as a CNMT)

Gender	Frequency	Percent
Male	119	43.8
Female	149	54.8
Prefer not to answer	4	1.5
Other	0	0.0
Subtotal	272	100.0
No response	0	
Total	272	



Total Respondents	2280
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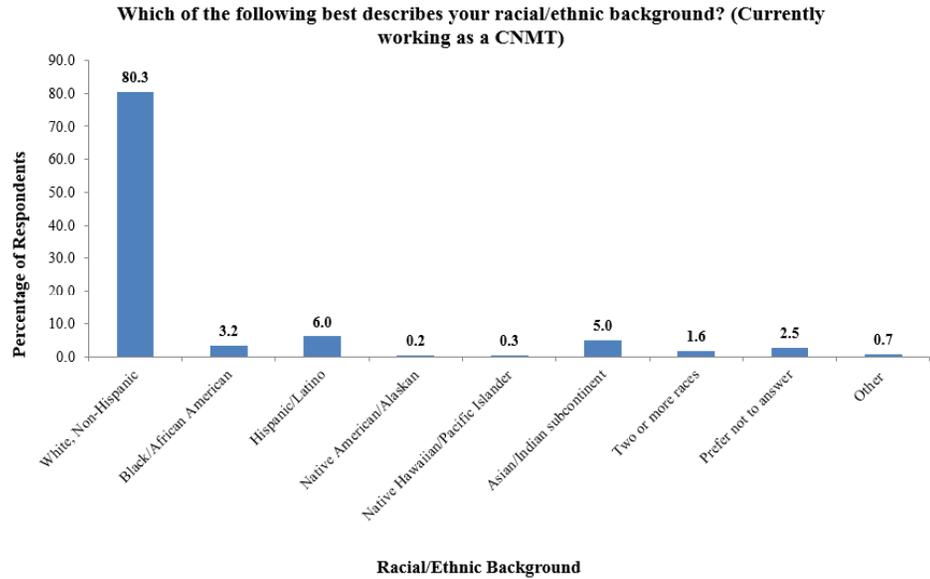
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Question 14. Which of the following BEST describes your race/ethnicity?

Which of the following best describes your racial/ethnic background? (Currently working as a CNMT)

Racial/Ethnic Background	Frequency	Percent
White, Non-Hispanic	1609	80.3
Black/African American	65	3.2
Hispanic/Latino	121	6.0
Native American/Alaskan	5	0.2
Native Hawaiian/Pacific Islander	6	0.3
Asian/Indian subcontinent	100	5.0
Two or more races	32	1.6
Prefer not to answer	51	2.5
Other	15	0.7
Subtotal	2004	100.0
No Reponse	4	
Total	2008	

Other Racial/Ethnic Background	Frequency
50% Irish/ 50%Native American	1
Afro-Cuban American	1
arab north african	1
Earthing	1
Hmong	1
Human	3
MEDDLE EASTERN	1
Middle Eastern	2
Southeast Asian	1
West indian	1
White/ Euro American	1
white/hispanic	1
Total	15



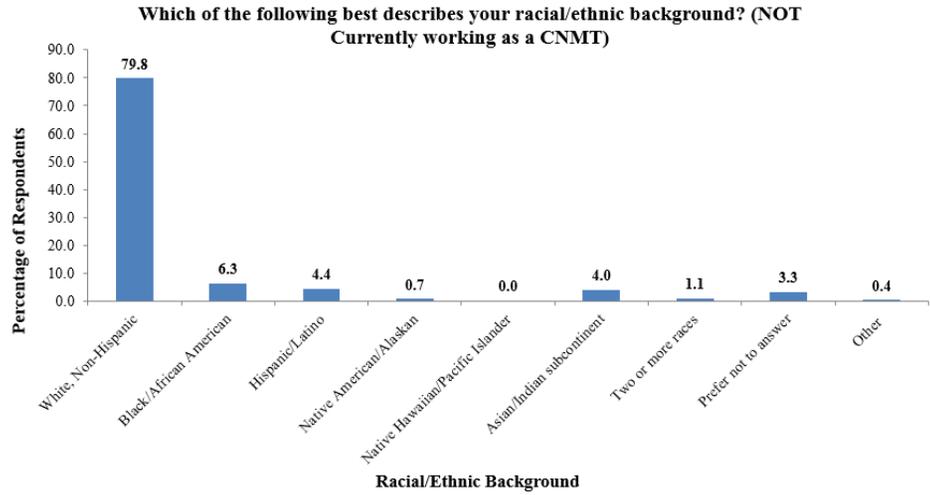
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Which of the following best describes your racial/ethnic background? (NOT Currently working as a CNMT)

Racial/Ethnic Background	Frequency	Percent
White, Non-Hispanic	217	79.8
Black/African American	17	6.3
Hispanic/Latino	12	4.4
Native American/Alaskan	2	0.7
Native Hawaiian/Pacific Islander	0	0.0
Asian/Indian subcontinent	11	4.0
Two or more races	3	1.1
Prefer not to answer	9	3.3
Other	1	0.4
Subtotal	272	100.0
No Reponse	0	
Total	272	

Other Racial/Ethnic Background	Frequency
Caucasion	1
Total	1

Total Respondents	2280
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Respondent Sample Characteristics

Evaluating the overall responses to the demographic questions provided some summary information about the respondents.

The typical respondent graduated from an NMTCB recognized program with a Bachelor's degree and was working full-time in a CNMT-related role as a staff technologist. The respondent has been practicing as a Certified Nuclear Medicine Technologist for 21 years or more. The respondent primarily practices in an inpatient facility or a hospital outpatient facility and the focus of their practice is general nuclear medicine. The typical respondent was likely to be a white non-Hispanic female.

The Committee reviewed the data and was comfortable that the demographic results provided a picture of a typical respondent, while capturing the diversity of Nuclear Medicine Technologists practicing in the U.S. The Committee was in agreement that, based on the review of the data, no important population subgroups were underrepresented.

Survey Analysis Data Findings

Frequency and Importance Ratings

After answering the demographic questions, respondents were asked to provide a single rating indicating if they believed that Nuclear Medicine Technologists performed each task or KSA in their practice and how critical a given task was, if performed. If respondents believed the task was never performed they were asked to rate it a “0” (*Not Performed*). Respondents indicating the task was performed were asked to rate it on a 1–4 importance/criticality scale with “1” representing a task that was *Not Important*, “2” representing a task that was *Low Importance*, “3” representing a task that was deemed *Moderately Important*, “4” representing a task that was *Extremely Important*. Combining the frequency and importance decisions into one rating eliminated the possibility of arriving at dichotomous findings whereby a task could be rated as *Not Performed* by a significant portion of the respondents, while also being rated as being *Moderately Important* or *Extremely Important*.

Appendices E, F, and G provide data describing the number of respondents who provided a frequency rating for each task or KSA (n=313), the mean (average) frequency rating and associated standard error, and the percentage of respondents who indicated that the task is *Not Performed* by the entry level, minimally-competent Nuclear Medicine Technologist. Appendix E presents the tasks and KSAs in survey order, Appendix F presents the survey analysis of tasks sorted by highest and lowest *Not Performed* (Zero) weighting, and Appendix G presents an analysis of the survey results with the tasks sorted by lowest to highest mean importance rating. All three appendices include the number of respondents who provided an importance/performance, nonperformance rating for each task or KSA. Importance ratings were calculated using only the 1–4 ratings; All “0” (*Not Performed*) ratings for a given task were eliminated from the task criticality calculations as presented in Appendices E, F, and G.

Subgroup Analysis

In addition to importance ratings for the entire sample, averages were also calculated for subgroups of respondents who answered the experience, geographic region, region type, practice setting, and

in what capacity do they work in questions, allowing for statistical comparisons among subgroups. Analysis of Variance (ANOVA) was used to test for differences among the experience, geographic, and supervisor queries. ANOVA was conducted to compare the mean importance ratings to ensure that the overall importance ratings were not being swayed by respondents of a particular experience level, geographic location, type of practice settings, or capacity as none of those are part of the description of minimal competency.

Experience Subgroup Comparisons

Across the mean comparisons (313 Subdomain or KSAs, 5 comparison groups), differences were flagged as significant at the $p < 0.01$ level resulting in 64 Subdomains or KSAs flagged as different in responses by years of experience. Fifty-four tasks were shown to be significant at the $p < 0.05$ level. All differences were noteworthy, but not important, since all specialties, although disparate in their ratings, felt the tasks were *Moderate to Extremely high Important* (average of 2.70 and above). Therefore, the Committee felt that the opinions of all geographic specialty population subgroups were taken into account. Appendix H, Table H-1 shows the ANOVA results for the experience for all tasks on the survey.

Geographic Region Subgroup Comparison

Across the mean comparisons (313 KSAs, 4 comparison groups) for geographic subgroups, 159 Subdomains or KSAs were flagged as significantly different at the $p < 0.01$ level, but most were not important, as all experience groups rated the task above *Moderately Important* (importance rating above 3.0). Tasks VA9k, VA9l, VA11a and VA11b seem to have been rated as more important in the South.

Forty-five tasks were shown to be significant at the $p < 0.05$ level. All were noteworthy, but not important, since all geographic regions, although disparate in their ratings, felt the tasks were *Moderately Important* or higher (average ratings of 2.9 and above). Therefore, the Committee felt that the opinions of all geographic specialty population subgroups were taken into account. Appendix H, Table H-2 shows the ANOVA results for geographic location for all tasks on the survey.

Region Type Subgroup Comparison

Across the mean comparisons (313 KSAs, 3 comparison groups-Rural, Urban, Suburban) 63 differences were flagged as significant at the $p < 0.01$ level, but none were important, as all experience groups rated the task above *Moderately Important* (importance rating above 2.7). Fifty-six additional tasks were shown to be significant at the $p < 0.05$ level. All differences were noteworthy, but not important, since all types of regions, although disparate in their ratings, felt the tasks were *Moderately Important* or higher. Therefore, the Committee felt that the opinions of all subgroups were taken into account. Appendix H, Table H-3 shows the ANOVA results for all tasks on the survey.

Practice Setting Subgroup Comparison

Across the mean comparisons (313 KSAs, 5 comparison groups) 70 differences were flagged as significant at the $p < 0.01$ level. Task IA1aiii was found to be more important by the Research Facility subgroup. Tasks IIC3b, IID1 and IID2 appear to be rated lower in importance for the

Mobile Unit subgroup. Tasks VA5g, VA9a and VA11g are rated lower in importance for the Research Facility subgroup.

Thirty-six additional tasks were shown to be significant at the $p < 0.05$ level. All differences were noteworthy, but not important, since all types of practice settings, although disparate in their ratings, felt the tasks were *Moderately Important* or higher. Therefore, the Committee felt that the opinions of all subgroups were taken into account. Appendix H, Table H-4 shows the ANOVA results for all tasks on the survey.

Capacity Subgroup Comparison

Across the mean comparisons (131 KSAs, 5 comparison groups), 35 differences were flagged as significant at the $p < 0.01$ level. Task IA1aiii and VA7c were considered more important Content Area Domain Weighting and Test Specifications

by retired people than full-time and part-time people. Task IIC4d, VA5g and VA7b and VA11g were considered more important by retired people than any of the other subgroups. Forty-two additional tasks were shown to be significant at the $p < 0.05$ level. All differences were noteworthy, but not important, since all types of capacities, although disparate in their ratings, felt the tasks were *Moderately Important* or higher. Therefore, the Committee felt that the opinions of all subgroups were taken into account. Appendix H, Table H-5 shows the ANOVA results for all tasks on the survey.

Task Exclusion Analysis

Having completed the analysis of the subgroup response data, the Committee went on to review the total respondent group importance and frequency data, as presented in appendices E, F, and G, in order to determine whether findings warranted the elimination of any tasks or KSAs from the content outline.

Appendix E: Mean Importance

The highest mean importance rating was for task VF1 (task 276, Verify Patient Identification, which received a 3.95 importance rating, *Extremely Important*. Appendix E shows importance ratings along with frequency ratings in survey order.

Appendix F: Frequency of Nonperformance

The task with the highest *Not Performed* rating was VA11a (task 248), with 43.5% of respondents indicating they did not perform the task. The next task rated the highest on non-performance was VA11b with 42.79% of respondents indicating that they did not perform the task.

The committee reviewed all tasks rated as not performed by more than 25% of respondents, and felt that all tasks were important (based on criticality ratings). For all tasks the Committee reached consensus that the tasks should remain on the content outline or be removed from the content outline. Fourteen tasks were eliminated based on nonperformance frequency. Table 11 shows all tasks not performed by 25% or more respondents.

Appendix G: Tasks in Lowest to Highest Importance Rating Order

Appendix G outlines the KSAs sorted in order of least-to-most important.

TABLE 11. Tasks Performed by Fewer than 75% of Respondents

Order	KSA	# of Ratings	Non-performance Frequency	Percentage
248	VA11a	2274	989	43.49%
249	VA11b	2269	971	42.79%
240	VA9l	2258	899	39.81%
254	VA11g	2253	892	39.59%
215	VA7b	2262	889	39.30%
100	IIIC5g	2264	857	37.85%
97	IIIC5d	2260	842	37.26%
101	IIIC5h	2245	829	36.93%
95	IIIC5b	2268	836	36.86%
93	IIIC4d	2253	822	36.48%
83	IIIC2e	2257	822	36.42%
99	IIIC5f	2257	800	35.45%
108	IIID7	2244	785	34.98%
96	IIIC5c	2267	784	34.58%
208	VA5g	2261	780	34.50%
253	VA11f	2270	780	34.36%
252	VA11e	2269	766	33.76%
102	IIID1	2255	736	32.64%
243	VA10c	2265	736	32.49%
228	VA8l	2256	732	32.45%
192	VA2f	2249	724	32.19%
103	IIID2	2261	717	31.71%
190	VA2d	2265	713	31.48%
229	VA9a	2269	714	31.47%
124	IIIE16	2256	704	31.21%
88	IIIC3d	2249	695	30.90%
216	VA7c	2252	693	30.77%
118	IIIE10	2259	691	30.59%
105	IIID4	2247	681	30.31%
98	IIIC5e	2266	685	30.23%
239	VA9k	2267	681	30.04%
195	VA3c	2273	681	29.96%
115	IIIE7	2264	677	29.90%
202	VA5a	2272	667	29.36%
52	IIIA1cii	2248	655	29.14%
138	IIIF2	2261	657	29.06%
247	VA10g	2249	653	29.04%
84	IIIC2f	2247	639	28.44%
256	VA12b	2247	637	28.35%
121	IIIE13	2260	638	28.23%
135	IIIF1d	2262	638	28.21%

Order	KSA	# of Ratings	Non-performance Frequency	Percentage
225	VA8i	2273	639	28.11%
115	III E7	2264	677	29.90%
236	VA9h	2267	637	28.10%
82	III C2d	2253	632	28.05%
106	III D5	2258	629	27.86%
107	III D6	2258	622	27.55%
86	III C3b	2252	611	27.13%
224	VA8h	2272	613	26.98%
235	VA9g	2267	605	26.69%
51	III A1ci	2262	596	26.35%
194	VA3b	2274	597	26.25%
214	VA7a	2259	592	26.21%
49	III A1a	2268	592	26.10%
50	III A1b	2244	584	26.02%
203	VA5b	2272	591	26.01%
226	VA8j	2263	587	25.94%
180	IV C3a	2277	587	25.78%
209	VA6a	2263	568	25.10%
196	VA3d	2268	568	25.04%

Final Content Outline Review and Approval

The Committee was then asked to review the final content outline, task-by-task to ensure that all tasks/KSAs met the following criteria:

1. Is this task important?
2. Is this task written clearly?
3. Is this task regularly performed by practitioners?
4. Is this task redundant or does it overlap other tasks?
5. Is the task's position on the outline clear and logical?
6. Is there a way to test/assess this task?

The Committee agreed to approve the new content outline as edited. Appendix I includes the full details of the final outline.

Examination Distribution and Content Area Weightings

Content Area Domain Weighting and Test Specifications

Survey results, followed by SME conversation during the webinar, led to the determination that an additional content domain was necessary. This led to the addition of a fifth content domain: Domain I: Radiation Physics and Detection. Once the outline was finalized, the Committee was asked to establish the weighting (emphasis) for each of the five main content areas that would form the basis for the examination. At the end of the survey, respondents were asked to assign main content area weightings using a percentage assignment model, where all assignments had to total 100%. The Committee used this respondent data along with consideration of the number and importance of tasks in a given sub-content area, and the importance/difficulty of tasks within a given sub-content area, to reach consensus that the content area weighting for the examination be finalized as indicated in Table 12.

With the examination content area weighting of the examination established, the Committee recommended that assessment of competence could be made continuing the use of a 125-item 5-option linear multiple choice examination. The Committee further recommended that the examination include 100 scored items and 25 pretest items. SMT will analyze data and decide which items will count for the initial form.

The examination will be offered in English only and will be closed book. Candidates will be provided with scratch paper during the examination. Calculators are allowed only if they are noiseless and battery- or solar-powered. Calculators capable of storing text will not be allowed. Passing candidates will receive notice of passing with a scaled score while failing candidates will receive notice of a scaled score and performance feedback.

TABLE 12. Main Content Area Weighting Data and Decisions

Domain	Respondent Average	Committee SME Averages	Weight based on # of KSAs	2017 JA Result Weighting
Domain I: Radiation Physics and Detection	13.7%	7.0%	3.5%	7.0%
Domain II: Radiation Safety and Regulations	16.4%	13.0%	12.1%	13.0%
Domain III: Pharmaceutical and Radiopharmaceutical Agents	21.2%	25.0%	31.9%	25.0%
Domain IV: Instrument Operations and Quality Control	16.9%	15.0%	11.5%	15.0%
Domain V: Clinical Procedures	31.8%	40.0%	40.9%	40.0%

Review of classical statistics will be used to ensure that questions are performing properly. The minimum passing score will be established on the first examination (linear) using an Angoff Method combined with a holistic scoring method, such as the Hofstee method, with IRT equating used to establish passing scores for subsequent examinations.

Review NMTCB Eligibility Requirements and Recertification Requirements

Eligibility Requirement Link to the NMTCB Content Outline

The workshop facilitator then led the Committee through an exercise to establish a link between the NMTCB program eligibility requirements, the definition of entry level minimal competence, and the ability of candidates to learn the concepts being tested. This exercise is designed to ensure that eligibility requirements are strict enough to ensure that candidates meeting them will have had the opportunity to learn the tasks on the content outline. This ensures that eligibility requirements are neither too strict (acting as a barrier to practice) nor too lenient (where candidates meeting eligibility requirements are unlikely to earn the credential).

Conclusion

The final approved Job Analysis content was translated into the content outline of the NMTCB credentialing examination. The adopted content outline will serve as the blueprint for development of new NMTCB examinations. This information will be published and made available to educators, candidates, regulators, and the general public, establishing the openness and transparency of the NMTCB credentialing program. Adoption of this content outline, content area weighting, eligibility requirements, and recertification requirements thereby establishes the link between job performance of critical tasks, successful examination performance, and continued competence in the profession for credential holders.

Appendix A: NMTCB CNMT Job Analysis Committee, Instructions, and Agenda

Name	Practice Location
Linda Davidge	MA
Corey Meunier	RI
Michael Novack	NJ
Tammy Lollo	PA
Jacinthe (Jay) Jaskulski	CT
Wesley Folds	AZ
Rosemary Nace	PA
Melinda Castro	CA
Kasha Balestrieri	NY
Todd Rippley	CA
Kirley Simpson	GA
Michaele Kroeger	TX

TABLE A-1. *Subject Matter Expert Job Analysis Participants*

Schroeder Measurement Technologies, Inc.



2492 Bayshore Blvd. Suite 201

SMT

Dunedin, Florida 34698

52 Carriage Trail

Belle Mead, NJ 08502

August 29, 2017

Katie Neal, Executive Director

Nuclear Medicine Technology Certification Board

3558 Habersham at Northlake, Building I

Tucker, GA 30084-4009

Dear Katie and members of the Job Analysis Advisory Committee,

Please accept my thanks and appreciation in advance for your willingness to serve as a Subject Matter Expert on this most important project of performing a Job Analysis of the role of the Nuclear Medicine Technologist. You are probably acquainted with the rich history of the Certified Nuclear Medicine Technologist (CNMT) program and the commitment that the NMTCB has made to the promotion of this credential: I am writing to outline how your service will support the Board's efforts to ensure that the program meets the highest standards for certification programs.

The goal of the Job Analysis is to produce researched-based evidence that the CNMT Credentialing program is *job related, reliable, legally defensible, and valid*. Demonstrating these characteristics involves performance of tasks across the CNMT program, but the foundation is based upon the quality and comprehensive nature of the analysis of the role of the Nuclear Medicine Technologist in today's medical environment. Please see the attached document entitled *Standards Based Certification and Licensure* for more information on how the Job Analysis fits into the Certification program cycle of tasks and responsibilities.

We are meeting March 11-12, 2017 to initiate the Job Analysis study and expect to perform the following tasks:

1. *Discuss and establish a profile of the entry-level, minimally-competent CNMT.* We will consider current CNMT eligibility standards, typical education and experience expectations for entry-level Nuclear Medical Technologists, and the scope of skills CNMTs demonstrate and how those skills may be obtained. With this, and all matters we will address, your opinion and experience are critical. Please feel free to bring or reference materials that might relate to this discussion in terms of your experience as a CNMT, or roles you may have held supervising, teaching or mentoring CNMTs.

2. *Compile an exhaustive task listing of the knowledge, skills, and abilities (KSAs) required of the CNMTs working in the role today.* As a starting point, we will be working from the current content outline of the CNMT examination. In my role as a psychometric specialist, I will be performing a literature search prior to the workshop to augment the content outline to reflect changes that have taken place in the role scope and practice since the last job analysis was performed. I will also include any tasks identified during a series of interviews I have conducted of practitioners who are active in the role. Our job will be to ensure that all critical tasks that CNMTs perform are included on this listing, with focus on the way the role has changed over the past five-plus years, not only in terms of legislative and standards-based changes, but changes in technology, patient safety advances, and required cognitive skills. Your opinion and insight identifying the KSAs that may be over-or-under represented, as well as those that may have been omitted, or should be deleted, will be paramount to our success.

3. With the task listing complete, you will be asked to participate in discussions concerning the following job analysis survey considerations:

- format of the survey
- introductory information to provide to respondents
- demographic data to be collected
- survey sampling methodology
- incentives
- publicity

The CNMT program represents an extraordinary investment of time, talent and money, and all matters that you will be asked to participate in are to be considered confidential. Likewise, any materials you may use or see during your service are considered secure and should be kept as such. Please click on the link below to sign a nondisclosure document and provide demographic data. The demographic questionnaire will be used to establish a group profile documenting the diversity of experience, education, practice setting, and geographic

representation of the Advisory Committee members. Please click on the link and once in the survey select the NMTCB option in the “program” selection list.

<http://www.smttest.com/JobAnalysis/forms/survey.aspx?surid=61>

You have been asked to participate in this process due to your expertise as a CNMT, or working with CNMTs and your representativeness of the diversity of practice. We are counting on your willingness to share your understanding of this role in a creative and open forum. Please be thinking of the role of the CNMT: How is it changing, what are the critical skills performed, and how can we best measure them? Consider the minimally competent candidate who just meets the eligibility requirements to sit for the certification examination. What KSAs would you expect this candidate to demonstrate in order to protect the public and practice competently and effectively? Current eligibility requirements may be found here:

<https://www.nmtcb.org/exam/instructions.php#eligibility>

I look forward to working with you. Please feel free to contact me with any questions or concerns, as I am,

Yours truly,

Kate Windom

Director of Accreditation and Program Services

kwindom@smttest.com

/Sent via e-mail

/Enclosures: 1. Agenda (below)

/Attachments: 1. Standards Based Certification and Licensure (pdf)

Agenda

Certified Nuclear Medical Technologist Job Analysis Workshop

March 11-12, 2017

Embassy Suites, Atlanta Airport Hotel

Atlanta, Georgia

Saturday, March 11, 2017

8:00 am–8:30 **Welcome – Introductions, breakfast served at SMT**

Discussion of the Goals of the Workshop

9:30 am – **Lunch (Lunch served in meeting – Breaks as needed) – 5:00 pm**

Development and discussion of:

- Profile of the Minimally Competent Practitioner
- Role of the CNMT
- Knowledges, Skills and Abilities required of the Minimally Competent CNMT
- Discussion of task listing organization

Sunday, March 12, 2017

8:00 am – 3:30 pm **Breakfast and Lunch in meeting room and Continuation of Job Analysis Survey Development Tasks:**

- Review of exhaustive task listing and consensus of final task listing for use on the survey.
- Discussion/establishment of the survey details including:

1. survey construction
 2. survey scheduling: time and task
 3. invitations – sampling plan
 4. respondent group
 5. use of incentives
 6. communications
 7. demographic questionnaire
 8. development of a rating scale
 9. survey marketing/publicity
- Discussion of future planning (What comes next?)



Affidavit of Nondisclosure

I, (name) _____

(ADDRESS) _____

hereby swear and affirm that I shall not disclose or provide to anyone, directly or indirectly any information or documents to which I have been made privy during development and/or preparation of the Job Analysis Research Study supporting the Nuclear Medicine Technology Certification Board, Certified Nuclear Medicine Technologist Examination Program, rendered by the NMTCB with support from Schroeder Measurement Technologies, Inc.

It is understood that all documents or examination related materials, or confidential information received from the NMTCB or SMT are and shall remain the exclusive property of the NMTCB and that all documents or information shall be destroyed/deleted or promptly returned to the NMTCB upon completion of my service as a Subject Matter Expert during the Job Analysis Research Study.

I affirm that my participation in this Job Analysis does not present a conflict of interest. Should one arise, I will disclose any and all conflicts, potential conflicts, and/or perceived conflicts during my participation in the Job Analysis Research Study.

Signature

Date

Witness

Date

Schroeder Measurement Technologies, Inc.

Appendix B: A Survey of the Role of the Nuclear Medical Technologist

Survey Introduction Email

Dear Colleagues:

As you are keenly aware, the Nuclear Medicine Technology Certification Board (NMTCB) Certified Nuclear Medicine Technologist Credential is among its greatest assets. This credentialing program requires continuous enhancement to ensure that it reflects up-to-date competencies supporting the ethical, effective, and competent performance of the Nuclear Medicine Technologist profession. As part of those efforts, I am requesting your assistance and participation in a Job Analysis Study of the role of the Certified Nuclear Medicine Technologist. The survey will assist in making necessary improvements by providing us with a quantitative description of the knowledge, skills and abilities (knowledge elements) that you and your colleagues believe are important to competent performance. This is your opportunity to contribute to the content of future CNMT Examinations. Your advice is crucial to this effort and can only be obtained through participation in this survey.

I know your time is valuable and your efforts are appreciated. To thank you for your help with this important project, we'll be conducting drawings for ten \$100 VISA gift cards. Five of the VISA gift cards will be raffled within the first two weeks after the launch of this survey. You can choose to participate in the drawings by submitting your name and email at the end of the survey. You can also be "excused" from 2 CEU NMTCB credits for successfully completing each section of the survey. You will not earn CEU credits, but will be required to submit two fewer credits at the time of CNMT recertification. These "excused" credits will not be applicable to state recertification CEU requirements.

The survey should take about 60 minutes to complete.

By using the login, you will receive when you enter the survey, you will be able to return to the survey if you wish to complete it in more than one sitting. If you are accidentally disconnected from the internet while you are completing the survey, your *login will also allow you to return to the survey, with your decisions from the last submitted survey page saved*. You may change your responses by moving up and down the knowledge element listing, up until the point at the end of the survey that you click "Submit Survey." Incomplete surveys cannot be accepted. The survey is best completed on a laptop or computer, but may be completed on a large cell phone or tablet.

Please click on the following link to enter the survey.

<http://www.smttest.com/JobAnalysis/forms/survey.aspx?surid=67>

Online Survey



Welcome to the Nuclear Medicine Technologist Certification Board (NMTCB) Job Analysis Survey

The purpose of this survey is to review and update the content outline for the Certified Nuclear Medicine Technologist (CNMT) examination. Respondents should be CNMTs, or hold a license/credential to practice as a Nuclear Medicine Technologist, or be directly supervising professionals serving in this role. If you are not a CNMT or licensee, or are not actively supervising staff who are, please feel free to forward this survey to an active Nuclear Medicine Technologist who might be interested in participating.

The Survey that follows contains an exhaustive list of tasks that may be performed by entry-level CNMTs working in a variety of practice settings. While licensing requirements differ by state, the NMTCB CNMT requirements are as follows:

- Completion of a programmatically-accredited certificate, associate degree, or baccalaureate degree program in nuclear medicine technology.
- Educational programs must have structured clinical training sufficient to provide clinical competency in radiation safety, instrumentation, clinical procedures, and radiopharmacy.
- Most programs include at least 800 hours of clinical training supervised by program faculty.

All CNMT candidates must also agree to abide by a Code of Ethics. Someone meeting these significant minimum requirements would be considered "entry-level," while serving as CNMT should in no way be considered an entry-level job.

[Next](#)

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



You may revisit your survey record at any time before the **survey closes on May 4, 2017.**

There are three sections in this survey:

Section 1: Demographic Questions. Demographic questions help us develop a profile of the Certified Nuclear Medicine Technologist and the environment in which you practice.

Section 2: Job Domains. This section lists essential elements of knowledge, skills, and abilities required of a competent entry-level CNMT in his or her work. This list of knowledge elements is organized by job domain and was developed by a diverse group of CNMTs. You are asked to indicate how important each knowledge element is to public protection and competent performance of an entry-level CNMT.

Section 3: Post-Survey Questionnaire. In this section, you are asked to assign weights to each of the main content areas. This data will be analyzed to determine the distribution of content for the CNMT certification exam. You will also have the opportunity to specify any knowledge or tasks you feel may have been overlooked in this survey.

All responses are strictly confidential. Email addresses will not be used for any reason other than those clearly expressed in this survey. Please answer **ALL** items and sections completely. After completing the survey, you will qualify for drawings to win one of ten \$100 VISA gift cards. Five of the VISA gift cards will be raffled within the first two weeks after the launch of this survey. Your responses and your registration for the drawing will never be linked. If you have any technical problems associated with taking the survey, please contact Schroeder Measurement Technologies (SMT) at (800) 556-0484 extension 2104 from 8:00 AM to 4:30 PM (EST), Monday - Friday, or by email at jceleste@smttest.com.

Before starting the survey, you will 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 email address in the box provided for "New Users," then click the "Submit" button. Your access code will then be displayed to you; write it down for future reference in the event that you are interrupted before completing the survey, or if you wish to reenter at any time. Once you record your Access Code, you can use the fields designated for "Returning Users." **Email addresses are used for the sole purpose of allowing a means of access to the survey.**

New User Email Address:

Returning User Email Address: Access Code:

[Forgot your access code?](#)

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



Section 1: Demographic Questions. Presented below are general demographic questions used to help us understand the role of a CNMT. This basic demographic information is standard for the survey procedure. Factors such as age, years of experience, geographic region, and job setting are regularly grouped and analyzed as part of a rigorous sample validation process. [Table of Contents](#)

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.

* Denotes a required field

1. What was your pathway to becoming a Certified Nuclear Medicine Technologist?
< select >
2. What was awarded when you graduated from Nuclear Medicine Technology education and training?
< select >
3. What is your highest level of education?
< select >
4. How many years have you been practicing as a Certified Nuclear Medicine Technologist? *
< select >

5. What Nuclear Medicine Technologist credentials or certificates do you hold? (check all that apply)

- NMTCB - Certified Nuclear Medicine Technologist - CNMT
- NMTCB - Computed Tomography Technologist - NMTCB(CT)
- NMTCB - Nuclear Cardiology Technologist - NCT
- NMTCB - PET Technologist - PET
- NMTCB - Nuclear Medicine Advanced Associate - NMAA
- ARRT - Nuclear Medicine Technology - RT(N)
- ARRT - Radiography - RT(R)
- ARRT - Computed Tomography - RT(CT)
- ARRT - Magnetic Resonance Imaging - RT(MR)
- ARRT - Radiation Therapy - RT(T)
- ARRT - Cardiovascular/Interventional Radiography - RT(CV)
- ARRT - Cardiac-Interventional Radiography - RT(CI)
- ARRT - Vascular-Interventional Radiography - RT(VI)
- ARRT - Mammography - RT(M)
- ARRT - Quality Management - RT(QM)
- ARRT - Bone Densitometry - RT(BD)
- ARRT - Sonography - RT(S)
- ARRT - Vascular Sonography - RT(VS)
- ARRT - Breast Sonography - RT(BS)
- MDDB - Medical Dosimetrist - MD
- ARDMS - Diagnostic Medical Sonography - RDMS
- ARDMS - Diagnostic Cardiac Sonography - RDCS
- ARDMS - Vascular Sonography - RVT
- CAMRT - Nuclear Medicine Technology - RTNM
- CAMRT - Radiological Technology - RTR
- CAMRT - Magnetic Resonance - RMR
- CAMRT - Radiation Therapy - RTT
- ARMRLT - Magnetic Resonance - ARMRLT
- Other (please specify)

6. In what capacity are you employed as a Nuclear Medicine Technologist? *

< select >

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Section 1: Demographic Questions. Presented below are general demographic questions used to help us understand the role of a CNMT. This basic demographic information is standard for the survey procedure. Factors such as age, years of experience, geographic region, and job setting are regularly grouped and analyzed as part of a rigorous sample validation process. [Table of Contents](#)

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.

* Denotes a required field

7. Which of the following **BEST** describes your primary practice setting? *

< select >

8. Which of the following **BEST** describes the **primary focus** of your practice? *

< select >

9. Select the category that **BEST** describes your primary position? *

< select >

10. Which of the following **BEST** describes your geographic region of practice?

< select >

11. In which State/territory or country is your primary practice? *

< select >

12. Which of the following describes your age?

< select >

13. Which of the following describes your gender?

< select >

14. Which of the following **BEST** describes your race/ethnicity?

< select >

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Section 1: Demographic Questions. Presented below are general demographic questions used to help us understand the role of a CNMT. This basic demographic information is standard for the survey procedure. Factors such as age, years of experience, geographic region, and job setting are regularly grouped and analyzed as part of a rigorous sample validation process. [Table of Contents](#)

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* Denotes a required field

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< select >

8. In which State/territory or country is your primary practice? *

< select >

9. Which of the following describes your age?

< select >

10. Which of the following describes your gender?

< select >

11. Which of the following **BEST** describes your race/ethnicity?

< select >

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Section 2: Job Domains

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Welcome to the Nuclear Medicine Technologist Certification Board (NMTCB)
Certified Nuclear Medicine Technologist (CNMT) Job Analysis Survey

The purpose of this survey is to review and update the content outline for the CNMT examination.

Please keep in mind the profile of the entry-level CNMT for each task as you provide a single rating response to the following question: *How important is this knowledge element in relation to the ethical, effective, and competent performance of an entry-level CNMT?*

Using the rating scale, select the rating that best describes your opinion on the importance of the knowledge element. Please select "Not Performed" if the entry-level CNMT does NOT perform or apply the competency.

IMPORTANCE
0 Not Performed
1 Not Important
2 Low Importance
3 Moderately Important
4 Extremely Important

0	1	2	3	4
Not Performed	Not Performed	Low Importance	Moderately Important	Extremely Important

Domain I: Radiation Physics and Detection

Task A. Physical properties

1. Radioactive materials:

a. Modes of decay:

i. Gamma emitters

ii. Beta emitters

iii. Alpha emitters

iv. Positron emitters

Not Performed	Not Performed	Low Importance	Moderately Important	Extremely Important
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. X-ray production:

a. Bremsstrahlung

b. Characteristic x-ray

Not Performed	Not Performed	Low Importance	Moderately Important	Extremely Important
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Task B. Measurement of radioactivity and decay calculations

Task C. Interactions of radiation with matter

Task D. Radiation detector types and basic principles

Task E. Counting statistics

Not Performed	Not Performed	Low Importance	Moderately Important	Extremely Important
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Section 2: Job Domains (continued)

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How important is this knowledge to the practice of a competent entry-level CNMT? Please select "Not Performed" if the entry-level CNMT does NOT perform or apply the competency. For those activities that the entry-level CNMT does perform or supervise, provide an importance rating using the scale range from "Not Important" to "Extremely Important." If you are unable to see the header row for the rating scale, hovering over the button in the cell will display the rating that is associated with that button.

IMPORTANCE
0 Not Performed
1 Not Important
2 Low Importance
3 Moderately Important
4 Extremely Important

0	1	2	3	4
Not Performed	Not Performed	Low Importance	Moderately Important	Extremely Important

Domain II: Radiation Safety and Regulations

Task A. Biological effects of radiation exposure

<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
----------------------------------	-----------------------	-----------------------	-----------------------	-----------------------

Task B. Protection techniques and calculations:

1. Time

2. Distance (inverse square law)

3. Shielding (shielding equations)

Not Performed	Not Performed	Low Importance	Moderately Important	Extremely Important
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Task C. Monitoring protocols and requirements (e.g., timing and frequency):

1. Radiation surveys (area monitoring) including:

a. Survey meters and well counters

b. Choice of radiation detection devices (e.g., Geiger Counters, sodium iodide detectors)

c. Frequency and limits of wipe surveys

Not Performed	Not Performed	Low Importance	Moderately Important	Extremely Important
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. Personal monitoring devices

3. Personal protective equipment (e.g., lab coat, gloves, syringe shields)

<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
----------------------------------	-----------------------	-----------------------	-----------------------	-----------------------

4. Effective dose equivalent limits for:

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
a. Radiation workers	●	○	○	○	●
b. Pregnant radiation workers	●	○	○	○	●
c. General public	●	○	○	○	●
Task D. Practice and adhere to ALARA	●	○	○	○	●
Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:					
1. Posting warning and informational signs delineating restricted and unrestricted areas	●	○	○	○	●
2. Surveying, inspecting, and inventorying radioactive materials	●	○	○	○	●
3. Responding to adverse events:					
a. Trigger levels and monitoring methods	●	○	○	○	●
b. Radiation exposure	●	○	○	○	●
c. Radiation spills	●	○	○	○	●
d. Protection during adverse events	●	○	○	○	●
e. Personnel, patient, and/or public decontamination	●	○	○	○	●
f. Area/equipment decontamination	●	○	○	○	●
4. Adhere to radioactive waste storage requirements	●	○	○	○	●
5. Dispose of radioactive materials (e.g., liquids, solids, gasses, contaminated materials)	●	○	○	○	●
6. Identify recordable and reportable events	●	○	○	○	●
7. Maintain records as required for:					
a. Receipt, storage, and disposal of radioactive materials	●	○	○	○	●
b. Radiation monitoring and reporting	●	○	○	○	●
c. Equipment calibration and maintenance	●	○	○	○	●
d. Staff, patient, occupational and public exposure	●	○	○	○	●
e. Nuclear medicine diagnostic and therapeutic procedures	●	○	○	○	●
Task F. Practice and adhere to Department of Transportation (DOT) - Radiopharmaceutical Transport requirements:					
1. Use of shielding containers	●	○	○	○	●
2. Labeling requirements (e.g., transportation index, name, concentration, expiration date/time, total activity, assay date/time)	●	○	○	○	●
3. Package monitoring/receiving/returning	●	○	○	○	●
Task G. Practice and adhere to Environmental Protection Agency (EPA) requirements	●	○	○	○	●
Task H. Practice and adhere to Occupational Safety and Health Administration (OSHA) requirements	●	○	○	○	●
Task I. Practice and adhere to Health and Human Services (HHS)/Health Insurance Portability and Accountability Act (HIPAA) requirements:					
1. Protecting patient rights and privacy	●	○	○	○	●
2. Maintaining patient records	●	○	○	○	●
3. Releasing information to authorized parties	●	○	○	○	●
Task J. Knowledge of institutional and departmental accreditation organizations	●	○	○	○	●



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Section 2: Job Domains (continued). [Table of Contents](#)

How important is this knowledge to the practice of a competent entry-level CNMT? Please select "Not Performed" if the entry-level CNMT does NOT perform or apply the competency. For those activities that the entry-level CNMT does perform or supervise, provide an importance rating using the scale range from "Not Important" to "Extremely Important." If you are unable to see the header row for the rating scale, hovering over the button in the cell will display the rating that is associated with that button.

4	3	2	1	0
Extremely Important	Moderately Important	Low Importance	Not Important	Not Performed
Domain III: Pharmaceutical and Radiopharmaceutical Agents				
Task A. Elute radionuclide generator, perform and evaluate quality control tests:				
1. Types of generators (e.g., ^{99m}Tc, ⁸²Sr/⁸²Rb, etc.):				
a. Elution				
b. Generator yield - volume and activity				
c. Quality control procedures:				
i. ^{99m} Tc/ ^{99m} Tc (^{99m} Tc breakthrough and AI +3 content)				
ii. ⁸² Sr/ ⁸² Rb (measured activity and levels of ⁸² Sr & ⁸⁵ Sr)				
2. Dose calibrator operation/units of radioactivity				
Task B. Prepare radiopharmaceutical kits, perform quality control, and evaluate results:				
1. Radiopharmaceutical kits:				

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
a. Activity and volume limitations	●	○	○	○	●
b. Activity calculations	●	○	○	○	●
c. Insure particle size and number if needed	●	○	○	○	●

2. Radiopharmaceutical quality control:

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
a. Visual inspection - color and clarity	●	○	○	○	●
b. Radiochemical purity	●	○	○	○	●

3. Labeling kits

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
4. Storage of kits before and after reconstitution	●	○	○	○	●

Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:

1. Tc99m labeled radiopharmaceuticals:

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
a. Tc99m sodium pertechnetate	●	○	○	○	●
b. Tc99m oxidronate/HDP	●	○	○	○	●
c. Tc99m medronate/MDP	●	○	○	○	●
d. Tc99m pentetate/DTPA	●	○	○	○	●
e. Tc99m macroaggregated albumin/MAA	●	○	○	○	●
f. Tc99m sulfur colloid	●	○	○	○	●
g. Tc99m disofenin/mebrofenin (Choletec®)	●	○	○	○	●
h. Tc99m meglumine/MAG3	●	○	○	○	●
i. Tc99m pyrophosphate/PYP	●	○	○	○	●
j. Tc99m sestamibi/MIBI (Cardiolite®)	●	○	○	○	●
k. Tc99m tetrofosmin (Myoview®)	●	○	○	○	●
l. Tc99m succimer/DMSA	●	○	○	○	●
m. Tc99m exametazime/HMPAO (Ceretec®)	●	○	○	○	●
n. Tc99m bicisate/ECD (Neurolite®)	●	○	○	○	●
o. Tc99m labeled RBCs	●	○	○	○	●
p. Tc99m denatured radiolabeled RBCs	●	○	○	○	●
q. Tc99m HMPAO tagged WBCs	●	○	○	○	●
r. Tc99m tilmanocept (Lymphoseek®)	●	○	○	○	●

2. Iodine labeled radiopharmaceuticals:

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
a. I-123 sodium iodide	●	○	○	○	●
b. I-131 sodium iodide	●	○	○	○	●
c. I-123 MIBG	●	○	○	○	●
d. I-131 MIBG	●	○	○	○	●
e. I-131 serum albumin/RISA	●	○	○	○	●
f. I-123 Ioflupane (DaTscan®)	●	○	○	○	●

3. Indium labeled radiopharmaceuticals:

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
a. In-111 Pentetate (DTPA)	●	○	○	○	●
b. In-111 chloride	●	○	○	○	●
c. In-111 oxine labeled WBCs	●	○	○	○	●
d. In-111 labeled MAB (capromab pentetide)(Prostascint®)	●	○	○	○	●
e. In-111 pentetreotide (Octreoscan®)	●	○	○	○	●

4. Miscellaneous diagnostic radiopharmaceuticals:

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
a. Tl201 thallous chloride	●	○	○	○	●
b. Ga67 gallium citrate	●	○	○	○	●
c. Xe133 gas	●	○	○	○	●
d. C14 urea	●	○	○	○	●

5. Positron Emission Tomography:

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
a. F-18 FDG	●	○	○	○	●
b. F-18 Florbetaben (NeuraCept®)	●	○	○	○	●
c. F-18 Florbetapir (Amyvid®)	●	○	○	○	●
d. F-18 Flutemetamol (Vizamyl®)	●	○	○	○	●
e. F-18 Sodium Fluoride (NaF)	●	○	○	○	●
f. Rb82 chloride	●	○	○	○	●
g. N13 ammonia	●	○	○	○	●
h. Ga-68 Dotatate	●	○	○	○	●

Task D. Understand the characteristics (i.e., mechanism of localization), indications, contraindications, and administration of therapeutic radiopharmaceuticals:

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
1. Sr89 chloride (Metastron®)	●	○	○	○	●
2. Sm153 EDTMP Ixodronam (Quadramet®)	●	○	○	○	●
3. I-131 sodium iodide	●	○	○	○	●
4. Y90 Ibritumomab tiuxetan (Zevalin®)	●	○	○	○	●
5. Y90 microspheres (SIR-Spheres®, TheraSphere®)	●	○	○	○	●
6. Ra223 Radium dichloride (Xofigo®)	●	○	○	○	●
7. I-125 Seeds	●	○	○	○	●

Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
1. dipyridamole (Persantine®)	●	○	○	○	●
2. adenosine	●	○	○	○	●
3. dobutamine	●	○	○	○	●
4. aminophylline	●	○	○	○	●
5. regadenoson (Lexiscan®)	●	○	○	○	●
6. captopril	●	○	○	○	●
7. enalaprilat	●	○	○	○	●
8. furosemide (Lasix®)	●	○	○	○	●
9. insulin	●	○	○	○	●
10. acetazolamide	●	○	○	○	●
11. cholecystokinin/sincalide/CCK	●	○	○	○	●
12. morphine	●	○	○	○	●
13. cimetidine/ranitidine/famotidine	●	○	○	○	●
14. ACD solution	●	○	○	○	●
15. heparin	●	○	○	○	●
16. hetastarch	●	○	○	○	●
17. contrast media (oral and IV)	●	○	○	○	●
18. Lugol's solution/SSKI	●	○	○	○	●
19. Thyroid Stimulating Hormone (TSH)	●	○	○	○	●
20. Lidocaine	●	○	○	○	●
21. Lidocaine (EMLA) cream	●	○	○	○	●

22. atropine	●	○	○	○	●
23. recombinant human TSH (Thyrogen®)	●	○	○	○	●

Task F. Label blood components with radiopharmaceutical according to protocol:

1. Labeling procedures:

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
a. Required lab equipment and supplies	●	○	○	○	●
b. Anticoagulants and other additives	●	○	○	○	●
c. Chemical reactions	●	○	○	○	●
d. Cell washing	●	○	○	○	●
e. Required radiopharmaceuticals	●	○	○	○	●
f. Method: in vivo or in vitro	●	○	○	○	●
2. Centrifuge operation	●	○	○	○	●
3. Calculation of labeling efficiency and administered dosage	●	○	○	○	●
4. Reinjection patient and sample verification	●	○	○	○	●

Task G. Understand the routes of administration:

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
1. Administration modes (e.g., IV, IM)	●	○	○	○	●
2. Administration techniques (e.g., bolus injection, straight stick, IV line)	●	○	○	○	●

Task H. Prepare and administer non-radioactive agents:

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
1. Follow aseptic technique	●	○	○	○	●
2. Adverse side-effects and treatment	●	○	○	○	●
3. Antidote/reversal agent	●	○	○	○	●
4. Interventional pharmaceuticals	●	○	○	○	●
5. Non-radioactive agents (e.g., ACD solution, heparin, contrast media, TSH, atropine, etc.,)	●	○	○	○	●



Section 2: Job Domains (continued)

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How important is this knowledge to the practice of a competent entry-level CNMT? Please select "Not Performed" if the entry-level CNMT does NOT perform or apply the competency. For those activities that the entry-level CNMT does perform or supervise, provide an importance rating using the scale range from "Not Important" to "Extremely Important." If you are unable to see the header row for the rating scale, hovering over the button in the cell will display the rating that is associated with that button.

IMPORTANCE
0 Not Performed
1 Not Important
2 Low Importance
3 Moderately Important
4 Extremely Important

	0 Not Performed	1 Not Important	2 Low Importance	3 Moderately Important	4 Extremely Important
Domain IV: Instrument Operations and Quality Control					
Task A. Non-imaging equipment, components, and operation:					
1. Perform and evaluate quality control on well counters and probes:					
a. Calibrate and perform quality control on the sodium iodide scintillation detector	●	●	●	●	●
b. Conduct a gamma ray spectra and pulse height analysis	●	●	●	●	●
c. Apply formulas (e.g., energy resolution, sensitivity, Chi-square statistics, etc.)	●	●	●	●	●
2. Determine operational status of survey meter:					
a. Survey meter operations and components	●	●	●	●	●
b. Survey meter quality control	●	●	●	●	●
c. Perform and evaluate dose calibrator constancy, accuracy, linearity, and geometry tests	●	●	●	●	●
Task B. Imaging equipment, components, and operation:					
1. Gamma Camera quality control:					
a. Uniformity	●	●	●	●	●
b. Spatial resolution	●	●	●	●	●
c. Visual image quality	●	●	●	●	●
d. Phantoms	●	●	●	●	●
e. Artifacts	●	●	●	●	●
f. Assess system sensitivity	●	●	●	●	●
g. Pulse height analysis	●	●	●	●	●
2. SPECT and SPECT/CT imaging system:					
a. Attenuation correction	●	●	●	●	●
b. SPECT camera quality control:					
i. Center of rotation	●	●	●	●	●
ii. Field uniformity requirements	●	●	●	●	●
iii. Pixel calibration	●	●	●	●	●
iv. 3-D uniformity and resolution (e.g., Jaszcz phantom)	●	●	●	●	●
v. Artifacts	●	●	●	●	●
3. PET and PET/CT imaging systems:					
a. Application of attenuation corrections	●	●	●	●	●
b. PET quality control (e.g., daily blank scan, normalization scan, 2-D/3-D well counter, artifacts, etc.)	●	●	●	●	●
4. CT imaging systems:					
a. Co-registration of images	●	●	●	●	●
b. CT quality control (e.g., contrast and spatial resolution, noise, uniformity, artifacts, etc.)	●	●	●	●	●
5. Computer equipment (e.g., monitors, matrix sizes, printers, etc.)					
6. Networking and information systems (i.e., PACS and RIS)					
Task C. Auxiliary equipment:					
1. Laboratory equipment (e.g., centrifuge, fume hoods)					
2. Patient care equipment:					
a. Intravenous infusion pump	●	●	●	●	●
b. ECG monitor	●	●	●	●	●
c. Pulse oximeter	●	●	●	●	●
d. Defibrillator	●	●	●	●	●
e. Glucose meter	●	●	●	●	●
f. Blood pressure equipment	●	●	●	●	●
3. Non-imaging equipment:					
a. Xenon delivery system and trap	●	●	●	●	●
b. Aerosol delivery system	●	●	●	●	●
c. Treadmill	●	●	●	●	●



Section 2: Job Domains (continued)

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How important is this knowledge to the practice of a competent entry-level CNMT? Please select "Not Performed" if the entry-level CNMT does NOT perform or apply the competency. For those activities that the entry-level CNMT does perform or supervise, provide an importance rating using the scale range from "Not Important" to "Extremely Important." If you are unable to see the header row for the rating scale, hovering over the button in the cell will display the rating that is associated with that button.

IMPORTANCE
0 Not Performed
1 Not Important
2 Low Importance
3 Moderately Important
4 Extremely Important

	0 Not Performed	1 Not Important	2 Low Importance	3 Moderately Important	4 Extremely Important
Domain V: Clinical Procedures					
Task A. Knowledge and performance of nuclear medicine procedures:					
1. Pulmonary:					
a. Radioaerosol	●	●	●	●	●
b. Gas ventilation	●	●	●	●	●
c. Perfusion	●	●	●	●	●
d. Perfusion/Ventilation quantitation	●	●	●	●	●
2. Bone/Musculoskeletal scans:					
a. Limited	●	●	●	●	●
b. Whole-body	●	●	●	●	●
c. 3-phase	●	●	●	●	●
d. 4-phase	●	●	●	●	●
e. SPECT	●	●	●	●	●
f. NaF PET	●	●	●	●	●
3. Oncology:					
a. Ga67 tumor imaging, planar, and SPECT	●	●	●	●	●
b. Monoclonal antibody imaging	●	●	●	●	●
c. Peptide imaging	●	●	●	●	●
d. Breast imaging	●	●	●	●	●
e. Lymphoscintigraphy/sentinel lymph node localization	●	●	●	●	●
f. Tumor imaging, PET	●	●	●	●	●
g. Neuroendocrine tumor imaging	●	●	●	●	●
4. Infection:					
a. Ga67 infection imaging	●	●	●	●	●
b. Tagged WBC imaging	●	●	●	●	●
5. Renal/Genitourinary:					
a. Cystogram, direct	●	●	●	●	●
b. Effective renal plasma flow (ERPF)	●	●	●	●	●
c. Glomerular filtration rate (GFR)	●	●	●	●	●
d. Renal anatomy, planar, SPECT	●	●	●	●	●
e. Renal flow	●	●	●	●	●
f. Renogram (Lasix®, and ACE inhibitors)	●	●	●	●	●
g. Testicular	●	●	●	●	●
6. Endocrine:					
a. Adrenal imaging	●	●	●	●	●
b. Parathyroid imaging, planar, and SPECT	●	●	●	●	●
c. Thyroid imaging	●	●	●	●	●
d. Thyroid uptake	●	●	●	●	●
e. Whole body survey for thyroid metastases	●	●	●	●	●
7. Hematopoietic:					
a. Bone marrow imaging	●	●	●	●	●
b. Total blood volume, plasma volume, red cell mass	●	●	●	●	●
c. Spleen scan with labeled, denatured RBCs	●	●	●	●	●
8. Cardiovascular:					
a. Myocardial perfusion, planar	●	●	●	●	●
b. Myocardial perfusion, SPECT, attenuation and non-attenuation	●	●	●	●	●
c. Myocardial perfusion, gated SPECT	●	●	●	●	●
d. First pass for EF and wall motion	●	●	●	●	●
e. Gated cardiac blood pool, rest	●	●	●	●	●
f. Gated cardiac blood pool, stress	●	●	●	●	●
g. Gated cardiac blood pool, SPECT	●	●	●	●	●
h. Cardiac shunt	●	●	●	●	●
i. Cardiac CT SPECT	●	●	●	●	●
j. MIBG	●	●	●	●	●
k. Myocardial viability (thallium, FDG)	●	●	●	●	●
l. Cardiac PET	●	●	●	●	●
9. Gastrointestinal:					

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
a. Esophageal motility/transit	●	○	○	○	●
b. Gastric emptying (liquid/solid)	●	○	○	○	●
c. Gastroesophageal reflux	●	○	○	○	●
d. Gastrointestinal bleeding	●	○	○	○	●
e. Hemangioma	●	○	○	○	●
f. Hepatobiliary with and without GBEP	●	○	○	○	●
g. Peritoneal venous shunt patency	●	○	○	○	●
h. Liver-lung shunt mapping (arterial)	●	○	○	○	●
i. Liver-spleen imaging, planar, and SPECT	●	○	○	○	●
j. Meckel's diverticulum	●	○	○	○	●
k. Salivary (parotid)	●	○	○	○	●
l. H. Pylori breath test	●	○	○	○	●
10. Central Nervous System:					
a. Brain flow, brain death	●	○	○	○	●
b. Brain imaging, planar, and SPECT	●	○	○	○	●
c. Dopamine receptor DaT scan	●	○	○	○	●
d. Cisternogram	●	○	○	○	●
e. CSF leak	●	○	○	○	●
f. CSF shunt patency	●	○	○	○	●
g. Brain PET	●	○	○	○	●
11. Radionuclide Therapy:					
a. Intracavity (e.g., P-32)	●	○	○	○	●
b. Polycythemia vera/leukemia	●	○	○	○	●
c. Thyroid	●	○	○	○	●
d. Metastatic bone	●	○	○	○	●
e. Monoclonal antibody therapy (Zevalin®)	●	○	○	○	●
f. Embolic radiotherapy (labeled microspheres)	●	○	○	○	●
g. Brachytherapy	●	○	○	○	●
12. CT Imaging Procedures:					
a. Attenuation correction/anatomical localization	●	○	○	○	●
b. Diagnostic	●	○	○	○	●
Task B. Schedule patient studies to accommodate sequencing of multiple procedures and special orders:					
1. Schedule the camera time	●	○	○	○	●
2. Schedule multiple radionuclide procedures for a single patient	●	○	○	○	●
3. Schedule same-day multiple modality procedures for a single patient	●	○	○	○	●
Task C. Procure supply of radiopharmaceuticals, considering license possession limits and schedule	●	○	○	○	●
Task D. Instruct patient, family, and personnel concerning procedures and precautions	●	○	○	○	●
Task E. Receive, prepare, and provide care to patient:					
1. Protect patient information and privacy according to the Healthcare Insurance and Portability and Accountability Act (HIPAA)	●	○	○	○	●
2. Perform basic patient care (e.g., vital signs, basic first aid)	●	○	○	○	●
3. Practice correct patient transferring techniques	●	○	○	○	●
4. Use and accommodate patient support devices:					
a. Intravenous infusion pump/lines	●	○	○	○	●
b. Supplemental oxygen	●	○	○	○	●
c. Foley catheter and drainage bag	●	○	○	○	●
d. ECG monitor	●	○	○	○	●
5. Receive and prepare patient, verify patient identification and written orders for study	●	○	○	○	●
6. Perform pre-examination screening including review of:					
a. Verify patient preparations and identify contraindications	●	○	○	○	●
b. Medical history	●	○	○	○	●
c. Current medications	●	○	○	○	●
d. Allergic and adverse reaction history	●	○	○	○	●
e. Review relevant lab values	●	○	○	○	●
7. Verify that informed consent has been obtained	●	○	○	○	●

Task F. Select and administer prescribed radiopharmaceutical:

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
1. Verify patient identification	●	○	○	○	●
2. Administer radiopharmaceutical using appropriate route and technique	●	○	○	○	●

Task G. Monitor and assess patient condition

Task H. Implement emergency procedures (e.g., in case of fainting, seizure, cardiopulmonary arrest, etc.)

Task I. Prepare equipment and perform examinations:

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
1. Position patient using anatomical markers and immobilization techniques	●	○	○	○	●
2. Establish imaging parameters for data acquisition	●	○	○	○	●

Task J. Evaluate image quality:

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
1. Normal and abnormal scan patterns	●	○	○	○	●
2. Identify artifacts and causes	●	○	○	○	●
3. Co-registration of images (SPECT/CT and PET/CT)	●	○	○	○	●
4. Repeat study and/or perform additional views	●	○	○	○	●

Task K. Perform post-procedure assessment

Task L. Provide patient/caregiver education concerning discharge instructions and cautions

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
Task M. Process and evaluate computer generated data:	●	○	○	○	●

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
1. Data storage, transfer, and retrieval	●	○	○	○	●
2. Image formation (static, dynamic, ERNA, list mode)	●	○	○	○	●
3. Image reconstruction (SPECT, PET)	●	○	○	○	●
4. Image enhancement (e.g., filters, matrix, intensity, etc.)	●	○	○	○	●

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
5. Quantitative analysis:	●	○	○	○	●
a. Regions of interest and quantification	●	○	○	○	●
b. Curve generation and analysis	●	○	○	○	●
c. Image normalization and subtraction	●	○	○	○	●
6. Display formatting (image size, number of images, intensity adjustments)	●	○	○	○	●

Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
1. Basic electrocardiography (ECG):	●	○	○	○	●

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
a. Cardiac conduction system	●	○	○	○	●
b. Components of a normal ECG wave form	●	○	○	○	●
c. Recognizing and responding to changes on a resting or stress ECG	●	○	○	○	●
2. ECG lead placements	●	○	○	○	●

3. Treadmill stress techniques (i.e., Bruce and modified Bruce) and bicycle stress techniques:

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
a. Contraindications	●	○	○	○	●
b. Duration/termination parameters	●	○	○	○	●

4. Pharmacological stress protocols:

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
a. Contraindications	●	○	○	○	●
b. Timing of pharmacological stress agent	●	○	○	○	●
c. Timing of radiopharmaceutical injection	●	○	○	○	●
d. Duration/termination parameters	●	○	○	○	●
e. Drug side-effects and appropriate treatment	●	○	○	○	●
f. Reversal agents and techniques	●	○	○	○	●

Task O. Obtain samples and/or data for non-imaging studies:

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
1. Data specimen collection techniques, including timing, methods, containers, and storage	●	○	○	○	●
2. Background correction	●	○	○	○	●
3. External counting techniques	●	○	○	○	●

Task P. Calculate and evaluate the results of non-imaging studies:

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
1. Error analysis	●	○	○	○	●
2. Calculations	●	○	○	○	●

Task Q. Prepare, survey, and clean radiotherapy administration and/or isolation room

	Not Performed	Not Important	Low Importance	Moderately Important	Extremely Important
	●	○	○	○	●



Section 3: Post Survey Questionnaire. In this section, you are asked to assign a percentage to each main content area according to its importance to the job of an entry-level CNMT. You also have the opportunity to identify any knowledge or tasks you feel may have been overlooked in this survey. [Table of Contents](#)

What percent of exam questions should be allotted per main content area? **Please note that you are required to provide percentage values that sum to 100 BEFORE moving to another page of the survey.**

- 1. Radiation Physics and Detection
 - 2. Radiation Safety and Regulations
 - 3. Pharmaceuticals and Radiopharmaceuticals
 - 4. Instrument Operations and Quality Control
 - 5. Clinical Procedures
- Total: Must sum to 100%

How well do you feel the survey covered the role of the CNMT?
< select >

Please describe any tasks you feel were left off of the survey. Your response is limited to 1,000 characters.

Please feel free to address any comments you may have. Your response is limited to 1,000 characters.

Thank you for your time and participation!

Thank you for your time and participation! To be entered into the drawings to win one of the ten \$100 gift cards, please provide your name, NMTCB certificate number, and email address below. Your name and contact information will remain separate from your survey responses.

Please enter your first and last name:

Please enter your NMTCB certificate number

Contact email contact address:

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NMTCB thanks you for completing the survey.

Your participation in this survey has been essential for determining a complete and accurate list of knowledge elements required of a CNMT.

(You will be redirected to the Nuclear Medicine Technology Certification Board website in 15 seconds).



Appendix C: Respondent-Identified Tasks left off of the Survey

TABLE C-1. Unedited Responses as Received: Tasks Left Off of the Survey

Respondent Comment
A few things seem to have been covered but deserve their own attention, esp. NRC/State regulations including radiation Safety Officer duties and training, Radiation Safety Committee importance, make-up, and duties.; Explanations to in-house staff including Floor Practitioners, Nursing at all levels, and Medical Assistants as well as family members or the general public including facility administration.; The importance of documentation to include coding, and proper accounting of both chargeable
A general knowledge of CTP4 codes and knowing which one to use for each test
accreditation
Acquiring continuing ed credits
Administer drugs that are directed by physician
All subjects covered
All Task were covered
all tasks were covered
ANOATOMY
Any CNMT worth a grain of salt should be or strive to be 100% knowledgeable on all areas you asked. Most Nm tech have more and better education than others working in radiology. Our understanding of radiation, physics, biology and chemistry as well as critical thinking are paramount. this is why at most facilities NMT are tasked with doing more than just scan
As a CNMT in a rural community you are required to be responsible for the radiation safety program. Would be nice to receive the requirements to be the Radiation Safety Officer within the NMTCB.
As a technologist in a rural area, "other tasks" are broadly defined so additional skills are a must.
As of now our nurse does many of the tasks I responded to as important. I think CNMT students need to learn these tasks if they don't already. Like interpreting EKGs and prepping for a treadmill.
Assessment of different age groups, team work, more of the interpersonal aspects of imaging
Be sure technologists are aware of Patient ID-name/DOB, check physician orders before injecting, verify correct pharm/dose before injecting, review previous studies as not to duplicate/expose unnecessarily. Test on the QC required annually by the Joint Commission.
Bed side manner and professionalism
BEDSIDE MANOR AND PHYSICIAN RELATIONS.; UNDERSTANDING THE WORKPLACE AND THE MISSION OF THAT GOAL.
Bio-distribution and Biological half life of the radiopharmaceutical. shipping and receiving of radioactive materials.
bio-distribution, pharmacokinetics, radiobiology, pathophysiology, health physics
Calling ordering MDs to get the correct requisition and not misadminister radioisotopes. Answering all medical questions the doctors refuse to answer. Making medical decisions out of our scope of practice.
cant think of any

Respondent Comment
clinical area
Coding (CPT/ICD-10); Medical Necessity; Billing regulations and Requirements
coding compliance
communication skills regarding patients of different parts of society
competing clinical tests and why one made be used instead
Completely describe task
computer skills
Coordination of other imaging modalities with NM procedures. Patient education/information regarding prep and testing procedures.
Coordination of supporting departments, and staff.
Covered pretty well. Problem solving could be introduced.
covers all areas well
CPR certified at all times while working as a Nuclear med tech.
CT id becoming more relevant in Nuclear Medicine. Include more CT items.
CT technique/ X-ray use and production
Customer service aspects....treating pt as a customer; total care not just for the exam ordered
Customer service is a big part of caring for the patients, connecting with other departments, and completing the full circle of a healing culture.
Dealing with difficult patients maybe?
Diagnostic CT requires sectional anatomy. I feel that training for sectional anatomy was weak and nonexistent in regards to CT and PET.
Efficiency
Electronic charting,imaging protocols
Emotional intelligence interaction with patients.
empathy, recognizing and anticipating moods/changes in moods, how to deal with different types of patients, pregnancy
Empathy. Patient care
emphasis on aseptic technique and "clean " enviorment
emphasis on electronic medical record keeping
entry level techs should be trusted with assigned duties, but must be encouraged to ask for help when in doubt.
Every thing looks good
every thing was covered
Everything is covered.
everything seems adequate
Everything was adequately covered in the survey for future examination creation.
everything was covered
Everything was covered.
explain benefits vs risk of radiation to patient

Respondent Comment
For describing a techs position more than 1 selection should be allowed to better demonstrate our roles. I serve as an assistant radiation safety officer and as a nuclear medicine tech. Some techs fill more than 1 primary role.
General Patient Advocacy in Nuclear Medicine.
Good
Good survey. Felt that it covered everything
Good to go. Need it ALL
Handling of radioactive waste, pregnancy and Rph etc..
Hard for some Nuclear Medicine technologists to take this survey due to the fact that some technologists are not practicing in nuclear medicine.
health care system overall in terms of cost, political ideas, and structure
HIPPA STANDARDS, BLS, PROFESSIONAL ETIQUETTE, IMPORTANCE OF BED-SIDE MANNER
Hire Americans
How to fix artifact issues - GI uptake, cold spots, etc.
how to interact with patients and their families; relieve their stress and anxiety
How to speak to patients, dealing with irate patients,
How to treat patients and their families. How to quell their anxiety
Human physiology and disease processes.
I believe CT certification should be incorporated into the NM program
I believe that incoming nuclear technologists should be acquainted with RIA procedures and more depth into therapeutic treatments.
I believe the survey covers most task required.
I cant think of any
I didnt feel like it left anything out.
I do not think a particular area was left out but we need to encourage nuc med schools to teach ecg tracings to their students especially since the nuc med techs are the ones mostly doing stress testing nowadays
I dont feel like anything was left on the survey.
I dont recall seeing troubleshooting for cameras or lab equipment - if that wasnt on there, it should be. You cant just send everyone home and wait for Biomed to show up, especially if youre in a rural area.
I feel all aspects were included
I feel that this was a very in-depth survey.
I feel the survey covered most of the important aspects that make up being a Nuclear Medicine Technologist. I think it could go into more detail of what warrants a Moderately important score vs . Very Important.
I feel the tasks are very relevant and 99% are needed knowledge on a weekly, if not daily bases for a technologist.

Respondent Comment
I feel this survey basically determined what I do at my facility. If a CNMT is at all proficient, all these questions are very important. This survey does not address the current trend of rotating CNMTS through various facilities, inpatient and outpatient, in a large healthcare system. The questions are pertinent to both facilities, but the responsibilities are now varied and shared.
i felt it was a good, comprehensive guideline for what we SHOULD know as Nuclear Medicine Technologists. Perhaps one may not need to know EVERYTHING about the topics, but should at least be introduced to almost ALL of the items. Some will be more applicable than others, depending on ones work environment and ancillary personnel (EKG techs, department RN, nuclear pharmacist on site, etc)
I felt it was completely comprehensive
I felt this survey covered CNMT tasks very well.
I find that I provide more clinical care in an out patient facility then in a hospital setting, ex. Blood pressure, EKG, etc. Students should be better prepared.
I have used different types of cameras and that is something that students should be more familiar with. The vast knowledge of hybrid is something that is new since I was a student over 18 years ago. Knowledge of different modalities and what they use now instead of what we use, like testicular scan, spiral CT, etc.. in place of Nuclear. The field has changed a lot but this survey was wonderful and brought me back to college.
I think everything was addressed completely!
I think everything was covered.
I think some of the tasks need to be seperated further. For example constancy test vs all annual calibration
I think that we should have how important it is for the technologist working in any PET/CT or Nuclear Medicine Department should be a licensed Nuclear Medicine tech.
I think that you covered everything.
I think the survey cover the topic completely
I think the survey needed to emphasize exam procedures a little better.
I think we have covered it all.
I think you covered it
I thought it was a well rounded survey
I thought you thought this through very thoroughly.
I wish there were more questions about patient care skills. I work in a cancer clinic and have worked with students and new technologists who can only learn what NOT to say or do from time and experience.
I work 2 NM jobs, hospital and clinic, general and cardiac.
I work in general, cardiac, PET and radiopharmacy.
I would add a section on patient psychology, the way to deal with different types of patients.
I would select very adequately if choice were available because I also feel that it was very close to completely covered.
I131 therapy prep. Xofigo therapy.

Respondent Comment
ICD-10 and CPT codes are becoming more important to know. In many cases it is useful to know the codes for the more common procedures that we perform in order to interact with the departments that are requesting this type of information. It isnt enough to know how to perform the procedure. In regards to our respective area, we are being asked about these codes, what each represents and the subtle differences among them.
Id like to see customer service and CPT info on the exam because this is what techs are dealing with every day.
If feasible, the different machines with the companies that produce them.; Advantages/disadvantages between the fields too. Very minor though.
Importance of communication skills in all interactions with our own team, as well as with internal and external customers, patients and their families. ; CNMTs do much more than just the science and technology of nuclear medicine. In order to deliver excellent services we must know that there is a lot of care, compassion and understanding of the human nature involved in this occupation.
Importance of teamwork; open communications; excellent customer service and compassion.
in FL there is not a lot PET or SPECT/CT being done, very few hospitals even have PET and even fewer have SPECT/CT. 50% of my work in hospitals and outpatient facilities is cardiac. The rest is HIDA, V/Q, GI Bleeds, Bone scans, Thyroid/ParaThyroid, and some renal and DAT. I have not done any brain deaths, salivary glands, liver, spleen, testicular, renal hypertension, or a host of other nuc scans that are no longer relevant in the last 5-8 years
Include more PET-specific content.
Include Unit doses as I have not used 99Mo/99mTc-Generators in 20 years.
Infection control and hazardous communication
infection control is very important specifically in hospital setting Maybe understanding a few of the big problems like C diff and MRSA
Infection control, nursing care
Infection control, sterile technique,positioning
insurance and coding
Insurance coverage, hospital quality program, and physician satisfaction.
Insurance precertification and verification
Interacting with professional staff (MD/RNs)
Interaction with ordering physicians, as well as Radiologists, recommendations and opinion when asked for, and liability.
it is greatly put together, the survey cover all aspect of NMT job
It is important for new technologists to know how to communicate with patients and other staff. Something that is lacking in the new generation

Respondent Comment
It is of lesser importance that most content of the survey, but I think it might be worthwhile to address ergonomics and repetitive motion injury to workers as healthcare workers. Proper patient handling in regards to avoiding injury to ourselves is important and additionally, there are many routine tasks performed where workflow habits eventually take a toll. Keyboard/mouse angels matter. We often work on the same side of equipment, imaging systems and limit our range of motion. We may twist aw
It seems through to me. I think it covers the vast majority of what is possible for a nuclear tech to see in the clinical setting.
It should also focus on financial compensation
ITLC; Radiopharm impurities; Methods of localization
IV starting process
IV starts, urinary catheter placement, pediatric (age specific) considerations, no radiopharm (UD), technologist scope of practice/role vs RSO & physicist, pathology recognition, various radiation monitoring survey probes and when to utilize each, bio-assays, NMIS, dexta/bone mineral density exams
IV/vein insertions/techniques/issues.
Ive experienced many job limitations to who can perform which procedure and who can be held responsible.
Job seeking attributes
Know proper garb for contact with patients having various resistant organism infections (gloves only, gown and gloves, gown gloves and mask, etc.) and whether hand sanitizer is sufficient or if actual soap and water is required upon removing PPE.
Knowledge that you will be left alone with patient when on call and need proper training in moving and lifting the patient alone and possibly unable to help move due to extreme medical conditions
Learning different processing programs
Lymphedema, Melanoma
m
making patients comfortable during exams should somehow be emphasized.
Management based tasks (customer service, finance/billing, and regulatory tasks)
Many of the questions are setting specific, will vary widely among different institutions.
Maybe some USP requirements?
MEDICAL TERMINOLOGY.; REVIEW OF COMMON LAB TESTING / VALUES.
More detailed patient prep. for tests. Some tests may be erroneously acquitted, generating an invalid result, even though the data acquisition and processing looks flawlessly.
More emphasis on patient interaction and scheduling procedures.
More joint commission type questions should prepare new tech for whats ahead
More pathways to hybrid certification.
More research related questions
more specifics for USP 797,

Respondent Comment
most students have book sense but lack in the patient care area and the organizational skills not sure you can teach the inter action with patients with out hands on I came from OJT training and a hospital based radiology program we worked with patients almost immediately
MRI applications- Im sure in the future PET/MR will become very utilized
MRI AS A ROLE WITH PET AND CT WITH PET
Must know and be knowledgeable with writing protocols, clinical judgment of patients true conditions and symptoms
My ranking was high or low few in between because I feel all graduates need to know all to understand what is needed. today reading physicians are off campus in many facilities and one needs to know what is pertinent to diagnose. also it is not just nuclear medicine any longer, many hats so to speak are worn, you need to know 100% or in my case you need to know, most institutions leave no room for error because of the governing bodies in todays health care
n/a
NA
Need clinical examples for abnormalities
need to have more question about modern day studies
New technologists should have some basic training on bedside manner and how to respond to emotionally difficult situations.
ninguna
NO
No Comment
No Comments
no response.
no tasks were left off, it was an effective tool, but I think each option where we decide weather we do a procedure or determine its value to a protocol should be better defined. As in the Sully movie, the human step has been removed, and although it may be absolute to pick one, that may depend in the situation. A nuclear tech often thinks automatically-it becomes second nature.
none
none everything was covered
none I can think of so far.
None noted
NONE THAT I CAN THINK OF
None to my knowledge
None, outstanding survey.
None.
None. All covered.
Not aware of any
NOTHING

Respondent Comment
Nothing noted regarding patients with disabilities. As a deaf Nuclear Medicine Technologist - I always find ways to work around a patients disabilities. This needs to be addressed since a lot of more patients are disabled in some way - Deaf or Losing hearing, Blind, or low sight, wheelchairs, amputees and all of that.
Nothing on the survey regarding understanding of clinical research
nrc and deep inspections how to pass and keep records.
NRC Survey readiness
Nuclear Medicine Tech role in radiologic incident emergency preparedness
Nuclear Medicine Technologists should have the basic understanding of EKG and patient medications. So very very important. One can argue that these areas fall under nursing, but in actual practice CNMTs are the professionals caring for these patients especially in isolated cardiology offices, and mobile PET-CT scanners. Its crucial that techs understand EKG and medications and how they react with the testing.
OK
OSHA requirements, infection control
PACS
Patency of IVs is important in my job
patient care
Patient care - communication, legal aspects, infection control. Just my thoughts.
patient care - its a tough on to measure...
patient care (understanding and knowing how to take care sick
Patient care has evolved to a form of customer service. Nuclear medicine is no longer just a cold clinical procedure where we need to display competency. New students need to be able to show compassion, patience, and competence. Take the time to make sure the patients understand the procedure and are comfortable as possible throughout the procedure.
Patient care manners such as body languages, or patient safety such as leave the patient on the scanning table alone.
Patient care questions
patient care, putting others first, clean clothing, dressing up for event relating to NM. 20 somethings type dress like I do when on the farm
Patient care. Professionalism with patient, coworkers and within organization
patient doses/adult-children
Patient interaction
patient interaction; customer service
Patient interactions. You can train a tech with all kinds of knowledge but they need to be able to deal with increasingly sick and elderly patients with multiple problems on day one. Techs often leave school with no patient care skills and no common sense.
patient satisfaction- press gainey.
PATIENT SCRIPTING, AND INTERPERSONAL SKILLS AND INTERACTION WITH PHYSICIANS
pediatric

Respondent Comment
PET SUV values
PET/MR
Phlebotomy. A Tech who is not a good phlebotomist is useless.
Possibly too specific for this survey, but how to deal with difficult patients in particular.
prep inpatient room for radioactive iodine isolation
Preparation of common kits
Preparing the technologist for how interdepartmental communications work . Educating them on their true role as a technologist. What to do when Radiologist require something that makes no sense due to our education. HOwever its the radiologist who does not understand nuclear medicine. What then?
Professionalism, teamwork, and ethical discretion
Radiation safety officer duties and career pathway.; Ability to cross train i.e. obtain CT, MRI, ARDMS certification and the impact on their job.
Radiation Safety Officer training should be included in NMT training programs.
Receiving and return of shipments from the radiopharmacy.
Reporting of events, incidents, etc to management or other entities as required. Dealing with customers and patients beyond patient care and sending images to radiologists. Personal safety and protection beyond ALARA and lifting, such as aggressive patients or physically- or mentally-disabled patients.
-research knowledge (basics); -bone mineral density
research on upcoming procedures and awareness of new procedures
responsibility to job parameters; attendance, call, etc
Safety of the CNMT- body mechanics training. ; Also, we often have to juggle multiple patients at the same time due to volume - we need to have limits and a clear set of guidelines that states "if a patient is being imaged, the technologist must be within eyesight of the patient at all times"
scanning and safety with i tech
Schools should better prepare students for more practical measures like GM counter functions and quarterly assignments etc rather than pharmaceuticals no one other than researchers use!
Scope of practice, PET/MR
scope of practice; NRC regulations that apply to NM
seemed complete
Setting IVs in patients
Skin prep for ECG electrodes and ECG artifacts
Solid state detectors and semiconductor detectors
Some of these components depend on whether the site is unit dose from a commercial nuclear pharmacy or still using on site generators. We have been unit dose for 15 to 20 years.
Survey should include questions concerning pay
testing blood glucose levels
The ability to assess a clinical situation quickly and how to respond accordingly.
the actual caring for patients, emotionally and physically

Respondent Comment
The financial aspects of insurance and prior authorizations have become such a part of my responsibilities that it seems a simple order check before performing exams is no longer sufficient.
The first question regarding the facility: our facility is outpatient and inpatient.
The great importance of effective communication between patients and co-workers. Verbal, written, non-verbal, etc.
The importance of accreditation and routine safety. Body mechanics and laboratory consistency.
The role of nuc med techs in advising patients on radiation safety principles and precautions could be delineated more clearly. This could also include their role in advising healthcare providers on these matters--both diagnostically (i.e., a pregnant patient shows up for a lung scan) and therapeutically (i.e., both outpatient and longer-term inpatient procedures, which often involve contact with family members).
The scheduling of procedures is very important and can be taught as the method for localization of radiopharmaceuticals is taught but experience is the main teacher when considering scheduling of procedures.
The technologists use of patient communication skills to assist in the performance and obtain a "top Level" study is crucial to the outcome for both parties. Therefore, I always insist on in house training on a quarterly basis for the whole team. In the long run it does save time to your schedule and promotes the department as well. This may be listed under clinical procedures in a "Pre-screening" explanation of exam category.
There was nothing left behind. Thank you
This survey was painfully long and WAY too thorough already
time management skills; teamwork skills
TJC compliance, ACR or ICANL accreditation, CPT coding importance
to support and goals of the organization, you work for
Today all depends on the patients satisfaction with the imaging procedure. Maybe more on making the pt. feeling respected for higher satisfaction scores.
training with different vendors software
Understanding of ICANL
Understanding patient values in medicine. Some patients may object to the use of blood products.
venipuncture, IV starts, IV contrast reactions, CT quality control and artifact recognition
Venipuncture/IV Placement
Very basic questions about Billing/Reimbursement (authorizations for procedure, what is a CPT code, Diagnosis codes, etc)
Very Complete
very comprehensive
VERY FEW
Very thorough
We also do in some Nuc Med Departments Bone Densitometry Test

Respondent Comment
We are doing a ton of background work for precerts and orders. Technologist should be familiar with the ICD10 codes and how they affect the day to day operations. Ordering offices want exams done ASAP. More times than not the exams are ordered before precert. Techs are constantly putting out fires.
We should include in the survey about the situations of tracers around the world and how to solve the problem, since this situation affects our jobs.
well counter, thyroid probe, and survey meter QC
Well done
Well done survey
with this much task, please consider change/update the title of the nuclear medicine practitioner. The title technologist is no longer adequate. The title advanced associate is not practical in a real workplace setting. thanks
Working well with physicians, nurses and support staff.
X-ray production as associate with CT
You need to add the following 3 things:; 1. Calculate radiopharmaceutical doses (patient doses). ; 2. Draw radiopharmaceutical doses from a multi dose vial. ; 3. Verify the activity of individual patient unit doses.; These 3 could go in the section on Radiopharmacy or Clinical Procedures under a heading called Prepare, Dispense and Verify individual patient doses.
You really hit all of the tasks we perform. We all need to be able to work w our peers and a diverse group of patients.
You seemed to cover everything

TABLE C-2. Unedited Responses as Received: Respondent Comments

Respondent Comment
A few of the questions related to work that may, or may not be, within a technologists scope of work. For example, technologists should be familiar with dose calibrator QC, but in many facilities they will not be responsible for performing linearity and geometry. Similarly, technologists should be familiar with gamma camera operation and QC, but would not normally be responsible for calibration and uniformity mapping. Again, this could be dependent upon state and facility.
A lot of health care organizations nuclear medicine Technologist are paid below standard although they have a bachelors of nuclear medicine
A lot of procedures are hospital specific and a lot mentioned are not performed anymore.
a lot of the older clinical procedures are being phased out and only bigger hospitals do neuro exams so most new technologists will never see those but hospitals are becoming more interested in SPECT/CT imaging
A SLOWING FIELD.
A uniform training of what Minimum NMT requirements is crucial to being entitled to operate related attenuation correction apparatus i.e. low energy & diagnostic CT w/ administration of Contrast.; Absent uniformity, we struggle state by state to be recognized as so empowered, as differing authorizing agencies vary considerably in training. Ensuring the NMTCB Brand IS trained enough to be considered adequate for that duty, Otherwise, we get left behind in technology.
above
Admission of student freeze for a few years!! There are 100 students to 1 available job currently. Please stop accepting students nationwide for 1-2yrs to allow a balance again
Also I would want to know if I would have lost my current answers if I moved to the previous page.
Although I have not worked in a clinical setting for a number of years, I feel my feedback is valuable as I did work in a variety of different settings over the years and have maintained my credentials (earned the required continuing education hours)
Although I stated @ beginning of survey that I am not employed in Nuclear Medicine, I do assist when my staff needs assistance or coverage.
Amazing all the things we cover on a daily basis.
Anatomy and physiology; infection control & USP 797 would also be an important part of education,
Answers reflect my current work environment in a cardiac clinic.
Any entry-level CNMT will do just fine with guidance from a seasoned CNMT. It just takes practice (with guidance) to become confident.
As a manager and RSO I believe entry level Nuclear Medicine Technologists need to have a strong understanding of the many facets of the profession in order to function competently.

Respondent Comment
As a new graduate, I worked in a single technologist department. I feel entry level techs should be prepared to run a small department.
AS A SOLO CARDIOLOGY TECH, I WISH ID HAD MORE EXPERIENCE WITH ANNUAL CAMERA QC (PHANTOM, ETC) AS WELL AS RECORD KEEPING!
Basics of insurance and reimbursement would be nice to cover (preauth, etc)
Because I have been practicing nuclear cardiology for the most part and a bit of renal, and bone scans, my responses somewhere were affected but i believe an entry level CNMT must be well rounded.
BED SIDE-MANNER IS AN IMPORTANT COMPONENT THAT SHOULD BE STRESSED TO NEW GRADUATES, AS IT IMPACTS THE OVER ALL EXPERIENCE OF THE PATIENT AND COULD HAVE ADVERSE EFFECTS ON THE TECHNICAL ASPECTS OF THE PROCEDURE BEING PERFORMED. i.e., PATIENT STRESS LEVEL "NERVOUSNESS" AND OR PHOBIAS CAN BE GREATLY REDUCED AND OR ELIMINATED TO PROVIDE A MORE POSITIVE EXPERIENCE FOR THE PATIENT. IMPORTANCE OF PROFESSIONALISM AND INTERACTIONS BETWEEN TECHNOLOGISTS AND OTHER MEDICAL PROFESSIONALS.
Being primarily pediatrics, my responses to certain exams/radiopharms are scaled given not clinically indicated or performed but i acknowledge their importance in the adult setting. We also mostly utilize UDs. I also think entry level MRI should be considered as PET/MR develops and increases in popularity.
Being someone who really only practices PET, this survey wasnt really geared toward what entry level techs I would work with would need to do.
Besides the continuing education credits required for the CNMT exam I would like to see only continuing education credits acceptable for PET specialty exam not exam every 7 years.
CALLE CASTAN TOBEÑAS 75 P01 Pta 34
career advancement in NMAA-PA
Clinical procedures will be learned on site and vary from site to site depending on Radiologists guidelines. Instrumentation and quality control will change with each piece of equipment, however, a basic understanding of the principles is an absolute.
CNMT ROLES DIFFER. WE HAVE RNS, ECG TECHS, AND PHYSICIAN OR MIDLEVEL FOR RX ADMINISTRATION
Compensation has not been kept up to date with "business" practices and careers, just with inner career standards. Its a old fashion salary standard.
CT is becoming increasingly important.
Did not like the button survey
Didactic training is important but even more so is clinical skills. Computer data processing assessment and Analysis is becoming more and more important then knowing how the beans are generated. Having Knowledge and Skills to perform basic Imaging procedures is helpful and getting new graduates incorporated into effective workflow in a department. With adequate education and skill set new graduates would be easily Incorporated into the workflow and become helpful members of a team. Thank you for

Respondent Comment
Diversity and inclusion of all patients and peers is important. Understanding the hospital goals and management structure is valuable.
Entry Level may have different standards depending on where the technologist had received education, or where the technologist is expected to work.
Ethics and Compassion, I feel like students need to be reminded that although we are working and this can become very routine, we are working with a person that is very nervous about getting exams done and the results can alter their way of life. I feel we leave emotions out but we need to remind them that we are here to make the exam process as best as we can for them.
Every new nuclear medicine technologist should know the 5 subject areas above enough to practice confidently. There is always a learning curve and " on the job" training. I am a stickler for the fundamentals of nuclear medicine technology.; New technologists have to be detail oriented and focused. ; I went to Salem State University and they prepared me very well for the real world. I did not know everything, but I was always willing to learn to be a better technologist.
excellent
Excellent survey
For a new tech some of the tests are no longer performed or are done by lead tech or supervisor , depending on where you work.
For the rad safety and regs section of the exam--there should be much less percentage of questions based on rote memorization of regulatory text, and more questions on performance based rad safety/health phys operations in practice. The NRC, and many States, have overhauled their inspection approach to be largely performance based. Students are too focused on memorizing regs that can be looked up if needed, and arent learning how to enact these principles in practice. Improved questions could in
Good
Good job!
Good luck with that job
good old common sense cannot be taught but should be a requirement of any good technologist. Always being able to anticipate and respond to changes and or be prepared to answer questions is extremely important
Good survey
Great Survey
great survey questions
Having worked at many hospitals in 3 areas of the country and seeing a wide variety of educations, the strength or weakness of educational institutions is very apparent. It is of the utmost importance for all technologists to know 99% of the tasks on the list, even the older out of dated studies that are rarely done anymore. There may come a time or place where that knowledge could come into use or help solve a problem. Any technologist that answers many tasks with the less important ratings sho
hire American
how can you put any of the above as more important than the other

Respondent Comment
I am actually unemployed because of lack of job availability, but I didnt want to put "not working as a CNMT" because I feel that is different than being unemployed but wanting to be working as a CNMT if that makes sense.
I am in radiation safety therefore I gave my answers what I deal with at my job. I gave up nuclear medicine because there were no jobs....but many associate degree graduate have jobs...very unfair. And they flooded the field....I know since I live in Texas!!!
I am probably not the best person for this survey as I have been doing PET exclusively since 2010.
I believe majority of the content encompassing the survey is vital to a proper foundation in preparation for new graduates to a variety of clinical opportunities.
I believe the most important parts are radiation safety, administration, patient care, machine maintainence, and IV techniques. Everything regarding images, set up, parameters and so forth are usually determined by each facility - Different settings and machines and all can be learned on the job.
I continue to see what I call newbie techs (>5years experience) have difficulty in the operation of the gamma camera systems. Too many of them are afraid to push the limits and learn the systems. They are used to a click here, click there operation and cant overcome the complex software issues with todays processing computers.
I definitely appreciate that you guys are trying to identify "wasted time" in Nuclear Medicine Education. But the fact is that you need the stuff that you dont use or dont use often as much as you need the stuff you use every day. You have to be aware of alternatives for radiopharmaceuticals or imaging procedures in the cases of shortages or equipment malfunctions, as well as the simple fact that different places use different techniques. No tech works in one place forever.
I do not have any comments or concerns.
i do not have any.
I feel like I wasnt adequately prepared for all the regulations that CNMTs are required to follow and inspected on when I entered the work force.
I feel like there should be a complete separation of PET and General Nuclear Medicine. I feel that with the inclusion of PET into the curriculum, future technologists are not absorbing enough information to become adequate techs. Either separate the two or make it a 4 year program. Please do away with the one year programs completely! They are not producing qualified technologists at all.
I feel NMTs need to have a bachelors degree or more.
I feel that a CNA class should be required so patient care techniques and basics of lifting, etc. can be learned. Also the NMTCB should be strictly a 4 year degree.
I feel that being a CNMT is not what it used to be and not in a good way. The doctors are beyond lazy and managment allows them to get away with illegal practices. Any errors the doctors make rest on the technologists shoulders. Attendings dont seem to know much; they constantly go online for basic medical information (google, wikipedia, Ask Jeves). Patients are not preped for exams properly & still preform exams.

Respondent Comment
I feel that most all of the questions were important for an entry-level tech, even just for solid knowledge base. Some of the things are not used right away, but I would rather be prepared to handle it. The things that I marked as lower, or not done, I did not have to do (or use) as an entry-level tech. I still think they are important though.
I feel that patient care should always be emphasized as a fundamental part of our jobs, not only to those in the beginning of healthcare careers, but additionally (especially) throughout our careers as complacency can set in over time. This should NOT be strongly addressed as part of test questions in a certification process because it serves no practicality to do so. Instead this should be encouraged in clinical courses, continuing education and also target individuals serving in leadership rol
I feel that the survey could have been shortend in responses to each category. Fr me personally all areas are extremely important for a CNMT. Being knowlegable even in he day to day operation of a Nuclear Medicine department demands focus. Thank you
I feel the clinical procedures are very important, but most are left for on the job training. If you work at a cardiac facility, you wont know much about general nuc med or PET. If you work in a PET facility only, hard to keep up on the nuc med procedures.
I feel the main difference in technologist is customer service, most facilities have protocols and you can google information if you come across something you are not familiar with.
I feel there were many things listed that are mandated by law, you must know HIPPA, you must know radiopharmaceutical shipping by DOT. Why not focus on a section of items that could be a dying use of technique, such as imaging using Cr51?
I feel very strongly that the crossover from nuclear to computed tomography and vice versa only be allowed through formal schooling and clinical requirements.
I find myself shaking my head about this survey. For an entry level NMT I feel that 99% of the tasks listed in this survey are extremely important and that not even one should be considered less than moderately important. A NMT graduate doesnt know where they will be employed. Obviously a Teaching institution will do procedures that a Cardiac center will not. That means that every NMT Grad should be fully prepared to be educated in all aspects of Nuc Med.
i have and always feel that a ct/nm license is not and has never been needed. the ct/nm scanner we have is not a diagnostic tool, and i understand most are not: but we are expected or will be expected to have both licenses. for a rural tech, this is very unnecessary and burdensome. for me, it serves no purpose and will some day remove me from my job.
I have been an ARRT (R) (N) and CNTCB, with accredited hospital based programs and some college classes. I learned a tremendous amount in my earlier years in classes and in hospital clinical settings. My learning has continued over my 40 year career. I mentioned above the survey compiled is outstanding as it covered my career. I can also state in the last 5 years the hospital I work at has hired, 3 technologists, 2 with ten year histories and 1 new grad. They all lacked knowledge in instru
I have been out of field for a time so answers will be my experience and what I have done in the past.

Respondent Comment

I have worked strictly Cardiac for 15 years now with a couple General Nuclear studies thrown in there, so my opinion is based on my previous years from 2000 taking call and Hospital experience. I do not know what the field is like any longer in those settings. I do feel that the field is not as diverse as it used to be hence the students not needing to know the older studies that are no longer used. I.e: testicular, parathyroid, first pass studies, older type therapy that Crosier Chester used to

I highly appreciate the time and the effort

I just feel like a lot of the topics would be better taught on the job (its really hard to understand until you are there doing it)

I live in florida and I graduated two years ago and been unable to find a job because no one in this region is willing to hire new grad.

I only responded with answers to what is performed at my clinic.

I personally tell young people to avoid working in the medical field. The market is flooded with techs, and the truth is medicine is all about money. Corp. American will grind you into dust, then say next. I make less money now than I did 10 years ago WTF? The stress is just not worth it. Green energy is the technology that will take mankind to the next step. Plus, for some reason Drs, think they can talk to you like your dirt! Fuck those guys. without techs there just a bunch of people who know

I realize that there is probably no way to control this, but I think that in order to be a supervisor of an inpatient hospital general nuc med dept, you should have actually done general nucs. I know of a hospital where the supervisor has only done cardiac nucs, so he has no idea what it is like to do general. Also, I think there should be limitations to how many hours a nuc tech can work in a week. I know of a hospital where call on weekends can be busy enough to justify hiring someone part

I remember when I took the exam and barely passing it. By far the most difficult test Ive ever taken. I just feel like there should have more questions with more obvious answers, specifically the math questions were very time consuming.

I run 3 hospitals and 4 labs 3 nm and 1 pet/ct we offer a wide variety of exams I am also the radiation safety officer for each hospital I didnt believe your survey reflexed the fact that most NM ts]echs are multi taskers

I think a new grads need to understand that in nuclear medicine the interaction with patients is more involved, most procedure have mutliple steps verses CT or MRI in general so they need to be comfortable dealing with the general public in a more interactive way.

I think I would have used different answer choices.

I think in practice a technologist is expected to assist in getting the cameras credentialed so it would be nice to learn more about that in school, and be tested on it on the boards.

I think most radiopharmaceutical prep is done at a radio pharmacy these days, although it is important to have a general background knowledge of elution. Most systems perform PHA and other QC quarterly or annually automatically, or it is done by the physicist/system engineer. All filtering and matrices are usually built into the system protocols as well

Respondent Comment
I think the level of knowledge required to do all the task of nuclear medicine as a technologist those student deserve to get at least bachelor degree in bachelor of science in nuclear medicine.
I think there were several procedures listed that NMTs no longer perform.
I think theres a significant difference between starting your first job in a well established & large clinic/department vs. starting at a small, more isolated clinic/department where there may not be many other techs to consult with. Since nuclear medicine is a small field some entry-level techs may begin their careers where they are expected to be fully competent in everything. So while its tempting to remove some of the content, I just keep thinking about what a tech would be expected to kno
I think this is an excellent survey. This covered every possible aspect of what is required of a beginning nuclear medicine technologist.
I tried to answer the questions based on what would be expected of an entry level technologist at our facility.
I was Technical Director of a Nuclear Cardiology lab for a private practice for 15 yrs. The lab was closed because of the shift in insurance reinbursements. I was unable to find employment as a Nuc Med Tech. I eventually was hired by PA DEP as a Radiation Health Physicist. I would like to stress how important the physics and safety is to have for the job I am performing now.
I wish I had more experience making radio-pharmaceutical kits. I also wish had more hands on experience in a nuclear pharmacy.
I work in a Cardiac Clinic for the last 15 years, so I have limited knowledge of some of the new NM products and no PET knowledge
I work in a dedicated PET/CT Department as well as a dedicated Cardiology Department.
I work in a level 1 trauma center, WVU Medicine, and handle both in & out patients. You need to expand your choices to reflect better. We deal with the most pediatric, oncology, etc that most of WV hospitals send our way
I would leave Positron and CT imaging questions on introductory level since they are part of different certification process
I would like to see less emphasis on certain radiopharmaceuticals tasks, i.e. generator elution, kit preparation, kit QC, etc. since most nuclear departments are staffed by a radiopharmacist or get unit doses. Therefore, most technologist no longer perform the tasks mentioned above.
I would suggest patient interaction and perhaps basics of healthcare system and laws.
if you guys could do a survey where you can select that you do none of the procedures under renal, endocrine, etc. I am a cardiac tech and dont do any general and I just spent 20 minutes clicking a million bubbles when I could have just said no to all general exams.
Im not sure if this was helpful due to the fact that I only work in cardiology.
Impressed by the depth of the survey. If all NMTs came into the workforce with this level of knowledge, it would be great!
In Indiana, nobody uses Mo/Tc generators as techs. We use all unit doses. However, we do use the Sr/Rb generator in PET/CT.
in my 30 + years of experience I feel the survey covered most of every task a nuc-med tech performs

Respondent Comment
In our hospital teaching setting, we have students do a pipetting efficiency & accuracy during their radiopharmacy rotation.
In put received from New graduates, frequently hear about too many CT and PET question on CNMT exams. CNMT should focus on more NM aspects. CT/PET questions can be included to some extent , as separate qualifications / registry are available.
In regard to radiopharmaceuticals, these are usually prepared off site into unit doses. Generators maybe be used at large universities but not at hospitals. I feel the student must be aware of adverse effects for adjunctive medications and other pharmaceuticals (IE: Lexiscan) . With all the radiopharmaceuticals I feel that the most common exams should be tested on, but not all possible exams. Counting statistics, QC and patient artifacts should be taught more aggressively. As a seasoned technol
In the demographic area at the beginning of the survey my answer does not represent my pathway to NMTCB. I graduated from a JRCNMT accredited school BEFORE there was a NMTCB. So i was neither on the job trained nor a graduate of an NMTCB associated program. Also i dont only work in an inpatient facility we also have satellite out patient facilities. Our techs rotate between these and need to function independently. We also contract Med Phys service and out techs are heavily required to know a lo
In work settings you should be able to pick more than one setting. As my hospital provide In/Out-patients setting plus we also have a mobile PET unit.
Interested in discussing a 4 bedroom home. Please call me
Is everyone still finding it difficult to find positions especially full time in the field? Survey could have addressed the decline of jobs in our field or is it just too many techs produced too fast?
Is Proscint still being used?
It is always difficult to exactly quantify most anything when dealing with the almost infinite degree of variance from one patient to another. That being said, there are minimum degrees of expertise that should be associated with the designation of "technologist" versus "technician". It is a difficult task at best to discern the "proper" amount of knowledge and/or acquaintance with the minutiae that comprises Nuclear Medicine Technology. Good luck guys!
It seemed strange to answer questions in terms of importance. Seems like there could be a better way to format questions. Not sure?
It was hard to decide what was important in some cases. Every department is a little different. Even though I might not deal with a certain task, I still felt it was important for a technologist to know.
It was unclear if the tasks of the "newbie" were what they would actually be doing at THIS facility or in general. I answered as to what would be required to work INDEPENDENTLY at this facility.
It would probably be helpful to know our functions if we are not working as nuclear medicine technologists

Respondent Comment
Joint Commission and some state regulations have taken away many of the functions of the nuclear medicine technologist. Many of the items students are tested on are not available in the clinical setting to perform such as medication administration. I believe the knowledge is important, but perhaps unfair to test on. Cardiac stress testing is often performed by a nurse or exercise physiologist and also falls in this same category.
Jonathan Barron; 8157 Mandan Ter
keep up the good work
Learning other roles is important, ex CT scanning and stress testing.
Looks very thorough
m
Make sure to address issues of how to obtain differing exams under less ideal situations, such as: amputatees, partial exams, claustrophobia, AMS, etc.
Many nuclear med depths receive doses from an independent lab. Tagging, labeling Rx and QA are done there. The nuclear med student gets very little exposure of what goes on in a nuclear pharmacy. The pharmacy questions should take this into consideration for the future techs.
May emphasis in increase hours in clinical practices to get more strong clinical procedures.
More and more facilities are requiring dual certified technologists. I feel schools should be required to produce dual certified technologists (Nuclear Medicine & CT). This is important to help students come out a program more employable.
more emphasis on anatomy and physiology.
More therapy knowledge for the entry-level technologist, nuclear medicine school is the only time the technologist receives formal education of RNT
Most CNMT today do not administer drugs or provide coverage in the stress lab.
Most departments have RNS that monitor EKGs, give medications in cardiac testing. That made some of the questions difficult to evaluate, but certainly a new technologist should be aware of negative patient responses.
Most departments will happily train entry level techs in their specific procedures but a good understanding of healthcare basics can make the process much smoother. In education, I think discussing different ideas of exams/techniques/pharmaceuticals in class prepares the student with the confidence needed to learn and implement them later.
Most entry level positions do not perform PET imaging but it is still important to understand these exams as well as the necessary steps to perform them. As well as the radiation protection information.
Most facilities have a stress lab with nurses that take care of stress tests and meds. Quite a few of the exams are uncommon or not performed at smaller hospitals.
Most of the cutting edge procedures, radio pharmaceuticals and equipment are only going to be reserved for the top research/teaching hospitals in the country. The majority of techs will never do these procedures during their career and there should be little emphasis on those types of questions. Patient care is very subjective between facilities and what is asked on tests is not always what is done at a patient care center.

Respondent Comment
Most of the information that you covered should be know by the nm technologist. Depending on the nm tech position that the come to work in will dictate what they need to know. Will they be utilizing everything that is on your survey, no not really. But if they do decide to work in a facility where the do general nm, cardiac, oncology, therapies and PET, they must know everything to start. Knowledge is the key to a great technologist!
Most of these answers will vary depending on what type of facility you work in and what staff you have in place. Hospitals tend to have a Nuclear Pharmacist, Nursing Staff, Physicists, etc. Some of these tasks are not required for Nuclear Medicine Technologists to perform.
My answers were based on where I work and what I feel is important to know to do my job. Clinical procedures will be different at each facility, therefor it is difficult to tell what a person should be tested on. A lot of the techniques are mastered over time, not always something you will know after one year of learning.
My exam had quite a few rare study questions. I think it is most important to cover the information you will perform on a daily basis or more often than the rare studies because in a real situation, you are able to look up the protocol for a rare study.
My main career as a nuc tech has been in nuclear cardiology. Answering questions regarding other modalities in nuclear medicine (i.e. general nucs,) I have not been doing general nucs for so long it is hard to answer importance these days of knowledge regarding that area. Of course having a solid understanding initially out of school is very importance since hard to know one will end up.
My NMTCB exam in 2011 did not reflect what was in the study guide. I hope that has changed. The exam had outdated information on it that was not covered in school.
My response in part was due to working in a Pediatric facility that does not do many of the exams focused on adults.
my role is somewhat unique so not sure if my responses would address that of a typical CNMT. I work for a COR Lab and train imaging centers in procedures for clinical research trials
N.A.
n/a
N1434 Grouse Road
NA
Need for basic x-ray physics, instrumentation, quality control and imaging techniques. CT techs are replacing NM techs when they are able to pass the PET registry. NM programs may need to be lengthened to accommodate the necessary x-ray information needed.
need for new procedures and radiopharmaceuticals
Need to address coming loss of isotope due to aging medical reactors
Need to continue to teach the physics...understand how it works so the critical thinking skills can be utilized to figure out issues when techs graduate and are working. Not everything is laid out in a book, have to think through how things work to get the answer.
ninguna
No
no additional comments

Respondent Comment
no comment
No comment.
no comments
No comments.
Nond
none
none at this time
None available.
None- I know many people think some of these things should not be on the exam. But the person who really need it or the ones who end up being in a one-man show. I need all the help they can get. All these tools make them successful!
None of these things applied to me since I am not currently working in that field. You all should have tried to figure out why so many people have license and cannot find work.
None Thanks
NONE,WELL COVERD.
None.
not performing spect/ct nor pet in our dept but feel its very important for entry level- even if just to teach us old timers when the modality is finally available
NOTHING
Nuclear medicine is having certain tests taken away from it and given to other modalities that are also expanding. Training in PET/CT or PET/MRI would allow for future proofing ones education and preparing them for the job market. New techs need to have one other modality due to the demand in the job market. Techs without CT usually are not hired in California unless it is a very rural area or they do not do PET/CT.
Nuclear Medicine Technology programs should not only allow the student to sit for the general Nuclear Medicine certification boards upon graduating, but also be competent to sit for the Computed Tomography boards.
Obviously, the scope of an entry level technologist will vary depending on the type of institution and the variety of exams performed by that institution
Of course, each department will vary on what procedures they perform. I work for a large healthcare organization which has completely replaced Ga-67 imaging with Ga-68 PET. We are, however, a platinum stroke center, so we do a lot more CNS imaging than most facilities. Diamox and shunt patency and cisternogram studies are still part of daily practice here, though they arent that common in general nuclear medicine practice.
once someone passes a specialty exam i.e. PET one should not have to take it again in 6 years. The knowledge does not go away after 6 years. However you are asking people to spend another \$200.00 to retake something they already passed.

Respondent Comment
One technical issue with the survey was that the pop up on the answer table kept interfering with my answer selection. ; It was harder to give some of these answers a "low importance to high importance" value. I basically tried to base it off of how often we do some of these studies/procedures. One important data set would probably be do see how often clinics perform a certain amount of scans/procedures to judge the overall prevalence and weight.
organizing skills people skills telephone skills communication ; we all have a radiopharmacy for our doses who milks a generator ??? or hand dips film in radiology we have to know the physics behind the radioactive doses and the calibration the decaying of the isotopes but just for the exam I guess radiation safety all the lab accreditation rules paper work and keeping up with the paper work should be stressed so many new procedures to know too
Other than tagged RBC & WBC - need to remove hematology laboratory questions and the P 32 questions.
Our group is expected to be able to work in several areas. Entry level has two different meanings at our institution, 3-11 is different than day shift. All day shift staff do inpt., outpt., & cardiacs. 5 of us also do PET.
Over 35 years as a Nuclear medicine technologist, there have been less emphasis on invitro types of exams, blood volume determinations, C-14 pylori, wbc labelling, kit preparations. These have left to the radiopharmacies. Nuclear medicine physicians now a days are more likely to be radiologists with a few months of nuclear training. vs "dedicated " nuclear medicine doctors of the past.
page 2 question 7 and 8 does not accurately describe the setting, We perform a large number of both in patients and out patients (in a medical center setting), and we also performs large numbers of General, PET/CT and Cardiac imaging. Our staff rotates through all the imaging areas.
Patient interactive is a task we often overlook, when its the genesis of excellent patient outcome.
Perhaps to emphasize the constant need for sterility in all aspects.
Personally I believe that 90% of the job is hands on. There is only so much you can teach in school and only by being in the field and doing procedures and being around patients everyday can one truly learn how to be a well rounded NMT. With the shift to unit doses, rotations in a radiopharmacy should be included in training (although legally difficult). Also classes in basic patient care should be given. Also the community as a whole needs to access the global need for NMTechs and not have schools
PET/CT FUSION IMAGING NEEDS TO BE ADDRESSED MORE THAN IN YEARS PAST.
Please address the lack of jobs. New Graduates looking for work like crazy.
Please consider changing all NMT training program to be a post graduated program that require all student to have a BS in science or higher education prior to enter the program. Majority of new grad CNMT are not adequately trained.
please remove blood/plasma studies.....please add/remove radiopharmaceuticals as they leave the market or receive FDA approval....please remove ACD solution and ascorbic acid as these are related primarily to blood volume....please list "cold" PYP under miscellaneous agents

Respondent Comment
Please remove the radio button "balloon " preview when hovering over the responses on survey. Very irritating and totally unnecessary.
Pop up at selection got in the way of clicking the dot and made the survey take longer
Procedures and Radiopharmaceuticals included on the exam should be updated more frequently than is done currently. Educators should not be spending time teaching students about things no longer in practice, especially as the depth and breadth of the entry level technologist continues to expand with hybrid imaging.
Radiologist, technologist communications
Radiopharmacy isnt as important as it used to be. I have not milked a generator or used the decay formula since my 1983 graduation due to the use of centralized pharmacies.
recertification should focus on what is new since previous exam
Regulatory compliance has become a focus in my job. This is a trend that needs to be addressed to prospective technologists
So much is variable between facilities, a new tech should be familiar with but not necessarily proficient at procedures and processing
Social issues should be addressed in a Nuclear program
Some items grouped together should have been separated.
Some of the tasks presented may or may not be performed by an entry level technologist. In a small hospital setting, they may perform more task than in a large hospital or university medical center.
Some of these components ie scheduling, patient prep, history and others have been outsourced to contracted services and the NM tech has little to no control or input anymore.
Sorry - my survey will not be useful as I am not currently practicing in Nuclear Medicine.
Strange or ambiguous survey.
Survey is quite long and the pop-up instructions is not only annoying but it also delays clicking the correct answer.
Survey was a great way to get responses to what is happening at various facilities.
Teaching compassion for patients is hard to test for.
Teamwork and the ability to work closely with others is very important.
technologist really need to know IV insertion.
technologist responsibility (Scope of Practice) administering adjunctive medications. Aminophylline in particular??
Test should concentrate and focus on nuclear medicine and not nursing skills. But, I must say in my job I do a lot of things nurses do. Those skills came in time.
thank you
Thank you for asking us old timers about our experience. I will celibrate 34 years in the field in May.
Thank you.
Thanks!

Respondent Comment
The exam is appropriate for an entry level CNMT to have the understanding of how Nuclear Medicine works and the science behind it. The real understanding and knowledge of Nuclear Medicine comes from the clinical and on the job experience.
THE EXAMINATION BOARD SHOULD ALSO CONCENTRATE FROM TIME TO TIME WHICH AREAS OF THE TEST STUDENTS PERFORM POORLY.
The field of Nuclear Medicine has declined in job opportunities and pay rate, from non accreditation colleges. NCT is not recognized as a specialty, and changes nothing about job increases or promotions
The field of nuclear medicine is not that complex in my opinion. It would be my preference that any information from historical to the latest approved procedures be covered on the exam.
The information on the exam should be updated more frequently. For example, some of the radiopharmaceuticals on the NMTCB list are not even commercially available any longer. These should be updated about every other year, or more frequently than current.
The NMTCB needs to do a better job explaining the different certifications to hospital organizations. I have had to explain on many occasions that you do not need the cardiac certification to do cardiac studies. Also, I have had to explain to HR that it is impossible to hire a new graduate with the cardiac certification because of the paid on the job component required to get enough hours to be able to sit for the test. I have been denied jobs because I did not have the PET certification and hav
The only reason I gave only 20% to clinical procedures is because even though that is probably the most important, procedures will vary between institutions and physicians. Basics should be know, but specifics will be taught upon hire.
The only thing I would change about the test is the time. I felt like I wasnt given enough time or maybe make the time warnings bigger. I took the test all the way until the very end and I dont remember the time warning.
The primary place of practice did not include my setting as an educator in an educational institution, so I chose "research facility." The Radiation Physics and Detection questions were in some cases more knowledge-based than practice-based, so were hard to answer. For the procedure questions, I answered "not done" where the procedures are not done in any of my clinical sites.
The survey design is poor. I know this is out of your control, but it was hard to choose your response. Clicking the appropriate button was difficult on both a computer and tablet. Also, the demographic information did not have adequate responses to allow me to properly describe my information.
The survey really covered all of Nuclear Medicine today.
There are many things I, as supervisor, would not have an entry level tech doing in my lab. I always start new techs off on the simplest tasks to find out how well they follow established protocols and how well they listen to instruction from experienced techs. It generally takes 6 months to a year before a newly minted tech is really able to be scheduled alone in a room. The education has gotten very top heavy on book learning and techs come out of school with almost no patient contact skills.

Respondent Comment
There are so many gray areas in the American health care system and although it would be easy to distract new technologists away from the basic performance of their duties by giving them too much information at one time, I think it might be helpful in the future to give them some kind of grounding in the business of healthcare and the ethical minefield that we all walk in from time to time.
There are so many things on this list that I did not even recognize, and I have only been out of school for less than 15 years. It is changing quickly.
There are still WAY too many graduates competing for FEW jobs. Placement should be calculated based upon full-time nuclear - not PRN or part time or "related field".
There need to be less graduates from the Nuclear Medicine Programs too many PRN positions and not enough full time.
This survey appears very well-rounded when gearing toward an entry level technologist.
This survey was filled out based on the job positions held at a small rural hospital and currently a cardiology clinic that includes cardiac PET
This survey was long.
Too much PET for entry level. Most non-imaging equipment for cardiac studies are monitored by a nurse & exercise tech. Nuclear technologist role is limited to injection of pharmaceutical & imaging radiopharmaceutical. Never used Xenon since school in 1993!
types of facilities could be expanded to include , urban, rural, VA, County, etc.; ; Technologist could include travel, PRN, ; ; Licensed in more than 1 state?
Unable to select desired response on some questions. page wouldnt let me click response i wanted so I just had to select whatever.
Under the demographic questions, #7 there was no adequate answer for educators that work in a college/university. My affiliation with hospitals, clinics, or imaging centers is entirely through the JRCNMT affiliation agreements.; Domain III, F.1. Questions about cell labeling should separate WBC and RBC techniques. They are very different in complexity and requirements.; Domain IV, Task A, 1.a. I find the term calibrate confusing. In this context does it mean the daily constancy the technologists
Unfortunately, the role and responsibilities of the NMT continue to decline - as does the knowledge base. At the time of graduation, the entry level tech should be at the top of his/her game from a book learning standpoint - yet just in the infancy from a experience perspective...but that just doesnt seem to be the case. In my mind, almost all areas included in the job analysis are critical, or mostly critical but in the real world - other positions are taking over the basic fundamental respon
very good survey
Very important to be tested on all aspects of Nuclear Medicine. Once a technologist starts working they be the only technologist working at a site.; Adequate education, clinical rotations, and good patient care all required!
Very involved survey....looks like everything was covered
Very thorough --
Very thorough survey!

Respondent Comment
Very thorough.
Very through and complete!
W8851 Niblick Rd
We are a small community hospital. We also transport our own ER and "Observation Unit patients, so we need to assess transportation mode.
We only perform Nuclear Cardiology in our clinic.
we should concentrate more on procedures than much of the physics behind the camera. The camera are now so efficient now a days so spending more time in learning the physics is what would turn away the new students from graduating from this program.
Well covered.
When clicking on the bullet questions. There appeared a small window labeling the bullet. It made it impossible then to click the bullet. What a pain.
When I took the boards there was a ridiculous amount of questions regarding scans that were no longer prevalent (Schillings) and calculating dose decay. On the everyday job we dont really need to know these things as well at radiation physics.
When I took the NMTCB exam last year, there were many radiopharmacy and equipment questions which were 100% irrelevant to modern Nuclear Medicine. ie manual operation of SCAs or obscure radiopharms only used in research institutions.
When it comes to therapy doses or procedures others then the i131 ablation the rest are not needed to test on. No in the field dose them unless you work at a teaching hospital in that case you will be trained on the job for those procedures.
While I feel it important for the entry level technologist to know about elution, compounding and QC dynamics, I do not think this should be emphasized so much at the "skills" level, since this work is almost completely relegated to the registered radiopharmacist.
While i work in a cardiology practice the background of a general tech is still very important. the role of past experience cannot be under estimated
With every site performing scans with different protocols it is difficult to assess protocols on a board exam. Everything I had learned in school for imaging protocols was so different than my first job out of school. I felt like I was starting from scratch. As the SNM works to standardize procedures, and providing it is a successful endeavor, this will become easier and more important to access.
With the internet so readily available entry level technologist do not need to know as much. Knowing what pharmaceuticals to use and a basic understanding of radiation safety may be sufficient. Unfortunately this may lead to a; Growing number of entry level technologist who will not; Be trained by people who have an understanding of all aspects before they were automated by computer systems.
Would like to see the test reflect the whys (basics) of NM. Technology has made it too easy for new grads (button pushing). Not so much clinical procedure questions since every facility performs them differently.

**Appendix D: “Other” Responses for Credentials/Certifications,
State/Territory/Country of Primary Practice, and Race/Ethnicity**

TABLE D-1. Unedited Credentials/Certifications “Other”

Other Credential/Certification	Frequency
ACMDTT - Nuclear Medicine Technologist - MRT(NM)	1
AMT (American Medical Technologist), Registered Nurse (Philippines)	1
ANZSNM Accreditation; MRPBA registration (Australia)	1
ardms breast	1
Arizona State Nuclear License	1
Arkansas State Licenses for NM and CT	1
ARRT	1
ARRT (N)	1
ASCP	1
ascp (nm)	1
ASCP NM/MT	1
ASCP Nuclear Medicine	1
Ascp(n)	3
ASCP-NM	1
ASCP-Nuclear Medicine	1
BSN	1
CA State	1
California State certification for Bone Densitometry	1
California State Licensure as CTNM with venipuncture	1
CBDT - DEXA Technologist by the ISCD	1
CBDT (from ISCD) dexa	1
CBT-cert.bone densitometrist since 2001	1
CCI- Registered Cardiac Sonographer -RCS	1
CCI-RVS	1

Other Credential/Certification	Frequency
CCRP	1
CCT	1
Certified NM Specialist by Saudi commission for Health specialties	1
CIIP	1
CPT (Certified Phlebotomy Technician)	1
CRA	1
CRA Certified Radiology Administrator through AHRA	1
CRA-certified radiology administrator	1
CRLS certified renal lithotripsy specialist	1
CRT - Florida Licensed Nuclear Technologist	1
CRT, ARRT (F)	1
DABSNM	1
FL Dept of Health state license	1
GXMO DEXA	1
LNMT, NY	1
LPN	1
Maryland State License	1
medical technologist lab	1
MT (ASCP)	1
NJ State	1
NMASCP	1
NY State Licensed NMT	1
Radiation Safety Officer	2
RDMS	1
Registered Nurse	1

Other Credential/Certification	Frequency
Registered Nurse - Texas	1
RN, BSN	2
RPA/RA CBRPA	1
RSO	1
RSO - Radiation Safety Officer	1
SNM RTNM	1
State	1
state license- bone density, state license Nuclear Medicine	1
state of California license Nuclear Medicine, Radiologic Technologist	1
State of Texas RT	1
Total	63

TABLE D-2. Unedited “Other” State/Territory/Country

Other State/Territory/Country	Frequency
Alberta, Canada	3
British Columbia, Canada	2
Canada	9
Global Position	1
King Abdulaziz Medical City-Riyadh, Saudi Arabia	1
KING FAISAL SPECIALIST HOS&RESEARCH CENTER	1
London, United Kingdom	1
NSW, Australia	2
ONTARIO CANADA	1
Ontario, Canada	1
PAKISTAN	1
Saudi Arabia	2
UK	1
Vancouver, BC, Canada	1
Total	27

TABLE D-3. Unedited “Other” Race/Ethnicity

Other Race/Ethnicity	Frequency
50% Irish/ 50%Native American	1
Afro-Cuban American	1
arab north african	1
Caucasian	1
Earthling	1
Hmong	1
Human	3
MEDDLE EASTERN	1
Middle Eastern	2
Southeast Asian	1
West indian	1
White/ Euro Americian	1
white/hispanic	1
Total	16

Appendix E: Tasks in Survey Order with Frequency and Importance Data

Rating Scale

1 = Not Important

2 = Low Importance

3 = Moderate Importance

4 = Extremely Important

TABLE E-1. Tasks in Survey Order with Frequency and Importance Data

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
1	IA1ai	Domain I: Radiation Physics and Detection	Task A. Physical properties	1. Radioactive materials: a. Modes of decay: i. Gamma emitters	1.5%	3.85
2	IA1aii	Domain I: Radiation Physics and Detection	Task A. Physical properties	1. Radioactive materials: a. Modes of decay: ii. Beta emitters	10.8%	3.29
3	IA1aiii	Domain I: Radiation Physics and Detection	Task A. Physical properties	1. Radioactive materials: a. Modes of decay: iii. Alpha emitters	20.9%	2.93
4	IA1aiv	Domain I: Radiation Physics and Detection	Task A. Physical properties	1. Radioactive materials: a. Modes of decay: iv. Positron emitters	13.9%	3.58
5	IA2a	Domain I: Radiation Physics and Detection	Task A. Physical properties	2. X-ray production: a. Bremsstrahlung	12.2%	3.13
6	IA2b	Domain I: Radiation Physics and Detection	Task A. Physical properties	2. X-ray production: b. Characteristic x-ray	12.7%	3.05
7	IB	Domain I: Radiation Physics and Detection	Task B. Measurement of radioactivity and decay calculations		1.3%	3.73
8	IC	Domain I: Radiation Physics and Detection	Task C. Interactions of radiation with matter		3.0%	3.52
9	ID	Domain I: Radiation Physics and Detection	Task D. Radiation detector types and basic principles		1.5%	3.70
10	IE	Domain I: Radiation Physics and Detection	Task E. Counting statistics		3.0%	3.20

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
11	IIA	Domain II: Radiation Safety and Regulations	Task A. Biological effects of radiation exposure		1.2%	3.73
12	IIB1	Domain II: Radiation Safety and Regulations	Task B. Protection techniques and calculations:	1. Time	0.5%	3.90
13	IIB2	Domain II: Radiation Safety and Regulations	Task B. Protection techniques and calculations:	2. Distance (inverse square law)	0.6%	3.88
14	IIB3	Domain II: Radiation Safety and Regulations	Task B. Protection techniques and calculations:	3. Shielding (shielding equations)	0.7%	3.86
15	IIC1a	Domain II: Radiation Safety and Regulations	Task C. Monitoring protocols and requirements (e.g., timing and frequency):	1. Radiation surveys (area monitoring) including: a. Survey meters and well counters	0.5%	3.88
16	IIC1b	Domain II: Radiation Safety and Regulations	Task C. Monitoring protocols and requirements (e.g., timing and frequency):	1. Radiation surveys (area monitoring) including: b. Choice of radiation detection devices (e.g., Geiger Counters, sodium iodide detectors)	0.9%	3.71
17	IIC1c	Domain II: Radiation Safety and Regulations	Task C. Monitoring protocols and requirements (e.g., timing and frequency):	1. Radiation surveys (area monitoring) including: c. Frequency and limits of wipe surveys	0.7%	3.74
18	IIC2	Domain II: Radiation Safety and Regulations	Task C. Monitoring protocols and requirements (e.g., timing and frequency):	2. Personal monitoring devices	0.5%	3.82
19	IIC3	Domain II: Radiation Safety and Regulations	Task C. Monitoring protocols and requirements (e.g., timing and frequency):	3. Personal protective equipment (e.g., lab coat, gloves, syringe shields)	0.5%	3.84
20	IIC4a	Domain II: Radiation Safety and Regulations	Task C. Monitoring protocols and requirements (e.g., timing and frequency):	4. Effective dose equivalent limits for: a. Radiation workers	0.7%	3.72

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
21	IIC4b	Domain II: Radiation Safety and Regulations	Task C. Monitoring protocols and requirements (e.g., timing and frequency):	4. Effective dose equivalent limits for: b. Pregnant radiation workers	1.1%	3.72
22	IIC4c	Domain II: Radiation Safety and Regulations	Task C. Monitoring protocols and requirements (e.g., timing and frequency):	4. Effective dose equivalent limits for: c. General public	0.8%	3.61
23	IID	Domain II: Radiation Safety and Regulations	Task D. Practice and adhere to ALARA		0.5%	3.92
24	IIE1	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	1. Posting warning and informational signs delineating restricted and unrestricted areas	1.1%	3.72
25	IIE2	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	2. Surveying, inspecting, and inventorying radioactive materials	0.8%	3.84
26	IIE3a	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	3. Responding to adverse events: a. Trigger levels and monitoring methods	0.7%	3.76
27	IIE3b	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	3. Responding to adverse events: b. Radiation exposure	0.7%	3.82
28	IIE3c	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	3. Responding to adverse events: c. Radiation spills	0.7%	3.82
29	IIE3d	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	3. Responding to adverse events: d. Protection during adverse events	0.8%	3.77

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
30	IIE3e	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	3. Responding to adverse events: e. Personnel, patient, and/or public decontamination	1.0%	3.75
31	IIE3f	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	3. Responding to adverse events: f. Area/equipment decontamination	0.9%	3.78
32	IIE4	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	4. Adhere to radioactive waste storage requirements	0.6%	3.83
33	IIE5	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	5. Dispose of radioactive materials (e.g., liquids, solids, gasses, contaminated materials)	0.7%	3.85
34	IIE6	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	6. Identify recordable and reportable events	0.8%	3.79
35	IIE7a	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	7. Maintain records as required for: a. Receipt, storage, and disposal of radioactive materials	0.7%	3.79
36	IIE7b	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	7. Maintain records as required for: b. Radiation monitoring and reporting	0.8%	3.77
37	IIE7c	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	7. Maintain records as required for: c. Equipment calibration and maintenance	1.1%	3.78

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
38	IIE7d	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	7. Maintain records as required for: d. Staff, patient, occupational and public exposure	1.2%	3.73
39	IIE7e	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	7. Maintain records as required for: e. Nuclear medicine diagnostic and therapeutic procedures	1.4%	3.84
40	IIF1	Domain II: Radiation Safety and Regulations	Task F. Practice and adhere to Department of Transportation (DOT) - Radiopharmaceutical Transport requirements:	1. Use of shielding containers	0.8%	3.80
41	IIF2	Domain II: Radiation Safety and Regulations	Task F. Practice and adhere to Department of Transportation (DOT) - Radiopharmaceutical Transport requirements:	2. Labeling requirements (e.g., transportation index, name, concentration, expiration date/time, total activity, assay date/time)	0.9%	3.75
42	IIF3	Domain II: Radiation Safety and Regulations	Task F. Practice and adhere to Department of Transportation (DOT) - Radiopharmaceutical Transport requirements:	3. Package monitoring/receiving/returning	0.8%	3.75
43	IIG	Domain II: Radiation Safety and Regulations	Task G. Practice and adhere to Environmental Protection Agency (EPA) requirements		1.3%	3.58
44	IIH	Domain II: Radiation Safety and Regulations	Task H. Practice and adhere to Occupational Safety and Health Administration (OSHA) requirements		1.0%	3.66

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
45	III1	Domain II: Radiation Safety and Regulations	Task I. Practice and adhere to Health and Human Services (HHS)/Health Insurance Portability and Accountability Act (HIPAA) requirements:	1. Protecting patient rights and privacy	0.4%	3.87
46	III2	Domain II: Radiation Safety and Regulations	Task I. Practice and adhere to Health and Human Services (HHS)/Health Insurance Portability and Accountability Act (HIPAA) requirements:	2. Maintaining patient records	0.4%	3.82
47	III3	Domain II: Radiation Safety and Regulations	Task I. Practice and adhere to Health and Human Services (HHS)/Health Insurance Portability and Accountability Act (HIPAA) requirements:	3. Releasing information to authorized parties	1.4%	3.73
48	IIJ	Domain II: Radiation Safety and Regulations	Task J. Knowledge of institutional and departmental accreditation organizations		0.8%	3.56
49	III A1a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task A. Elute radionuclide generator, perform and evaluate quality control tests:	1. Types of generators (e.g., ⁹⁹ Mo/ ^{99m} Tc, ⁸² Sr/ ⁸² Rb, etc.): a. Elution	26.1%	3.16
50	III A1b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task A. Elute radionuclide generator, perform and evaluate quality control tests:	1. Types of generators (e.g., ⁹⁹ Mo/ ^{99m} Tc, ⁸² Sr/ ⁸² Rb, etc.): b. Generator yield - volume and activity	26.0%	3.17

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
51	IIIA1ci	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task A. Elute radionuclide generator, perform and evaluate quality control tests:	1. Types of generators (e.g., ⁹⁹ Mo/ ^{99m} Tc, ⁸² Sr/ ⁸² Rb, etc.):c. Quality control procedures: i. 99Mo 99mTc (99MO breakthrough and AI +3 content)	26.3%	3.21
52	IIIA1cii	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task A. Elute radionuclide generator, perform and evaluate quality control tests:	1. Types of generators (e.g., ⁹⁹ Mo/ ^{99m} Tc, ⁸² Sr/ ⁸² Rb, etc.):c. Quality control procedures: ii. 82Sr 82Rb (measured activity and levels of 82Sr & 85Sr)	29.1%	3.05
53	IIIA2	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task A. Elute radionuclide generator, perform and evaluate quality control tests:	2. Dose calibrator operation/units of radioactivity	4.4%	3.80
54	IIIB1a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task B. Prepare radiopharmaceutical kits, perform quality control, and evaluate results:	1. Radiopharmaceutical kits: a. Activity and volume limitations	12.5%	3.60
55	IIIB1b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task B. Prepare radiopharmaceutical kits, perform quality control, and evaluate results:	1. Radiopharmaceutical kits: b. Activity calculations	11.9%	3.61
56	IIIB1c	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task B. Prepare radiopharmaceutical kits, perform quality control, and evaluate results:	1. Radiopharmaceutical kits: c. Insure particle size and number if needed	16.4%	3.49

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
57	IIB2a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task B. Prepare radiopharmaceutical kits, perform quality control, and evaluate results:	2. Radiopharmaceutical quality control: a. Visual inspection - color and clarity	11.8%	3.55
58	IIB2b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task B. Prepare radiopharmaceutical kits, perform quality control, and evaluate results:	2. Radiopharmaceutical quality control: b. Radiochemical purity	17.5%	3.45
59	IIB3	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task B. Prepare radiopharmaceutical kits, perform quality control, and evaluate results:	3. Labeling kits	12.7%	3.64
60	IIB4	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task B. Prepare radiopharmaceutical kits, perform quality control, and evaluate results:	4. Storage of kits before and after reconstitution	12.7%	3.59
61	IIC1a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: a. Tc99m sodium pertechnetate	3.8%	3.86
62	IIC1b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: b. Tc99m oxidronate/HDP	23.1%	3.57

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
63	IIC1c	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: c. Tc99m medronate/MDP	8.4%	3.83
64	IIC1d	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: d. Tc99m pentetate/DTPA	10.3%	3.78
65	IIC1e	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: e. Tc99m macroaggregated albumin/MAA	8.5%	3.85
66	IIC1f	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: f. Tc99m sulfur colloid	7.7%	3.81

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
67	IIC1g	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: g. Tc99m disofenin/mebroenin (Choletec)	7.7%	3.83
68	IIC1h	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: h. Tc99m mertiatide/MAG3	8.9%	3.79
69	IIC1i	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: i. Tc99m pyrophosphate/PYP	15.9%	3.55
70	IIC1j	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: j. Tc99m sestamibi/MIBI (Cardiolite)	5.8%	3.84

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
71	IIC1k	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: k. Tc99m tetrofosmin (Myoview)	15.0%	3.73
72	IIC1l	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: l. Tc99m succimer/DMSA	22.1%	3.39
73	IIC1m	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: m. Tc99m exametazime/HMPAO (Ceretek)	15.6%	3.59
74	IIC1n	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: n. Tc99m bismuth-201/ECG (Neurolite)	22.8%	3.49

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
75	IIC1o	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: o. Tc99m labeled RBCs	7.4%	3.81
76	IIC1p	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: p. Tc99m denatured radiolabeled RBCs	24.3%	3.47
77	IIC1q	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: q. Tc99m HMPAO tagged WBCs	15.7%	3.66
78	IIC1r	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: r. Tc99m tilmanocept (Lymphoseek)	24.8%	3.49

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
79	IIC2a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	2. Iodine labeled radiopharmaceuticals: a. I-123 sodium iodide	9.9%	3.82
80	IIC2b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	2. Iodine labeled radiopharmaceuticals: b. I-131 sodium iodide	12.7%	3.83
81	IIC2c	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	2. Iodine labeled radiopharmaceuticals: c. I-123 MIBG	21.4%	3.54
82	IIC2d	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	2. Iodine labeled radiopharmaceuticals: d. I-131 MIBG	28.1%	3.39

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
83	IIC2e	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	2. Iodine labeled radiopharmaceuticals: e. I-131 serum albumin/RISA	36.4%	3.13
84	IIC2f	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	2. Iodine labeled radiopharmaceuticals: f. I-123 Ioflupane (DaTscan)	28.4%	3.41
85	IIC3a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	3. Indium labeled radiopharmaceuticals: a. In-111 Pentetate (DTPA)	17.9%	3.6
86	IIC3b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	3. Indium labeled radiopharmaceuticals: b. In-111 chloride	27.1%	3.42

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
87	IIC3c	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	3. Indium labeled radiopharmaceuticals: c. In-111 oxine labeled WBCs	15.4%	3.68
88	IIC3d	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	3. Indium labeled radiopharmaceuticals: d. In-111 labeled MAB (capromab pendetide)(Prostascint)	30.9%	3.27
89	IIC3e	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	3. Indium labeled radiopharmaceuticals: e. In-111 pentetreotide (Octreoscan)	14.7%	3.59
90	IIC4a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	4. Miscellaneous diagnostic radiopharmaceuticals: a. TI201 thallous chloride	12.3%	3.46

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
91	IIC4b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	4. Miscellaneous diagnostic radiopharmaceuticals: b. Ga67 gallium citrate	16.1%	3.39
92	IIC4c	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	4. Miscellaneous diagnostic radiopharmaceuticals: c. Xe133 gas	23.7%	3.55
93	IIC4d	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	4. Miscellaneous diagnostic radiopharmaceuticals: d. C14 urea	36.5%	2.87
94	IIC5a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	5. Positron Emission Tomography: a. F-18 FDG	20.7%	3.8

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
95	IIC5b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	5. Positron Emission Tomography: b. F-18 Florbetaben (Neuraceq)	36.9%	3.26
96	IIC5c	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	5. Positron Emission Tomography: c. F-18 Florbetapir (Amyvid)	34.6%	3.33
97	IIC5d	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	5. Positron Emission Tomography: d. F-18 Flutemetamol (Vizamyl)	37.3%	3.23
98	IIC5e	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	5. Positron Emission Tomography: e. F-18 Sodium Fluoride (NaF)	30.2%	3.48

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
99	IIC5f	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	5. Positron Emission Tomography: f. Rb82 chloride	35.4%	3.38
100	IIC5g	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	5. Positron Emission Tomography: g. N13 ammonia	37.9%	3.23
101	IIC5h	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	5. Positron Emission Tomography: h. Ga-68 Dotatate	36.9%	3.25
102	IID1	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task D. Understand the characteristics (i.e., mechanism of localization), indications, contraindications, and administration of therapeutic radiopharmaceuticals:	1. Sr89 chloride (Metastron)	32.6%	3.17

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
103	IIID2	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task D. Understand the characteristics (i.e., mechanism of localization), indications, contraindications, and administration of therapeutic radiopharmaceuticals:	2. Sm153 EDTMP leixidronam (Quadramet)	31.7%	3.17
104	IIID3	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task D. Understand the characteristics (i.e., mechanism of localization), indications, contraindications, and administration of therapeutic radiopharmaceuticals:	3. I-131 sodium iodide	17.5%	3.7
105	IIID4	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task D. Understand the characteristics (i.e., mechanism of localization), indications, contraindications, and administration of therapeutic radiopharmaceuticals:	4. Y90 ibritumomab tiuxetan (Zevalin)	30.3%	3.24
106	IIID5	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task D. Understand the characteristics (i.e., mechanism of localization), indications, contraindications, and administration of therapeutic radiopharmaceuticals:	5. Y90 microspheres (SIR-Spheres, TheraSphere)	27.9%	3.38

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
107	IIID6	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task D. Understand the characteristics (i.e., mechanism of localization), indications, contraindications, and administration of therapeutic radiopharmaceuticals:	6. Ra223 Radium dichloride (Xofigo)	27.5%	3.34
108	IIID7	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task D. Understand the characteristics (i.e., mechanism of localization), indications, contraindications, and administration of therapeutic radiopharmaceuticals:	7. I-125 Seeds	35.0%	3.06
109	IIIE1	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	1. dipyridamole (Persantine)	20.8%	3.37
110	IIIE2	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	2. adenosine	16.4%	3.52

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
111	IIIE3	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	3. dobutamine	11.6%	3.54
112	IIIE4	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	4. aminophylline	7.2%	3.67
113	IIIE5	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	5. regadenoson (Lexiscan)	6.4%	3.83
114	IIIE6	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	6. captopril	16.3%	3.43

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
115	IIIE7	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	7. enalaprilat	29.9%	3.29
116	IIIE8	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	8. furosemide (Lasix)	7.8%	3.7
117	IIIE9	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	9. insulin	21.7%	3.43
118	IIIE10	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	10. acetazolamide	30.6%	3.2

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
119	IIIE11	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	11. cholecystokinen/sincalide/CCK	9.3%	3.78
120	IIIE12	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	12. morphine	15.8%	3.59
121	IIIE13	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	13. cimetidine/ranitidine/famotidine	28.2%	3.2
122	IIIE14	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	14. ACD solution	24.2%	3.27

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
123	IIIE15	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	15. heparin	9.9%	3.58
124	IIIE16	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	16. hetastarch	31.2%	3.13
125	IIIE17	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	17. contrast media (oral and IV)	20.4%	3.44
126	IIIE18	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	18. Lugol's solution/SSKI	20.3%	3.41

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
127	IIIE19	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	19. Thyroid Stimulating Hormone (TSH)	18.6%	3.49
128	IIIE20	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	20. Lidocaine	21.5%	3.16
129	IIIE21	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	21. Lidocaine (EMLA) cream	22.8%	3.14
130	IIIE22	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	22. atropine	19.6%	3.31

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
131	IIIE23	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	23. recombinant human TSH (Thyrogen)	19.6%	3.44
132	IIIF1a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	1. Labeling procedures: a. Required lab equipment and supplies	12.1%	3.6
133	IIIF1b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	1. Labeling procedures: b. Anticoagulants and other additives	12.6%	3.57
134	IIIF1c	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	1. Labeling procedures: c. Chemical reactions	16.5%	3.43
135	IIIF1d	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	1. Labeling procedures: d. Cell washing	28.2%	3.2
136	IIIF1e	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	1. Labeling procedures: e. Required radiopharmaceuticals	11.8%	3.66
137	IIIF1f	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	1. Labeling procedures: f. Method: in vivo or in vitro	12.0%	3.59

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
138	IIIF2	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	2. Centrifuge operation	29.1%	3.11
139	IIIF3	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	3. Calculation of labeling efficiency and administered dosage	20.0%	3.46
140	IIIF4	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	4. Reinjection patient and sample verification	11.6%	3.73
141	IIIG1	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task G. Understand the routes of administration:	1. Administration modes (e.g., IV, IM)	0.9%	3.9
142	IIIG2	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task G. Understand the routes of administration:	2. Administration techniques (e.g., bolus injection, straight stick, IV line)	0.8%	3.91
143	IIIH1	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task H. Prepare and administer non-radioactive agents:	1. Follow aseptic technique	1.5%	3.94
144	IIIH2	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task H. Prepare and administer non-radioactive agents:	2. Adverse side-effects and treatment	1.9%	3.86
145	IIIH3	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task H. Prepare and administer non-radioactive agents:	3. Antidote/reversal agent	3.8%	3.78

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
146	IIIH4	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task H. Prepare and administer non-radioactive agents:	4. Interventional pharmaceuticals	4.9%	3.74
147	IIIH5	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task H. Prepare and administer non-radioactive agents:	5. Non-radioactive agents (e.g., ACD solution, heparin, contrast media, TSH, atropine, etc.,)	4.2%	3.67
148	IVA1a	Domain IV: Instrument Operations and Quality Control	Task A. Non-imaging equipment, components, and operation:	1. Perform and evaluate quality control on well counters and probes: a. Calibrate and perform quality control on the sodium iodide scintillation detector	5.3%	3.75
149	IVA1b	Domain IV: Instrument Operations and Quality Control	Task A. Non-imaging equipment, components, and operation:	1. Perform and evaluate quality control on well counters and probes: b. Conduct a gamma ray spectra and pulse height analysis	7.7%	3.42
150	IVA1c	Domain IV: Instrument Operations and Quality Control	Task A. Non-imaging equipment, components, and operation:	1. Perform and evaluate quality control on well counters and probes: c. Apply formulas (e.g., energy resolution, sensitivity, Chi-square statistics, etc.,)	8.0%	3.29
151	IVA2a	Domain IV: Instrument Operations and Quality Control	Task A. Non-imaging equipment, components, and operation:	2. Determine operational status of survey meter: a. Survey meter operations and components	0.9%	3.85
152	IVA2b	Domain IV: Instrument Operations and Quality Control	Task A. Non-imaging equipment, components, and operation:	2. Determine operational status of survey meter: b. Survey meter quality control	1.4%	3.81
153	IVA3	Domain IV: Instrument Operations and Quality Control	Task A. Non-imaging equipment, components, and operation:	3. Perform and evaluate dose calibrator constancy, accuracy, linearity, and geometry tests	2.2%	3.78

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
154	IVB1a	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	1. Gamma Camera quality control: a. Uniformity	1.4%	3.91
155	IVB1b	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	1. Gamma Camera quality control: b. Spatial resolution	2.0%	3.85
156	IVB1c	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	1. Gamma Camera quality control: c. Visual image quality	1.5%	3.9
157	IVB1d	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	1. Gamma Camera quality control: d. Phantoms	3.1%	3.75
158	IVB1e	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	1. Gamma Camera quality control: e. Artifacts	1.8%	3.87
159	IVB1f	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	1. Gamma Camera quality control: f. Assess system sensitivity	3.6%	3.64
160	IVB1g	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	1. Gamma Camera quality control: g. Pulse height analysis	5.5%	3.52
161	IVB2a	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	2. SPECT and SPECT/CT imaging system: a. Attenuation correction	6.6%	3.77
162	IVB2bi	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	2. SPECT and SPECT/CT imaging system: b. SPECT camera quality control: i. Center of rotation	2.8%	3.87
163	IVB2bii	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	2. SPECT and SPECT/CT imaging system: b. SPECT camera quality control: ii. Field uniformity requirements	2.9%	3.84

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
164	IVB2biii	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	2. SPECT and SPECT/CT imaging system: b. SPECT camera quality control: iii. Pixel calibration	7.9%	3.52
165	IVB2biv	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	2. SPECT and SPECT/CT imaging system: b. SPECT camera quality control: iv. 3-D uniformity and resolution (e.g., Jaczak phantom)	9.0%	3.56
166	IVB2bv	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	2. SPECT and SPECT/CT imaging system: b. SPECT camera quality control: v. Artifacts	3.6%	3.8
167	IVB3a	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	3. PET and PET/CT imaging systems: a. Application of attenuation corrections	21.2%	3.74
168	IVB3b	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	3. PET and PET/CT imaging systems: b. PET quality control (e.g., daily blank scan, normalization scan, 2-D/3-D well counter, artifacts, etc.,)	22.6%	3.77
169	IVB4a	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	4. CT imaging systems: a. Co-registration of images	22.4%	3.63
170	IVB4b	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	4. CT imaging systems: b. CT quality control (e.g., contrast and spatial resolution, noise, uniformity, artifacts, etc.,)	22.4%	3.61
171	IVB5	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	5. Computer equipment (e.g., monitors, matrix sizes, printers, etc.,)	15.3%	3.48

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
172	IVB6	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	6. Networking and information systems (i.e., PACS and RIS)	13.8%	3.53
173	IVC1	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	1. Laboratory equipment (e.g., centrifuge, fume hoods)	20.3%	3.18
174	IVC2a	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	2. Patient care equipment: a. Intravenous infusion pump	7.3%	3.49
175	IVC2b	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	2. Patient care equipment: b. ECG monitor	3.0%	3.59
176	IVC2c	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	2. Patient care equipment: c. Pulse oximeter	6.0%	3.44
177	IVC2d	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	2. Patient care equipment: d. Defibrillator	4.7%	3.61
178	IVC2e	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	2. Patient care equipment: e. Glucose meter	9.1%	3.47
179	IVC2f	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	2. Patient care equipment: f. Blood pressure equipment	3.7%	3.56
180	IVC3a	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	3. Non-imaging equipment: a. Xenon delivery system and trap	25.8%	3.55
181	IVC3b	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	3. Non-imaging equipment: b. Aerosol delivery system	15.4%	3.68
182	IVC3c	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	3. Non-imaging equipment: c. Treadmill	6.2%	3.5

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
183	VA1a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	1. Pulmonary: a. Radioaerosol	15.3%	3.75
184	VA1b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	1. Pulmonary: b. Gas ventilation	21.0%	3.72
185	VA1c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	1. Pulmonary: c. Perfusion	9.0%	3.88
186	VA1d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	1. Pulmonary: d. Perfusion/Ventilation quantitation	10.0%	3.76
187	VA2a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	2. Bone/Musculoskeletal scans: a. Limited	9.3%	3.76
188	VA2b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	2. Bone/Musculoskeletal scans: b. Whole-body	7.7%	3.91
189	VA2c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	2. Bone/Musculoskeletal scans: c. 3-phase	8.0%	3.89
190	VA2d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	2. Bone/Musculoskeletal scans: d. 4-phase	31.5%	3.41
191	VA2e	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	2. Bone/Musculoskeletal scans: e. SPECT	8.6%	3.83
192	VA2f	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	2. Bone/Musculoskeletal scans: f. NaF PET	32.2%	3.42
193	VA3a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	3. Oncology: a. Ga67 tumor imaging, planar, and SPECT	18.0%	3.4

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
194	VA3b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	3. Oncology: b. Monoclonal antibody imaging	26.3%	3.31
195	VA3c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	3. Oncology: c. Peptide imaging	30.0%	3.26
196	VA3d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	3. Oncology: d. Breast imaging	25.0%	3.45
197	VA3e	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	3. Oncology: e. Lymphoscintigraphy/sentinel lymph node localization	12.5%	3.74
198	VA3f	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	3. Oncology: f. Tumor imaging, PET	22.3%	3.79
199	VA3g	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	3. Oncology: g. Neuroendocrine tumor imaging	17.1%	3.63
200	VA4a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	4. Infection: a. Ga67 infection imaging	18.1%	3.4
201	VA4b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	4. Infection: b. Tagged WBC imaging	11.3%	3.75
202	VA5a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	5. Renal/Genitourinary: a. Cystogram, direct	29.4%	3.18
203	VA5b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	5. Renal/Genitourinary: b. Effective renal plasma flow (ERPF)	26.0%	3.31
204	VA5c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	5. Renal/Genitourinary: c. Glomerular filtration rate (GFR)	20.0%	3.45

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
205	VA5d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	5. Renal/Genitourinary: d. Renal anatomy, planar, SPECT	16.1%	3.57
206	VA5e	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	5. Renal/Genitourinary: e. Renal flow	9.4%	3.76
207	VA5f	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	5. Renal/Genitourinary: f. Renogram (Lasix, and ACE inhibitors)	9.2%	3.8
208	VA5g	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	5. Renal/Genitourinary: g. Testicular	34.5%	2.88
209	VA6a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	6. Endocrine: a. Adrenal imaging	25.1%	3.25
210	VA6b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	6. Endocrine: b. Parathyroid imaging, planar, and SPECT	9.1%	3.77
211	VA6c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	6. Endocrine: c. Thyroid imaging	8.7%	3.86
212	VA6d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	6. Endocrine: d. Thyroid uptake	9.3%	3.86
213	VA6e	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	6. Endocrine: e. Whole body survey for thyroid metastases	13.3%	3.74
214	VA7a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	7. Hematopoietic: a. Bone marrow imaging	26.2%	3.15
215	VA7b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	7. Hematopoietic: b. Total blood volume, plasma volume, red cell mass	39.3%	2.86

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
216	VA7c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	7. Hematopoietic: c. Spleen scan with labeled, denatured RBCs	30.8%	3
217	VA8a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: a. Myocardial perfusion, planar	18.6%	3.39
218	VA8b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: b. Myocardial perfusion, SPECT, attenuation and non-attenuation	4.8%	3.91
219	VA8c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: c. Myocardial perfusion, gated SPECT	4.6%	3.91
220	VA8d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: d. First pass for EF and wall motion	21.5%	3.34
221	VA8e	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: e. Gated cardiac blood pool, rest	9.1%	3.71
222	VA8f	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: f. Gated cardiac blood pool, stress	19.8%	3.49
223	VA8g	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: g. Gated cardiac blood pool, SPECT	18.5%	3.52
224	VA8h	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: h. Cardiac shunt	27.0%	3.15
225	VA8i	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: i. Cardiac CT SPECT	28.1%	3.49
226	VA8j	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: j. MIBG	25.9%	3.32

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
227	VA8k	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: k. Myocardial viability (thallium, FDG)	12.8%	3.53
228	VA8l	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: l. Cardiac PET	32.4%	3.53
229	VA9a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: a. Esophageal motility/transit	31.5%	3.08
230	VA9b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: b. Gastric emptying (liquid/solid)	9.1%	3.8
231	VA9c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: c. Gastroesophageal reflux	24.2%	3.28
232	VA9d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: d. Gastrointestinal bleeding	10.2%	3.8
233	VA9e	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: e. Hemangioma	14.2%	3.35
234	VA9f	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: f. Hepatobiliary with and without GBEF	9.5%	3.84
235	VA9g	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: g. Peritoneal venous shunt patency	26.7%	3.12
236	VA9h	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: h. Liver-lung shunt mapping (arterial)	28.1%	3.19
237	VA9i	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: i. Liver-spleen imaging, planar, and SPECT	12.8%	3.43

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
238	VA9j	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: j. Meckel's diverticulum	11.5%	3.34
239	VA9k	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: k. Salivary (parotid)	30.0%	2.97
240	VA9l	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: l. H. Pylori breath test	39.8%	2.85
241	VA10a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	10. Central Nervous System: a. Brain flow, brain death	18.5%	3.57
242	VA10b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	10. Central Nervous System: b. Brain imaging, planar, and SPECT	21.2%	3.49
243	VA10c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	10. Central Nervous System: c. Dopamine receptor DaT scan	32.5%	3.34
244	VA10d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	10. Central Nervous System: d. Cisternogram	20.1%	3.33
245	VA10e	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	10. Central Nervous System: e. CSF leak	21.1%	3.28
246	VA10f	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	10. Central Nervous System: f. CSF shunt patency	22.9%	3.26
247	VA10g	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	10. Central Nervous System: g. Brain PET	29.0%	3.54
248	VA11a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	11. Radionuclide Therapy: a. Intracavity (e.g., P-32)	43.5%	2.88

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
249	VA11b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	11. Radionuclide Therapy: b. Polycythemia vera/leukemia	42.8%	2.87
250	VA11c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	11. Radionuclide Therapy: c. Thyroid	15.5%	3.78
251	VA11d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	11. Radionuclide Therapy: d. Metastatic bone	22.9%	3.56
252	VA11e	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	11. Radionuclide Therapy: e. Monoclonal antibody therapy (Zevalin)	33.8%	3.2
253	VA11f	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	11. Radionuclide Therapy: f. Embolic radiotherapy (labeled microspheres)	34.4%	3.26
254	VA11g	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	11. Radionuclide Therapy: g. Brachytherapy	39.6%	3
255	VA12a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	12. CT Imaging Procedures: a. Attenuation correction/anatomical localization	23.1%	3.61
256	VA12b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	12. CT Imaging Procedures: b. Diagnostic	28.3%	3.4
257	VB1	Domain V: Clinical Procedures	Task B. Schedule patient studies to accommodate sequencing of multiple procedures and special orders:	1. Schedule the camera time	3.1%	3.65

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
258	VB2	Domain V: Clinical Procedures	Task B. Schedule patient studies to accommodate sequencing of multiple procedures and special orders:	2. Schedule multiple radionuclide procedures for a single patient	6.0%	3.64
259	VB3	Domain V: Clinical Procedures	Task B. Schedule patient studies to accommodate sequencing of multiple procedures and special orders:	3. Schedule same-day multiple modality procedures for a single patient	4.8%	3.65
260	VC	Domain V: Clinical Procedures	Task C. Procure supply of radiopharmaceuticals, considering license possession limits and schedule		2.3%	3.68
261	VD	Domain V: Clinical Procedures	Task D. Instruct patient, family, and personnel concerning procedures and precautions		1.1%	3.8
262	VE1	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	1. Protect patient information and privacy according to the Healthcare Insurance and Portability and Accountability Act (HIPAA)	0.8%	3.88
263	VE2	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	2. Perform basic patient care (e.g., vital signs, basic first aid)	1.5%	3.78
264	VE3	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	3. Practice correct patient transferring techniques	1.3%	3.81
265	VE4a	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	4. Use and accommodate patient support devices: a. Intravenous infusion pump/lines	3.7%	3.62

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
266	VE4b	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	4. Use and accommodate patient support devices: b. Supplemental oxygen	1.8%	3.67
267	VE4c	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	4. Use and accommodate patient support devices: c. Foley catheter and drainage bag	7.9%	3.44
268	VE4d	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	4. Use and accommodate patient support devices: d. ECG monitor	2.7%	3.62
269	VE5	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	5. Receive and prepare patient, verify patient identification and written orders for study	1.1%	3.87
270	VE6a	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	6. Perform pre-examination screening including review of: a. Verify patient preparations and identify contraindications	0.9%	3.89
271	VE6b	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	6. Perform pre-examination screening including review of: b. Medical history	1.0%	3.8
272	VE6c	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	6. Perform pre-examination screening including review of: c. Current medications	1.0%	3.76
273	VE6d	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	6. Perform pre-examination screening including review of: d. Allergic and adverse reaction history	1.1%	3.78
274	VE6e	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	6. Perform pre-examination screening including review of: e. Review relevant lab values	2.1%	3.7
275	VE7	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	7. Verify that informed consent has been obtained	1.5%	3.84

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
276	VF1	Domain V: Clinical Procedures	Task F. Select and administer prescribed radiopharmaceutical:	1. Verify patient identification	0.7%	3.95
277	VF2	Domain V: Clinical Procedures	Task F. Select and administer prescribed radiopharmaceutical:	2. Administer radiopharmaceutical using appropriate route and technique	0.7%	3.95
278	VG	Domain V: Clinical Procedures	Task G. Monitor and assess patient condition		1.0%	3.88
279	VH	Domain V: Clinical Procedures	Task H. Implement emergency procedures (e.g., in case of fainting, seizure, cardiopulmonary arrest, etc.,)		0.8%	3.9
280	VI1	Domain V: Clinical Procedures	Task I. Prepare equipment and perform examinations:	1. Position patient using anatomical markers and immobilization techniques	1.4%	3.86
281	VI2	Domain V: Clinical Procedures	Task I. Prepare equipment and perform examinations:	2. Establish imaging parameters for data acquisition	1.1%	3.86
282	VJ1	Domain V: Clinical Procedures	Task J. Evaluate image quality:	1. Normal and abnormal scan patterns	0.8%	3.89
283	VJ2	Domain V: Clinical Procedures	Task J. Evaluate image quality:	2. identify artifacts and causes	1.1%	3.89
284	VJ3	Domain V: Clinical Procedures	Task J. Evaluate image quality:	3. Co-registration of images (SPECT/CT and PET/CT)	13.1%	3.75
285	VJ4	Domain V: Clinical Procedures	Task J. Evaluate image quality:	4. Repeat study and/or perform additional views	1.5%	3.79
286	VK	Domain V: Clinical Procedures	Task K. Perform post-procedure assessment		1.8%	3.71
287	VL	Domain V: Clinical Procedures	Task L. Provide patient/caregiver education concerning discharge instructions and cautions		1.7%	3.74

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
288	VM1	Domain V: Clinical Procedures	Task M. Process and evaluate computer generated data:	1. Data storage, transfer, and retrieval	0.9%	3.68
289	VM2	Domain V: Clinical Procedures	Task M. Process and evaluate computer generated data:	2. Image formation (static, dynamic, ERNA, list mode)	1.5%	3.68
290	VM3	Domain V: Clinical Procedures	Task M. Process and evaluate computer generated data:	3. Image reconstruction (SPECT, PET)	1.5%	3.79
291	VM4	Domain V: Clinical Procedures	Task M. Process and evaluate computer generated data:	4. Image enhancement (e.g., filters, matrix, intensity, etc.,)	1.3%	3.69
292	VM5a	Domain V: Clinical Procedures	Task M. Process and evaluate computer generated data:	5. Quantitative analysis: a. Regions of interest and quantification	1.9%	3.77
293	VM5b	Domain V: Clinical Procedures	Task M. Process and evaluate computer generated data:	5. Quantitative analysis: b. Curve generation and analysis	2.8%	3.7
294	VM5c	Domain V: Clinical Procedures	Task M. Process and evaluate computer generated data:	5. Quantitative analysis: c. Image normalization and subtraction	2.9%	3.64
295	VM6	Domain V: Clinical Procedures	Task M. Process and evaluate computer generated data:	6. Display formatting (image size, number of images, intensity adjustments)	1.6%	3.7
296	VN1a	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	1. Basic electrocardiography (ECG): a. Cardiac conduction system	5.1%	3.53
297	VN1b	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	1. Basic electrocardiography (ECG): b. Components of a normal ECG wave form	4.6%	3.56

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
298	VN1c	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	1. Basic electrocardiography (ECG): c. Recognizing and responding to changes on a resting or stress ECG	5.0%	3.55
299	VN2	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	2. ECG lead placements	3.9%	3.68
300	VN3a	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	3. Treadmill stress techniques (i.e., Bruce and modified Bruce) and bicycle stress techniques: a. Contraindications	5.2%	3.72
301	VN3b	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	3. Treadmill stress techniques (i.e., Bruce and modified Bruce) and bicycle stress techniques: b. Duration/termination parameters	5.5%	3.67
302	VN4a	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	4. Pharmacological stress protocols: a. Contraindications	4.6%	3.83
303	VN4b	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	4. Pharmacological stress protocols: b. Timing of pharmacological stress agent	4.6%	3.83
304	VN4c	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	4. Pharmacological stress protocols: c. Timing of radiopharmaceutical injection	4.0%	3.87
305	VN4d	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	4. Pharmacological stress protocols: d. Duration/termination parameters	4.8%	3.79

Order	Element	Domain	Subdomain	KSA	Rate of Non-performance	Mean Importance
306	VN4e	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	4. Pharmacological stress protocols: e. Drug side-effects and appropriate treatment	5.0%	3.77
307	VN4f	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	4. Pharmacological stress protocols: f. Reversal agents and techniques	5.4%	3.75
308	VO1	Domain V: Clinical Procedures	Task O. Obtain samples and/or data for non-imaging studies:	1. Data specimen collection techniques, including timing, methods, containers, and storage	14.8%	3.41
309	VO2	Domain V: Clinical Procedures	Task O. Obtain samples and/or data for non-imaging studies:	2. Background correction	14.2%	3.42
310	VO3	Domain V: Clinical Procedures	Task O. Obtain samples and/or data for non-imaging studies:	3. External counting techniques	14.7%	3.39
311	VP1	Domain V: Clinical Procedures	Task P. Calculate and evaluate the results of non-imaging studies:	1. Error analysis	17.0%	3.31
312	VP2	Domain V: Clinical Procedures	Task P. Calculate and evaluate the results of non-imaging studies:	2. Calculations	16.1%	3.36
313	VQ	Domain V: Clinical Procedures	Task Q. Prepare, survey, and clean radiotherapy administration and/or isolation room		16.3%	3.55

Appendix F: Tasks in Highest to Lowest Nonperformance Order

Rating Scale

1 = Not Important

2 = Low Importance

3 = Moderate Importance

4 = Extremely Important

TABLE F-1. Tasks in Highest to Lowest Nonperformance Order

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
248	VA11a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	11. Radionuclide Therapy: a. Intracavity (e.g., P-32)	2274	989	43.5%
249	VA11b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	11. Radionuclide Therapy: b. Polycythemia vera/leukemia	2269	971	42.8%
240	VA9l	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: l. H. Pylori breath test	2258	899	39.8%
254	VA11g	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	11. Radionuclide Therapy: g. Brachytherapy	2253	892	39.6%
215	VA7b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	7. Hematopoietic: b. Total blood volume, plasma volume, red cell mass	2262	889	39.3%
100	IIC5g	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	5. Positron Emission Tomography: g. N13 ammonia	2264	857	37.9%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
97	IIC5d	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	5. Positron Emission Tomography: d. F-18 Flutemetamol (Vizamyl)	2260	842	37.3%
101	IIC5h	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	5. Positron Emission Tomography: h. Ga-68 Dotatate	2245	829	36.9%
95	IIC5b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	5. Positron Emission Tomography: b. F-18 Florbetaben (Neuraceq)	2268	836	36.9%
93	IIC4d	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	4. Miscellaneous diagnostic radiopharmaceuticals: d. C14 urea	2253	822	36.5%
83	IIC2e	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	2. Iodine labeled radiopharmaceuticals: e. I-131 serum albumin/RISA	2257	822	36.4%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
99	IIIC5f	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	5. Positron Emission Tomography: f. Rb82 chloride	2257	800	35.4%
108	IIID7	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task D. Understand the characteristics (i.e., mechanism of localization), indications, contraindications, and administration of therapeutic radiopharmaceuticals:	7. I-125 Seeds	2244	785	35.0%
96	IIIC5c	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	5. Positron Emission Tomography: c. F-18 Florbetapir (Amyvid)	2267	784	34.6%
208	VA5g	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	5. Renal/Genitourinary: g. Testicular	2261	780	34.5%
253	VA11f	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	11. Radionuclide Therapy: f. Embolic radiotherapy (labeled microspheres)	2270	780	34.4%
252	VA11e	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	11. Radionuclide Therapy: e. Monoclonal antibody therapy (Zevalin)	2269	766	33.8%
102	IIID1	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task D. Understand the characteristics (i.e., mechanism of localization), indications, contraindications, and administration of therapeutic radiopharmaceuticals:	1. Sr89 chloride (Metastron)	2255	736	32.6%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
243	VA10c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	10. Central Nervous System: c. Dopamine receptor DaT scan	2265	736	32.5%
228	VA8l	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: l. Cardiac PET	2256	732	32.4%
192	VA2f	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	2. Bone/Musculoskeletal scans: f. NaF PET	2249	724	32.2%
103	IIID2	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task D. Understand the characteristics (i.e., mechanism of localization), indications, contraindications, and administration of therapeutic radiopharmaceuticals:	2. Sm153 EDTMP lexidronam (Quadramet)	2261	717	31.7%
190	VA2d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	2. Bone/Musculoskeletal scans: d. 4-phase	2265	713	31.5%
229	VA9a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: a. Esophageal motility/transit	2269	714	31.5%
124	IIIE16	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	16. hetastarch	2256	704	31.2%
88	IIIC3d	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and	3. Indium labeled radiopharmaceuticals: d. In-111 labeled MAB (capromab pendetide)(Prostascint)	2249	695	30.9%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
			administration of diagnostic radiopharmaceuticals:				
216	VA7c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	7. Hematopoietic: c. Spleen scan with labeled, denatured RBCs	2252	693	30.8%
118	IIIE10	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	10. acetazolamide	2259	691	30.6%
105	IIID4	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task D. Understand the characteristics (i.e., mechanism of localization), indications, contraindications, and administration of therapeutic radiopharmaceuticals:	4. Y90 ibritumomab tiuxetan (Zevalin)	2247	681	30.3%
98	IIIC5e	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	5. Positron Emission Tomography: e. F-18 Sodium Fluoride (NaF)	2266	685	30.2%
239	VA9k	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: k. Salivary (parotid)	2267	681	30.0%
195	VA3c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	3. Oncology: c. Peptide imaging	2273	681	30.0%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
115	IIIE7	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	7. enalaprilat	2264	677	29.9%
202	VA5a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	5. Renal/Genitourinary: a. Cystogram, direct	2272	667	29.4%
52	IIIA1cii	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task A. Elute radionuclide generator, perform and evaluate quality control tests:	1. Types of generators (e.g., ⁹⁹ Mo/ ^{99m} Tc, ⁸² Sr/ ⁸² Rb, etc.);c. Quality control procedures: ii. 82Sr 82Rb (measured activity and levels of 82Sr & 85Sr)	2248	655	29.1%
138	IIIF2	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	2. Centrifuge operation	2261	657	29.1%
247	VA10g	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	10. Central Nervous System: g. Brain PET	2249	653	29.0%
84	IIIC2f	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	2. Iodine labeled radiopharmaceuticals: f. I-123 Ioflupane (DaTscan)	2247	639	28.4%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
256	VA12b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	12. CT Imaging Procedures: b. Diagnostic	2247	637	28.3%
121	IIIE13	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	13. cimetidine/ranitidine/famotidine	2260	638	28.2%
135	IIIF1d	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	1. Labeling procedures: d. Cell washing	2262	638	28.2%
225	VA8i	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: i. Cardiac CT SPECT	2273	639	28.1%
236	VA9h	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: h. Liver-lung shunt mapping (arterial)	2267	637	28.1%
82	IIIC2d	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	2. Iodine labeled radiopharmaceuticals: d. I-131 MIBG	2253	632	28.1%
106	IIID5	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task D. Understand the characteristics (i.e., mechanism of localization), indications, contraindications, and administration of therapeutic radiopharmaceuticals:	5. Y90 microspheres (SIR-Spheres, TheraSphere)	2258	629	27.9%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
107	IID6	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task D. Understand the characteristics (i.e., mechanism of localization), indications, contraindications, and administration of therapeutic radiopharmaceuticals:	6. Ra223 Radium dichloride (Xofigo)	2258	622	27.5%
86	IIC3b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	3. Indium labeled radiopharmaceuticals: b. In-111 chloride	2252	611	27.1%
224	VA8h	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: h. Cardiac shunt	2272	613	27.0%
235	VA9g	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: g. Peritoneal venous shunt patency	2267	605	26.7%
51	IIIA1ci	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task A. Elute radionuclide generator, perform and evaluate quality control tests:	1. Types of generators (e.g., ⁹⁹ Mo/ ^{99m} Tc, ⁸² Sr/ ⁸² Rb, etc.);c. Quality control procedures: i. ⁹⁹ Mo ^{99m} Tc (99MO breakthrough and AI +3 content)	2262	596	26.3%
194	VA3b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	3. Oncology: b. Monoclonal antibody imaging	2274	597	26.3%
214	VA7a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	7. Hematopoietic: a. Bone marrow imaging	2259	592	26.2%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
49	III A1a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task A. Elute radionuclide generator, perform and evaluate quality control tests:	1. Types of generators (e.g., ⁹⁹ Mo/ ⁹⁹ mTc, ⁸² Sr/ ⁸² Rb, etc.): a. Elution	2268	592	26.1%
50	III A1b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task A. Elute radionuclide generator, perform and evaluate quality control tests:	1. Types of generators (e.g., ⁹⁹ Mo/ ⁹⁹ mTc, ⁸² Sr/ ⁸² Rb, etc.): b. Generator yield - volume and activity	2244	584	26.0%
203	VA5b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	5. Renal/Genitourinary: b. Effective renal plasma flow (ERPF)	2272	591	26.0%
226	VA8j	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: j. MIBG	2263	587	25.9%
180	IVC3a	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	3. Non-imaging equipment: a. Xenon delivery system and trap	2277	587	25.8%
209	VA6a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	6. Endocrine: a. Adrenal imaging	2263	568	25.1%
196	VA3d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	3. Oncology: d. Breast imaging	2268	568	25.0%
78	III C1r	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: r. Tc99m tilmanocept (Lymphoseek)	2246	556	24.8%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
76	IIC1p	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: p. Tc99m denatured radiolabeled RBCs	2255	547	24.3%
122	IIIE14	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	14. ACD solution	2265	549	24.2%
231	VA9c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: c. Gastroesophageal reflux	2274	550	24.2%
92	IIC4c	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	4. Miscellaneous diagnostic radiopharmaceuticals: c. Xe133 gas	2249	534	23.7%
255	VA12a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	12. CT Imaging Procedures: a. Attenuation correction/anatomical localization	2264	523	23.1%
62	IIC1b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: b. Tc99m oxidronate/HDP	2272	524	23.1%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
251	VA11d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	11. Radionuclide Therapy: d. Metastatic bone	2267	520	22.9%
246	VA10f	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	10. Central Nervous System: f. CSF shunt patency	2266	519	22.9%
74	IIC1n	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: n. Tc99m bicisate/ECD (Neurolite)	2258	514	22.8%
129	IIIE21	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	21. Lidocaine (EMLA) cream	2268	516	22.8%
168	IVB3b	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	3. PET and PET/CT imaging systems: b. PET quality control (e.g., daily blank scan, normalization scan, 2-D/3-D well counter, artifacts, etc.,)	2227	503	22.6%
169	IVB4a	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	4. CT imaging systems: a. Co-registration of images	2270	508	22.4%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
170	IVB4b	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	4. CT imaging systems: b. CT quality control (e.g., contrast and spatial resolution, noise, uniformity, artifacts, etc.)	2263	506	22.4%
198	VA3f	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	3. Oncology: f. Tumor imaging, PET	2269	507	22.3%
72	IIIC11	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: 1. Tc99m succimer/DMSA	2270	501	22.1%
117	IIIE9	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	9. insulin	2271	493	21.7%
128	IIIE20	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	20. Lidocaine	2266	487	21.5%
220	VA8d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: d. First pass for EF and wall motion	2275	488	21.5%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
81	IIC2c	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	2. Iodine labeled radiopharmaceuticals: c. I-123 MIBG	2266	485	21.4%
242	VA10b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	10. Central Nervous System: b. Brain imaging, planar, and SPECT	2263	480	21.2%
167	IVB3a	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	3. PET and PET/CT imaging systems: a. Application of attenuation corrections	2252	477	21.2%
245	VA10e	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	10. Central Nervous System: e. CSF leak	2267	478	21.1%
184	VA1b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	1. Pulmonary: b. Gas ventilation	2271	477	21.0%
3	IA1aiii	Domain I: Radiation Physics and Detection	Task A. Physical properties	1. Radioactive materials: a. Modes of decay: iii. Alpha emitters	2230	466	20.9%
109	III E1	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	1. dipyridamole (Persantine)	2273	472	20.8%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
94	IIIC5a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	5. Positron Emission Tomography: a. F-18 FDG	2270	471	20.7%
125	IIIE17	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	17. contrast media (oral and IV)	2268	462	20.4%
173	IVC1	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	1. Laboratory equipment (e.g., centrifuge, fume hoods)	2197	447	20.3%
126	IIIE18	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	18. Lugol's solution/SSKI	2266	460	20.3%
244	VA10d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	10. Central Nervous System: d. Cisternogram	2264	454	20.1%
204	VA5c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	5. Renal/Genitourinary: c. Glomerular filtration rate (GFR)	2272	455	20.0%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
139	IIIF3	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	3. Calculation of labeling efficiency and administered dosage	2254	451	20.0%
222	VA8f	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: f. Gated cardiac blood pool, stress	2274	451	19.8%
130	IIIE22	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	22. atropine	2256	443	19.6%
131	IIIE23	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	23. recombinant human TSH (Thyrogen)	2219	435	19.6%
127	IIIE19	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	19. Thyroid Stimulating Hormone (TSH)	2265	422	18.6%
217	VA8a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: a. Myocardial perfusion, planar	2270	422	18.6%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
241	VA10a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	10. Central Nervous System: a. Brain flow, brain death	2262	419	18.5%
223	VA8g	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: g. Gated cardiac blood pool, SPECT	2268	419	18.5%
200	VA4a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	4. Infection: a. Ga67 infection imaging	2264	409	18.1%
193	VA3a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	3. Oncology: a. Ga67 tumor imaging, planar, and SPECT	2273	409	18.0%
85	IIC3a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	3. Indium labeled radiopharmaceuticals: a. In-111 Pentetate (DTPA)	2255	404	17.9%
104	IID3	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task D. Understand the characteristics (i.e., mechanism of localization), indications, contraindications, and administration of therapeutic radiopharmaceuticals:	3. I-131 sodium iodide	2257	395	17.5%
58	IIB2b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task B. Prepare radiopharmaceutical kits, perform quality control, and evaluate results:	2. Radiopharmaceutical quality control: b. Radiochemical purity	2269	396	17.5%
199	VA3g	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	3. Oncology: g. Neuroendocrine tumor imaging	2258	385	17.1%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
311	VP1	Domain V: Clinical Procedures	Task P. Calculate and evaluate the results of non-imaging studies:	1. Error analysis	2270	385	17.0%
134	IIIF1c	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	1. Labeling procedures: c. Chemical reactions	2259	372	16.5%
110	IIIE2	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	2. adenosine	2273	373	16.4%
56	IIIB1c	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task B. Prepare radiopharmaceutical kits, perform quality control, and evaluate results:	1. Radiopharmaceutical kits: c. Insure particle size and number if needed	2240	367	16.4%
114	IIIE6	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	6. captopril	2268	369	16.3%
313	VQ	Domain V: Clinical Procedures	Task Q. Prepare, survey, and clean radiotherapy administration and/or isolation room		2250	366	16.3%
205	VA5d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	5. Renal/Genitourinary: d. Renal anatomy, planar, SPECT	2275	366	16.1%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
312	VP2	Domain V: Clinical Procedures	Task P. Calculate and evaluate the results of non-imaging studies:	2. Calculations	2261	363	16.1%
91	IIIC4b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	4. Miscellaneous diagnostic radiopharmaceuticals: b. Ga67 gallium citrate	2255	362	16.1%
69	IIIC1i	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: i. Tc99m pyrophosphate/PYP	2273	362	15.9%
120	IIIE12	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	12. morphine	2267	359	15.8%
77	IIIC1q	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: q. Tc99m HMPAO tagged WBCs	2255	353	15.7%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
73	IIC1m	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: m. Tc99m exametazime/HMPAO (Ceretek)	2263	353	15.6%
250	VA11c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	11. Radionuclide Therapy: c. Thyroid	2273	353	15.5%
181	IVC3b	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	3. Non-imaging equipment: b. Aerosol delivery system	2272	350	15.4%
87	IIC3c	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	3. Indium labeled radiopharmaceuticals: c. In-111 oxine labeled WBCs	2247	345	15.4%
183	VA1a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	1. Pulmonary: a. Radioaerosol	2261	346	15.3%
171	IVB5	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	5. Computer equipment (e.g., monitors, matrix sizes, printers, etc.,)	2262	345	15.3%
71	IIC1k	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: k. Tc99m tetrofosmin (Myoview)	2265	339	15.0%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
308	VO1	Domain V: Clinical Procedures	Task O. Obtain samples and/or data for non-imaging studies:	1. Data specimen collection techniques, including timing, methods, containers, and storage	2270	337	14.8%
89	IIC3e	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	3. Indium labeled radiopharmaceuticals: e. In-111 pentetretotide (Octreoscan)	2236	328	14.7%
310	VO3	Domain V: Clinical Procedures	Task O. Obtain samples and/or data for non-imaging studies:	3. External counting techniques	2245	329	14.7%
233	VA9e	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: e. Hemangioma	2272	323	14.2%
309	VO2	Domain V: Clinical Procedures	Task O. Obtain samples and/or data for non-imaging studies:	2. Background correction	2265	322	14.2%
4	IA1aiv	Domain I: Radiation Physics and Detection	Task A. Physical properties	1. Radioactive materials: a. Modes of decay: iv. Positron emitters	2235	310	13.9%
172	IVB6	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	6. Networking and information systems (i.e., PACS and RIS)	2240	310	13.8%
213	VA6e	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	6. Endocrine: e. Whole body survey for thyroid metastases	2252	300	13.3%
284	VJ3	Domain V: Clinical Procedures	Task J. Evaluate image quality:	3. Co-registration of images (SPECT/CT and PET/CT)	2276	298	13.1%
227	VA8k	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: k. Myocardial viability (thallium, FDG)	2269	290	12.8%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
237	VA9i	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: i. Liver-spleen imaging, planar, and SPECT	2269	290	12.8%
59	IIIB3	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task B. Prepare radiopharmaceutical kits, perform quality control, and evaluate results:	3. Labeling kits	2255	287	12.7%
80	IIIC2b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	2. Iodine labeled radiopharmaceuticals: b. I-131 sodium iodide	2257	287	12.7%
60	IIIB4	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task B. Prepare radiopharmaceutical kits, perform quality control, and evaluate results:	4. Storage of kits before and after reconstitution	2248	285	12.7%
6	IA2b	Domain I: Radiation Physics and Detection	Task A. Physical properties	2. X-ray production: b. Characteristic x-ray	2241	284	12.7%
133	IIIF1b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	1. Labeling procedures: b. Anticoagulants and other additives	2265	285	12.6%
197	VA3e	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	3. Oncology: e. Lymphoscintigraphy/sentinel lymph node localization	2266	284	12.5%
54	IIIB1a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task B. Prepare radiopharmaceutical kits, perform quality control, and evaluate results:	1. Radiopharmaceutical kits: a. Activity and volume limitations	2272	284	12.5%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
90	IIIC4a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	4. Miscellaneous diagnostic radiopharmaceuticals: a. TI201 thallous chloride	2263	279	12.3%
5	IA2a	Domain I: Radiation Physics and Detection	Task A. Physical properties	2. X-ray production: a. Bremsstrahlung	2264	276	12.2%
132	IIIF1a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	1. Labeling procedures: a. Required lab equipment and supplies	2272	276	12.1%
137	IIIF1f	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	1. Labeling procedures: f. Method: in vivo or in vitro	2261	272	12.0%
55	IIIB1b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task B. Prepare radiopharmaceutical kits, perform quality control, and evaluate results:	1. Radiopharmaceutical kits: b. Activity calculations	2267	270	11.9%
136	IIIF1e	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	1. Labeling procedures: e. Required radiopharmaceuticals	2263	268	11.8%
57	IIIB2a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task B. Prepare radiopharmaceutical kits, perform quality control, and evaluate results:	2. Radiopharmaceutical quality control: a. Visual inspection - color and clarity	2271	268	11.8%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
111	IIIE3	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	3. dobutamine	2274	264	11.6%
140	IIIF4	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	4. Reinjection patient and sample verification	2225	257	11.6%
238	VA9j	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: j. Meckel's diverticulum	2261	261	11.5%
201	VA4b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	4. Infection: b. Tagged WBC imaging	2249	254	11.3%
2	IA1aii	Domain I: Radiation Physics and Detection	Task A. Physical properties	1. Radioactive materials: a. Modes of decay: ii. Beta emitters	2253	244	10.8%
64	IIIC1d	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: d. Tc99m pentetate/DTPA	2270	233	10.3%
232	VA9d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: d. Gastrointestinal bleeding	2272	231	10.2%
186	VA1d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	1. Pulmonary: d. Perfusion/Ventilation quantitation	2247	224	10.0%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
123	IIIE15	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	15. heparin	2264	224	9.9%
79	IIIC2a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	2. Iodine labeled radiopharmaceuticals: a. I-123 sodium iodide	2266	224	9.9%
234	VA9f	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: f. Hepatobiliary with and without GBEF	2269	216	9.5%
206	VA5e	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	5. Renal/Genitourinary: e. Renal flow	2270	213	9.4%
119	IIIE11	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	11. cholecystikinen/sincalide/CK	2272	212	9.3%
187	VA2a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	2. Bone/Musculoskeletal scans: a. Limited	2267	211	9.3%
212	VA6d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	6. Endocrine: d. Thyroid uptake	2261	210	9.3%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
207	VA5f	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	5. Renal/Genitourinary: f. Renogram (Lasix, and ACE inhibitors)	2262	207	9.2%
221	VA8e	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: e. Gated cardiac blood pool, rest	2277	208	9.1%
178	IVC2e	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	2. Patient care equipment: e. Glucose meter	2269	207	9.1%
210	VA6b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	6. Endocrine: b. Parathyroid imaging, planar, and SPECT	2269	207	9.1%
230	VA9b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: b. Gastric emptying (liquid/solid)	2269	207	9.1%
165	IVB2biv	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	2. SPECT and SPECT/CT imaging system: b. SPECT camera quality control: iv. 3-D uniformity and resolution (e.g., Jaczak phantom)	2275	205	9.0%
185	VA1c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	1. Pulmonary: c. Perfusion	2253	202	9.0%
68	IIC1h	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: h. Tc99m mertiatide/MAG3	2274	202	8.9%
211	VA6c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	6. Endocrine: c. Thyroid imaging	2266	197	8.7%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
191	VA2e	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	2. Bone/Musculoskeletal scans: e. SPECT	2271	196	8.6%
65	IIIC1e	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: e. Tc99m macroaggregated albumin/MAA	2273	194	8.5%
63	IIIC1c	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: c. Tc99m medronate/MDP	2268	191	8.4%
189	VA2c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	2. Bone/Musculoskeletal scans: c. 3-phase	2257	181	8.0%
150	IVA1c	Domain IV: Instrument Operations and Quality Control	Task A. Non-imaging equipment, components, and operation:	1. Perform and evaluate quality control on well counters and probes: c. Apply formulas (e.g., energy resolution, sensitivity, Chi-square statistics, etc.,)	2250	179	8.0%
164	IVB2biii	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	2. SPECT and SPECT/CT imaging system: b. SPECT camera quality control: iii. Pixel calibration	2266	179	7.9%
267	VE4c	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	4. Use and accommodate patient support devices: c. Foley catheter and drainage bag	2269	179	7.9%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
116	III E8	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	8. furosemide (Lasix)	2273	178	7.8%
67	III C1g	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: g. Tc99m disofenin/mebroenin (Choletec)	2271	176	7.7%
66	III C1f	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: f. Tc99m sulfur colloid	2272	176	7.7%
188	VA2b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	2. Bone/Musculoskeletal scans: b. Whole-body	2267	175	7.7%
149	IV A1b	Domain IV: Instrument Operations and Quality Control	Task A. Non-imaging equipment, components, and operation:	1. Perform and evaluate quality control on well counters and probes: b. Conduct a gamma ray spectra and pulse height analysis	2263	174	7.7%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
75	IIIC1o	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: o. Tc99m labeled RBCs	2261	168	7.4%
174	IVC2a	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	2. Patient care equipment: a. Intravenous infusion pump	2270	165	7.3%
112	IIIE4	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	4. aminophylline	2269	163	7.2%
161	IVB2a	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	2. SPECT and SPECT/CT imaging system: a. Attenuation correction	2228	148	6.6%
113	IIIE5	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	5. regadenoson (Lexiscan)	2275	146	6.4%
182	IVC3c	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	3. Non-imaging equipment: c. Treadmill	2268	141	6.2%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
258	VB2	Domain V: Clinical Procedures	Task B. Schedule patient studies to accommodate sequencing of multiple procedures and special orders:	2. Schedule multiple radionuclide procedures for a single patient	2270	136	6.0%
176	IVC2c	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	2. Patient care equipment: c. Pulse oximeter	2275	136	6.0%
70	III1j	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: j. Tc99m sestamibi/MIBI (Cardiolite)	2270	131	5.8%
301	VN3b	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	3. Treadmill stress techniques (i.e., Bruce and modified Bruce) and bicycle stress techniques: b. Duration/termination parameters	2250	124	5.5%
160	IVB1g	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	1. Gamma Camera quality control: g. Pulse height analysis	2250	123	5.5%
307	VN4f	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	4. Pharmacological stress protocols: f. Reversal agents and techniques	2259	121	5.4%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
148	IVA1a	Domain IV: Instrument Operations and Quality Control	Task A. Non-imaging equipment, components, and operation:	1. Perform and evaluate quality control on well counters and probes: a. Calibrate and perform quality control on the sodium iodide scintillation detector	2265	120	5.3%
300	VN3a	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	3. Treadmill stress techniques (i.e., Bruce and modified Bruce) and bicycle stress techniques: a. Contraindications	2261	118	5.2%
296	VN1a	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	1. Basic electrocardiography (ECG): a. Cardiac conduction system	2268	115	5.1%
306	VN4e	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	4. Pharmacological stress protocols: e. Drug side-effects and appropriate treatment	2260	113	5.0%
298	VN1c	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	1. Basic electrocardiography (ECG): c. Recognizing and responding to changes on a resting or stress ECG	2262	112	5.0%
146	IIIH4	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task H. Prepare and administer non-radioactive agents:	4. Interventional pharmaceuticals	2255	111	4.9%
218	VA8b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: b. Myocardial perfusion, SPECT, attenuation and non-attenuation	2273	110	4.8%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
305	VN4d	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	4. Pharmacological stress protocols: d. Duration/termination parameters	2274	110	4.8%
259	VB3	Domain V: Clinical Procedures	Task B. Schedule patient studies to accommodate sequencing of multiple procedures and special orders:	3. Schedule same-day multiple modality procedures for a single patient	2274	109	4.8%
177	IVC2d	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	2. Patient care equipment: d. Defibrillator	2274	108	4.7%
219	VA8c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: c. Myocardial perfusion, gated SPECT	2269	105	4.6%
297	VN1b	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	1. Basic electrocardiography (ECG): b. Components of a normal ECG wave form	2270	105	4.6%
303	VN4b	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	4. Pharmacological stress protocols: b. Timing of pharmacological stress agent	2274	105	4.6%
302	VN4a	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	4. Pharmacological stress protocols: a. Contraindications	2277	105	4.6%
53	IIIA2	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task A. Elute radionuclide generator, perform and evaluate quality control tests:	2. Dose calibrator operation/units of radioactivity	2202	97	4.4%
147	IIIH5	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task H. Prepare and administer non-radioactive agents:	5. Non-radioactive agents (e.g., ACD solution, heparin, contrast media, TSH, atropine, etc.,)	2260	94	4.2%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
304	VN4c	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	4. Pharmacological stress protocols: c. Timing of radiopharmaceutical injection	2273	92	4.0%
299	VN2	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	2. ECG lead placements	2245	87	3.9%
145	IIIH3	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task H. Prepare and administer non-radioactive agents:	3. Antidote/reversal agent	2271	87	3.8%
61	IIIC1a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: a. Tc99m sodium pertechnetate	2272	86	3.8%
265	VE4a	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	4. Use and accommodate patient support devices: a. Intravenous infusion pump/lines	2269	85	3.7%
179	IVC2f	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	2. Patient care equipment: f. Blood pressure equipment	2247	83	3.7%
159	IVB1f	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	1. Gamma Camera quality control: f. Assess system sensitivity	2260	82	3.6%
166	IVB2bv	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	2. SPECT and SPECT/CT imaging system: b. SPECT camera quality control: v. Artifacts	2245	81	3.6%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
257	VB1	Domain V: Clinical Procedures	Task B. Schedule patient studies to accommodate sequencing of multiple procedures and special orders:	1. Schedule the camera time	2272	71	3.1%
157	IVB1d	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	1. Gamma Camera quality control: d. Phantoms	2269	70	3.1%
10	IE	Domain I: Radiation Physics and Detection	Task E. Counting statistics		2253	68	3.0%
175	IVC2b	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	2. Patient care equipment: b. ECG monitor	2274	68	3.0%
8	IC	Domain I: Radiation Physics and Detection	Task C. Interactions of radiation with matter		2247	67	3.0%
163	IVB2bii	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	2. SPECT and SPECT/CT imaging system: b. SPECT camera quality control: ii. Field uniformity requirements	2273	67	2.9%
294	VM5c	Domain V: Clinical Procedures	Task M. Process and evaluate computer generated data:	5. Quantitative analysis: c. Image normalization and subtraction	2260	66	2.9%
162	IVB2bi	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	2. SPECT and SPECT/CT imaging system: b. SPECT camera quality control: i. Center of rotation	2274	64	2.8%
293	VM5b	Domain V: Clinical Procedures	Task M. Process and evaluate computer generated data:	5. Quantitative analysis: b. Curve generation and analysis	2263	63	2.8%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
268	VE4d	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	4. Use and accommodate patient support devices: d. ECG monitor	2261	61	2.7%
260	VC	Domain V: Clinical Procedures	Task C. Procure supply of radiopharmaceuticals, considering license possession limits and schedule		2270	53	2.3%
153	IVA3	Domain IV: Instrument Operations and Quality Control	Task A. Non-imaging equipment, components, and operation:	3. Perform and evaluate dose calibrator constancy, accuracy, linearity, and geometry tests	2249	49	2.2%
274	VE6e	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	6. Perform pre-examination screening including review of: e. Review relevant lab values	2259	47	2.1%
155	IVB1b	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	1. Gamma Camera quality control: b. Spatial resolution	2272	46	2.0%
292	VM5a	Domain V: Clinical Procedures	Task M. Process and evaluate computer generated data:	5. Quantitative analysis: a. Regions of interest and quantification	2263	44	1.9%
144	IIIH2	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task H. Prepare and administer non-radioactive agents:	2. Adverse side-effects and treatment	2276	44	1.9%
266	VE4b	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	4. Use and accommodate patient support devices: b. Supplemental oxygen	2272	42	1.8%
158	IVB1e	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	1. Gamma Camera quality control: e. Artifacts	2268	41	1.8%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
286	VK	Domain V: Clinical Procedures	Task K. Perform post-procedure assessment		2274	40	1.8%
287	VL	Domain V: Clinical Procedures	Task L. Provide patient/caregiver education concerning discharge instructions and cautions		2257	38	1.7%
295	VM6	Domain V: Clinical Procedures	Task M. Process and evaluate computer generated data:	6. Display formatting (image size, number of images, intensity adjustments)	2235	35	1.6%
290	VM3	Domain V: Clinical Procedures	Task M. Process and evaluate computer generated data:	3. Image reconstruction (SPECT, PET)	2262	35	1.5%
9	ID	Domain I: Radiation Physics and Detection	Task D. Radiation detector types and basic principles		2256	34	1.5%
156	IVB1c	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	1. Gamma Camera quality control: c. Visual image quality	2264	34	1.5%
143	IIIH1	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task H. Prepare and administer non-radioactive agents:	1. Follow aseptic technique	2277	34	1.5%
275	VE7	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	7. Verify that informed consent has been obtained	2241	33	1.5%
289	VM2	Domain V: Clinical Procedures	Task M. Process and evaluate computer generated data:	2. Image formation (static, dynamic, ERNA, list mode)	2263	33	1.5%
263	VE2	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	2. Perform basic patient care (e.g., vital signs, basic first aid)	2267	33	1.5%
1	IA1ai	Domain I: Radiation Physics and Detection	Task A. Physical properties	1. Radioactive materials: a. Modes of decay: i. Gamma emitters	2273	33	1.5%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
285	VJ4	Domain V: Clinical Procedures	Task J. Evaluate image quality:	4. Repeat study and/or perform additional views	2273	33	1.5%
280	VI1	Domain V: Clinical Procedures	Task I. Prepare equipment and perform examinations:	1. Position patient using anatomical markers and immobilization techniques	2259	32	1.4%
39	IIE7e	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	7. Maintain records as required for: e. Nuclear medicine diagnostic and therapeutic procedures	2236	31	1.4%
47	III3	Domain II: Radiation Safety and Regulations	Task I. Practice and adhere to Health and Human Services (HHS)/Health Insurance Portability and Accountability Act (HIPAA) requirements:	3. Releasing information to authorized parties	2255	31	1.4%
152	IVA2b	Domain IV: Instrument Operations and Quality Control	Task A. Non-imaging equipment, components, and operation:	2. Determine operational status of survey meter: b. Survey meter quality control	2256	31	1.4%
154	IVB1a	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	1. Gamma Camera quality control: a. Uniformity	2275	31	1.4%
7	IB	Domain I: Radiation Physics and Detection	Task B. Measurement of radioactivity and decay calculations		2258	30	1.3%
264	VE3	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	3. Practice correct patient transferring techniques	2245	29	1.3%
43	IIG	Domain II: Radiation Safety and Regulations	Task G. Practice and adhere to Environmental Protection Agency (EPA) requirements		2263	29	1.3%
291	VM4	Domain V: Clinical Procedures	Task M. Process and evaluate computer generated data:	4. Image enhancement (e.g., filters, matrix, intensity, etc.,)	2236	28	1.3%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
11	IIA	Domain II: Radiation Safety and Regulations	Task A. Biological effects of radiation exposure		2144	25	1.2%
38	IIE7d	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	7. Maintain records as required for: d. Staff, patient, occupational and public exposure	2255	26	1.2%
273	VE6d	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	6. Perform pre-examination screening including review of: d. Allergic and adverse reaction history	2263	26	1.1%
21	IIC4b	Domain II: Radiation Safety and Regulations	Task C. Monitoring protocols and requirements (e.g., timing and frequency):	4. Effective dose equivalent limits for: b. Pregnant radiation workers	2265	26	1.1%
269	VE5	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	5. Receive and prepare patient, verify patient identification and written orders for study	2229	25	1.1%
281	VI2	Domain V: Clinical Procedures	Task I. Prepare equipment and perform examinations:	2. Establish imaging parameters for data acquisition	2243	25	1.1%
283	VJ2	Domain V: Clinical Procedures	Task J. Evaluate image quality:	2. identify artifacts and causes	2269	25	1.1%
261	VD	Domain V: Clinical Procedures	Task D. Instruct patient, family, and personnel concerning procedures and precautions		2248	24	1.1%
37	IIE7c	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	7. Maintain records as required for: c. Equipment calibration and maintenance	2262	24	1.1%
24	IIE1	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	1. Posting warning and informational signs delineating restricted and unrestricted areas	2264	24	1.1%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
44	IIH	Domain II: Radiation Safety and Regulations	Task H. Practice and adhere to Occupational Safety and Health Administration (OSHA) requirements		2240	22	1.0%
278	VG	Domain V: Clinical Procedures	Task G. Monitor and assess patient condition		2265	22	1.0%
30	IIE3e	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	3. Responding to adverse events: e. Personnel, patient, and/or public decontamination	2269	22	1.0%
271	VE6b	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	6. Perform pre-examination screening including review of: b. Medical history	2269	22	1.0%
272	VE6c	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	6. Perform pre-examination screening including review of: c. Current medications	2270	22	1.0%
151	IVA2a	Domain IV: Instrument Operations and Quality Control	Task A. Non-imaging equipment, components, and operation:	2. Determine operational status of survey meter: a. Survey meter operations and components	2267	21	0.9%
270	VE6a	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	6. Perform pre-examination screening including review of: a. Verify patient preparations and identify contraindications	2269	21	0.9%
41	IIF2	Domain II: Radiation Safety and Regulations	Task F. Practice and adhere to Department of Transportation (DOT) - Radiopharmaceutical Transport requirements:	2. Labeling requirements (e.g., transportation index, name, concentration, expiration date/time, total activity, assay date/time)	2271	21	0.9%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
141	IIIG1	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task G. Understand the routes of administration:	1. Administration modes (e.g., IV, IM)	2261	20	0.9%
288	VM1	Domain V: Clinical Procedures	Task M. Process and evaluate computer generated data:	1. Data storage, transfer, and retrieval	2267	20	0.9%
16	IIC1b	Domain II: Radiation Safety and Regulations	Task C. Monitoring protocols and requirements (e.g., timing and frequency):	1. Radiation surveys (area monitoring) including: b. Choice of radiation detection devices (e.g., Geiger Counters, sodium iodide detectors)	2270	20	0.9%
31	IIE3f	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	3. Responding to adverse events: f. Area/equipment decontamination	2272	20	0.9%
279	VH	Domain V: Clinical Procedures	Task H. Implement emergency procedures (e.g., in case of fainting, seizure, cardiopulmonary arrest, etc.,)		2241	19	0.8%
142	IIIG2	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task G. Understand the routes of administration:	2. Administration techniques (e.g., bolus injection, straight stick, IV line)	2245	19	0.8%
36	IIE7b	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	7. Maintain records as required for: b. Radiation monitoring and reporting	2258	19	0.8%
29	IIE3d	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	3. Responding to adverse events: d. Protection during adverse events	2273	19	0.8%
282	VJ1	Domain V: Clinical Procedures	Task J. Evaluate image quality:	1. Normal and abnormal scan patterns	2274	19	0.8%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
22	IIC4c	Domain II: Radiation Safety and Regulations	Task C. Monitoring protocols and requirements (e.g., timing and frequency):	4. Effective dose equivalent limits for: c. General public	2241	18	0.8%
48	IIJ	Domain II: Radiation Safety and Regulations	Task J. Knowledge of institutional and departmental accreditation organizations		2251	18	0.8%
262	VE1	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	1. Protect patient information and privacy according to the Healthcare Insurance and Portability and Accountability Act (HIPAA)	2269	18	0.8%
40	IIF1	Domain II: Radiation Safety and Regulations	Task F. Practice and adhere to Department of Transportation (DOT) - Radiopharmaceutical Transport requirements:	1. Use of shielding containers	2271	18	0.8%
34	IIE6	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	6. Identify recordable and reportable events	2234	17	0.8%
25	IIE2	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	2. Surveying, inspecting, and inventorying radioactive materials	2235	17	0.8%
42	IIF3	Domain II: Radiation Safety and Regulations	Task F. Practice and adhere to Department of Transportation (DOT) - Radiopharmaceutical Transport requirements:	3. Package monitoring/receiving/returning	2265	17	0.8%
277	VF2	Domain V: Clinical Procedures	Task F. Select and administer prescribed radiopharmaceutical:	2. Administer radiopharmaceutical using appropriate route and technique	2269	17	0.7%
276	VF1	Domain V: Clinical Procedures	Task F. Select and administer prescribed radiopharmaceutical:	1. Verify patient identification	2270	17	0.7%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
26	IIE3a	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	3. Responding to adverse events: a. Trigger levels and monitoring methods	2274	17	0.7%
35	IIE7a	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	7. Maintain records as required for: a. Receipt, storage, and disposal of radioactive materials	2265	16	0.7%
27	IIE3b	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	3. Responding to adverse events: b. Radiation exposure	2274	16	0.7%
14	IIB3	Domain II: Radiation Safety and Regulations	Task B. Protection techniques and calculations:	3. Shielding (shielding equations)	2218	15	0.7%
33	IIE5	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	5. Dispose of radioactive materials (e.g., liquids, solids, gasses, contaminated materials)	2263	15	0.7%
28	IIE3c	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	3. Responding to adverse events: c. Radiation spills	2266	15	0.7%
17	IIC1c	Domain II: Radiation Safety and Regulations	Task C. Monitoring protocols and requirements (e.g., timing and frequency):	1. Radiation surveys (area monitoring) including: c. Frequency and limits of wipe surveys	2271	15	0.7%
20	IIC4a	Domain II: Radiation Safety and Regulations	Task C. Monitoring protocols and requirements (e.g., timing and frequency):	4. Effective dose equivalent limits for: a. Radiation workers	2271	15	0.7%
13	IIB2	Domain II: Radiation Safety and Regulations	Task B. Protection techniques and calculations:	2. Distance (inverse square law)	2252	14	0.6%
32	IIE4	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	4. Adhere to radioactive waste storage requirements	2262	14	0.6%

Order	Element	Domain	Subdomain	KSA	# of Ratings	Frequency of Non-performance	Percentage
19	IIC3	Domain II: Radiation Safety and Regulations	Task C. Monitoring protocols and requirements (e.g., timing and frequency):	3. Personal protective equipment (e.g., lab coat, gloves, syringe shields)	2219	12	0.5%
18	IIC2	Domain II: Radiation Safety and Regulations	Task C. Monitoring protocols and requirements (e.g., timing and frequency):	2. Personal monitoring devices	2259	12	0.5%
15	IIC1a	Domain II: Radiation Safety and Regulations	Task C. Monitoring protocols and requirements (e.g., timing and frequency):	1. Radiation surveys (area monitoring) including: a. Survey meters and well counters	2273	12	0.5%
12	IIB1	Domain II: Radiation Safety and Regulations	Task B. Protection techniques and calculations:	1. Time	2274	12	0.5%
23	IID	Domain II: Radiation Safety and Regulations	Task D. Practice and adhere to ALARA		2209	11	0.5%
46	III2	Domain II: Radiation Safety and Regulations	Task I. Practice and adhere to Health and Human Services (HHS)/Health Insurance Portability and Accountability Act (HIPAA) requirements:	2. Maintaining patient records	2269	10	0.4%
45	III1	Domain II: Radiation Safety and Regulations	Task I. Practice and adhere to Health and Human Services (HHS)/Health Insurance Portability and Accountability Act (HIPAA) requirements:	1. Protecting patient rights and privacy	2276	8	0.4%

Appendix G: Tasks in Lowest to Highest Importance Order

Rating Scale

1 = Not Important

2 = Low Importance

3 = Moderate Importance

4 = Extremely Important

TABLE G-1. Tasks in Lowest to Highest Importance Rating Order

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
240	VA9l	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: l. H. Pylori breath test	1359	2.85	1.00	1	4
215	VA7b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	7. Hematopoietic: b. Total blood volume, plasma volume, red cell mass	1374	2.86	0.97	1	4
249	VA11b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	11. Radionuclide Therapy: b. Polycythemia vera/leukemia	1299	2.87	0.96	1	4
93	IIC4d	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	4. Miscellaneous diagnostic radiopharmaceuticals: d. C14 urea	1431	2.87	0.95	1	4
208	VA5g	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	5. Renal/Genitourinary: g. Testicular	1480	2.88	1.01	1	4
248	VA11a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	11. Radionuclide Therapy: a. Intracavity (e.g., P-32)	1286	2.88	0.95	1	4
3	IA1aiii	Domain I: Radiation Physics and Detection	Task A. Physical properties	1. Radioactive materials: a. Modes of decay: iii. Alpha emitters	1765	2.93	0.92	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
239	VA9k	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: k. Salivary (parotid)	1586	2.97	0.96	1	4
254	VA11g	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	11. Radionuclide Therapy: g. Brachytherapy	1362	3.00	0.92	1	4
216	VA7c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	7. Hematopoietic: c. Spleen scan with labeled, denatured RBCs	1560	3.00	0.93	1	4
52	IIIA1cii	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task A. Elute radionuclide generator, perform and evaluate quality control tests:	1. Types of generators (e.g., ⁹⁹ Mo/ ^{99m} Tc, ⁸² Sr/ ⁸² Rb, etc.);c. Quality control procedures: ii. ⁸² Sr ⁸² Rb (measured activity and levels of ⁸² Sr & ⁸⁵ Sr)	1593	3.05	0.87	1	4
6	IA2b	Domain I: Radiation Physics and Detection	Task A. Physical properties	2. X-ray production: b. Characteristic x-ray	1958	3.05	0.83	1	4
108	IIID7	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task D. Understand the characteristics (i.e., mechanism of localization), indications, contraindications, and administration of therapeutic radiopharmaceuticals:	7. I-125 Seeds	1459	3.06	0.90	1	4
229	VA9a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: a. Esophageal motility/transit	1556	3.08	0.91	1	4
138	IIIF2	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	2. Centrifuge operation	1604	3.11	0.90	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
235	VA9g	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: g. Peritoneal venous shunt patency	1663	3.12	0.90	1	4
83	IIIC2e	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	2. Iodine labeled radiopharmaceuticals: e. I-131 serum albumin/RISA	1435	3.13	0.89	1	4
5	IA2a	Domain I: Radiation Physics and Detection	Task A. Physical properties	2. X-ray production: a. Bremsstrahlung	1989	3.13	0.81	1	4
124	IIIE16	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	16. hetastarch	1552	3.13	0.89	1	4
129	IIIE21	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	21. Lidocaine (EMLA) cream	1752	3.14	0.90	1	4
224	VA8h	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: h. Cardiac shunt	1660	3.15	0.92	1	4
214	VA7a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	7. Hematopoietic: a. Bone marrow imaging	1667	3.15	0.89	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
49	IIIA1a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task A. Elute radionuclide generator, perform and evaluate quality control tests:	1. Types of generators (e.g., ⁹⁹ Mo/ ^{99m} Tc, ⁸² Sr/ ⁸² Rb, etc.): a. Elution	1676	3.16	0.82	1	4
128	IIIE20	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	20. Lidocaine	1779	3.16	0.89	1	4
102	IIID1	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task D. Understand the characteristics (i.e., mechanism of localization), indications, contraindications, and administration of therapeutic radiopharmaceuticals:	1. Sr89 chloride (Metastron)	1519	3.17	0.85	1	4
50	IIIA1b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task A. Elute radionuclide generator, perform and evaluate quality control tests:	1. Types of generators (e.g., ⁹⁹ Mo/ ^{99m} Tc, ⁸² Sr/ ⁸² Rb, etc.): b. Generator yield - volume and activity	1660	3.17	0.82	1	4
103	IIID2	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task D. Understand the characteristics (i.e., mechanism of localization), indications, contraindications, and administration of therapeutic radiopharmaceuticals:	2. Sm153 EDTMP leixidronam (Quadramet)	1544	3.17	0.84	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
202	VA5a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	5. Renal/Genitourinary: a. Cystogram, direct	1606	3.18	0.89	1	4
173	IVC1	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	1. Laboratory equipment (e.g., centrifuge, fume hoods)	1751	3.18	0.84	1	4
236	VA9h	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: h. Liver-lung shunt mapping (arterial)	1631	3.19	0.89	1	4
252	VA11e	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	11. Radionuclide Therapy: e. Monoclonal antibody therapy (Zevalin)	1503	3.20	0.86	1	4
135	IIIF1d	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	1. Labeling procedures: d. Cell washing	1624	3.20	0.86	1	4
121	IIIE13	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	13. cimetidine/ranitidine/famotidine	1622	3.20	0.84	1	4
118	IIIE10	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	10. acetazolamide	1568	3.20	0.86	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
10	IE	Domain I: Radiation Physics and Detection	Task E. Counting statistics		2186	3.20	0.82	1	4
51	IIIA1ci	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task A. Elute radionuclide generator, perform and evaluate quality control tests:	1. Types of generators (e.g., ⁹⁹ Mo/ ^{99m} Tc, ⁸² Sr/ ⁸² Rb, etc.):c. Quality control procedures: i. ⁹⁹ Mo ^{99m} Tc (99MO breakthrough and AI +3 content)	1666	3.21	0.82	1	4
97	IIIC5d	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	5. Positron Emission Tomography: d. F-18 Flutemetamol (Vizamyl)	1418	3.23	0.81	1	4
100	IIIC5g	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	5. Positron Emission Tomography: g. N13 ammonia	1407	3.23	0.81	1	4
105	IIID4	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task D. Understand the characteristics (i.e., mechanism of localization), indications, contraindications, and administration of therapeutic radiopharmaceuticals:	4. Y90 ibritumomab tiuxetan (Zevalin)	1566	3.24	0.83	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
101	IIC5h	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	5. Positron Emission Tomography: h. Ga-68 Dotatate	1416	3.25	0.82	1	4
209	VA6a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	6. Endocrine: a. Adrenal imaging	1695	3.25	0.86	1	4
95	IIC5b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	5. Positron Emission Tomography: b. F-18 Florbetaben (Neuraceq)	1432	3.26	0.81	1	4
246	VA10f	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	10. Central Nervous System: f. CSF shunt patency	1748	3.26	0.86	1	4
253	VA11f	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	11. Radionuclide Therapy: f. Embolic radiotherapy (labeled microspheres)	1491	3.26	0.84	1	4
195	VA3c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	3. Oncology: c. Peptide imaging	1592	3.26	0.81	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
88	IIC3d	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	3. Indium labeled radiopharmaceuticals: d. In-111 labeled MAB (capromab pendetide)(Prostascint)	1554	3.27	0.83	1	4
122	IIIE14	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	14. ACD solution	1716	3.27	0.85	1	4
231	VA9c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: c. Gastroesophageal reflux	1725	3.28	0.84	1	4
245	VA10e	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	10. Central Nervous System: e. CSF leak	1790	3.28	0.84	1	4
150	IVA1c	Domain IV: Instrument Operations and Quality Control	Task A. Non-imaging equipment, components, and operation:	1. Perform and evaluate quality control on well counters and probes: c. Apply formulas (e.g., energy resolution, sensitivity, Chi-square statistics, etc.,)	2071	3.29	0.84	1	4
115	IIIE7	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	7. enalaprilat	1587	3.29	0.82	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
2	IA1aii	Domain I: Radiation Physics and Detection	Task A. Physical properties	1. Radioactive materials: a. Modes of decay: ii. Beta emitters	2010	3.29	0.77	1	4
311	VP1	Domain V: Clinical Procedures	Task P. Calculate and evaluate the results of non-imaging studies:	1. Error analysis	1883	3.31	0.83	1	4
194	VA3b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	3. Oncology: b. Monoclonal antibody imaging	1676	3.31	0.79	1	4
203	VA5b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	5. Renal/Genitourinary: b. Effective renal plasma flow (ERPF)	1682	3.31	0.83	1	4
130	IIIE22	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	22. atropine	1813	3.31	0.83	1	4
226	VA8j	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: j. MIBG	1677	3.32	0.85	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
96	IIC5c	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	5. Positron Emission Tomography: c. F-18 Florbetapir (Amyvid)	1483	3.33	0.79	1	4
244	VA10d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	10. Central Nervous System: d. Cisternogram	1811	3.33	0.82	1	4
220	VA8d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: d. First pass for EF and wall motion	1788	3.34	0.88	1	4
243	VA10c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	10. Central Nervous System: c. Dopamine receptor DaT scan	1530	3.34	0.83	1	4
238	VA9j	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: j. Meckel's diverticulum	2000	3.34	0.82	1	4
107	IID6	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task D. Understand the characteristics (i.e., mechanism of localization), indications, contraindications, and administration of therapeutic radiopharmaceuticals:	6. Ra223 Radium dichloride (Xofigo)	1636	3.34	0.79	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
233	VA9e	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: e. Hemangioma	1949	3.35	0.82	1	4
312	VP2	Domain V: Clinical Procedures	Task P. Calculate and evaluate the results of non-imaging studies:	2. Calculations	1896	3.36	0.81	1	4
109	IIIE1	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	1. dipyridamole (Persantine)	1801	3.37	0.84	1	4
106	IIID5	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task D. Understand the characteristics (i.e., mechanism of localization), indications, contraindications, and administration of therapeutic radiopharmaceuticals:	5. Y90 microspheres (SIR-Spheres, TheraSphere)	1629	3.38	0.78	1	4
99	IIIC5f	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	5. Positron Emission Tomography: f. Rb82 chloride	1457	3.38	0.77	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
91	IIC4b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	4. Miscellaneous diagnostic radiopharmaceuticals: b. Ga67 gallium citrate	1893	3.39	0.79	1	4
217	VA8a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: a. Myocardial perfusion, planar	1849	3.39	0.90	1	4
310	VO3	Domain V: Clinical Procedures	Task O. Obtain samples and/or data for non-imaging studies:	3. External counting techniques	1915	3.39	0.80	1	4
82	IIC2d	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	2. Iodine labeled radiopharmaceuticals: d. I-131 MIBG	1621	3.39	0.77	1	4
72	IIC11	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: l. Tc99m succimer/DMSA	1769	3.39	0.81	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
200	VA4a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	4. Infection: a. Ga67 infection imaging	1854	3.40	0.78	1	4
256	VA12b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	12. CT Imaging Procedures: b. Diagnostic	1611	3.40	0.78	1	4
193	VA3a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	3. Oncology: a. Ga67 tumor imaging, planar, and SPECT	1863	3.40	0.77	1	4
84	IIIC2f	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	2. Iodine labeled radiopharmaceuticals: f. I-123 Ioflupane (DaTscan)	1608	3.41	0.78	1	4
190	VA2d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	2. Bone/Musculoskeletal scans: d. 4-phase	1552	3.41	0.81	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
126	III E18	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	18. Lugol's solution/SSKI	1806	3.41	0.78	1	4
308	VO1	Domain V: Clinical Procedures	Task O. Obtain samples and/or data for non-imaging studies:	1. Data specimen collection techniques, including timing, methods, containers, and storage	1932	3.41	0.79	1	4
309	VO2	Domain V: Clinical Procedures	Task O. Obtain samples and/or data for non-imaging studies:	2. Background correction	1942	3.42	0.79	1	4
149	IVA1b	Domain IV: Instrument Operations and Quality Control	Task A. Non-imaging equipment, components, and operation:	1. Perform and evaluate quality control on well counters and probes: b. Conduct a gamma ray spectra and pulse height analysis	2089	3.42	0.79	1	4
192	VA2f	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	2. Bone/Musculoskeletal scans: f. NaF PET	1524	3.42	0.76	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
86	IIIC3b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	3. Indium labeled radiopharmaceuticals: b. In-111 chloride	1641	3.42	0.75	1	4
237	VA9i	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: i. Liver-spleen imaging, planar, and SPECT	1979	3.43	0.79	1	4
134	IIIF1c	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	1. Labeling procedures: c. Chemical reactions	1887	3.43	0.75	1	4
114	IIIE6	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	6. captopril	1899	3.43	0.76	1	4
117	IIIE9	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	9. insulin	1778	3.43	0.75	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
125	III E17	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	17. contrast media (oral and IV)	1806	3.44	0.78	1	4
267	VE4c	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	4. Use and accommodate patient support devices: c. Foley catheter and drainage bag	2089	3.44	0.78	1	4
176	IVC2c	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	2. Patient care equipment: c. Pulse oximeter	2140	3.44	0.75	1	4
131	III E23	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	23. recombinant human TSH (Thyrogen)	1784	3.44	0.75	1	4
204	VA5c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	5. Renal/Genitourinary: c. Glomerular filtration rate (GFR)	1818	3.45	0.77	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
58	IIIB2b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task B. Prepare radiopharmaceutical kits, perform quality control, and evaluate results:	2. Radiopharmaceutical quality control: b. Radiochemical purity	1873	3.45	0.73	1	4
196	VA3d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	3. Oncology: d. Breast imaging	1699	3.45	0.74	1	4
139	IIIF3	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	3. Calculation of labeling efficiency and administered dosage	1803	3.46	0.77	1	4
90	IIIC4a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	4. Miscellaneous diagnostic radiopharmaceuticals: a. TI201 thallous chloride	1984	3.46	0.73	1	4
76	IIIC1p	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: p. Tc99m denatured radiolabeled RBCs	1708	3.47	0.78	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
178	IVC2e	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	2. Patient care equipment: e. Glucose meter	2063	3.47	0.74	1	4
171	IVB5	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	5. Computer equipment (e.g., monitors, matrix sizes, printers, etc.,)	1918	3.48	0.75	1	4
98	IIC5e	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	5. Positron Emission Tomography: e. F-18 Sodium Fluoride (NaF)	1581	3.48	0.73	1	4
127	IIIE19	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	19. Thyroid Stimulating Hormone (TSH)	1843	3.49	0.74	1	4
174	IVC2a	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	2. Patient care equipment: a. Intravenous infusion pump	2105	3.49	0.72	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
56	IIIB1c	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task B. Prepare radiopharmaceutical kits, perform quality control, and evaluate results:	1. Radiopharmaceutical kits: c. Insure particle size and number if needed	1873	3.49	0.71	1	4
222	VA8f	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: f. Gated cardiac blood pool, stress	1824	3.49	0.81	1	4
242	VA10b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	10. Central Nervous System: b. Brain imaging, planar, and SPECT	1784	3.49	0.76	1	4
78	IIIC1r	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: r. Tc99m tilmanocept (Lymphoseek)	1690	3.49	0.75	1	4
225	VA8i	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: i. Cardiac CT SPECT	1635	3.49	0.77	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
74	IIC1n	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: n. Tc99m bicisate/ECD (Neurolite)	1744	3.49	0.74	1	4
182	IVC3c	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	3. Non-imaging equipment: c. Treadmill	2127	3.50	0.73	1	4
8	IC	Domain I: Radiation Physics and Detection	Task C. Interactions of radiation with matter		2181	3.52	0.68	1	4
164	IVB2biii	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	2. SPECT and SPECT/CT imaging system: b. SPECT camera quality control: iii. Pixel calibration	2088	3.52	0.71	1	4
110	IIIE2	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	2. adenosine	1900	3.52	0.72	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
223	VA8g	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: g. Gated cardiac blood pool, SPECT	1850	3.52	0.79	1	4
160	IVB1g	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	1. Gamma Camera quality control: g. Pulse height analysis	2128	3.52	0.72	1	4
296	VN1a	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	1. Basic electrocardiography (ECG): a. Cardiac conduction system	2152	3.53	0.68	1	4
228	VA8l	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: l. Cardiac PET	1525	3.53	0.71	1	4
227	VA8k	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: k. Myocardial viability (thallium, FDG)	1980	3.53	0.72	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
172	IVB6	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	6. Networking and information systems (i.e., PACS and RIS)	1931	3.53	0.71	1	4
81	IIIC2c	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	2. Iodine labeled radiopharmaceuticals: c. I-123 MIBG	1781	3.54	0.68	1	4
111	IIIE3	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	3. dobutamine	2010	3.54	0.70	1	4
247	VA10g	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	10. Central Nervous System: g. Brain PET	1596	3.54	0.71	1	4
313	VQ	Domain V: Clinical Procedures	Task Q. Prepare, survey, and clean radiotherapy administration and/or isolation room		1882	3.55	0.70	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
57	IIB2a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task B. Prepare radiopharmaceutical kits, perform quality control, and evaluate results:	2. Radiopharmaceutical quality control: a. Visual inspection - color and clarity	2003	3.55	0.66	1	4
92	IIIC4c	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	4. Miscellaneous diagnostic radiopharmaceuticals: c. Xe133 gas	1715	3.55	0.69	1	4
69	IIIC1i	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: i. Tc99m pyrophosphate/PYP	1911	3.55	0.72	1	4
298	VN1c	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	1. Basic electrocardiography (ECG): c. Recognizing and responding to changes on a resting or stress ECG	2149	3.55	0.68	1	4
180	IVC3a	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	3. Non-imaging equipment: a. Xenon delivery system and trap	1690	3.55	0.70	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
179	IVC2f	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	2. Patient care equipment: f. Blood pressure equipment	2164	3.56	0.67	1	4
48	IIJ	Domain II: Radiation Safety and Regulations	Task J. Knowledge of institutional and departmental accreditation organizations		2233	3.56	0.66	1	4
165	IVB2biv	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	2. SPECT and SPECT/CT imaging system: b. SPECT camera quality control: iv. 3-D uniformity and resolution (e.g., Jacak phantom)	2071	3.56	0.68	1	4
251	VA11d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	11. Radionuclide Therapy: d. Metastatic bone	1747	3.56	0.70	1	4
297	VN1b	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	1. Basic electrocardiography (ECG): b. Components of a normal ECG wave form	2164	3.56	0.66	1	4
62	IIC1b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: b. Tc99m oxidronate/HDP	1748	3.57	0.74	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
241	VA10a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	10. Central Nervous System: a. Brain flow, brain death	1844	3.57	0.70	1	4
205	VA5d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	5. Renal/Genitourinary: d. Renal anatomy, planar, SPECT	1910	3.57	0.72	1	4
133	IIIF1b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	1. Labeling procedures: b. Anticoagulants and other additives	1980	3.57	0.66	1	4
123	IIIE15	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	15. heparin	2040	3.58	0.65	1	4
4	IA1aiv	Domain I: Radiation Physics and Detection	Task A. Physical properties	1. Radioactive materials: a. Modes of decay: iv. Positron emitters	1926	3.58	0.69	1	4
43	IIG	Domain II: Radiation Safety and Regulations	Task G. Practice and adhere to Environmental Protection Agency (EPA) requirements		2234	3.58	0.64	1	4
137	IIIF1f	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	1. Labeling procedures: f. Method: in vivo or in vitro	1989	3.59	0.66	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
73	IIC1m	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: m. Tc99m exametazime/HMPAO (Ceretek)	1910	3.59	0.67	1	4
120	IIIE12	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	12. morphine	1908	3.59	0.65	1	4
60	IIIB4	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task B. Prepare radiopharmaceutical kits, perform quality control, and evaluate results:	4. Storage of kits before and after reconstitution	1963	3.59	0.64	1	4
175	IVC2b	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	2. Patient care equipment: b. ECG monitor	2207	3.59	0.64	1	4
89	IIC3e	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	3. Indium labeled radiopharmaceuticals: e. In-111 pentetreotide (Octreoscan)	1908	3.59	0.63	1	4
132	IIIF1a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	1. Labeling procedures: a. Required lab equipment and supplies	1996	3.60	0.65	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
54	IIIB1a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task B. Prepare radiopharmaceutical kits, perform quality control, and evaluate results:	1. Radiopharmaceutical kits: a. Activity and volume limitations	1988	3.60	0.63	1	4
85	IIIC3a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	3. Indium labeled radiopharmaceuticals: a. In-111 Pentetate (DTPA)	1851	3.60	0.65	1	4
177	IVC2d	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	2. Patient care equipment: d. Defibrillator	2167	3.61	0.66	1	4
170	IVB4b	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	4. CT imaging systems: b. CT quality control (e.g., contrast and spatial resolution, noise, uniformity, artifacts, etc.,)	1757	3.61	0.66	1	4
22	IIC4c	Domain II: Radiation Safety and Regulations	Task C. Monitoring protocols and requirements (e.g., timing and frequency):	4. Effective dose equivalent limits for: c. General public	2223	3.61	0.61	1	4
255	VA12a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	12. CT Imaging Procedures: a. Attenuation correction/anatomical localization	1741	3.61	0.66	1	4
55	IIIB1b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task B. Prepare radiopharmaceutical kits, perform quality control, and evaluate results:	1. Radiopharmaceutical kits: b. Activity calculations	1997	3.61	0.63	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
268	VE4d	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	4. Use and accommodate patient support devices: d. ECG monitor	2199	3.62	0.62	1	4
265	VE4a	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	4. Use and accommodate patient support devices: a. Intravenous infusion pump/lines	2183	3.62	0.63	1	4
169	IVB4a	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	4. CT imaging systems: a. Co-registration of images	1762	3.63	0.65	1	4
199	VA3g	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	3. Oncology: g. Neuroendocrine tumor imaging	1873	3.63	0.61	1	4
59	IIIB3	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task B. Prepare radiopharmaceutical kits, perform quality control, and evaluate results:	3. Labeling kits	1968	3.64	0.62	1	4
159	IVB1f	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	1. Gamma Camera quality control: f. Assess system sensitivity	2179	3.64	0.63	1	4
258	VB2	Domain V: Clinical Procedures	Task B. Schedule patient studies to accommodate sequencing of multiple procedures and special orders:	2. Schedule multiple radionuclide procedures for a single patient	2134	3.64	0.65	1	4
294	VM5c	Domain V: Clinical Procedures	Task M. Process and evaluate computer generated data:	5. Quantitative analysis: c. Image normalization and subtraction	2193	3.64	0.63	1	4
259	VB3	Domain V: Clinical Procedures	Task B. Schedule patient studies to accommodate sequencing of multiple procedures and special orders:	3. Schedule same-day multiple modality procedures for a single patient	2165	3.65	0.65	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
257	VB1	Domain V: Clinical Procedures	Task B. Schedule patient studies to accommodate sequencing of multiple procedures and special orders:	1. Schedule the camera time	2201	3.65	0.63	1	4
44	IIH	Domain II: Radiation Safety and Regulations	Task H. Practice and adhere to Occupational Safety and Health Administration (OSHA) requirements		2218	3.66	0.59	1	4
136	IIIF1e	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	1. Labeling procedures: e. Required radiopharmaceuticals	1995	3.66	0.61	1	4
77	IIIC1q	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: q. Tc99m HMPAO tagged WBCs	1902	3.66	0.62	1	4
266	VE4b	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	4. Use and accommodate patient support devices: b. Supplemental oxygen	2229	3.67	0.58	1	4
301	VN3b	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	3. Treadmill stress techniques (i.e., Bruce and modified Bruce) and bicycle stress techniques: b. Duration/termination parameters	2126	3.67	0.59	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
147	IIH5	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task H. Prepare and administer non-radioactive agents:	5. Non-radioactive agents (e.g., ACD solution, heparin, contrast media, TSH, atropine, etc.,)	2166	3.67	0.59	1	4
112	IIIE4	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	4. aminophylline	2106	3.67	0.59	1	4
260	VC	Domain V: Clinical Procedures	Task C. Procure supply of radiopharmaceuticals, considering license possession limits and schedule		2217	3.68	0.63	1	4
288	VM1	Domain V: Clinical Procedures	Task M. Process and evaluate computer generated data:	1. Data storage, transfer, and retrieval	2246	3.68	0.58	1	4
87	IIIC3c	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	3. Indium labeled radiopharmaceuticals: c. In-111 oxine labeled WBCs	1902	3.68	0.60	1	4
299	VN2	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	2. ECG lead placements	2157	3.68	0.58	1	4
181	IVC3b	Domain IV: Instrument Operations and Quality Control	Task C. Auxiliary equipment:	3. Non-imaging equipment: b. Aerosol delivery system	1922	3.68	0.58	1	4
289	VM2	Domain V: Clinical Procedures	Task M. Process and evaluate computer generated data:	2. Image formation (static, dynamic, ERNA, list mode)	2229	3.68	0.59	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
291	VM4	Domain V: Clinical Procedures	Task M. Process and evaluate computer generated data:	4. Image enhancement (e.g., filters, matrix, intensity, etc.,)	2207	3.69	0.58	1	4
293	VM5b	Domain V: Clinical Procedures	Task M. Process and evaluate computer generated data:	5. Quantitative analysis: b. Curve generation and analysis	2199	3.70	0.58	1	4
274	VE6e	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	6. Perform pre-examination screening including review of: e. Review relevant lab values	2212	3.70	0.58	1	4
295	VM6	Domain V: Clinical Procedures	Task M. Process and evaluate computer generated data:	6. Display formatting (image size, number of images, intensity adjustments)	2199	3.70	0.57	1	4
104	IIID3	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task D. Understand the characteristics (i.e., mechanism of localization), indications, contraindications, and administration of therapeutic radiopharmaceuticals:	3. I-131 sodium iodide	1862	3.70	0.60	1	4
116	IIIE8	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	8. furosemide (Lasix)	2095	3.70	0.56	1	4
9	ID	Domain I: Radiation Physics and Detection	Task D. Radiation detector types and basic principles		2222	3.70	0.55	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
16	IIC1b	Domain II: Radiation Safety and Regulations	Task C. Monitoring protocols and requirements (e.g., timing and frequency):	1. Radiation surveys (area monitoring) including: b. Choice of radiation detection devices (e.g., Geiger Counters, sodium iodide detectors)	2250	3.71	0.53	1	4
286	VK	Domain V: Clinical Procedures	Task K. Perform post-procedure assessment		2233	3.71	0.58	1	4
221	VA8e	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: e. Gated cardiac blood pool, rest	2068	3.71	0.59	1	4
21	IIC4b	Domain II: Radiation Safety and Regulations	Task C. Monitoring protocols and requirements (e.g., timing and frequency):	4. Effective dose equivalent limits for: b. Pregnant radiation workers	2239	3.72	0.53	1	4
300	VN3a	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	3. Treadmill stress techniques (i.e., Bruce and modified Bruce) and bicycle stress techniques: a. Contraindications	2143	3.72	0.55	1	4
24	IIE1	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	1. Posting warning and informational signs delineating restricted and unrestricted areas	2240	3.72	0.53	1	4
20	IIC4a	Domain II: Radiation Safety and Regulations	Task C. Monitoring protocols and requirements (e.g., timing and frequency):	4. Effective dose equivalent limits for: a. Radiation workers	2256	3.72	0.51	1	4
184	VA1b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	1. Pulmonary: b. Gas ventilation	1794	3.72	0.56	1	4
38	IIE7d	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	7. Maintain records as required for: d. Staff, patient, occupational and public exposure	2229	3.73	0.51	2	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
11	IIA	Domain II: Radiation Safety and Regulations	Task A. Biological effects of radiation exposure		2119	3.73	0.52	1	4
71	IIIC1k	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: k. Tc99m tetrofosmin (Myoview)	1926	3.73	0.57	1	4
140	IIIF4	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task F. Label blood components with radiopharmaceutical according to protocol:	4. Reinjection patient and sample verification	1968	3.73	0.58	1	4
7	IB	Domain I: Radiation Physics and Detection	Task B. Measurement of radioactivity and decay calculations		2229	3.73	0.55	1	4
47	III3	Domain II: Radiation Safety and Regulations	Task I. Practice and adhere to Health and Human Services (HHS)/Health Insurance Portability and Accountability Act (HIPAA) requirements:	3. Releasing information to authorized parties	2224	3.73	0.56	1	4
17	IIC1c	Domain II: Radiation Safety and Regulations	Task C. Monitoring protocols and requirements (e.g., timing and frequency):	1. Radiation surveys (area monitoring) including: c. Frequency and limits of wipe surveys	2256	3.74	0.51	1	4
213	VA6e	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	6. Endocrine: e. Whole body survey for thyroid metastases	1951	3.74	0.54	1	4
287	VL	Domain V: Clinical Procedures	Task L. Provide patient/caregiver education concerning discharge instructions and cautions		2218	3.74	0.56	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
167	IVB3a	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	3. PET and PET/CT imaging systems: a. Application of attenuation corrections	1775	3.74	0.53	1	4
146	IIIH4	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task H. Prepare and administer non-radioactive agents:	4. Interventional pharmaceuticals	2144	3.74	0.56	1	4
197	VA3e	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	3. Oncology: e. Lymphoscintigraphy/sentinel lymph node localization	1983	3.74	0.52	1	4
41	IIF2	Domain II: Radiation Safety and Regulations	Task F. Practice and adhere to Department of Transportation (DOT) - Radiopharmaceutical Transport requirements:	2. Labeling requirements (e.g., transportation index, name, concentration, expiration date/time, total activity, assay date/time)	2250	3.75	0.51	1	4
284	VJ3	Domain V: Clinical Procedures	Task J. Evaluate image quality:	3. Co-registration of images (SPECT/CT and PET/CT)	1978	3.75	0.54	1	4
42	IIF3	Domain II: Radiation Safety and Regulations	Task F. Practice and adhere to Department of Transportation (DOT) - Radiopharmaceutical Transport requirements:	3. Package monitoring/receiving/returning	2248	3.75	0.50	1	4
201	VA4b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	4. Infection: b. Tagged WBC imaging	1994	3.75	0.50	1	4
307	VN4f	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	4. Pharmacological stress protocols: f. Reversal agents and techniques	2138	3.75	0.53	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
148	IVA1a	Domain IV: Instrument Operations and Quality Control	Task A. Non-imaging equipment, components, and operation:	1. Perform and evaluate quality control on well counters and probes: a. Calibrate and perform quality control on the sodium iodide scintillation detector	2145	3.75	0.56	1	4
30	IIE3e	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	3. Responding to adverse events: e. Personnel, patient, and/or public decontamination	2247	3.75	0.50	1	4
183	VA1a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	1. Pulmonary: a. Radioaerosol	1915	3.75	0.54	1	4
157	IVB1d	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	1. Gamma Camera quality control: d. Phantoms	2200	3.75	0.53	1	4
26	IIE3a	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	3. Responding to adverse events: a. Trigger levels and monitoring methods	2257	3.76	0.47	2	4
186	VA1d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	1. Pulmonary: d. Perfusion/Ventilation quantitation	2024	3.76	0.51	1	4
272	VE6c	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	6. Perform pre-examination screening including review of: c. Current medications	2247	3.76	0.52	1	4
187	VA2a	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	2. Bone/Musculoskeletal scans: a. Limited	2056	3.76	0.55	1	4
206	VA5e	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	5. Renal/Genitourinary: e. Renal flow	2056	3.76	0.50	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
29	IIE3d	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	3. Responding to adverse events: d. Protection during adverse events	2254	3.77	0.49	1	4
292	VM5a	Domain V: Clinical Procedures	Task M. Process and evaluate computer generated data:	5. Quantitative analysis: a. Regions of interest and quantification	2218	3.77	0.50	1	4
36	IIE7b	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	7. Maintain records as required for: b. Radiation monitoring and reporting	2239	3.77	0.48	1	4
306	VN4e	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	4. Pharmacological stress protocols: e. Drug side-effects and appropriate treatment	2147	3.77	0.50	1	4
161	IVB2a	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	2. SPECT and SPECT/CT imaging system: a. Attenuation correction	2081	3.77	0.49	1	4
210	VA6b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	6. Endocrine: b. Parathyroid imaging, planar, and SPECT	2061	3.77	0.50	1	4
168	IVB3b	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	3. PET and PET/CT imaging systems: b. PET quality control (e.g., daily blank scan, normalization scan, 2-D/3-D well counter, artifacts, etc.)	1724	3.77	0.51	1	4
31	IIE3f	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	3. Responding to adverse events: f. Area/equipment decontamination	2252	3.78	0.46	2	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
119	III E11	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	11. cholecystokinen/sincalide/CK	2060	3.78	0.51	1	4
273	VE6d	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	6. Perform pre-examination screening including review of: d. Allergic and adverse reaction history	2237	3.78	0.52	1	4
145	III H3	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task H. Prepare and administer non-radioactive agents:	3. Antidote/reversal agent	2184	3.78	0.51	1	4
153	IV A3	Domain IV: Instrument Operations and Quality Control	Task A. Non-imaging equipment, components, and operation:	3. Perform and evaluate dose calibrator constancy, accuracy, linearity, and geometry tests	2200	3.78	0.49	1	4
37	III E7c	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	7. Maintain records as required for: c. Equipment calibration and maintenance	2238	3.78	0.48	1	4
64	III C1d	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: d. Tc99m pentetate/DTPA	2037	3.78	0.48	1	4
263	VE2	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	2. Perform basic patient care (e.g., vital signs, basic first aid)	2234	3.78	0.50	1	4
250	VA11c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	11. Radionuclide Therapy: c. Thyroid	1920	3.78	0.50	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
68	IIC1h	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: h. Tc99m mertiatide/MAG3	2072	3.79	0.49	1	4
305	VN4d	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	4. Pharmacological stress protocols: d. Duration/termination parameters	2164	3.79	0.48	1	4
198	VA3f	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	3. Oncology: f. Tumor imaging, PET	1762	3.79	0.49	1	4
34	IIE6	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	6. Identify recordable and reportable events	2217	3.79	0.46	1	4
285	VJ4	Domain V: Clinical Procedures	Task J. Evaluate image quality:	4. Repeat study and/or perform additional views	2240	3.79	0.47	1	4
290	VM3	Domain V: Clinical Procedures	Task M. Process and evaluate computer generated data:	3. Image reconstruction (SPECT, PET)	2226	3.79	0.47	1	4
35	IIE7a	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	7. Maintain records as required for: a. Receipt, storage, and disposal of radioactive materials	2249	3.79	0.46	1	4
94	IIC5a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	5. Positron Emission Tomography: a. F-18 FDG	1799	3.80	0.48	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
166	IVB2bv	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	2. SPECT and SPECT/CT imaging system: b. SPECT camera quality control: v. Artifacts	2165	3.80	0.46	1	4
261	VD	Domain V: Clinical Procedures	Task D. Instruct patient, family, and personnel concerning procedures and precautions		2224	3.80	0.49	1	4
230	VA9b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: b. Gastric emptying (liquid/solid)	2062	3.80	0.48	1	4
232	VA9d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: d. Gastrointestinal bleeding	2041	3.80	0.48	1	4
40	IIF1	Domain II: Radiation Safety and Regulations	Task F. Practice and adhere to Department of Transportation (DOT) - Radiopharmaceutical Transport requirements:	1. Use of shielding containers	2253	3.80	0.45	1	4
53	IIIA2	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task A. Elute radionuclide generator, perform and evaluate quality control tests:	2. Dose calibrator operation/units of radioactivity	2105	3.80	0.48	1	4
207	VA5f	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	5. Renal/Genitourinary: f. Renogram (Lasix, and ACE inhibitors)	2054	3.80	0.46	1	4
271	VE6b	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	6. Perform pre-examination screening including review of: b. Medical history	2246	3.80	0.47	1	4
66	IIIC1f	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: f. Tc99m sulfur colloid	2096	3.81	0.45	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
75	IIC1o	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: o. Tc99m labeled RBCs	2093	3.81	0.45	1	4
264	VE3	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	3. Practice correct patient transferring techniques	2216	3.81	0.47	1	4
152	IVA2b	Domain IV: Instrument Operations and Quality Control	Task A. Non-imaging equipment, components, and operation:	2. Determine operational status of survey meter: b. Survey meter quality control	2225	3.81	0.46	1	4
79	IIC2a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	2. Iodine labeled radiopharmaceuticals: a. I-123 sodium iodide	2042	3.82	0.44	1	4
18	IIC2	Domain II: Radiation Safety and Regulations	Task C. Monitoring protocols and requirements (e.g., timing and frequency):	2. Personal monitoring devices	2247	3.82	0.43	2	4
27	IIE3b	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	3. Responding to adverse events: b. Radiation exposure	2258	3.82	0.41	2	4
28	IIE3c	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	3. Responding to adverse events: c. Radiation spills	2251	3.82	0.42	1	4
46	III2	Domain II: Radiation Safety and Regulations	Task I. Practice and adhere to Health and Human Services (HHS)/Health Insurance Portability and Accountability Act (HIPAA) requirements:	2. Maintaining patient records	2259	3.82	0.45	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
302	VN4a	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	4. Pharmacological stress protocols: a. Contraindications	2172	3.83	0.44	1	4
113	IIIE5	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures:	5. regadenoson (Lexiscan)	2129	3.83	0.42	2	4
191	VA2e	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	2. Bone/Musculoskeletal scans: e. SPECT	2074	3.83	0.45	1	4
67	IIIC1g	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: g. Tc99m disofenin/mebroenin (Choletec)	2095	3.83	0.43	1	4
32	IIIE4	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	4. Adhere to radioactive waste storage requirements	2248	3.83	0.41	1	4
63	IIIC1c	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: c. Tc99m medronate/MDP	2077	3.83	0.43	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
80	IIC2b	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	2. Iodine labeled radiopharmaceuticals: b. I-131 sodium iodide	1970	3.83	0.43	1	4
303	VN4b	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	4. Pharmacological stress protocols: b. Timing of pharmacological stress agent	2169	3.83	0.43	1	4
70	IIC1j	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: j. Tc99m sestamibi/MIBI (Cardiolite)	2139	3.84	0.41	1	4
234	VA9f	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	9. Gastrointestinal: f. Hepatobiliary with and without GBEF	2053	3.84	0.45	1	4
25	IIE2	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	2. Surveying, inspecting, and inventorying radioactive materials	2218	3.84	0.40	1	4
275	VE7	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	7. Verify that informed consent has been obtained	2208	3.84	0.44	1	4
39	IIE7e	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	7. Maintain records as required for: e. Nuclear medicine diagnostic and therapeutic procedures	2205	3.84	0.41	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
19	IIC3	Domain II: Radiation Safety and Regulations	Task C. Monitoring protocols and requirements (e.g., timing and frequency):	3. Personal protective equipment (e.g., lab coat, gloves, syringe shields)	2207	3.84	0.41	1	4
163	IVB2bii	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	2. SPECT and SPECT/CT imaging system: b. SPECT camera quality control: ii. Field uniformity requirements	2207	3.84	0.42	1	4
151	IVA2a	Domain IV: Instrument Operations and Quality Control	Task A. Non-imaging equipment, components, and operation:	2. Determine operational status of survey meter: a. Survey meter operations and components	2246	3.85	0.41	1	4
33	IIE5	Domain II: Radiation Safety and Regulations	Task E. Practice and adhere to Nuclear Regulatory Commission (NRC) requirements:	5. Dispose of radioactive materials (e.g., liquids, solids, gasses, contaminated materials)	2248	3.85	0.39	1	4
65	IIIC1e	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: e. Tc99m macroaggregated albumin/MAA	2079	3.85	0.40	1	4
1	IA1ai	Domain I: Radiation Physics and Detection	Task A. Physical properties	1. Radioactive materials: a. Modes of decay: i. Gamma emitters	2241	3.85	0.40	1	4
155	IVB1b	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	1. Gamma Camera quality control: b. Spatial resolution	2226	3.85	0.41	1	4
281	VI2	Domain V: Clinical Procedures	Task I. Prepare equipment and perform examinations:	2. Establish imaging parameters for data acquisition	2218	3.86	0.41	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
14	IIB3	Domain II: Radiation Safety and Regulations	Task B. Protection techniques and calculations:	3. Shielding (shielding equations)	2203	3.86	0.42	1	4
212	VA6d	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	6. Endocrine: d. Thyroid uptake	2051	3.86	0.39	1	4
280	VII	Domain V: Clinical Procedures	Task I. Prepare equipment and perform examinations:	1. Position patient using anatomical markers and immobilization techniques	2227	3.86	0.41	1	4
144	IIH2	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task H. Prepare and administer non-radioactive agents:	2. Adverse side-effects and treatment	2232	3.86	0.39	1	4
211	VA6c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	6. Endocrine: c. Thyroid imaging	2068	3.86	0.38	1	4
61	IIIC1a	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals:	1. Tc99m labeled radiopharmaceuticals: a. Tc99m sodium pertechnetate	2186	3.86	0.38	1	4
304	VN4c	Domain V: Clinical Procedures	Task N. Prepare and perform cardiac monitoring and/or assist with stress testing:	4. Pharmacological stress protocols: c. Timing of radiopharmaceutical injection	2181	3.87	0.38	1	4
162	IVB2bi	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	2. SPECT and SPECT/CT imaging system: b. SPECT camera quality control: i. Center of rotation	2210	3.87	0.37	1	4
269	VE5	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	5. Receive and prepare patient, verify patient identification and written orders for study	2203	3.87	0.40	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
158	IVB1e	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	1. Gamma Camera quality control: e. Artifacts	2228	3.87	0.37	1	4
45	III1	Domain II: Radiation Safety and Regulations	Task I. Practice and adhere to Health and Human Services (HHS)/Health Insurance Portability and Accountability Act (HIPAA) requirements:	1. Protecting patient rights and privacy	2268	3.87	0.38	1	4
185	VA1c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	1. Pulmonary: c. Perfusion	2051	3.88	0.35	1	4
15	IIC1a	Domain II: Radiation Safety and Regulations	Task C. Monitoring protocols and requirements (e.g., timing and frequency):	1. Radiation surveys (area monitoring) including: a. Survey meters and well counters	2261	3.88	0.34	1	4
262	VE1	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	1. Protect patient information and privacy according to the Healthcare Insurance and Portability and Accountability Act (HIPAA)	2251	3.88	0.38	1	4
13	IIB2	Domain II: Radiation Safety and Regulations	Task B. Protection techniques and calculations:	2. Distance (inverse square law)	2238	3.88	0.37	1	4
278	VG	Domain V: Clinical Procedures	Task G. Monitor and assess patient condition		2243	3.88	0.37	1	4
282	VJ1	Domain V: Clinical Procedures	Task J. Evaluate image quality:	1. Normal and abnormal scan patterns	2255	3.89	0.43	1	15
283	VJ2	Domain V: Clinical Procedures	Task J. Evaluate image quality:	2. identify artifacts and causes	2244	3.89	0.35	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
189	VA2c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	2. Bone/Musculoskeletal scans: c. 3-phase	2076	3.89	0.34	1	4
270	VE6a	Domain V: Clinical Procedures	Task E. Receive, prepare, and provide care to patient:	6. Perform pre-examination screening including review of: a. Verify patient preparations and identify contraindications	2247	3.89	0.35	1	4
141	III G1	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task G. Understand the routes of administration:	1. Administration modes (e.g., IV, IM)	2241	3.90	0.35	1	4
12	IIB1	Domain II: Radiation Safety and Regulations	Task B. Protection techniques and calculations:	1. Time	2262	3.90	0.32	2	4
156	IVB1c	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	1. Gamma Camera quality control: c. Visual image quality	2231	3.90	0.32	2	4
279	VH	Domain V: Clinical Procedures	Task H. Implement emergency procedures (e.g., in case of fainting, seizure, cardiopulmonary arrest, etc.,)		2222	3.90	0.42	1	15
142	III G2	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task G. Understand the routes of administration:	2. Administration techniques (e.g., bolus injection, straight stick, IV line)	2226	3.91	0.33	1	4
219	VA8c	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: c. Myocardial perfusion, gated SPECT	2164	3.91	0.34	1	4
218	VA8b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	8. Cardiovascular: b. Myocardial perfusion,	2163	3.91	0.33	1	4

Order	Element	Domain	Subdomain	KSA	N	Mean Importance	St. Dev	Min	Max
				SPECT, attenuation and non-attenuation					
154	IVB1a	Domain IV: Instrument Operations and Quality Control	Task B. Imaging equipment, components, and operation:	1. Gamma Camera quality control: a. Uniformity	2244	3.91	0.31	2	4
188	VA2b	Domain V: Clinical Procedures	Task A. Knowledge and performance of nuclear medicine procedures:	2. Bone/Musculoskeletal scans: b. Whole-body	2092	3.91	0.30	1	4
23	IID	Domain II: Radiation Safety and Regulations	Task D. Practice and adhere to ALARA		2198	3.92	0.30	2	4
143	IIH1	Domain III: Pharmaceutical and Radiopharmaceutical Agents	Task H. Prepare and administer non-radioactive agents:	1. Follow aseptic technique	2243	3.94	0.27	1	4
277	VF2	Domain V: Clinical Procedures	Task F. Select and administer prescribed radiopharmaceutical:	2. Administer radiopharmaceutical using appropriate route and technique	2252	3.95	0.25	1	4
276	VF1	Domain V: Clinical Procedures	Task F. Select and administer prescribed radiopharmaceutical:	1. Verify patient identification	2253	3.95	0.26	1	4

Appendix H: Subgroup Analyses of Experience, Location, and Supervisory Role

TABLE H-1 Average Importance Ratings by Experience

Rating Scale
 1 = Not Important
 2 = Low Importance
 3 = Moderate Importance
 4 = Extremely Important

Key:
 *=Significant at the .05 level
 **=Significant at the .01 level

Order	Element	Mean by Experience					Mean Differences									
		Less than 5 years (1)	5 to 10 years (2)	11 to 15 years (3)	16 to 20 years (4)	21 or more years (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
1	IA1ai	3.82	3.87	3.83	3.85	3.86	-0.05	-0.02	-0.03	-0.05	0.03	0.02	0.00	-0.01	-0.03	-0.02
2	IA1aii	3.30	3.22	3.25	3.30	3.33	0.08	0.05	0.00	-0.03	-0.03	-0.08	-0.11	-0.05	-0.08	-0.03
3	IA1aiii	2.94	2.87	2.92	2.92	2.96	0.06	0.02	0.01	-0.02	-0.04	-0.05	-0.09	-0.01	-0.04	-0.03
4	IA1aiv	3.58	3.54	3.62	3.55	3.59	0.04	-0.04	0.03	-0.01	-0.08	-0.02	-0.05	0.06	0.03	-0.04
5	IA2a	3.16	3.17	3.05	3.04	3.17	0.00	0.11	0.13	-0.01	0.11	0.13	0.00	0.02	-0.12	-0.13
6	IA2b	3.06	3.06	3.03	2.98	3.08	0.00	0.03	0.08	-0.02	0.03	0.08	-0.02	0.05	-0.05	-0.10
7	IB	3.68	3.72	3.69	3.70	3.78	-0.04	-0.01	-0.02	-0.10	0.02	0.02	-0.06	-0.01	-0.09	-0.08
8	IC	3.45	3.50	3.50	3.54	3.55	-0.05	-0.04	-0.09	-0.09	0.00	-0.04	-0.04	-0.04	-0.05	0.00
9	ID	3.69	3.67	3.65	3.72	3.74	0.02	0.04	-0.03	-0.05	0.02	-0.05	-0.07	-0.07	-0.09*	-0.03
10	IE	2.98	3.06	3.15	3.17	3.36	-0.08	-0.17	-0.19	-0.38**	-0.09	-0.11	-0.30**	-0.02	-0.21**	-0.19**
11	IIA	3.67	3.73	3.72	3.73	3.75	-0.06	-0.04	-0.06	-0.07	0.01	0.00	-0.02	-0.02	-0.03	-0.01
12	IIB1	3.86	3.90	3.90	3.90	3.90	-0.04	-0.04	-0.04	-0.04	0.00	0.00	0.00	0.00	0.00	0.00
13	IIB2	3.86	3.88	3.89	3.90	3.88	-0.03	-0.03	-0.05	-0.03	-0.01	-0.02	0.00	-0.01	0.01	0.02
14	IIB3	3.84	3.86	3.86	3.86	3.86	-0.02	-0.01	-0.02	-0.01	0.01	0.00	0.01	-0.01	0.00	0.01

Order	Element	Mean by Experience					Mean Differences									
		Less than 5 years (1)	5 to 10 years (2)	11 to 15 years (3)	16 to 20 years (4)	21 or more years (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
15	IIC1a	3.81	3.90	3.88	3.88	3.89	-0.08*	-0.07	-0.06	-0.08**	0.02	0.02	0.00	0.01	-0.01	-0.02
16	IIC1b	3.61	3.69	3.71	3.69	3.75	-0.08	-0.10	-0.08	-0.14**	-0.02	0.00	-0.06	0.02	-0.04	-0.06
17	IIC1c	3.65	3.71	3.75	3.76	3.76	-0.06	-0.10	-0.11	-0.11*	-0.04	-0.05	-0.06	-0.01	-0.02	-0.01
18	IIC2	3.79	3.81	3.83	3.80	3.84	-0.02	-0.04	-0.01	-0.05	-0.01	0.02	-0.02	0.03	-0.01	-0.04
19	IIC3	3.80	3.82	3.86	3.80	3.87	-0.02	-0.07	0.00	-0.07	-0.04	0.02	-0.05	0.06	-0.01	-0.07
20	IIC4a	3.69	3.71	3.69	3.72	3.75	-0.02	0.01	-0.02	-0.06	0.03	0.00	-0.04	-0.03	-0.07	-0.04
21	IIC4b	3.69	3.73	3.68	3.67	3.75	-0.03	0.01	0.02	-0.06	0.04	0.05	-0.02	0.01	-0.07	-0.08
22	IIC4c	3.58	3.60	3.58	3.58	3.64	-0.03	0.00	0.00	-0.06	0.02	0.02	-0.03	0.00	-0.06	-0.06
23	IID	3.89	3.89	3.92	3.91	3.94	0.00	-0.03	-0.02	-0.05	-0.03	-0.01	-0.04	0.01	-0.02	-0.03
24	IIE1	3.71	3.65	3.67	3.69	3.78	0.06	0.04	0.02	-0.07	-0.03	-0.04	-0.14**	-0.01	-0.11**	-0.10
25	IIE2	3.81	3.80	3.83	3.82	3.88	0.01	-0.02	-0.01	-0.08	-0.02	-0.02	-0.08**	0.00	-0.06	-0.06
26	IIE3a	3.68	3.72	3.77	3.76	3.79	-0.04	-0.09	-0.08	-0.11**	-0.05	-0.04	-0.07	0.01	-0.02	-0.03
27	IIE3b	3.76	3.80	3.81	3.83	3.85	-0.04	-0.05	-0.07	-0.09**	-0.01	-0.03	-0.05	-0.02	-0.04	-0.02
28	IIE3c	3.76	3.80	3.81	3.79	3.87	-0.05	-0.05	-0.04	-0.11**	0.00	0.01	-0.07	0.01	-0.06	-0.08
29	IIE3d	3.68	3.73	3.74	3.73	3.83	-0.05	-0.07	-0.05	-0.15**	-0.01	0.00	-0.10**	0.01	-0.09*	-0.10*
30	IIE3e	3.72	3.71	3.74	3.73	3.79	0.01	-0.03	-0.01	-0.08	-0.04	-0.02	-0.08*	0.01	-0.05	-0.06
31	IIE3f	3.74	3.76	3.76	3.73	3.81	-0.02	-0.02	0.01	-0.07	-0.01	0.02	-0.06	0.03	-0.05	-0.08
32	IIE4	3.78	3.79	3.85	3.86	3.84	-0.02	-0.08	-0.08	-0.06	-0.06	-0.06	-0.05	-0.01	0.01	0.02
33	IIE5	3.79	3.79	3.86	3.85	3.88	0.00	-0.07	-0.07	-0.09*	-0.07	-0.06	-0.08**	0.00	-0.02	-0.02
34	IIE6	3.69	3.75	3.79	3.78	3.83	-0.06	-0.10*	-0.08	-0.14**	-0.04	-0.02	-0.08*	0.02	-0.04	-0.05
35	IIE7a	3.71	3.72	3.77	3.80	3.85	-0.01	-0.06	-0.09	-0.14**	-0.05	-0.08	-0.13**	-0.03	-0.08*	-0.05

Order	Element	Mean by Experience					Mean Differences									
		Less than 5 years (1)	5 to 10 years (2)	11 to 15 years (3)	16 to 20 years (4)	21 or more years (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
36	IIE7b	3.69	3.71	3.74	3.76	3.83	-0.01	-0.05	-0.07	-0.14**	-0.03	-0.06	-0.12**	-0.03	-0.09*	-0.06
37	IIE7c	3.71	3.75	3.72	3.78	3.85	-0.04	-0.01	-0.06	-0.14**	0.03	-0.03	-0.10**	-0.05	-0.13**	-0.07
38	IIE7d	3.68	3.68	3.68	3.69	3.79	0.00	-0.01	-0.02	-0.11*	0.00	-0.01	-0.10**	-0.01	-0.10**	-0.09
39	IIE7e	3.77	3.81	3.81	3.83	3.90	-0.04	-0.04	-0.07	-0.13**	0.00	-0.02	-0.09**	-0.03	-0.09**	-0.07
40	IIF1	3.74	3.79	3.76	3.78	3.85	-0.05	-0.02	-0.04	-0.11**	0.03	0.00	-0.06	-0.02	-0.09**	-0.07
41	IIF2	3.67	3.72	3.75	3.73	3.79	-0.04	-0.07	-0.05	-0.11*	-0.03	-0.01	-0.07	0.02	-0.04	-0.06
42	IIF3	3.69	3.72	3.75	3.75	3.77	-0.03	-0.06	-0.06	-0.08	-0.02	-0.02	-0.05	0.00	-0.03	-0.03
43	IIG	3.55	3.52	3.59	3.56	3.62	0.03	-0.03	-0.01	-0.06	-0.06	-0.04	-0.09	0.03	-0.03	-0.06
44	IIH	3.62	3.62	3.63	3.62	3.70	0.00	-0.01	0.00	-0.08	-0.01	0.00	-0.08	0.01	-0.07	-0.08
45	III1	3.90	3.89	3.85	3.85	3.88	0.01	0.05	0.05	0.02	0.04	0.04	0.01	0.00	-0.03	-0.03
46	III2	3.81	3.81	3.81	3.78	3.85	0.00	0.00	0.03	-0.04	0.00	0.04	-0.04	0.03	-0.04	-0.07
47	III3	3.73	3.70	3.75	3.70	3.75	0.03	-0.02	0.03	-0.02	-0.05	0.00	-0.05	0.05	-0.01	-0.06
48	IIJ	3.54	3.54	3.54	3.53	3.60	0.01	0.01	0.01	-0.06	0.00	0.01	-0.06	0.00	-0.07	-0.07
49	IIIA1a	3.08	3.11	3.05	3.26	3.22	-0.03	0.02	-0.19	-0.15	0.06	-0.15	-0.11	-0.21*	-0.17*	0.04
50	IIIA1b	3.14	3.10	3.06	3.26	3.23	0.04	0.07	-0.12	-0.10	0.03	-0.16	-0.14	-0.20	-0.17*	0.02
51	IIIA1ci	3.15	3.13	3.09	3.25	3.30	0.02	0.06	-0.10	-0.15	0.04	-0.12	-0.17*	-0.16	-0.21**	-0.05
52	IIIA1cii	2.91	2.93	2.94	3.09	3.16	-0.02	-0.04	-0.18	-0.25**	-0.02	-0.16	-0.24**	-0.15	-0.22**	-0.07
53	IIIA2	3.71	3.78	3.76	3.78	3.86	-0.07	-0.05	-0.07	-0.16**	0.02	0.00	-0.08*	-0.02	-0.10**	-0.08
54	IIIB1a	3.57	3.53	3.59	3.55	3.65	0.04	-0.02	0.02	-0.09	-0.06	-0.02	-0.13*	0.04	-0.07	-0.10
55	IIIB1b	3.61	3.52	3.59	3.62	3.67	0.09	0.03	0.00	-0.05	-0.07	-0.09	-0.15**	-0.03	-0.08	-0.05
56	IIIB1c	3.42	3.42	3.50	3.49	3.54	0.00	-0.08	-0.07	-0.12	-0.08	-0.07	-0.12	0.01	-0.04	-0.05

Order	Element	Mean by Experience					Mean Differences									
		Less than 5 years (1)	5 to 10 years (2)	11 to 15 years (3)	16 to 20 years (4)	21 or more years (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
57	IIIB2a	3.51	3.45	3.55	3.53	3.60	0.07	-0.03	-0.02	-0.09	-0.10	-0.08	-0.15**	0.01	-0.05	-0.07
58	IIIB2b	3.40	3.31	3.41	3.45	3.53	0.09	-0.01	-0.04	-0.13	-0.10	-0.14	-0.23**	-0.03	-0.12	-0.09
59	IIIB3	3.63	3.52	3.67	3.62	3.67	0.11	-0.04	0.01	-0.04	-0.15*	-0.09	-0.15**	0.06	0.00	-0.06
60	IIIB4	3.54	3.49	3.63	3.59	3.63	0.05	-0.09	-0.05	-0.09	-0.14*	-0.10	-0.14**	0.04	0.00	-0.04
61	IIIC1a	3.87	3.86	3.87	3.83	3.86	0.01	0.00	0.04	0.01	0.00	0.03	0.00	0.03	0.01	-0.03
62	IIIC1b	3.45	3.49	3.54	3.53	3.65	-0.04	-0.10	-0.08	-0.20**	-0.06	-0.04	-0.16**	0.02	-0.11	-0.12
63	IIIC1c	3.83	3.85	3.83	3.80	3.83	-0.02	0.00	0.03	0.00	0.02	0.05	0.02	0.03	0.00	-0.03
64	IIIC1d	3.79	3.77	3.78	3.74	3.80	0.01	0.00	0.04	-0.01	-0.01	0.03	-0.03	0.04	-0.02	-0.06
65	IIIC1e	3.87	3.85	3.86	3.81	3.85	0.02	0.02	0.06	0.02	0.00	0.05	0.00	0.05	0.00	-0.04
66	IIIC1f	3.82	3.83	3.81	3.77	3.81	0.00	0.01	0.05	0.02	0.01	0.05	0.02	0.04	0.01	-0.03
67	IIIC1g	3.83	3.84	3.83	3.79	3.83	0.00	0.00	0.04	0.00	0.01	0.05	0.00	0.04	0.00	-0.04
68	IIIC1h	3.78	3.79	3.78	3.76	3.80	-0.01	-0.01	0.02	-0.02	0.00	0.03	-0.01	0.03	-0.01	-0.04
69	IIIC1i	3.49	3.53	3.48	3.49	3.62	-0.05	0.01	0.00	-0.13	0.05	0.05	-0.08	-0.01	-0.14*	-0.13
70	IIIC1j	3.87	3.84	3.84	3.81	3.84	0.02	0.02	0.05	0.03	0.00	0.03	0.01	0.03	0.00	-0.02
71	IIIC1k	3.67	3.77	3.73	3.74	3.73	-0.09	-0.06	-0.07	-0.06	0.03	0.02	0.04	-0.01	0.00	0.02
72	IIIC1l	3.29	3.36	3.34	3.37	3.47	-0.07	-0.04	-0.08	-0.18*	0.03	-0.01	-0.11	-0.04	-0.13	-0.10
73	IIIC1m	3.55	3.53	3.55	3.58	3.64	0.02	0.00	-0.02	-0.09	-0.02	-0.05	-0.11	-0.02	-0.09	-0.07
74	IIIC1n	3.47	3.46	3.46	3.45	3.55	0.01	0.02	0.03	-0.08	0.00	0.01	-0.09	0.01	-0.10	-0.11
75	IIIC1o	3.84	3.81	3.82	3.78	3.81	0.02	0.01	0.06	0.03	-0.01	0.04	0.00	0.04	0.01	-0.03
76	IIIC1p	3.38	3.42	3.41	3.49	3.53	-0.04	-0.03	-0.11	-0.15	0.01	-0.07	-0.11	-0.08	-0.12	-0.03
77	IIIC1q	3.64	3.65	3.61	3.65	3.71	0.00	0.03	-0.01	-0.06	0.04	0.00	-0.06	-0.04	-0.09	-0.05

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		Less than 5 years (1)	5 to 10 years (2)	11 to 15 years (3)	16 to 20 years (4)	21 or more years (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
78	IIIc1r	3.48	3.47	3.44	3.42	3.55	0.01	0.04	0.06	-0.07	0.03	0.05	-0.08	0.02	-0.11	-0.13
79	IIIc2a	3.82	3.84	3.83	3.79	3.81	-0.02	-0.01	0.03	0.01	0.01	0.05	0.03	0.04	0.02	-0.02
80	IIIc2b	3.84	3.87	3.83	3.80	3.82	-0.03	0.01	0.04	0.02	0.04	0.07	0.05	0.03	0.00	-0.03
81	IIIc2c	3.51	3.51	3.49	3.45	3.60	0.00	0.01	0.05	-0.09	0.02	0.05	-0.09	0.04	-0.11	-0.15*
82	IIIc2d	3.34	3.42	3.36	3.32	3.43	-0.08	-0.02	0.02	-0.08	0.06	0.10	-0.01	0.03	-0.07	-0.10
83	IIIc2e	3.06	3.12	3.10	3.02	3.19	-0.07	-0.05	0.04	-0.14	0.02	0.11	-0.07	0.09	-0.09	-0.18
84	IIIc2f	3.37	3.42	3.36	3.29	3.46	-0.05	0.01	0.08	-0.09	0.06	0.12	-0.04	0.07	-0.10	-0.17
85	IIIc3a	3.60	3.63	3.58	3.57	3.61	-0.03	0.02	0.03	-0.02	0.05	0.06	0.02	0.01	-0.03	-0.04
86	IIIc3b	3.27	3.34	3.36	3.42	3.53	-0.07	-0.09	-0.15	-0.26**	-0.02	-0.08	-0.19**	-0.05	-0.17*	-0.11
87	IIIc3c	3.65	3.63	3.65	3.69	3.71	0.02	0.00	-0.04	-0.06	-0.02	-0.06	-0.08	-0.04	-0.06	-0.02
88	IIIc3d	3.22	3.24	3.18	3.26	3.33	-0.02	0.04	-0.04	-0.11	0.06	-0.02	-0.09	-0.08	-0.15	-0.07
89	IIIc3e	3.63	3.60	3.58	3.56	3.60	0.02	0.05	0.07	0.03	0.03	0.05	0.00	0.02	-0.02	-0.04
90	IIIc4a	3.44	3.47	3.46	3.46	3.47	-0.03	-0.02	-0.03	-0.03	0.01	0.01	0.00	0.00	-0.01	-0.01
91	IIIc4b	3.39	3.40	3.34	3.35	3.41	-0.02	0.05	0.03	-0.02	0.07	0.05	-0.01	-0.01	-0.07	-0.06
92	IIIc4c	3.63	3.58	3.50	3.48	3.54	0.05	0.13	0.16	0.09	0.09	0.11	0.04	0.02	-0.05	-0.07
93	IIIc4d	2.82	2.86	2.81	2.86	2.93	-0.04	0.00	-0.05	-0.12	0.04	0.00	-0.07	-0.05	-0.12	-0.07
94	IIIc5a	3.88	3.81	3.84	3.76	3.75	0.06	0.04	0.11	0.12**	-0.03	0.05	0.06	0.08	0.09*	0.01
95	IIIc5b	3.12	3.23	3.15	3.28	3.35	-0.11	-0.03	-0.15	-0.23**	0.08	-0.05	-0.12	-0.12	-0.20**	-0.08
96	IIIc5c	3.25	3.29	3.25	3.34	3.39	-0.03	0.01	-0.09	-0.14	0.04	-0.06	-0.11	-0.10	-0.15	-0.05
97	IIIc5d	3.11	3.17	3.14	3.29	3.32	-0.06	-0.03	-0.18	-0.21*	0.03	-0.12	-0.14	-0.14	-0.17*	-0.03
98	IIIc5e	3.43	3.45	3.47	3.50	3.51	-0.02	-0.04	-0.07	-0.08	-0.02	-0.05	-0.07	-0.03	-0.04	-0.02

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		Less than 5 years (1)	5 to 10 years (2)	11 to 15 years (3)	16 to 20 years (4)	21 or more years (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
99	IIIC5f	3.22	3.39	3.36	3.41	3.43	-0.16	-0.14	-0.19	-0.21*	0.02	-0.03	-0.05	-0.05	-0.07	-0.02
100	IIIC5g	3.12	3.20	3.15	3.21	3.33	-0.07	-0.03	-0.09	-0.21*	0.04	-0.01	-0.13	-0.06	-0.18*	-0.12
101	IIIC5h	3.20	3.20	3.18	3.21	3.33	0.01	0.02	-0.01	-0.13	0.02	-0.01	-0.14	-0.03	-0.16	-0.12
102	IIID1	3.12	3.05	3.03	3.21	3.27	0.07	0.09	-0.10	-0.15	0.02	-0.16	-0.22**	-0.18	-0.24**	-0.06
103	IIID2	3.14	3.06	3.03	3.23	3.28	0.08	0.11	-0.09	-0.13	0.03	-0.17	-0.22**	-0.20	-0.24**	-0.04
104	IIID3	3.81	3.67	3.68	3.68	3.70	0.15*	0.14	0.14	0.11	-0.01	-0.01	-0.03	0.00	-0.03	-0.02
105	IIID4	3.31	3.21	3.15	3.21	3.28	0.10	0.16	0.10	0.04	0.06	0.00	-0.06	-0.06	-0.12	-0.07
106	IIID5	3.43	3.39	3.33	3.35	3.38	0.05	0.11	0.08	0.05	0.06	0.03	0.00	-0.03	-0.06	-0.03
107	IIID6	3.35	3.35	3.28	3.32	3.37	0.00	0.08	0.04	-0.02	0.08	0.04	-0.02	-0.04	-0.09	-0.05
108	IIID7	3.15	3.02	2.98	3.09	3.08	0.12	0.16	0.05	0.07	0.04	-0.07	-0.06	-0.11	-0.10	0.01
109	IIIE1	3.58	3.37	3.30	3.27	3.37	0.21*	0.27**	0.31**	0.20*	0.07	0.10	0.00	0.03	-0.07	-0.10
110	IIIE2	3.62	3.50	3.54	3.43	3.52	0.12	0.08	0.19*	0.10	-0.04	0.07	-0.02	0.11	0.02	-0.09
111	IIIE3	3.64	3.49	3.58	3.48	3.53	0.15	0.06	0.16	0.11	-0.09	0.01	-0.04	0.10	0.05	-0.05
112	IIIE4	3.72	3.64	3.67	3.60	3.70	0.08	0.05	0.11	0.02	-0.03	0.04	-0.06	0.06	-0.03	-0.10
113	IIIE5	3.89	3.83	3.85	3.78	3.81	0.05	0.03	0.11*	0.08	-0.02	0.05	0.03	0.07	0.05	-0.03
114	IIIE6	3.41	3.37	3.40	3.44	3.48	0.04	0.01	-0.03	-0.07	-0.03	-0.06	-0.10	-0.03	-0.07	-0.04
115	IIIE7	3.36	3.21	3.21	3.26	3.34	0.16	0.15	0.10	0.02	-0.01	-0.06	-0.14	-0.05	-0.13	-0.08
116	IIIE8	3.82	3.69	3.72	3.67	3.68	0.13*	0.10	0.15*	0.14**	-0.03	0.02	0.02	0.05	0.04	0.00
117	IIIE9	3.57	3.44	3.43	3.40	3.40	0.14	0.14	0.17	0.18*	0.00	0.04	0.04	0.03	0.04	0.00
118	IIIE10	3.28	3.13	3.15	3.15	3.25	0.15	0.13	0.13	0.03	-0.02	-0.02	-0.13	0.00	-0.11	-0.10
119	IIIE11	3.85	3.76	3.81	3.75	3.76	0.09	0.04	0.10	0.09	-0.04	0.02	0.00	0.06	0.05	-0.01

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120	III E12	3.68	3.54	3.61	3.57	3.58	0.14	0.07	0.12	0.10	-0.08	-0.03	-0.05	0.05	0.03	-0.02
121	III E13	3.29	3.06	3.21	3.15	3.25	0.23*	0.08	0.14	0.04	-0.15	-0.09	-0.19*	0.06	-0.04	-0.10
122	III E14	3.34	3.17	3.24	3.25	3.31	0.17	0.10	0.09	0.03	-0.07	-0.08	-0.14	-0.01	-0.07	-0.06
123	III E15	3.67	3.59	3.59	3.53	3.55	0.08	0.08	0.14	0.12	0.00	0.06	0.04	0.06	0.04	-0.02
124	III E16	3.24	3.05	3.10	3.10	3.16	0.19	0.15	0.14	0.08	-0.04	-0.05	-0.11	-0.01	-0.07	-0.06
125	III E17	3.56	3.40	3.41	3.42	3.43	0.16	0.15	0.14	0.13	0.00	-0.02	-0.03	-0.02	-0.02	0.00
126	III E18	3.55	3.32	3.41	3.36	3.42	0.22**	0.14	0.19	0.13	-0.08	-0.04	-0.10	0.05	-0.01	-0.06
127	III E19	3.63	3.43	3.50	3.48	3.45	0.2*	0.13	0.15	0.18**	-0.07	-0.05	-0.02	0.02	0.05	0.03
128	III E20	3.33	3.10	3.18	3.19	3.12	0.23*	0.14	0.14	0.21*	-0.08	-0.09	-0.02	0.00	0.06	0.07
129	III E21	3.25	3.06	3.15	3.15	3.14	0.19	0.10	0.10	0.11	-0.09	-0.09	-0.08	0.00	0.01	0.01
130	III E22	3.40	3.24	3.29	3.39	3.31	0.16	0.10	0.01	0.08	-0.06	-0.15	-0.08	-0.10	-0.02	0.08
131	III E23	3.51	3.41	3.44	3.36	3.46	0.10	0.07	0.16	0.05	-0.03	0.05	-0.05	0.09	-0.02	-0.11
132	III F1a	3.67	3.65	3.56	3.58	3.57	0.02	0.11	0.09	0.10	0.08	0.07	0.08	-0.02	-0.01	0.01
133	III F1b	3.65	3.62	3.57	3.56	3.53	0.03	0.08	0.09	0.12	0.05	0.06	0.08	0.01	0.04	0.02
134	III F1c	3.49	3.42	3.39	3.41	3.43	0.07	0.09	0.08	0.06	0.03	0.02	-0.01	-0.01	-0.04	-0.03
135	III F1d	3.29	3.21	3.16	3.16	3.20	0.07	0.13	0.13	0.09	0.05	0.05	0.01	0.00	-0.04	-0.04
136	III F1e	3.75	3.66	3.68	3.64	3.62	0.09	0.07	0.11	0.13*	-0.02	0.03	0.04	0.05	0.06	0.01
137	III F1f	3.68	3.60	3.56	3.53	3.58	0.08	0.12	0.15	0.10	0.04	0.07	0.02	0.03	-0.02	-0.05
138	III F2	3.25	3.10	3.03	3.06	3.13	0.15	0.22	0.19	0.12	0.07	0.04	-0.03	-0.03	-0.09	-0.07
139	III F3	3.54	3.47	3.37	3.42	3.49	0.08	0.17	0.12	0.05	0.10	0.04	-0.02	-0.05	-0.12	-0.07
140	III F4	3.76	3.71	3.70	3.68	3.76	0.05	0.05	0.08	-0.01	0.01	0.03	-0.05	0.02	-0.06	-0.09

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141	IIIG1	3.89	3.87	3.91	3.86	3.91	0.02	-0.02	0.03	-0.02	-0.04	0.01	-0.04	0.05	0.00	-0.05
142	IIIG2	3.91	3.88	3.92	3.88	3.92	0.02	-0.01	0.03	-0.01	-0.04	0.01	-0.04	0.04	0.00	-0.05
143	IIIH1	3.92	3.95	3.93	3.92	3.95	-0.02	0.00	0.01	-0.02	0.02	0.03	0.00	0.01	-0.02	-0.03
144	IIIH2	3.85	3.84	3.85	3.84	3.88	0.01	0.00	0.01	-0.03	-0.01	0.00	-0.03	0.01	-0.03	-0.04
145	IIIH3	3.80	3.77	3.77	3.71	3.80	0.02	0.03	0.09	0.00	0.00	0.06	-0.03	0.06	-0.03	-0.09
146	IIIH4	3.78	3.72	3.74	3.73	3.74	0.06	0.04	0.05	0.05	-0.02	0.00	-0.01	0.02	0.01	-0.01
147	IIIH5	3.77	3.65	3.70	3.60	3.66	0.11	0.07	0.16*	0.11	-0.05	0.05	0.00	0.10	0.04	-0.05
148	IVA1a	3.68	3.74	3.74	3.68	3.80	-0.06	-0.06	0.00	-0.13*	0.00	0.06	-0.07	0.06	-0.06	-0.12*
149	IVA1b	3.36	3.38	3.40	3.33	3.49	-0.02	-0.04	0.03	-0.13	-0.02	0.05	-0.11	0.07	-0.09	-0.15*
150	IVA1c	3.25	3.22	3.23	3.24	3.36	0.03	0.02	0.01	-0.11	-0.01	-0.02	-0.14	-0.01	-0.13	-0.12
151	IVA2a	3.80	3.83	3.87	3.80	3.87	-0.03	-0.07	0.00	-0.07	-0.03	0.04	-0.03	0.07	0.00	-0.07
152	IVA2b	3.76	3.79	3.84	3.79	3.84	-0.03	-0.08	-0.03	-0.08	-0.05	0.00	-0.05	0.05	0.00	-0.05
153	IVA3	3.75	3.75	3.78	3.75	3.82	0.00	-0.02	0.00	-0.06	-0.02	0.00	-0.06	0.02	-0.04	-0.07
154	IVB1a	3.87	3.89	3.93	3.88	3.93	-0.02	-0.06	-0.01	-0.06*	-0.04	0.01	-0.04	0.05	0.00	-0.06
155	IVB1b	3.84	3.80	3.87	3.84	3.88	0.04	-0.03	0.00	-0.04	-0.07	-0.04	-0.08*	0.03	-0.01	-0.04
156	IVB1c	3.85	3.87	3.92	3.86	3.93	-0.03	-0.08*	-0.02	-0.08**	-0.05	0.01	-0.06*	0.06	-0.01	-0.07*
157	IVB1d	3.76	3.71	3.77	3.67	3.78	0.05	-0.01	0.09	-0.02	-0.06	0.04	-0.08	0.10	-0.01	-0.11*
158	IVB1e	3.84	3.84	3.89	3.82	3.91	0.00	-0.04	0.02	-0.06	-0.05	0.02	-0.07*	0.07	-0.02	-0.08**
159	IVB1f	3.63	3.60	3.68	3.55	3.66	0.03	-0.05	0.08	-0.03	-0.08	0.05	-0.06	0.13	0.02	-0.11
160	IVB1g	3.53	3.49	3.51	3.41	3.58	0.04	0.02	0.12	-0.05	-0.02	0.08	-0.09	0.10	-0.07	-0.17**
161	IVB2a	3.81	3.77	3.79	3.70	3.77	0.04	0.03	0.11	0.04	-0.01	0.08	0.00	0.09	0.01	-0.07

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		Less than 5 years (1)	5 to 10 years (2)	11 to 15 years (3)	16 to 20 years (4)	21 or more years (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
162	IVB2bi	3.85	3.85	3.84	3.83	3.91	0.00	0.01	0.02	-0.05	0.01	0.02	-0.05	0.02	-0.06	-0.08*
163	IVB2bii	3.81	3.82	3.83	3.78	3.89	-0.01	-0.02	0.03	-0.08*	-0.01	0.04	-0.07*	0.05	-0.06	-0.11**
164	IVB2biii	3.54	3.49	3.53	3.44	3.55	0.05	0.01	0.09	-0.01	-0.04	0.05	-0.06	0.08	-0.02	-0.10
165	IVB2biv	3.60	3.53	3.55	3.49	3.59	0.07	0.05	0.12	0.01	-0.02	0.05	-0.06	0.07	-0.04	-0.10
166	IVB2bv	3.74	3.78	3.78	3.77	3.84	-0.04	-0.05	-0.03	-0.10*	0.00	0.01	-0.06	0.01	-0.05	-0.07
167	IVB3a	3.73	3.75	3.75	3.68	3.76	-0.01	-0.01	0.05	-0.02	0.00	0.07	-0.01	0.07	-0.01	-0.08
168	IVB3b	3.79	3.77	3.76	3.72	3.79	0.03	0.04	0.07	0.00	0.01	0.05	-0.03	0.04	-0.04	-0.07
169	IVB4a	3.63	3.61	3.60	3.60	3.65	0.02	0.03	0.03	-0.03	0.01	0.01	-0.04	0.00	-0.06	-0.06
170	IVB4b	3.67	3.61	3.58	3.58	3.60	0.06	0.10	0.09	0.07	0.04	0.03	0.01	-0.01	-0.02	-0.02
171	IVB5	3.48	3.49	3.45	3.43	3.50	-0.01	0.04	0.05	-0.01	0.05	0.06	0.00	0.01	-0.05	-0.06
172	IVB6	3.62	3.55	3.52	3.52	3.50	0.08	0.10	0.10	0.13	0.02	0.03	0.05	0.01	0.03	0.02
173	IVC1	3.27	3.22	3.14	3.19	3.15	0.05	0.13	0.08	0.12	0.09	0.03	0.07	-0.05	-0.02	0.04
174	IVC2a	3.64	3.45	3.41	3.46	3.50	0.19**	0.23**	0.18*	0.15*	0.04	-0.01	-0.04	-0.05	-0.09	-0.03
175	IVC2b	3.69	3.58	3.54	3.54	3.61	0.11	0.15*	0.15	0.08	0.04	0.04	-0.03	-0.01	-0.08	-0.07
176	IVC2c	3.53	3.44	3.38	3.43	3.45	0.08	0.15	0.10	0.07	0.07	0.02	-0.01	-0.05	-0.08	-0.03
177	IVC2d	3.69	3.59	3.57	3.56	3.62	0.11	0.12	0.14	0.07	0.02	0.03	-0.03	0.02	-0.05	-0.06
178	IVC2e	3.65	3.46	3.46	3.43	3.45	0.19*	0.19*	0.21**	0.20**	0.00	0.02	0.01	0.03	0.01	-0.02
179	IVC2f	3.60	3.54	3.51	3.52	3.59	0.05	0.09	0.07	0.01	0.04	0.02	-0.05	-0.02	-0.08	-0.07
180	IVC3a	3.68	3.52	3.51	3.50	3.57	0.16	0.18*	0.18	0.12	0.01	0.02	-0.05	0.01	-0.06	-0.07
181	IVC3b	3.75	3.66	3.68	3.63	3.69	0.09	0.08	0.12	0.07	-0.01	0.03	-0.02	0.05	-0.01	-0.06
182	IVC3c	3.64	3.51	3.47	3.46	3.47	0.12	0.17*	0.18*	0.16*	0.04	0.05	0.04	0.01	0.00	-0.01

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183	VA1a	3.75	3.73	3.74	3.77	3.76	0.02	0.02	-0.02	0.00	0.00	-0.04	-0.02	-0.03	-0.02	0.01
184	VA1b	3.81	3.75	3.70	3.67	3.71	0.06	0.11	0.14	0.10	0.05	0.09	0.04	0.04	-0.01	-0.04
185	VA1c	3.89	3.88	3.88	3.85	3.89	0.02	0.02	0.04	0.01	0.00	0.02	-0.01	0.02	-0.01	-0.03
186	VA1d	3.78	3.78	3.77	3.72	3.76	0.00	0.01	0.06	0.02	0.01	0.06	0.03	0.05	0.02	-0.04
187	VA2a	3.68	3.78	3.76	3.77	3.79	-0.09	-0.08	-0.08	-0.11	0.02	0.01	-0.01	-0.01	-0.03	-0.02
188	VA2b	3.92	3.91	3.92	3.91	3.91	0.01	-0.01	0.01	0.00	-0.02	0.00	-0.01	0.01	0.01	0.00
189	VA2c	3.88	3.89	3.90	3.88	3.90	-0.01	-0.02	0.00	-0.02	-0.01	0.01	-0.01	0.02	0.00	-0.02
190	VA2d	3.31	3.29	3.32	3.31	3.54	0.02	-0.01	0.00	-0.23**	-0.03	-0.02	-0.25**	0.01	-0.22**	-0.23**
191	VA2e	3.81	3.82	3.83	3.81	3.84	0.00	-0.01	0.01	-0.03	-0.01	0.01	-0.03	0.02	-0.02	-0.04
192	VA2f	3.39	3.38	3.35	3.51	3.46	0.01	0.04	-0.12	-0.07	0.03	-0.13	-0.08	-0.16	-0.11	0.05
193	VA3a	3.40	3.44	3.30	3.39	3.44	-0.03	0.10	0.01	-0.04	0.14	0.05	0.00	-0.09	-0.14*	-0.05
194	VA3b	3.27	3.20	3.24	3.31	3.41	0.07	0.03	-0.04	-0.14	-0.04	-0.10	-0.20**	-0.06	-0.16*	-0.10
195	VA3c	3.20	3.17	3.19	3.29	3.35	0.03	0.01	-0.09	-0.15	-0.02	-0.12	-0.18*	-0.10	-0.16*	-0.06
196	VA3d	3.45	3.41	3.41	3.45	3.48	0.04	0.05	0.01	-0.03	0.01	-0.03	-0.07	-0.04	-0.08	-0.04
197	VA3e	3.79	3.73	3.75	3.72	3.73	0.06	0.05	0.07	0.06	-0.01	0.01	0.00	0.02	0.01	-0.01
198	VA3f	3.85	3.78	3.79	3.75	3.78	0.08	0.06	0.11	0.07	-0.01	0.03	-0.01	0.04	0.01	-0.04
199	VA3g	3.62	3.61	3.61	3.61	3.66	0.02	0.01	0.02	-0.04	-0.01	0.00	-0.05	0.01	-0.04	-0.05
200	VA4a	3.42	3.42	3.30	3.36	3.43	0.00	0.12	0.06	-0.01	0.11	0.06	-0.01	-0.06	-0.13	-0.07
201	VA4b	3.77	3.74	3.71	3.71	3.77	0.03	0.06	0.06	-0.01	0.03	0.03	-0.03	0.00	-0.06	-0.06
202	VA5a	3.30	3.18	3.12	3.16	3.18	0.12	0.18	0.15	0.13	0.06	0.02	0.00	-0.04	-0.06	-0.02
203	VA5b	3.42	3.29	3.26	3.25	3.33	0.13	0.17	0.17	0.09	0.03	0.04	-0.04	0.01	-0.08	-0.08

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204	VA5c	3.49	3.48	3.38	3.38	3.47	0.01	0.11	0.11	0.03	0.10	0.10	0.02	0.00	-0.08	-0.08
205	VA5d	3.51	3.53	3.55	3.54	3.62	-0.03	-0.05	-0.03	-0.11	-0.02	-0.01	-0.09	0.01	-0.07	-0.08
206	VA5e	3.74	3.75	3.75	3.72	3.80	-0.01	-0.01	0.02	-0.06	0.00	0.03	-0.05	0.03	-0.04	-0.08
207	VA5f	3.82	3.80	3.82	3.74	3.81	0.02	0.00	0.09	0.01	-0.01	0.07	0.00	0.08	0.01	-0.07
208	VA5g	2.90	2.78	2.75	2.84	2.98	0.12	0.15	0.06	-0.08	0.03	-0.05	-0.20	-0.08	-0.23*	-0.15
209	VA6a	3.24	3.21	3.22	3.26	3.29	0.03	0.02	-0.02	-0.05	-0.01	-0.05	-0.08	-0.04	-0.07	-0.03
210	VA6b	3.82	3.79	3.78	3.69	3.77	0.03	0.04	0.13*	0.05	0.01	0.09	0.02	0.09	0.01	-0.08
211	VA6c	3.88	3.87	3.86	3.81	3.86	0.01	0.02	0.07	0.02	0.01	0.06	0.01	0.05	0.00	-0.05
212	VA6d	3.87	3.87	3.87	3.81	3.85	-0.01	0.00	0.06	0.02	0.00	0.07	0.02	0.06	0.02	-0.05
213	VA6e	3.72	3.76	3.72	3.70	3.76	-0.05	-0.01	0.02	-0.04	0.04	0.07	0.01	0.02	-0.03	-0.06
214	VA7a	3.15	3.16	3.03	3.13	3.21	-0.02	0.12	0.02	-0.06	0.13	0.03	-0.05	-0.10	-0.18*	-0.08
215	VA7b	2.99	2.91	2.79	2.86	2.84	0.07	0.20	0.13	0.15	0.12	0.06	0.08	-0.07	-0.05	0.02
216	VA7c	3.14	3.04	2.97	3.01	2.96	0.10	0.17	0.13	0.18	0.07	0.03	0.08	-0.04	0.01	0.06
217	VA8a	3.62	3.46	3.45	3.35	3.27	0.16	0.17	0.27*	0.35**	0.00	0.11	0.19*	0.10	0.19*	0.08
218	VA8b	3.91	3.92	3.93	3.88	3.91	-0.02	-0.02	0.03	0.00	0.00	0.05	0.01	0.05	0.02	-0.03
219	VA8c	3.91	3.92	3.92	3.91	3.90	-0.01	-0.01	0.00	0.01	0.00	0.01	0.02	0.01	0.02	0.01
220	VA8d	3.37	3.30	3.33	3.31	3.35	0.08	0.04	0.07	0.03	-0.04	-0.01	-0.05	0.03	-0.01	-0.04
221	VA8e	3.71	3.65	3.72	3.74	3.73	0.05	-0.01	-0.04	-0.02	-0.07	-0.09	-0.07	-0.03	-0.01	0.02
222	VA8f	3.61	3.52	3.52	3.49	3.42	0.09	0.09	0.12	0.18*	0.00	0.03	0.09	0.03	0.09	0.07
223	VA8g	3.62	3.53	3.57	3.50	3.48	0.10	0.05	0.13	0.15	-0.04	0.03	0.05	0.08	0.10	0.02
224	VA8h	3.27	3.15	3.06	3.09	3.17	0.13	0.21	0.18	0.10	0.08	0.06	-0.02	-0.03	-0.11	-0.08

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225	VA8i	3.56	3.53	3.45	3.47	3.48	0.03	0.11	0.09	0.07	0.08	0.06	0.05	-0.02	-0.03	-0.01
226	VA8j	3.40	3.33	3.22	3.33	3.33	0.07	0.18	0.07	0.08	0.11	0.00	0.00	-0.11	-0.10	0.01
227	VA8k	3.53	3.55	3.48	3.57	3.53	-0.02	0.05	-0.04	0.00	0.07	-0.02	0.02	-0.10	-0.05	0.04
228	VA8l	3.51	3.49	3.51	3.58	3.55	0.01	0.00	-0.07	-0.04	-0.01	-0.08	-0.05	-0.07	-0.04	0.03
229	VA9a	3.09	3.03	3.02	3.01	3.15	0.06	0.07	0.09	-0.06	0.02	0.03	-0.12	0.01	-0.13	-0.14
230	VA9b	3.84	3.82	3.79	3.75	3.79	0.02	0.04	0.09	0.05	0.03	0.07	0.03	0.04	0.00	-0.04
231	VA9c	3.35	3.22	3.25	3.24	3.31	0.14	0.10	0.11	0.04	-0.03	-0.02	-0.10	0.01	-0.07	-0.08
232	VA9d	3.77	3.80	3.81	3.75	3.81	-0.03	-0.04	0.03	-0.04	-0.01	0.06	-0.01	0.07	0.00	-0.07
233	VA9e	3.33	3.23	3.33	3.33	3.43	0.11	0.00	0.01	-0.10	-0.11	-0.10	-0.2**	0.00	-0.10	-0.10
234	VA9f	3.85	3.84	3.85	3.83	3.83	0.01	-0.01	0.01	0.01	-0.01	0.01	0.00	0.02	0.02	0.00
235	VA9g	3.22	3.09	3.07	3.07	3.15	0.13	0.15	0.15	0.08	0.02	0.02	-0.05	0.00	-0.08	-0.07
236	VA9h	3.33	3.17	3.15	3.16	3.19	0.16	0.18	0.17	0.14	0.01	0.01	-0.02	-0.01	-0.03	-0.03
237	VA9i	3.44	3.43	3.40	3.41	3.44	0.01	0.04	0.03	0.00	0.02	0.02	-0.01	-0.01	-0.03	-0.03
238	VA9j	3.26	3.33	3.28	3.36	3.39	-0.07	-0.02	-0.10	-0.13	0.05	-0.03	-0.06	-0.07	-0.11	-0.04
239	VA9k	3.09	2.94	2.83	2.90	3.02	0.15	0.26*	0.19	0.07	0.11	0.04	-0.08	-0.07	-0.20*	-0.12
240	VA9l	2.95	2.77	2.72	2.78	2.93	0.18	0.22	0.16	0.02	0.04	-0.02	-0.16	-0.06	-0.21	-0.15
241	VA10a	3.61	3.58	3.57	3.55	3.55	0.03	0.04	0.06	0.06	0.01	0.03	0.03	0.02	0.02	0.00
242	VA10b	3.54	3.47	3.45	3.49	3.51	0.07	0.09	0.05	0.03	0.02	-0.02	-0.04	-0.04	-0.06	-0.02
243	VA10c	3.43	3.29	3.27	3.32	3.36	0.13	0.16	0.10	0.06	0.03	-0.03	-0.07	-0.05	-0.10	-0.04
244	VA10d	3.35	3.37	3.34	3.29	3.31	-0.02	0.01	0.07	0.05	0.03	0.08	0.07	0.05	0.04	-0.02
245	VA10e	3.35	3.32	3.30	3.29	3.24	0.03	0.05	0.06	0.11	0.02	0.03	0.08	0.01	0.06	0.05

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246	VA10f	3.31	3.30	3.26	3.25	3.23	0.01	0.05	0.06	0.08	0.04	0.05	0.07	0.01	0.03	0.02
247	VA10g	3.54	3.52	3.48	3.56	3.57	0.02	0.05	-0.03	-0.03	0.03	-0.05	-0.05	-0.08	-0.08	0.00
248	VA11a	3.00	2.85	2.82	2.98	2.86	0.15	0.18	0.02	0.14	0.04	-0.13	-0.01	-0.16	-0.04	0.12
249	VA11b	2.98	2.86	2.80	2.95	2.85	0.12	0.18	0.03	0.13	0.06	-0.09	0.01	-0.15	-0.05	0.10
250	VA11c	3.85	3.75	3.79	3.76	3.78	0.10	0.06	0.08	0.06	-0.03	-0.01	-0.03	0.02	0.00	-0.02
251	VA11d	3.65	3.57	3.48	3.55	3.57	0.07	0.16	0.10	0.08	0.09	0.03	0.00	-0.06	-0.09	-0.03
252	VA11e	3.27	3.14	3.12	3.14	3.25	0.12	0.14	0.12	0.02	0.02	0.00	-0.11	-0.02	-0.12	-0.10
253	VA11f	3.34	3.22	3.25	3.24	3.26	0.12	0.09	0.10	0.08	-0.03	-0.02	-0.04	0.01	-0.01	-0.02
254	VA11g	3.04	2.98	2.98	3.12	2.96	0.06	0.06	-0.08	0.07	0.00	-0.14	0.02	-0.14	0.02	0.16
255	VA12a	3.71	3.65	3.61	3.61	3.57	0.06	0.11	0.10	0.15*	0.04	0.04	0.08	0.00	0.04	0.04
256	VA12b	3.55	3.47	3.40	3.43	3.31	0.08	0.15	0.12	0.24**	0.06	0.03	0.15*	-0.03	0.09	0.12
257	VB1	3.73	3.65	3.65	3.63	3.63	0.08	0.08	0.10	0.09	0.00	0.02	0.01	0.02	0.01	0.00
258	VB2	3.70	3.61	3.64	3.57	3.65	0.09	0.06	0.13	0.05	-0.03	0.04	-0.04	0.07	-0.01	-0.08
259	VB3	3.66	3.66	3.61	3.60	3.67	0.01	0.05	0.07	0.00	0.05	0.06	-0.01	0.01	-0.06	-0.07
260	VC	3.70	3.63	3.65	3.65	3.71	0.07	0.05	0.05	-0.01	-0.02	-0.02	-0.08	-0.01	-0.06	-0.06
261	VD	3.83	3.75	3.79	3.77	3.82	0.08	0.04	0.06	0.01	-0.04	-0.02	-0.07	0.02	-0.04	-0.05
262	VE1	3.90	3.88	3.89	3.81	3.90	0.02	0.02	0.09*	0.01	-0.01	0.06	-0.02	0.07	-0.01	-0.08*
263	VE2	3.82	3.77	3.81	3.77	3.77	0.05	0.01	0.05	0.05	-0.04	-0.01	-0.01	0.04	0.04	0.00
264	VE3	3.84	3.84	3.82	3.76	3.80	0.00	0.02	0.08	0.04	0.02	0.08	0.04	0.06	0.02	-0.04
265	VE4a	3.73	3.56	3.65	3.54	3.62	0.16*	0.07	0.18**	0.10	-0.09	0.02	-0.06	0.11	0.03	-0.08
266	VE4b	3.75	3.64	3.74	3.59	3.65	0.12	0.01	0.16*	0.10	-0.10	0.05	-0.01	0.15*	0.09	-0.06

Order	Element	Mean by Experience					Mean Differences									
		Less than 5 years (1)	5 to 10 years (2)	11 to 15 years (3)	16 to 20 years (4)	21 or more years (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
267	VE4c	3.52	3.39	3.50	3.32	3.45	0.13	0.03	0.20*	0.08	-0.10	0.07	-0.05	0.17*	0.05	-0.12
268	VE4d	3.68	3.59	3.63	3.52	3.63	0.09	0.06	0.17*	0.05	-0.04	0.07	-0.04	0.11	0.00	-0.12
269	VE5	3.87	3.83	3.88	3.82	3.90	0.04	-0.01	0.04	-0.04	-0.05	0.01	-0.07*	0.05	-0.03	-0.08*
270	VE6a	3.90	3.88	3.89	3.82	3.92	0.01	0.01	0.08	-0.02	0.00	0.06	-0.03	0.07	-0.03	-0.10**
271	VE6b	3.82	3.79	3.82	3.72	3.83	0.02	0.00	0.10	-0.01	-0.03	0.07	-0.04	0.10	-0.01	-0.11**
272	VE6c	3.76	3.75	3.78	3.67	3.79	0.01	-0.02	0.09	-0.03	-0.03	0.08	-0.04	0.11	-0.01	-0.12**
273	VE6d	3.79	3.77	3.78	3.68	3.81	0.03	0.01	0.11	-0.01	-0.01	0.08	-0.04	0.10	-0.03	-0.12**
274	VE6e	3.69	3.70	3.71	3.63	3.72	0.00	-0.01	0.07	-0.03	-0.01	0.07	-0.03	0.08	-0.02	-0.10
275	VE7	3.85	3.83	3.85	3.72	3.88	0.02	0.00	0.12*	-0.03	-0.02	0.10*	-0.05	0.12**	-0.03	-0.16**
276	VF1	3.94	3.94	3.94	3.92	3.97	0.01	0.00	0.02	-0.02	0.00	0.02	-0.03	0.02	-0.02	-0.05
277	VF2	3.95	3.93	3.95	3.91	3.96	0.01	0.00	0.04	-0.02	-0.02	0.02	-0.03	0.04	-0.01	-0.05*
278	VG	3.90	3.87	3.88	3.82	3.91	0.04	0.02	0.08	0.00	-0.02	0.05	-0.04	0.06	-0.02	-0.09**
279	VH	3.92	3.88	3.88	3.84	3.94	0.03	0.03	0.07	-0.02	0.00	0.04	-0.05	0.04	-0.05	-0.09*
280	VI1	3.86	3.83	3.86	3.82	3.88	0.03	0.00	0.05	-0.02	-0.03	0.01	-0.05	0.05	-0.02	-0.06
281	VI2	3.83	3.84	3.85	3.83	3.88	-0.01	-0.02	0.00	-0.06	-0.01	0.01	-0.04	0.02	-0.03	-0.05
282	VJ1	3.87	3.87	3.90	3.85	3.90	0.00	-0.03	0.02	-0.04	-0.04	0.02	-0.04	0.06	0.00	-0.06
283	VJ2	3.87	3.88	3.90	3.85	3.90	-0.02	-0.03	0.02	-0.03	-0.02	0.04	-0.02	0.05	0.00	-0.05
284	VJ3	3.75	3.74	3.75	3.73	3.76	0.01	0.00	0.02	-0.01	-0.01	0.01	-0.02	0.02	-0.01	-0.03
285	VJ4	3.80	3.80	3.81	3.73	3.80	0.01	0.00	0.08	0.01	-0.01	0.07	0.00	0.08	0.01	-0.07
286	VK	3.72	3.68	3.72	3.63	3.73	0.04	0.00	0.09	-0.01	-0.04	0.05	-0.05	0.09	-0.01	-0.10
287	VL	3.74	3.72	3.72	3.69	3.77	0.02	0.03	0.05	-0.03	0.00	0.03	-0.05	0.03	-0.05	-0.08

Order	Element	Mean by Experience					Mean Differences									
		Less than 5 years (1)	5 to 10 years (2)	11 to 15 years (3)	16 to 20 years (4)	21 or more years (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
288	VM1	3.68	3.64	3.67	3.63	3.71	0.04	0.01	0.05	-0.03	-0.03	0.01	-0.07	0.04	-0.04	-0.08
289	VM2	3.64	3.64	3.69	3.64	3.72	0.00	-0.05	0.00	-0.09	-0.05	0.00	-0.08	0.05	-0.03	-0.08
290	VM3	3.76	3.74	3.76	3.78	3.84	0.02	0.00	-0.02	-0.08	-0.03	-0.04	-0.11**	-0.02	-0.08*	-0.06
291	VM4	3.60	3.66	3.67	3.68	3.73	-0.06	-0.07	-0.08	-0.13*	-0.01	-0.02	-0.07	-0.01	-0.06	-0.05
292	VM5a	3.74	3.75	3.75	3.72	3.80	-0.01	0.00	0.02	-0.06	0.00	0.03	-0.05	0.03	-0.05	-0.08
293	VM5b	3.61	3.65	3.66	3.70	3.77	-0.04	-0.04	-0.08	-0.15**	-0.01	-0.05	-0.12**	-0.04	-0.11*	-0.07
294	VM5c	3.56	3.60	3.60	3.63	3.70	-0.04	-0.05	-0.07	-0.14**	0.00	-0.03	-0.10	-0.03	-0.10	-0.07
295	VM6	3.69	3.65	3.67	3.71	3.74	0.04	0.02	-0.02	-0.05	-0.02	-0.06	-0.09	-0.05	-0.07	-0.03
296	VN1a	3.55	3.58	3.53	3.49	3.50	-0.02	0.02	0.06	0.05	0.04	0.08	0.07	0.04	0.03	-0.01
297	VN1b	3.60	3.62	3.53	3.51	3.56	-0.02	0.07	0.09	0.04	0.09	0.11	0.06	0.02	-0.03	-0.05
298	VN1c	3.58	3.59	3.52	3.53	3.55	-0.01	0.06	0.05	0.03	0.07	0.06	0.04	-0.01	-0.03	-0.02
299	VN2	3.75	3.71	3.65	3.65	3.67	0.04	0.10	0.10	0.07	0.06	0.06	0.04	0.00	-0.02	-0.02
300	VN3a	3.82	3.78	3.71	3.69	3.68	0.04	0.11	0.13	0.15**	0.07	0.09	0.1*	0.02	0.03	0.01
301	VN3b	3.76	3.73	3.66	3.63	3.64	0.03	0.10	0.13	0.12*	0.07	0.10	0.10	0.04	0.03	-0.01
302	VN4a	3.88	3.87	3.80	3.75	3.83	0.01	0.08	0.13**	0.05	0.07	0.12**	0.04	0.05	-0.03	-0.08
303	VN4b	3.86	3.86	3.82	3.75	3.84	0.00	0.04	0.11*	0.02	0.05	0.11*	0.02	0.07	-0.02	-0.09*
304	VN4c	3.87	3.89	3.87	3.81	3.87	-0.02	0.00	0.07	0.00	0.02	0.08*	0.02	0.06	-0.01	-0.07
305	VN4d	3.82	3.83	3.77	3.70	3.79	-0.01	0.04	0.12*	0.03	0.05	0.13**	0.04	0.08	-0.02	-0.09
306	VN4e	3.81	3.81	3.76	3.70	3.77	0.00	0.05	0.11	0.04	0.05	0.11	0.04	0.06	-0.01	-0.07
307	VN4f	3.77	3.79	3.72	3.68	3.76	-0.01	0.05	0.10	0.01	0.07	0.11	0.02	0.04	-0.04	-0.09
308	VO1	3.49	3.45	3.35	3.33	3.43	0.04	0.13	0.16	0.06	0.09	0.12	0.02	0.03	-0.08	-0.10

Order	Element	Mean by Experience					Mean Differences									
		Less than 5 years (1)	5 to 10 years (2)	11 to 15 years (3)	16 to 20 years (4)	21 or more years (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
309	VO2	3.47	3.46	3.35	3.32	3.44	0.01	0.12	0.15	0.03	0.11	0.14	0.02	0.03	-0.09	-0.12
310	VO3	3.41	3.42	3.33	3.28	3.43	0.00	0.08	0.13	-0.02	0.08	0.13	-0.01	0.05	-0.10	-0.15
311	VP1	3.34	3.34	3.31	3.23	3.32	0.00	0.04	0.11	0.02	0.03	0.11	0.02	0.08	-0.01	-0.09
312	VP2	3.39	3.37	3.36	3.28	3.37	0.02	0.03	0.10	0.01	0.01	0.08	-0.01	0.08	-0.01	-0.09
313	VQ	3.64	3.61	3.49	3.50	3.53	0.03	0.15	0.13	0.11	0.12	0.10	0.08	-0.02	-0.04	-0.02

TABLE H-2 ANOVA Subgroup Analysis by Geographic Region of Practice

Rating Scale

- 1 = Not Important
- 2 = Low Importance
- 3 = Moderate Importance
- 4 = Extremely Important

Key:

- *=Significant at the .05 level
- **=Significant at the .01 level

Order	Element	Mean by Geographic Region of Practice				Mean Differences					
		Midwest (M)	Northeast (N)	South (S)	West (W)	M vs. N	M vs. S	M vs. W	N vs. S	N vs. W	S vs. W
1	IA1ai	3.82	3.85	3.86	3.88	-0.03	-0.04	-0.06	-0.01	-0.03	-0.02
2	IA1aii	3.19	3.23	3.34	3.38	-0.04	-0.15**	-0.19**	-0.11	-0.15	-0.04
3	IA1aiii	2.87	2.99	2.89	3.02	-0.11	-0.02	-0.15	0.10	-0.03	-0.13
4	IA1aiv	3.52	3.58	3.59	3.64	-0.06	-0.06	-0.12	0.00	-0.06	-0.06
5	IA2a	3.02	3.13	3.18	3.18	-0.11	-0.16**	-0.16	-0.05	-0.05	0.00
6	IA2b	2.94	3.06	3.09	3.14	-0.12	-0.15*	-0.2**	-0.03	-0.08	-0.05
7	IB	3.69	3.76	3.76	3.71	-0.08	-0.07	-0.02	0.00	0.06	0.06
8	IC	3.46	3.48	3.57	3.52	-0.02	-0.11*	-0.06	-0.09	-0.04	0.05
9	ID	3.69	3.73	3.71	3.68	-0.03	-0.02	0.01	0.01	0.05	0.03
10	IE	3.19	3.21	3.22	3.18	-0.03	-0.03	0.00	-0.01	0.03	0.04
11	IIA	3.67	3.74	3.78	3.71	-0.07	-0.11**	-0.04	-0.04	0.03	0.06
12	IIB1	3.89	3.91	3.90	3.90	-0.02	-0.01	-0.01	0.01	0.01	0.00
13	IIB2	3.87	3.89	3.89	3.88	-0.02	-0.02	0.00	0.00	0.02	0.02
14	IIB3	3.84	3.86	3.88	3.84	-0.02	-0.04	0.00	-0.02	0.02	0.04
15	IIC1a	3.87	3.87	3.91	3.84	0.00	-0.03	0.03	-0.04	0.03	0.06*
16	IIC1b	3.65	3.72	3.75	3.70	-0.07	-0.10**	-0.05	-0.03	0.02	0.05

Order	Element	Mean by Geographic Region of Practice				Mean Differences					
		Midwest (M)	Northeast (N)	South (S)	West (W)	M vs. N	M vs. S	M vs. W	N vs. S	N vs. W	S vs. W
17	IIC1c	3.74	3.73	3.77	3.67	0.01	-0.03	0.07	-0.04	0.06	0.09*
18	IIC2	3.84	3.82	3.84	3.75	0.02	0.00	0.09*	-0.02	0.08	0.09**
19	IIC3	3.85	3.88	3.86	3.76	-0.02	0.00	0.09*	0.02	0.11**	0.09**
20	IIC4a	3.70	3.72	3.77	3.64	-0.02	-0.06	0.07	-0.04	0.09	0.13**
21	IIC4b	3.70	3.70	3.76	3.65	0.00	-0.07	0.04	-0.06	0.05	0.11*
22	IIC4c	3.58	3.59	3.65	3.57	-0.01	-0.07	0.01	-0.06	0.01	0.08
23	IID	3.92	3.90	3.92	3.92	0.02	0.00	0.00	-0.02	-0.02	0.01
24	IIE1	3.70	3.75	3.76	3.64	-0.05	-0.06	0.05	-0.01	0.10	0.11**
25	IIE2	3.82	3.84	3.86	3.82	-0.02	-0.04	0.01	-0.02	0.02	0.04
26	IIE3a	3.78	3.77	3.77	3.67	0.00	0.01	0.10*	0.00	0.10*	0.10*
27	IIE3b	3.84	3.83	3.83	3.76	0.01	0.01	0.08*	0.00	0.07	0.07
28	IIE3c	3.82	3.84	3.84	3.77	-0.01	-0.02	0.05	-0.01	0.06	0.07
29	IIE3d	3.77	3.79	3.79	3.67	-0.02	-0.02	0.10*	0.00	0.12**	0.12**
30	IIE3e	3.76	3.78	3.77	3.65	-0.02	-0.01	0.12**	0.01	0.13**	0.13**
31	IIE3f	3.78	3.78	3.79	3.73	-0.01	-0.01	0.05	0.00	0.06	0.06
32	IIE4	3.83	3.84	3.85	3.78	-0.01	-0.02	0.05	-0.01	0.06	0.06
33	IIE5	3.85	3.86	3.86	3.79	-0.02	-0.01	0.05	0.01	0.07	0.07
34	IIE6	3.79	3.78	3.82	3.72	0.01	-0.03	0.07	-0.04	0.06	0.1**
35	IIE7a	3.77	3.80	3.83	3.74	-0.03	-0.07	0.02	-0.04	0.05	0.09*
36	IIE7b	3.74	3.77	3.81	3.71	-0.02	-0.07	0.03	-0.04	0.06	0.10*
37	IIE7c	3.76	3.78	3.82	3.75	-0.02	-0.06	0.01	-0.04	0.03	0.07
38	IIE7d	3.69	3.74	3.77	3.68	-0.05	-0.08*	0.01	-0.03	0.05	0.09
39	IIE7e	3.82	3.83	3.86	3.84	-0.01	-0.04	-0.02	-0.03	-0.01	0.02

Order	Element	Mean by Geographic Region of Practice				Mean Differences					
		Midwest (M)	Northeast (N)	South (S)	West (W)	M vs. N	M vs. S	M vs. W	N vs. S	N vs. W	S vs. W
40	IIF1	3.79	3.80	3.82	3.75	-0.01	-0.03	0.04	-0.02	0.05	0.07
41	IIF2	3.74	3.79	3.75	3.71	-0.05	-0.01	0.02	0.04	0.07	0.04
42	IIF3	3.76	3.75	3.76	3.71	0.01	-0.01	0.05	-0.02	0.04	0.05
43	IIG	3.48	3.63	3.65	3.53	-0.15**	-0.17**	-0.04	-0.02	0.10	0.12*
44	IIH	3.59	3.65	3.73	3.60	-0.07	-0.14**	-0.01	-0.07	0.05	0.12*
45	III1	3.86	3.87	3.88	3.88	-0.01	-0.02	-0.01	-0.01	0.00	0.00
46	III2	3.82	3.80	3.85	3.79	0.02	-0.03	0.04	-0.05	0.02	0.06
47	III3	3.70	3.71	3.77	3.72	-0.01	-0.07	-0.02	-0.06	-0.01	0.05
48	IJJ	3.52	3.56	3.62	3.50	-0.04	-0.10*	0.02	-0.07	0.05	0.12*
49	IIIA1a	3.14	3.18	3.17	3.10	-0.04	-0.03	0.04	0.00	0.08	0.07
50	IIIA1b	3.14	3.18	3.21	3.08	-0.04	-0.07	0.06	-0.03	0.10	0.13
51	IIIA1ci	3.17	3.25	3.25	3.11	-0.08	-0.08	0.06	0.00	0.14	0.14
52	IIIA1cii	2.92	3.10	3.12	3.02	-0.18	-0.20**	-0.10	-0.02	0.08	0.10
53	IIIA2	3.81	3.78	3.81	3.77	0.03	0.00	0.04	-0.03	0.01	0.04
54	IIIB1a	3.57	3.67	3.60	3.55	-0.11	-0.03	0.02	0.07	0.12	0.05
55	IIIB1b	3.58	3.65	3.63	3.58	-0.07	-0.04	0.01	0.03	0.08	0.05
56	IIIB1c	3.46	3.53	3.50	3.46	-0.07	-0.04	0.00	0.03	0.07	0.03
57	IIIB2a	3.51	3.61	3.58	3.45	-0.10	-0.06	0.06	0.04	0.16*	0.12
58	IIIB2b	3.41	3.49	3.51	3.32	-0.08	-0.10	0.09	-0.02	0.17*	0.19**
59	IIIB3	3.64	3.71	3.62	3.58	-0.07	0.02	0.06	0.09	0.13	0.04
60	IIIB4	3.56	3.65	3.60	3.55	-0.09	-0.04	0.02	0.05	0.11	0.06
61	IIIC1a	3.86	3.86	3.87	3.83	0.00	-0.01	0.03	-0.01	0.03	0.04
62	IIIC1b	3.46	3.51	3.69	3.50	-0.05	-0.23**	-0.04	-0.18**	0.01	0.19**

Order	Element	Mean by Geographic Region of Practice				Mean Differences					
		Midwest (M)	Northeast (N)	South (S)	West (W)	M vs. N	M vs. S	M vs. W	N vs. S	N vs. W	S vs. W
63	IIIc1c	3.83	3.81	3.84	3.82	0.02	-0.02	0.01	-0.04	-0.02	0.02
64	IIIc1d	3.76	3.78	3.81	3.78	-0.02	-0.05	-0.02	-0.03	0.00	0.02
65	IIIc1e	3.85	3.85	3.86	3.84	0.00	-0.01	0.01	-0.01	0.00	0.02
66	IIIc1f	3.81	3.78	3.83	3.82	0.03	-0.02	-0.01	-0.05	-0.04	0.01
67	IIIc1g	3.82	3.81	3.86	3.82	0.01	-0.04	-0.01	-0.05	-0.02	0.03
68	IIIc1h	3.76	3.75	3.82	3.79	0.01	-0.06	-0.02	-0.07	-0.04	0.03
69	IIIc1i	3.45	3.68	3.63	3.39	-0.24**	-0.18**	0.05	0.05	0.29**	0.24**
70	IIIc1j	3.83	3.83	3.86	3.81	0.01	-0.03	0.02	-0.03	0.01	0.05
71	IIIc1k	3.69	3.66	3.80	3.69	0.03	-0.11**	-0.01	-0.14**	-0.04	0.11
72	IIIc1l	3.26	3.35	3.52	3.34	-0.09	-0.27**	-0.09	-0.17*	0.01	0.18*
73	IIIc1m	3.49	3.54	3.68	3.57	-0.05	-0.18**	-0.07	-0.14*	-0.03	0.11
74	IIIc1n	3.38	3.48	3.58	3.48	-0.10	-0.20**	-0.10	-0.10	-0.01	0.10
75	IIIc1o	3.79	3.77	3.84	3.82	0.02	-0.05	-0.02	-0.07	-0.04	0.03
76	IIIc1p	3.37	3.46	3.57	3.38	-0.09	-0.21**	-0.01	-0.12	0.08	0.20**
77	IIIc1q	3.57	3.69	3.72	3.68	-0.12	-0.15**	-0.10	-0.03	0.01	0.04
78	IIIc1r	3.48	3.38	3.55	3.51	0.10	-0.07	-0.03	-0.17*	-0.13	0.04
79	IIIc2a	3.80	3.79	3.85	3.82	0.01	-0.04	-0.01	-0.05	-0.02	0.03
80	IIIc2b	3.83	3.81	3.85	3.84	0.02	-0.02	-0.01	-0.04	-0.03	0.01
81	IIIc2c	3.50	3.50	3.58	3.53	0.00	-0.07	-0.03	-0.08	-0.03	0.05
82	IIIc2d	3.30	3.34	3.47	3.38	-0.03	-0.17**	-0.08	-0.13	-0.04	0.09
83	IIIc2e	3.02	3.05	3.25	3.09	-0.03	-0.23**	-0.07	-0.20	-0.04	0.16
84	IIIc2f	3.33	3.38	3.47	3.40	-0.06	-0.15*	-0.08	-0.09	-0.02	0.07
85	IIIc3a	3.53	3.53	3.67	3.65	0.00	-0.14**	-0.12	-0.14*	-0.12	0.02

Order	Element	Mean by Geographic Region of Practice				Mean Differences					
		Midwest (M)	Northeast (N)	South (S)	West (W)	M vs. N	M vs. S	M vs. W	N vs. S	N vs. W	S vs. W
86	IIIC3b	3.31	3.36	3.51	3.48	-0.06	-0.20**	-0.17*	-0.14	-0.11	0.03
87	IIIC3c	3.65	3.59	3.72	3.72	0.06	-0.07	-0.07	-0.14*	-0.14	0.00
88	IIIC3d	3.15	3.22	3.40	3.20	-0.07	-0.24**	-0.04	-0.18*	0.02	0.20*
89	IIIC3e	3.54	3.55	3.64	3.61	0.00	-0.10	-0.07	-0.10	-0.06	0.03
90	IIIC4a	3.35	3.50	3.56	3.41	-0.16*	-0.21**	-0.07	-0.05	0.09	0.14*
91	IIIC4b	3.24	3.41	3.50	3.34	-0.16*	-0.25**	-0.09	-0.09	0.07	0.16*
92	IIIC4c	3.49	3.48	3.63	3.51	0.01	-0.14**	-0.02	-0.15*	-0.03	0.12
93	IIIC4d	2.73	2.85	2.98	2.88	-0.12	-0.25**	-0.15	-0.13	-0.03	0.10
94	IIIC5a	3.80	3.78	3.82	3.77	0.02	-0.02	0.03	-0.04	0.01	0.05
95	IIIC5b	3.09	3.30	3.37	3.23	-0.22*	-0.29**	-0.15	-0.07	0.07	0.14
96	IIIC5c	3.17	3.34	3.42	3.34	-0.17	-0.26**	-0.17	-0.08	0.00	0.09
97	IIIC5d	3.07	3.25	3.34	3.22	-0.18	-0.27**	-0.15	-0.09	0.03	0.12
98	IIIC5e	3.38	3.50	3.54	3.49	-0.12	-0.16**	-0.11	-0.04	0.01	0.05
99	IIIC5f	3.24	3.42	3.47	3.38	-0.17	-0.23**	-0.14	-0.05	0.04	0.09
100	IIIC5g	3.11	3.25	3.33	3.19	-0.14	-0.22**	-0.07	-0.08	0.06	0.15
101	IIIC5h	3.09	3.26	3.35	3.27	-0.17	-0.26**	-0.18	-0.08	-0.01	0.07
102	IIID1	3.03	3.07	3.31	3.18	-0.04	-0.28**	-0.15	-0.24**	-0.11	0.14
103	IIID2	3.03	3.05	3.32	3.20	-0.01	-0.29**	-0.17	-0.28**	-0.16	0.12
104	IIID3	3.70	3.63	3.72	3.74	0.06	-0.03	-0.04	-0.09	-0.10	-0.01
105	IIID4	3.08	3.20	3.35	3.29	-0.12	-0.27**	-0.21*	-0.15	-0.09	0.06
106	IIID5	3.32	3.31	3.44	3.39	0.00	-0.13	-0.08	-0.13	-0.08	0.05
107	IIID6	3.28	3.30	3.38	3.42	-0.01	-0.09	-0.14	-0.08	-0.12	-0.04
108	IIID7	2.97	3.00	3.14	3.11	-0.03	-0.16	-0.13	-0.14	-0.11	0.03

Order	Element	Mean by Geographic Region of Practice				Mean Differences					
		Midwest (M)	Northeast (N)	South (S)	West (W)	M vs. N	M vs. S	M vs. W	N vs. S	N vs. W	S vs. W
109	III E1	3.22	3.49	3.43	3.33	-0.26**	-0.21**	-0.11	0.06	0.15	0.10
110	III E2	3.42	3.53	3.58	3.53	-0.11	-0.16**	-0.11	-0.05	0.00	0.05
111	III E3	3.45	3.54	3.61	3.49	-0.09	-0.15**	-0.03	-0.06	0.06	0.12
112	III E4	3.57	3.70	3.73	3.69	-0.13*	-0.16**	-0.12*	-0.03	0.01	0.04
113	III E5	3.81	3.75	3.86	3.85	0.06	-0.05	-0.03	-0.11**	-0.09*	0.02
114	III E6	3.27	3.42	3.54	3.44	-0.15	-0.28**	-0.18*	-0.12	-0.03	0.10
115	III E7	3.12	3.27	3.40	3.26	-0.15	-0.28**	-0.14	-0.14	0.01	0.15
116	III E8	3.71	3.62	3.73	3.71	0.09	-0.02	0.00	-0.11*	-0.09	0.02
117	III E9	3.36	3.39	3.49	3.45	-0.02	-0.12	-0.09	-0.10	-0.06	0.04
118	III E10	3.03	3.14	3.35	3.17	-0.11	-0.31**	-0.14	-0.20*	-0.03	0.17
119	III E11	3.78	3.70	3.82	3.75	0.07	-0.04	0.03	-0.11**	-0.05	0.06
120	III E12	3.55	3.49	3.66	3.62	0.06	-0.11*	-0.07	-0.17**	-0.13	0.04
121	III E13	3.05	3.09	3.34	3.22	-0.04	-0.29**	-0.17	-0.25**	-0.13	0.11
122	III E14	3.18	3.15	3.35	3.33	0.03	-0.16*	-0.15	-0.19*	-0.18	0.02
123	III E15	3.54	3.54	3.62	3.58	0.00	-0.09	-0.04	-0.08	-0.04	0.04
124	III E16	3.04	3.05	3.23	3.14	-0.01	-0.19*	-0.10	-0.18	-0.09	0.09
125	III E17	3.34	3.40	3.52	3.43	-0.07	-0.18**	-0.09	-0.12	-0.03	0.09
126	III E18	3.33	3.34	3.47	3.46	-0.01	-0.14*	-0.13	-0.13	-0.12	0.01
127	III E19	3.46	3.34	3.57	3.48	0.12	-0.11	-0.02	-0.23**	-0.13	0.09
128	III E20	3.09	3.10	3.27	3.10	-0.01	-0.18**	-0.01	-0.17	0.00	0.18*
129	III E21	3.05	3.09	3.26	3.08	-0.03	-0.21**	-0.03	-0.18	0.01	0.19*
130	III E22	3.16	3.23	3.48	3.23	-0.07	-0.32**	-0.07	-0.25**	0.00	0.25**
131	III E23	3.41	3.31	3.52	3.46	0.10	-0.11	-0.05	-0.21**	-0.15	0.06

Order	Element	Mean by Geographic Region of Practice				Mean Differences					
		Midwest (M)	Northeast (N)	South (S)	West (W)	M vs. N	M vs. S	M vs. W	N vs. S	N vs. W	S vs. W
132	III F1a	3.58	3.57	3.62	3.60	0.01	-0.04	-0.02	-0.05	-0.03	0.02
133	III F1b	3.52	3.54	3.63	3.57	-0.02	-0.11*	-0.06	-0.09	-0.03	0.05
134	III F1c	3.37	3.38	3.48	3.42	-0.01	-0.11	-0.05	-0.10	-0.05	0.06
135	III F1d	3.18	3.05	3.29	3.15	0.13	-0.11	0.02	-0.24**	-0.11	0.13
136	III F1e	3.64	3.64	3.69	3.63	-0.01	-0.06	0.01	-0.05	0.01	0.06
137	III F1f	3.55	3.56	3.64	3.55	-0.02	-0.09	-0.01	-0.08	0.01	0.08
138	III F2	3.06	3.00	3.22	3.04	0.06	-0.15	0.02	-0.21*	-0.03	0.18
139	III F3	3.44	3.42	3.54	3.34	0.02	-0.10	0.10	-0.12	0.08	0.20**
140	III F4	3.74	3.72	3.74	3.70	0.02	0.00	0.04	-0.02	0.02	0.04
141	III G1	3.87	3.90	3.92	3.87	-0.03	-0.05	0.00	-0.02	0.03	0.05
142	III G2	3.89	3.91	3.93	3.88	-0.02	-0.03	0.01	-0.02	0.03	0.04
143	III H1	3.92	3.92	3.96	3.92	0.00	-0.03	0.00	-0.03	0.00	0.04
144	III H2	3.82	3.84	3.90	3.86	-0.02	-0.08**	-0.04	-0.06	-0.02	0.03
145	III H3	3.72	3.76	3.83	3.78	-0.04	-0.12**	-0.06	-0.08	-0.02	0.06
146	III H4	3.69	3.71	3.81	3.71	-0.02	-0.12**	-0.02	-0.10	0.00	0.10
147	III H5	3.62	3.61	3.76	3.64	0.01	-0.14**	-0.02	-0.15**	-0.03	0.12*
148	IVA1a	3.74	3.71	3.78	3.74	0.03	-0.04	0.00	-0.07	-0.03	0.04
149	IVA1b	3.35	3.38	3.51	3.37	-0.03	-0.16**	-0.02	-0.12	0.01	0.13
150	IVA1c	3.16	3.29	3.40	3.22	-0.13	-0.24**	-0.06	-0.11	0.07	0.18*
151	IVA2a	3.85	3.83	3.87	3.80	0.02	-0.02	0.06	-0.04	0.03	0.08*
152	IVA2b	3.82	3.81	3.84	3.76	0.01	-0.02	0.05	-0.02	0.05	0.07
153	IVA3	3.74	3.79	3.83	3.74	-0.05	-0.09**	0.00	-0.04	0.05	0.09
154	IVB1a	3.91	3.91	3.92	3.89	0.01	-0.01	0.02	-0.01	0.01	0.03

Order	Element	Mean by Geographic Region of Practice				Mean Differences					
		Midwest (M)	Northeast (N)	South (S)	West (W)	M vs. N	M vs. S	M vs. W	N vs. S	N vs. W	S vs. W
155	IVB1b	3.84	3.84	3.88	3.84	0.00	-0.04	0.00	-0.04	0.00	0.04
156	IVB1c	3.91	3.89	3.91	3.87	0.02	0.00	0.04	-0.03	0.02	0.05
157	IVB1d	3.72	3.76	3.79	3.71	-0.04	-0.07	0.01	-0.04	0.04	0.08
158	IVB1e	3.88	3.85	3.89	3.85	0.03	-0.01	0.03	-0.03	0.00	0.03
159	IVB1f	3.60	3.63	3.68	3.61	-0.04	-0.09	-0.01	-0.05	0.03	0.08
160	IVB1g	3.42	3.54	3.61	3.48	-0.12	-0.19**	-0.07	-0.07	0.06	0.12
161	IVB2a	3.77	3.73	3.79	3.77	0.04	-0.03	-0.01	-0.07	-0.05	0.02
162	IVB2bi	3.88	3.84	3.89	3.85	0.04	-0.01	0.03	-0.06	-0.01	0.04
163	IVB2bii	3.84	3.82	3.87	3.82	0.02	-0.04	0.02	-0.06	0.00	0.06
164	IVB2biii	3.48	3.41	3.60	3.51	0.07	-0.12*	-0.03	-0.19**	-0.09	0.09
165	IVB2biv	3.53	3.49	3.64	3.51	0.04	-0.12*	0.02	-0.16**	-0.02	0.14*
166	IVB2bv	3.78	3.78	3.84	3.75	0.00	-0.06	0.02	-0.06	0.03	0.08
167	IVB3a	3.73	3.73	3.77	3.69	-0.01	-0.05	0.03	-0.04	0.04	0.08
168	IVB3b	3.77	3.77	3.79	3.76	0.00	-0.03	0.01	-0.02	0.01	0.04
169	IVB4a	3.56	3.65	3.67	3.62	-0.09	-0.10	-0.05	-0.01	0.03	0.05
170	IVB4b	3.57	3.57	3.65	3.60	0.00	-0.07	-0.03	-0.07	-0.03	0.04
171	IVB5	3.41	3.51	3.53	3.46	-0.10	-0.12	-0.05	-0.02	0.04	0.07
172	IVB6	3.48	3.54	3.55	3.55	-0.06	-0.07	-0.07	-0.02	-0.01	0.00
173	IVC1	3.09	3.13	3.27	3.17	-0.04	-0.18**	-0.07	-0.14	-0.03	0.10
174	IVC2a	3.35	3.39	3.63	3.48	-0.04	-0.28**	-0.13	-0.23**	-0.09	0.14*
175	IVC2b	3.46	3.52	3.71	3.61	-0.05	-0.25**	-0.14*	-0.20**	-0.09	0.11
176	IVC2c	3.29	3.31	3.60	3.46	-0.02	-0.31**	-0.17*	-0.29**	-0.14	0.14*
177	IVC2d	3.51	3.53	3.70	3.62	-0.02	-0.19**	-0.12	-0.18**	-0.10	0.08

Order	Element	Mean by Geographic Region of Practice				Mean Differences					
		Midwest (M)	Northeast (N)	South (S)	West (W)	M vs. N	M vs. S	M vs. W	N vs. S	N vs. W	S vs. W
178	IVC2e	3.36	3.40	3.58	3.49	-0.04	-0.22**	-0.13	-0.18**	-0.09	0.09
179	IVC2f	3.41	3.49	3.70	3.56	-0.08	-0.3**	-0.16**	-0.21**	-0.07	0.14**
180	IVC3a	3.47	3.45	3.68	3.52	0.02	-0.2**	-0.05	-0.22**	-0.07	0.16*
181	IVC3b	3.64	3.65	3.72	3.72	0.00	-0.07	-0.08	-0.07	-0.07	0.00
182	IVC3c	3.31	3.46	3.64	3.52	-0.15*	-0.33**	-0.21**	-0.17**	-0.06	0.12
183	VA1a	3.74	3.74	3.76	3.77	0.00	-0.02	-0.03	-0.03	-0.03	-0.01
184	VA1b	3.69	3.63	3.79	3.71	0.06	-0.10*	-0.01	-0.16**	-0.07	0.08
185	VA1c	3.88	3.84	3.91	3.87	0.03	-0.03	0.00	-0.06	-0.03	0.04
186	VA1d	3.75	3.70	3.79	3.78	0.06	-0.03	-0.02	-0.09	-0.08	0.01
187	VA2a	3.78	3.71	3.78	3.77	0.08	0.00	0.02	-0.07	-0.06	0.01
188	VA2b	3.91	3.89	3.93	3.89	0.02	-0.02	0.02	-0.04	0.00	0.04
189	VA2c	3.90	3.88	3.90	3.86	0.03	0.00	0.04	-0.03	0.01	0.04
190	VA2d	3.33	3.39	3.46	3.41	-0.06	-0.14	-0.09	-0.07	-0.02	0.05
191	VA2e	3.84	3.80	3.83	3.83	0.04	0.01	0.00	-0.03	-0.03	0.00
192	VA2f	3.23	3.40	3.52	3.53	-0.16	-0.28**	-0.29**	-0.12	-0.13	-0.01
193	VA3a	3.21	3.41	3.55	3.36	-0.20**	-0.35**	-0.16	-0.15	0.04	0.19**
194	VA3b	3.19	3.21	3.45	3.30	-0.03	-0.27**	-0.11	-0.24**	-0.08	0.16
195	VA3c	3.11	3.16	3.42	3.24	-0.04	-0.31**	-0.13	-0.27**	-0.09	0.18*
196	VA3d	3.41	3.37	3.52	3.41	0.04	-0.11	0.00	-0.15	-0.04	0.11
197	VA3e	3.77	3.67	3.77	3.72	0.10	0.00	0.05	-0.10*	-0.05	0.05
198	VA3f	3.79	3.74	3.81	3.79	0.05	-0.02	0.00	-0.07	-0.05	0.02
199	VA3g	3.57	3.56	3.69	3.67	0.01	-0.12*	-0.10	-0.13*	-0.11	0.02
200	VA4a	3.19	3.37	3.55	3.40	-0.18*	-0.36**	-0.21**	-0.18**	-0.03	0.15*

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		Midwest (M)	Northeast (N)	South (S)	West (W)	M vs. N	M vs. S	M vs. W	N vs. S	N vs. W	S vs. W
201	VA4b	3.71	3.70	3.79	3.74	0.01	-0.08*	-0.03	-0.09	-0.04	0.05
202	VA5a	3.01	3.07	3.34	3.18	-0.06	-0.33**	-0.17	-0.27**	-0.11	0.16
203	VA5b	3.19	3.21	3.45	3.28	-0.02	-0.27**	-0.09	-0.24**	-0.07	0.17*
204	VA5c	3.37	3.36	3.54	3.42	0.01	-0.17**	-0.05	-0.18*	-0.06	0.12
205	VA5d	3.50	3.54	3.62	3.61	-0.04	-0.12*	-0.11	-0.08	-0.08	0.01
206	VA5e	3.75	3.72	3.80	3.76	0.03	-0.05	-0.01	-0.07	-0.04	0.03
207	VA5f	3.80	3.74	3.83	3.81	0.06	-0.04	-0.01	-0.10*	-0.07	0.03
208	VA5g	2.67	2.87	3.04	2.84	-0.21	-0.38**	-0.17	-0.17	0.03	0.20
209	VA6a	3.13	3.20	3.38	3.23	-0.07	-0.25**	-0.10	-0.19*	-0.03	0.15
210	VA6b	3.75	3.68	3.81	3.81	0.07	-0.06	-0.05	-0.13**	-0.12*	0.01
211	VA6c	3.86	3.82	3.88	3.86	0.05	-0.02	0.01	-0.07	-0.04	0.03
212	VA6d	3.86	3.81	3.88	3.85	0.05	-0.02	0.01	-0.07	-0.04	0.03
213	VA6e	3.74	3.65	3.77	3.77	0.09	-0.03	-0.03	-0.12*	-0.12*	-0.01
214	VA7a	3.01	3.10	3.30	3.11	-0.09	-0.29**	-0.09	-0.2*	-0.01	0.20*
215	VA7b	2.69	2.83	3.02	2.82	-0.14	-0.33**	-0.13	-0.20	0.01	0.21
216	VA7c	2.84	2.88	3.18	2.96	-0.04	-0.33**	-0.12	-0.30**	-0.08	0.21*
217	VA8a	3.25	3.35	3.49	3.40	-0.10	-0.25**	-0.15	-0.15	-0.05	0.09
218	VA8b	3.89	3.90	3.93	3.91	-0.01	-0.03	-0.01	-0.02	0.00	0.02
219	VA8c	3.91	3.89	3.92	3.90	0.02	-0.01	0.01	-0.03	-0.01	0.02
220	VA8d	3.16	3.41	3.43	3.29	-0.25**	-0.26**	-0.12	-0.02	0.12	0.14
221	VA8e	3.68	3.68	3.76	3.69	0.00	-0.08	-0.02	-0.08	-0.02	0.06
222	VA8f	3.35	3.47	3.61	3.46	-0.12	-0.27**	-0.11	-0.14	0.01	0.15
223	VA8g	3.43	3.51	3.62	3.47	-0.08	-0.19**	-0.04	-0.11	0.04	0.15

Order	Element	Mean by Geographic Region of Practice				Mean Differences					
		Midwest (M)	Northeast (N)	South (S)	West (W)	M vs. N	M vs. S	M vs. W	N vs. S	N vs. W	S vs. W
224	VA8h	2.98	3.04	3.30	3.17	-0.05	-0.31**	-0.19	-0.26**	-0.13	0.12
225	VA8i	3.40	3.44	3.61	3.43	-0.04	-0.21**	-0.03	-0.17*	0.01	0.18*
226	VA8j	3.20	3.16	3.48	3.29	0.04	-0.27**	-0.09	-0.32**	-0.13	0.18*
227	VA8k	3.43	3.46	3.63	3.51	-0.03	-0.20**	-0.08	-0.17**	-0.05	0.12
228	VA8l	3.41	3.50	3.62	3.53	-0.08	-0.21**	-0.11	-0.12	-0.03	0.10
229	VA9a	2.91	3.05	3.23	3.05	-0.14	-0.31**	-0.14	-0.17	0.00	0.18
230	VA9b	3.82	3.72	3.83	3.79	0.09	-0.02	0.03	-0.11**	-0.06	0.05
231	VA9c	3.17	3.22	3.42	3.19	-0.05	-0.25**	-0.02	-0.20**	0.03	0.23**
232	VA9d	3.76	3.78	3.84	3.80	-0.01	-0.08*	-0.03	-0.07	-0.02	0.05
233	VA9e	3.18	3.28	3.49	3.39	-0.10	-0.31**	-0.22**	-0.22**	-0.12	0.10
234	VA9f	3.84	3.76	3.88	3.86	0.07	-0.04	-0.02	-0.11**	-0.10*	0.01
235	VA9g	2.95	2.97	3.28	3.19	-0.02	-0.33**	-0.24**	-0.3**	-0.22	0.09
236	VA9h	3.01	3.12	3.33	3.23	-0.11	-0.32**	-0.22*	-0.21*	-0.11	0.10
237	VA9i	3.28	3.35	3.58	3.40	-0.07	-0.3**	-0.13	-0.23**	-0.06	0.18**
238	VA9j	3.27	3.25	3.45	3.30	0.01	-0.18**	-0.04	-0.19**	-0.05	0.14
239	VA9k	2.79	2.91	3.16	2.87	-0.12	-0.37**	-0.08	-0.25**	0.04	0.29**
240	VA9l	2.62	2.81	3.00	2.87	-0.19	-0.38**	-0.25*	-0.19	-0.06	0.13
241	VA10a	3.48	3.43	3.70	3.55	0.05	-0.22**	-0.07	-0.27**	-0.11	0.16*
242	VA10b	3.42	3.42	3.58	3.47	-0.01	-0.17**	-0.06	-0.16*	-0.05	0.11
243	VA10c	3.26	3.27	3.43	3.34	0.00	-0.16*	-0.08	-0.16	-0.08	0.08
244	VA10d	3.22	3.17	3.46	3.37	0.05	-0.24**	-0.15	-0.28**	-0.20*	0.09
245	VA10e	3.14	3.16	3.42	3.33	-0.02	-0.27**	-0.18*	-0.25**	-0.16	0.09
246	VA10f	3.11	3.15	3.37	3.35	-0.04	-0.26**	-0.24**	-0.22**	-0.20	0.02

Order	Element	Mean by Geographic Region of Practice				Mean Differences					
		Midwest (M)	Northeast (N)	South (S)	West (W)	M vs. N	M vs. S	M vs. W	N vs. S	N vs. W	S vs. W
247	VA10g	3.45	3.54	3.58	3.59	-0.08	-0.13	-0.13	-0.04	-0.05	-0.01
248	VA11a	2.71	2.77	3.07	2.84	-0.07	-0.36**	-0.14	-0.29**	-0.07	0.23*
249	VA11b	2.67	2.75	3.08	2.80	-0.08	-0.41**	-0.12	-0.33**	-0.04	0.29**
250	VA11c	3.78	3.70	3.81	3.82	0.08	-0.02	-0.04	-0.11*	-0.12*	-0.01
251	VA11d	3.56	3.45	3.62	3.56	0.11	-0.06	0.00	-0.17*	-0.11	0.06
252	VA11e	3.04	3.10	3.33	3.26	-0.06	-0.29**	-0.22*	-0.23**	-0.16	0.07
253	VA11f	3.14	3.12	3.40	3.29	0.02	-0.26**	-0.16	-0.28**	-0.18	0.10
254	VA11g	2.84	2.89	3.15	3.01	-0.06	-0.31**	-0.18	-0.26**	-0.12	0.14
255	VA12a	3.60	3.60	3.64	3.60	0.00	-0.04	-0.01	-0.04	0.00	0.04
256	VA12b	3.30	3.41	3.48	3.37	-0.11	-0.17**	-0.06	-0.07	0.04	0.11
257	VB1	3.60	3.61	3.69	3.68	0.00	-0.08	-0.07	-0.08	-0.07	0.01
258	VB2	3.60	3.66	3.64	3.69	-0.05	-0.04	-0.09	0.01	-0.04	-0.05
259	VB3	3.60	3.63	3.68	3.67	-0.03	-0.08	-0.07	-0.05	-0.04	0.01
260	VC	3.64	3.66	3.70	3.71	-0.02	-0.06	-0.07	-0.04	-0.05	-0.01
261	VD	3.79	3.77	3.81	3.81	0.02	-0.01	-0.02	-0.04	-0.04	0.00
262	VE1	3.89	3.88	3.89	3.88	0.01	0.00	0.00	-0.01	0.00	0.01
263	VE2	3.76	3.73	3.83	3.76	0.03	-0.07	0.00	-0.1*	-0.03	0.07
264	VE3	3.81	3.79	3.84	3.80	0.02	-0.03	0.01	-0.05	-0.01	0.04
265	VE4a	3.58	3.56	3.69	3.59	0.02	-0.11*	0.00	-0.13*	-0.02	0.11
266	VE4b	3.64	3.59	3.73	3.66	0.06	-0.08	-0.02	-0.14**	-0.08	0.06
267	VE4c	3.37	3.37	3.52	3.45	0.00	-0.15**	-0.08	-0.15*	-0.08	0.07
268	VE4d	3.55	3.58	3.69	3.61	-0.03	-0.15**	-0.06	-0.11*	-0.03	0.09
269	VE5	3.88	3.89	3.88	3.83	0.00	0.01	0.06	0.01	0.06	0.05

Order	Element	Mean by Geographic Region of Practice				Mean Differences					
		Midwest (M)	Northeast (N)	South (S)	West (W)	M vs. N	M vs. S	M vs. W	N vs. S	N vs. W	S vs. W
270	VE6a	3.88	3.90	3.91	3.88	-0.02	-0.02	0.00	-0.01	0.01	0.02
271	VE6b	3.78	3.78	3.84	3.80	0.00	-0.06	-0.02	-0.07	-0.02	0.05
272	VE6c	3.73	3.72	3.81	3.76	0.00	-0.08*	-0.03	-0.08	-0.03	0.05
273	VE6d	3.76	3.76	3.82	3.75	0.00	-0.06	0.01	-0.05	0.01	0.07
274	VE6e	3.67	3.63	3.74	3.73	0.05	-0.07	-0.06	-0.12*	-0.11	0.01
275	VE7	3.80	3.85	3.86	3.85	-0.05	-0.06	-0.05	-0.01	0.00	0.01
276	VF1	3.95	3.96	3.96	3.94	-0.01	-0.01	0.01	0.00	0.02	0.01
277	VF2	3.94	3.96	3.96	3.94	-0.02	-0.02	-0.01	0.00	0.01	0.01
278	VG	3.86	3.89	3.91	3.88	-0.03	-0.05	-0.02	-0.02	0.01	0.03
279	VH	3.87	3.91	3.92	3.92	-0.04	-0.04	-0.05	-0.01	-0.01	0.00
280	VI1	3.85	3.85	3.88	3.84	0.01	-0.03	0.01	-0.03	0.01	0.04
281	VI2	3.85	3.86	3.87	3.83	-0.01	-0.02	0.02	-0.02	0.03	0.05
282	VJ1	3.87	3.89	3.89	3.91	-0.02	-0.01	-0.03	0.00	-0.02	-0.02
283	VJ2	3.87	3.89	3.90	3.89	-0.02	-0.03	-0.02	-0.01	0.00	0.01
284	VJ3	3.74	3.76	3.76	3.72	-0.01	-0.01	0.02	0.00	0.03	0.03
285	VJ4	3.79	3.77	3.80	3.79	0.03	-0.01	0.01	-0.04	-0.02	0.02
286	VK	3.66	3.70	3.74	3.73	-0.03	-0.08	-0.07	-0.04	-0.04	0.00
287	VL	3.71	3.73	3.77	3.74	-0.02	-0.06	-0.03	-0.03	-0.01	0.03
288	VM1	3.64	3.67	3.71	3.67	-0.03	-0.06	-0.03	-0.03	0.00	0.03
289	VM2	3.63	3.68	3.73	3.67	-0.05	-0.11**	-0.05	-0.06	0.00	0.06
290	VM3	3.77	3.77	3.81	3.80	0.00	-0.04	-0.03	-0.04	-0.03	0.01
291	VM4	3.62	3.67	3.74	3.71	-0.05	-0.12**	-0.09	-0.06	-0.03	0.03
292	VM5a	3.73	3.74	3.80	3.76	0.00	-0.07	-0.03	-0.07	-0.03	0.04

Order	Element	Mean by Geographic Region of Practice				Mean Differences					
		Midwest (M)	Northeast (N)	South (S)	West (W)	M vs. N	M vs. S	M vs. W	N vs. S	N vs. W	S vs. W
293	VM5b	3.66	3.68	3.74	3.70	-0.02	-0.08	-0.05	-0.06	-0.02	0.04
294	VM5c	3.60	3.60	3.69	3.64	0.00	-0.09	-0.04	-0.09	-0.04	0.05
295	VM6	3.68	3.67	3.72	3.71	0.01	-0.04	-0.03	-0.05	-0.04	0.01
296	VN1a	3.41	3.48	3.63	3.53	-0.07	-0.22**	-0.12	-0.15**	-0.05	0.10
297	VN1b	3.46	3.50	3.65	3.59	-0.04	-0.19**	-0.13	-0.15**	-0.09	0.06
298	VN1c	3.45	3.49	3.65	3.55	-0.05	-0.21**	-0.10	-0.16**	-0.06	0.10
299	VN2	3.61	3.67	3.74	3.67	-0.06	-0.13**	-0.06	-0.07	0.00	0.08
300	VN3a	3.62	3.67	3.80	3.73	-0.05	-0.18**	-0.11	-0.13**	-0.06	0.07
301	VN3b	3.58	3.59	3.77	3.68	-0.01	-0.19**	-0.10	-0.18**	-0.10	0.09
302	VN4a	3.76	3.79	3.87	3.87	-0.03	-0.12**	-0.12**	-0.08*	-0.08	0.00
303	VN4b	3.79	3.77	3.87	3.89	0.02	-0.08*	-0.09*	-0.10**	-0.12**	-0.02
304	VN4c	3.85	3.83	3.89	3.90	0.01	-0.05	-0.05	-0.06	-0.07	0.00
305	VN4d	3.73	3.74	3.84	3.83	-0.01	-0.11**	-0.10*	-0.10*	-0.09	0.01
306	VN4e	3.69	3.72	3.83	3.81	-0.03	-0.13**	-0.12**	-0.11**	-0.09	0.02
307	VN4f	3.66	3.71	3.82	3.80	-0.04	-0.15**	-0.13**	-0.11*	-0.09	0.02
308	VO1	3.37	3.28	3.52	3.40	0.09	-0.15**	-0.03	-0.24**	-0.12	0.12
309	VO2	3.37	3.30	3.51	3.42	0.07	-0.14*	-0.05	-0.21**	-0.12	0.09
310	VO3	3.33	3.26	3.49	3.40	0.07	-0.16**	-0.07	-0.22**	-0.14	0.09
311	VP1	3.20	3.24	3.43	3.31	-0.04	-0.23**	-0.11	-0.19**	-0.08	0.12
312	VP2	3.24	3.29	3.46	3.38	-0.05	-0.22**	-0.13	-0.17*	-0.08	0.09
313	VQ	3.51	3.43	3.59	3.61	0.08	-0.08	-0.10	-0.16*	-0.18*	-0.02

TABLE H-3 ANOVA Subgroup Analysis by Supervisory Role

Rating Scale
 1 = Not Important
 2 = Low Importance
 3 = Moderate Importance
 4 = Extremely Important

Key:
 *=Significant at the .05 level
 **=Significant at the .01 level

Order	Element	Mean by Geographic Region of Practice			Mean Differences		
		Rural (1)	Suburban (2)	Urban (3)	1 vs 2	1 vs 3	2 vs 3
1	IA1ai	3.83	3.84	3.86	-0.02	-0.03	-0.02
2	IA1aii	3.19	3.25	3.33	-0.06	-0.14	-0.08
3	IA1aiii	2.88	2.90	2.95	-0.02	-0.07	-0.05
4	IA1aiv	3.44	3.56	3.62	-0.11	-0.18**	-0.06
5	IA2a	3.04	3.09	3.17	-0.06	-0.13	-0.07
6	IA2b	2.98	3.02	3.08	-0.04	-0.11	-0.07
7	IB	3.79	3.73	3.72	0.06	0.06	0.00
8	IC	3.55	3.50	3.52	0.05	0.02	-0.02
9	ID	3.70	3.70	3.71	0.00	-0.01	-0.01
10	IE	3.27	3.14	3.22	0.13	0.05	-0.08
11	IIA	3.74	3.70	3.75	0.04	-0.01	-0.05
12	IIB1	3.89	3.89	3.91	0.00	-0.02	-0.02
13	IIB2	3.90	3.87	3.89	0.03	0.01	-0.02
14	IIB3	3.86	3.83	3.87	0.02	-0.01	-0.03
15	IIC1a	3.90	3.89	3.87	0.02	0.03	0.01
16	IIC1b	3.70	3.69	3.72	0.01	-0.02	-0.03
17	IIC1c	3.79	3.72	3.73	0.07	0.06	-0.01
18	IIC2	3.87	3.81	3.82	0.06	0.05	-0.01
19	IIC3	3.90	3.83	3.84	0.07	0.06	-0.01
20	IIC4a	3.73	3.70	3.73	0.03	0.00	-0.03
21	IIC4b	3.75	3.71	3.72	0.05	0.04	-0.01
22	IIC4c	3.64	3.57	3.62	0.07	0.02	-0.05
23	IID	3.93	3.90	3.92	0.03	0.00	-0.02

Mean by Geographic Region of Practice					Mean Differences		
Order	Element	Rural (1)	Suburban (2)	Urban (3)	1 vs 2	1 vs 3	2 vs 3
24	IIE1	3.72	3.73	3.71	-0.01	0.01	0.03
25	IIE2	3.85	3.85	3.84	0.01	0.01	0.01
26	IIE3a	3.74	3.76	3.75	-0.02	-0.01	0.01
27	IIE3b	3.81	3.82	3.83	-0.01	-0.02	-0.01
28	IIE3c	3.81	3.81	3.83	0.00	-0.02	-0.02
29	IIE3d	3.76	3.76	3.77	0.00	-0.02	-0.01
30	IIE3e	3.76	3.75	3.75	0.01	0.01	0.00
31	IIE3f	3.78	3.77	3.78	0.02	0.01	-0.01
32	IIE4	3.88	3.84	3.81	0.03	0.06	0.03
33	IIE5	3.87	3.84	3.84	0.03	0.03	0.01
34	IIE6	3.84	3.77	3.79	0.07	0.06	-0.02
35	IIE7a	3.86	3.80	3.77	0.06	0.08**	0.03
36	IIE7b	3.83	3.76	3.75	0.07	0.08	0.01
37	IIE7c	3.87	3.77	3.77	0.09**	0.10**	0.01
38	IIE7d	3.79	3.72	3.71	0.06	0.07	0.01
39	IIE7e	3.85	3.85	3.84	0.01	0.01	0.00
40	IIF1	3.81	3.79	3.80	0.02	0.01	-0.01
41	IIF2	3.77	3.74	3.74	0.03	0.03	0.00
42	IIF3	3.77	3.76	3.74	0.01	0.03	0.02
43	IIG	3.59	3.58	3.58	0.01	0.02	0.01
44	IIH	3.65	3.63	3.67	0.02	-0.03	-0.04
45	III1	3.90	3.85	3.88	0.04	0.02	-0.02
46	III2	3.84	3.80	3.84	0.04	0.00	-0.04
47	III3	3.76	3.71	3.74	0.05	0.02	-0.03
48	IIJ	3.60	3.53	3.57	0.07	0.03	-0.04
49	IIIA1a	3.12	3.11	3.20	0.01	-0.08	-0.09
50	IIIA1b	3.11	3.12	3.21	-0.01	-0.11	-0.09
51	IIIA1ci	3.18	3.15	3.25	0.03	-0.08	-0.11
52	IIIA1cii	2.95	2.98	3.10	-0.03	-0.15	-0.12
53	IIIA2	3.75	3.82	3.79	-0.07	-0.04	0.03
54	IIIB1a	3.61	3.60	3.59	0.01	0.02	0.01
55	IIIB1b	3.63	3.60	3.62	0.03	0.01	-0.01

Mean by Geographic Region of Practice					Mean Differences		
Order	Element	Rural (1)	Suburban (2)	Urban (3)	1 vs 2	1 vs 3	2 vs 3
56	IIIB1c	3.49	3.47	3.49	0.02	0.00	-0.02
57	IIIB2a	3.57	3.57	3.52	0.00	0.05	0.05
58	IIIB2b	3.44	3.44	3.45	0.00	0.00	0.00
59	IIIB3	3.65	3.62	3.64	0.04	0.01	-0.03
60	IIIB4	3.61	3.59	3.58	0.02	0.03	0.01
61	IIIC1a	3.84	3.86	3.87	-0.02	-0.03	-0.01
62	IIIC1b	3.56	3.60	3.54	-0.04	0.02	0.06
63	IIIC1c	3.81	3.82	3.84	-0.01	-0.03	-0.02
64	IIIC1d	3.79	3.78	3.78	0.01	0.01	0.00
65	IIIC1e	3.83	3.85	3.85	-0.02	-0.02	0.00
66	IIIC1f	3.76	3.81	3.81	-0.05	-0.05	0.00
67	IIIC1g	3.80	3.83	3.83	-0.03	-0.03	0.00
68	IIIC1h	3.73	3.77	3.81	-0.04	-0.07	-0.03
69	IIIC1i	3.53	3.54	3.56	-0.01	-0.03	-0.01
70	IIIC1j	3.84	3.83	3.84	0.00	-0.01	-0.01
71	IIIC1k	3.71	3.72	3.74	-0.01	-0.04	-0.03
72	IIIC1l	3.36	3.34	3.44	0.02	-0.08	-0.10
73	IIIC1m	3.54	3.53	3.63	0.01	-0.10	-0.10**
74	IIIC1n	3.34	3.39	3.58	-0.05	-0.24**	-0.18**
75	IIIC1o	3.78	3.80	3.82	-0.02	-0.05	-0.02
76	IIIC1p	3.51	3.39	3.50	0.12	0.01	-0.11**
77	IIIC1q	3.65	3.64	3.68	0.01	-0.03	-0.04
78	IIIC1r	3.56	3.42	3.53	0.13	0.03	-0.10**
79	IIIC2a	3.81	3.81	3.82	0.00	-0.01	-0.01
80	IIIC2b	3.81	3.83	3.84	-0.02	-0.02	-0.01
81	IIIC2c	3.44	3.45	3.61	-0.01	-0.17**	-0.16**
82	IIIC2d	3.29	3.34	3.44	-0.05	-0.14	-0.10
83	IIIC2e	3.18	3.06	3.16	0.12	0.02	-0.10
84	IIIC2f	3.26	3.29	3.50	-0.03	-0.24**	-0.21**
85	IIIC3a	3.54	3.58	3.63	-0.04	-0.09	-0.05
86	IIIC3b	3.36	3.39	3.45	-0.03	-0.09	-0.06
87	IIIC3c	3.56	3.66	3.71	-0.10	-0.15**	-0.05

Order	Element	Mean by Geographic Region of Practice			Mean Differences		
		Rural (1)	Suburban (2)	Urban (3)	1 vs 2	1 vs 3	2 vs 3
88	IIIC3d	3.36	3.21	3.29	0.15	0.07	-0.08
89	IIIC3e	3.50	3.56	3.63	-0.06	-0.13**	-0.07
90	IIIC4a	3.53	3.48	3.44	0.05	0.09	0.04
91	IIIC4b	3.32	3.36	3.41	-0.04	-0.10	-0.05
92	IIIC4c	3.41	3.51	3.59	-0.10	-0.19**	-0.09
93	IIIC4d	2.87	2.75	2.95	0.12	-0.08	-0.20**
94	IIIC5a	3.80	3.77	3.81	0.03	-0.01	-0.03
95	IIIC5b	3.28	3.20	3.29	0.08	-0.01	-0.09
96	IIIC5c	3.27	3.27	3.37	0.00	-0.10	-0.10
97	IIIC5d	3.27	3.19	3.25	0.08	0.02	-0.06
98	IIIC5e	3.42	3.45	3.51	-0.03	-0.08	-0.06
99	IIIC5f	3.33	3.35	3.41	-0.02	-0.08	-0.07
100	IIIC5g	3.19	3.18	3.27	0.01	-0.08	-0.09
101	IIIC5h	3.21	3.17	3.30	0.04	-0.09	-0.13**
102	IIID1	3.11	3.15	3.19	-0.04	-0.08	-0.04
103	IIID2	3.13	3.14	3.20	-0.01	-0.07	-0.06
104	IIID3	3.63	3.67	3.74	-0.04	-0.10	-0.06
105	IIID4	3.17	3.18	3.28	-0.02	-0.12	-0.10
106	IIID5	3.21	3.30	3.45	-0.09	-0.24**	-0.15**
107	IIID6	3.24	3.29	3.39	-0.04	-0.15	-0.10
108	IIID7	3.09	3.04	3.07	0.04	0.02	-0.02
109	IIIE1	3.31	3.34	3.41	-0.03	-0.10	-0.07
110	IIIE2	3.53	3.47	3.55	0.06	-0.02	-0.08
111	IIIE3	3.57	3.49	3.56	0.08	0.01	-0.07
112	IIIE4	3.67	3.64	3.70	0.03	-0.02	-0.05
113	IIIE5	3.82	3.81	3.84	0.01	-0.01	-0.02
114	IIIE6	3.51	3.38	3.45	0.13	0.06	-0.07
115	IIIE7	3.35	3.25	3.29	0.10	0.06	-0.04
116	IIIE8	3.70	3.68	3.72	0.03	-0.01	-0.04
117	IIIE9	3.48	3.36	3.47	0.12	0.01	-0.11**
118	IIIE10	3.18	3.14	3.24	0.04	-0.06	-0.10
119	IIIE11	3.78	3.78	3.77	0.00	0.01	0.01

Order	Element	Mean by Geographic Region of Practice			Mean Differences		
		Rural (1)	Suburban (2)	Urban (3)	1 vs 2	1 vs 3	2 vs 3
120	III E12	3.67	3.57	3.59	0.10	0.08	-0.02
121	III E13	3.18	3.15	3.24	0.03	-0.06	-0.09
122	III E14	3.27	3.22	3.30	0.05	-0.04	-0.08
123	III E15	3.58	3.54	3.60	0.04	-0.02	-0.06
124	III E16	3.07	3.09	3.17	-0.02	-0.10	-0.08
125	III E17	3.46	3.35	3.49	0.11	-0.03	-0.14**
126	III E18	3.28	3.33	3.48	-0.05	-0.20**	-0.15**
127	III E19	3.50	3.42	3.52	0.07	-0.03	-0.10
128	III E20	3.26	3.11	3.17	0.16	0.09	-0.07
129	III E21	3.20	3.08	3.17	0.12	0.03	-0.09
130	III E22	3.34	3.27	3.33	0.07	0.01	-0.06
131	III E23	3.37	3.37	3.50	0.00	-0.13	-0.13**
132	III F1a	3.61	3.58	3.60	0.03	0.00	-0.03
133	III F1b	3.61	3.55	3.58	0.07	0.04	-0.03
134	III F1c	3.45	3.37	3.45	0.08	0.00	-0.08
135	III F1d	3.28	3.12	3.23	0.16	0.05	-0.11
136	III F1e	3.70	3.63	3.67	0.07	0.03	-0.04
137	III F1f	3.63	3.54	3.60	0.09	0.03	-0.06
138	III F2	3.13	3.03	3.15	0.11	-0.02	-0.12
139	III F3	3.50	3.43	3.47	0.07	0.03	-0.05
140	III F4	3.71	3.74	3.73	-0.02	-0.02	0.01
141	III G1	3.92	3.88	3.90	0.04	0.02	-0.02
142	III G2	3.93	3.90	3.91	0.03	0.02	-0.01
143	III H1	3.96	3.93	3.94	0.03	0.02	-0.01
144	III H2	3.89	3.84	3.86	0.04	0.02	-0.02
145	III H3	3.80	3.75	3.79	0.05	0.02	-0.03
146	III H4	3.81	3.71	3.74	0.10	0.07	-0.03
147	III H5	3.73	3.62	3.70	0.11**	0.03	-0.08**
148	IV A1a	3.77	3.75	3.75	0.02	0.02	0.00
149	IV A1b	3.43	3.35	3.46	0.08	-0.03	-0.11**
150	IV A1c	3.35	3.22	3.31	0.13	0.04	-0.09
151	IV A2a	3.85	3.83	3.85	0.02	-0.01	-0.03

Order	Element	Mean by Geographic Region of Practice			Mean Differences		
		Rural (1)	Suburban (2)	Urban (3)	1 vs 2	1 vs 3	2 vs 3
152	IVA2b	3.81	3.80	3.82	0.01	-0.02	-0.03
153	IVA3	3.79	3.77	3.79	0.03	0.01	-0.02
154	IVB1a	3.90	3.90	3.92	0.00	-0.01	-0.01
155	IVB1b	3.84	3.84	3.86	0.00	-0.02	-0.02
156	IVB1c	3.90	3.90	3.90	0.01	0.00	0.00
157	IVB1d	3.77	3.73	3.76	0.04	0.01	-0.04
158	IVB1e	3.87	3.86	3.88	0.01	-0.01	-0.03
159	IVB1f	3.68	3.61	3.65	0.07	0.03	-0.04
160	IVB1g	3.54	3.47	3.55	0.07	-0.01	-0.09**
161	IVB2a	3.73	3.75	3.79	-0.03	-0.06	-0.04
162	IVB2bi	3.85	3.87	3.87	-0.01	-0.02	-0.01
163	IVB2bii	3.83	3.83	3.85	0.00	-0.02	-0.02
164	IVB2biii	3.46	3.48	3.55	-0.02	-0.10	-0.08
165	IVB2biv	3.56	3.55	3.57	0.01	-0.01	-0.02
166	IVB2bv	3.77	3.78	3.81	0.00	-0.03	-0.03
167	IVB3a	3.68	3.72	3.76	-0.03	-0.08	-0.05
168	IVB3b	3.72	3.75	3.80	-0.03	-0.08	-0.05
169	IVB4a	3.55	3.58	3.67	-0.02	-0.11	-0.09**
170	IVB4b	3.48	3.53	3.67	-0.05	-0.19**	-0.14**
171	IVB5	3.44	3.41	3.52	0.03	-0.08	-0.11**
172	IVB6	3.54	3.47	3.56	0.07	-0.02	-0.08
173	IVC1	3.08	3.07	3.26	0.01	-0.17**	-0.18**
174	IVC2a	3.46	3.45	3.51	0.01	-0.05	-0.06
175	IVC2b	3.60	3.56	3.61	0.03	-0.01	-0.04
176	IVC2c	3.41	3.39	3.48	0.02	-0.07	-0.09
177	IVC2d	3.56	3.57	3.64	-0.01	-0.08	-0.07
178	IVC2e	3.44	3.38	3.54	0.05	-0.10	-0.16**
179	IVC2f	3.53	3.51	3.60	0.02	-0.07	-0.08**
180	IVC3a	3.45	3.51	3.60	-0.06	-0.15	-0.09
181	IVC3b	3.68	3.70	3.67	-0.02	0.01	0.03
182	IVC3c	3.48	3.48	3.51	0.00	-0.03	-0.03
183	VA1a	3.81	3.77	3.72	0.04	0.08	0.04

Order	Element	Mean by Geographic Region of Practice			Mean Differences		
		Rural (1)	Suburban (2)	Urban (3)	1 vs 2	1 vs 3	2 vs 3
184	VA1b	3.69	3.69	3.75	0.00	-0.06	-0.06
185	VA1c	3.89	3.88	3.88	0.01	0.01	0.01
186	VA1d	3.69	3.76	3.78	-0.07	-0.10**	-0.03
187	VA2a	3.84	3.75	3.75	0.09	0.09	0.00
188	VA2b	3.92	3.91	3.92	0.01	0.00	-0.01
189	VA2c	3.91	3.90	3.88	0.01	0.03	0.02
190	VA2d	3.42	3.34	3.44	0.08	-0.02	-0.10
191	VA2e	3.78	3.81	3.85	-0.04	-0.07	-0.03
192	VA2f	3.37	3.41	3.43	-0.05	-0.07	-0.02
193	VA3a	3.36	3.32	3.46	0.04	-0.10	-0.14**
194	VA3b	3.25	3.23	3.36	0.02	-0.11	-0.13**
195	VA3c	3.20	3.17	3.33	0.03	-0.13	-0.16**
196	VA3d	3.42	3.38	3.49	0.04	-0.08	-0.12**
197	VA3e	3.72	3.73	3.75	-0.01	-0.03	-0.02
198	VA3f	3.71	3.77	3.81	-0.05	-0.10	-0.04
199	VA3g	3.48	3.56	3.70	-0.08	-0.22**	-0.14**
200	VA4a	3.31	3.31	3.46	-0.01	-0.16	-0.15**
201	VA4b	3.71	3.71	3.78	0.00	-0.06	-0.06**
202	VA5a	3.29	3.08	3.21	0.21**	0.07	-0.13**
203	VA5b	3.41	3.24	3.34	0.17	0.06	-0.11
204	VA5c	3.53	3.34	3.49	0.19**	0.04	-0.15**
205	VA5d	3.55	3.52	3.61	0.04	-0.05	-0.09
206	VA5e	3.74	3.72	3.79	0.02	-0.05	-0.07**
207	VA5f	3.79	3.78	3.82	0.01	-0.02	-0.03
208	VA5g	3.03	2.83	2.87	0.20	0.16	-0.04
209	VA6a	3.23	3.13	3.33	0.11	-0.09	-0.20**
210	VA6b	3.72	3.75	3.80	-0.03	-0.08	-0.05
211	VA6c	3.84	3.85	3.87	-0.01	-0.03	-0.02
212	VA6d	3.86	3.85	3.86	0.01	-0.01	-0.02
213	VA6e	3.64	3.70	3.78	-0.06	-0.14**	-0.08**
214	VA7a	3.13	3.01	3.24	0.12	-0.10	-0.22**
215	VA7b	2.93	2.73	2.92	0.20	0.01	-0.19**

Mean by Geographic Region of Practice					Mean Differences		
Order	Element	Rural (1)	Suburban (2)	Urban (3)	1 vs 2	1 vs 3	2 vs 3
216	VA7c	3.05	2.91	3.04	0.14	0.01	-0.13
217	VA8a	3.32	3.37	3.41	-0.05	-0.09	-0.04
218	VA8b	3.90	3.91	3.91	-0.01	-0.02	0.00
219	VA8c	3.92	3.91	3.90	0.01	0.01	0.01
220	VA8d	3.40	3.30	3.35	0.10	0.05	-0.05
221	VA8e	3.68	3.71	3.72	-0.03	-0.05	-0.02
222	VA8f	3.53	3.47	3.49	0.06	0.04	-0.02
223	VA8g	3.59	3.48	3.53	0.11	0.05	-0.06
224	VA8h	3.21	3.05	3.19	0.16	0.02	-0.14**
225	VA8i	3.50	3.41	3.54	0.09	-0.04	-0.13**
226	VA8j	3.33	3.17	3.40	0.16	-0.07	-0.22**
227	VA8k	3.45	3.44	3.60	0.01	-0.15**	-0.16**
228	VA8l	3.48	3.43	3.59	0.04	-0.11	-0.16**
229	VA9a	3.08	2.96	3.15	0.12	-0.07	-0.19**
230	VA9b	3.81	3.78	3.81	0.04	0.00	-0.03
231	VA9c	3.30	3.17	3.34	0.13	-0.04	-0.17**
232	VA9d	3.74	3.79	3.82	-0.05	-0.08	-0.03
233	VA9e	3.34	3.27	3.40	0.07	-0.06	-0.13**
234	VA9f	3.88	3.82	3.84	0.06	0.03	-0.03
235	VA9g	3.12	2.96	3.22	0.17	-0.10	-0.27**
236	VA9h	3.10	3.06	3.28	0.04	-0.18	-0.22**
237	VA9i	3.35	3.35	3.48	0.00	-0.13	-0.13**
238	VA9j	3.30	3.24	3.41	0.07	-0.11	-0.17**
239	VA9k	2.99	2.84	3.04	0.15	-0.05	-0.20**
240	VA9l	2.83	2.74	2.90	0.09	-0.07	-0.16**
241	VA10a	3.33	3.51	3.64	-0.17**	-0.31**	-0.13**
242	VA10b	3.26	3.39	3.59	-0.13	-0.33**	-0.20**
243	VA10c	3.16	3.22	3.43	-0.06	-0.27**	-0.21**
244	VA10d	3.18	3.23	3.41	-0.05	-0.22**	-0.18**
245	VA10e	3.16	3.18	3.36	-0.02	-0.20**	-0.18**
246	VA10f	3.10	3.15	3.35	-0.05	-0.25**	-0.20**
247	VA10g	3.43	3.42	3.62	0.00	-0.19**	-0.19**

Mean by Geographic Region of Practice					Mean Differences		
Order	Element	Rural (1)	Suburban (2)	Urban (3)	1 vs 2	1 vs 3	2 vs 3
248	VA11a	2.98	2.79	2.91	0.19	0.07	-0.12
249	VA11b	2.95	2.77	2.90	0.18	0.05	-0.13
250	VA11c	3.77	3.75	3.81	0.02	-0.04	-0.06
251	VA11d	3.53	3.51	3.60	0.02	-0.07	-0.09
252	VA11e	3.13	3.12	3.25	0.01	-0.12	-0.13**
253	VA11f	3.20	3.15	3.33	0.05	-0.14	-0.19**
254	VA11g	3.04	2.93	3.02	0.10	0.02	-0.09
255	VA12a	3.59	3.52	3.67	0.07	-0.08	-0.15**
256	VA12b	3.37	3.28	3.47	0.10	-0.10	-0.20**
257	VB1	3.71	3.60	3.66	0.11	0.04	-0.07
258	VB2	3.66	3.60	3.66	0.06	0.01	-0.05
259	VB3	3.70	3.61	3.66	0.09	0.04	-0.05
260	VC	3.78	3.62	3.69	0.16**	0.10	-0.07
261	VD	3.83	3.76	3.81	0.07	0.02	-0.05
262	VE1	3.91	3.85	3.89	0.05	0.01	-0.04
263	VE2	3.76	3.74	3.81	0.02	-0.05	-0.07**
264	VE3	3.82	3.77	3.83	0.05	-0.01	-0.06**
265	VE4a	3.66	3.58	3.64	0.08	0.02	-0.07
266	VE4b	3.69	3.63	3.68	0.06	0.01	-0.05
267	VE4c	3.45	3.35	3.49	0.09	-0.04	-0.13**
268	VE4d	3.64	3.58	3.64	0.06	0.00	-0.06
269	VE5	3.87	3.85	3.89	0.02	-0.01	-0.03
270	VE6a	3.90	3.88	3.90	0.03	0.00	-0.02
271	VE6b	3.80	3.77	3.82	0.03	-0.02	-0.05
272	VE6c	3.76	3.73	3.78	0.03	-0.02	-0.05
273	VE6d	3.78	3.77	3.78	0.02	0.00	-0.02
274	VE6e	3.73	3.66	3.72	0.07	0.01	-0.06
275	VE7	3.85	3.84	3.84	0.01	0.00	0.00
276	VF1	3.95	3.94	3.95	0.00	-0.01	-0.01
277	VF2	3.95	3.94	3.95	0.01	0.00	-0.01
278	VG	3.85	3.88	3.89	-0.03	-0.04	-0.01
279	VH	3.88	3.90	3.91	-0.02	-0.03	-0.01

Mean by Geographic Region of Practice					Mean Differences		
Order	Element	Rural (1)	Suburban (2)	Urban (3)	1 vs 2	1 vs 3	2 vs 3
280	VI1	3.87	3.83	3.87	0.04	0.00	-0.04
281	VI2	3.88	3.84	3.86	0.04	0.01	-0.03
282	VJ1	3.89	3.88	3.89	0.00	0.00	0.00
283	VJ2	3.87	3.88	3.90	0.00	-0.03	-0.02
284	VJ3	3.72	3.72	3.77	0.00	-0.05	-0.05
285	VJ4	3.80	3.78	3.79	0.02	0.01	-0.01
286	VK	3.72	3.66	3.73	0.06	-0.01	-0.07
287	VL	3.77	3.72	3.75	0.05	0.02	-0.03
288	VM1	3.75	3.64	3.68	0.11	0.07	-0.04
289	VM2	3.75	3.65	3.69	0.10	0.06	-0.04
290	VM3	3.81	3.76	3.81	0.05	0.00	-0.05
291	VM4	3.68	3.65	3.71	0.02	-0.03	-0.06
292	VM5a	3.77	3.73	3.79	0.05	-0.01	-0.06**
293	VM5b	3.71	3.65	3.73	0.06	-0.02	-0.08**
294	VM5c	3.67	3.59	3.66	0.08	0.01	-0.07
295	VM6	3.78	3.65	3.72	0.13**	0.06	-0.07
296	VN1a	3.55	3.47	3.56	0.08	-0.01	-0.09**
297	VN1b	3.54	3.50	3.61	0.04	-0.06	-0.10**
298	VN1c	3.53	3.49	3.59	0.04	-0.06	-0.10**
299	VN2	3.71	3.62	3.71	0.09	0.00	-0.08**
300	VN3a	3.67	3.69	3.75	-0.02	-0.08	-0.06
301	VN3b	3.62	3.62	3.71	-0.01	-0.10	-0.09**
302	VN4a	3.83	3.78	3.85	0.05	-0.02	-0.07**
303	VN4b	3.85	3.80	3.85	0.05	0.00	-0.05
304	VN4c	3.91	3.84	3.87	0.07	0.04	-0.03
305	VN4d	3.81	3.74	3.81	0.07	0.00	-0.07**
306	VN4e	3.79	3.72	3.79	0.07	0.00	-0.07**
307	VN4f	3.76	3.70	3.78	0.06	-0.02	-0.08**
308	VO1	3.48	3.36	3.43	0.12	0.04	-0.07
309	VO2	3.45	3.36	3.45	0.09	0.01	-0.09
310	VO3	3.44	3.33	3.41	0.11	0.03	-0.08
311	VP1	3.38	3.22	3.35	0.16	0.04	-0.13**

Mean by Geographic Region of Practice					Mean Differences		
Order	Element	Rural (1)	Suburban (2)	Urban (3)	1 vs 2	1 vs 3	2 vs 3
312	VP2	3.41	3.28	3.39	0.14	0.02	-0.11**
313	VQ	3.57	3.51	3.56	0.06	0.02	-0.05

TABLE H-4 Average Importance Ratings by Practice Setting

Rating Scale

- 1 = Not Important
- 2 = Low Importance
- 3 = Moderate Importance
- 4 = Extremely Important

Key:

- *=Significant at the .05 level
- **=Significant at the .01 level

Order	Element	Mean by Practice Setting					Mean Differences									
		Hospital outpatient facility (HF)	Inpatient facility (IF)	Mobile unit (MU)	Outpatient free-standing facility (OFSF)	Research facility (RF)	HF vs IF	HF vs MU	HF vs OFSF	HF vs RF	IF vs MU	IF vs OFSF	IF vs RF	MU vs OFSF	MU vs RF	OFSF vs RF
1	IA1ai	3.85	3.87	3.81	3.85	3.85	-0.02	0.04	-0.01	0.00	0.06	0.01	0.02	-0.05	-0.04	0.01
2	IA1aai	3.23	3.33	2.91	3.24	3.50	-0.10	0.32	-0.01	-0.27	0.42**	0.09	-0.17	-0.33	-0.59**	-0.26
3	IA1aiii	2.92	2.90	2.62	2.87	3.09	0.03	0.31	0.05	-0.17	0.28	0.02	-0.20	-0.26	-0.48	-0.22
4	IA1aiv	3.55	3.54	3.74	3.63	3.80	0.01	-0.18	-0.08	-0.25	-0.19	-0.09	-0.26	0.10	-0.07	-0.17
5	IA2a	3.09	3.12	3.19	3.09	3.35	-0.03	-0.10	0.00	-0.26	-0.07	0.03	-0.23	0.10	-0.16	-0.26
6	IA2b	3.00	3.04	3.19	2.99	3.37	-0.04	-0.19	0.01	-0.37*	-0.15	0.05	-0.33	0.20	-0.18	-0.38*
7	IB	3.75	3.72	3.57	3.71	3.83	0.03	0.18	0.04	-0.08	0.14	0.01	-0.11	-0.14	-0.26	-0.12
8	IC	3.49	3.54	3.40	3.51	3.63	-0.05	0.09	-0.02	-0.14	0.14	0.03	-0.09	-0.11	-0.23	-0.12
9	ID	3.69	3.73	3.64	3.68	3.80	-0.04	0.04	0.01	-0.12	0.08	0.05	-0.08	-0.04	-0.16	-0.12
10	IE	3.15	3.22	3.06	3.23	3.34	-0.06	0.10	-0.08	-0.19	0.16	-0.02	-0.12	-0.18	-0.28	-0.11
11	IIA	3.69	3.73	3.72	3.75	3.81	-0.03	-0.03	-0.06	-0.11	0.01	-0.02	-0.08	-0.03	-0.09	-0.06
12	IIB1	3.89	3.90	3.88	3.91	3.91	0.00	0.02	-0.02	-0.02	0.02	-0.02	-0.02	-0.04	-0.04	0.00
13	IIB2	3.89	3.88	3.85	3.87	3.89	0.01	0.03	0.01	0.00	0.03	0.01	-0.01	-0.02	-0.04	-0.02
14	IIB3	3.85	3.85	3.89	3.86	3.91	-0.01	-0.05	-0.02	-0.07	-0.04	-0.01	-0.06	0.03	-0.02	-0.05

Order	Element	Mean by Practice Setting					Mean Differences									
		Hospital outpatient facility (HF)	Inpatient facility (IF)	Mobile unit (MU)	Outpatient free-standing facility (OFSF)	Research facility (RF)	HF vs IF	HF vs MU	HF vs OFSF	HF vs RF	IF vs MU	IF vs OFSF	IF vs RF	MU vs OFSF	MU vs RF	OFSF vs RF
15	IIC1a	3.89	3.90	3.88	3.87	3.79	-0.02	0.01	0.01	0.10	0.03	0.03	0.12	0.00	0.09	0.09
16	IIC1b	3.73	3.70	3.63	3.68	3.72	0.02	0.10	0.04	0.01	0.08	0.02	-0.02	-0.06	-0.09	-0.03
17	IIC1c	3.73	3.75	3.66	3.74	3.78	-0.02	0.07	-0.01	-0.05	0.09	0.01	-0.03	-0.08	-0.12	-0.04
18	IIC2	3.84	3.83	3.79	3.83	3.78	0.01	0.05	0.01	0.05	0.04	0.00	0.05	-0.05	0.00	0.05
19	IIC3	3.85	3.84	3.74	3.83	3.85	0.01	0.12	0.02	0.00	0.11	0.01	0.00	-0.09	-0.11	-0.02
20	IIC4a	3.71	3.71	3.61	3.76	3.70	0.00	0.10	-0.05	0.01	0.10	-0.05	0.01	-0.16	-0.09	0.07
21	IIC4b	3.71	3.70	3.64	3.77	3.63	0.01	0.06	-0.06	0.08	0.05	-0.07	0.06	-0.12	0.01	0.13
22	IIC4c	3.59	3.61	3.44	3.63	3.50	-0.02	0.15	-0.04	0.09	0.17	-0.02	0.11	-0.19	-0.06	0.13
23	IID	3.92	3.92	3.89	3.92	3.96	0.00	0.03	0.00	-0.03	0.03	0.00	-0.04	-0.03	-0.06	-0.03
24	IIE1	3.70	3.72	3.71	3.75	3.67	-0.01	0.00	-0.05	0.03	0.01	-0.04	0.04	-0.04	0.04	0.08
25	IIE2	3.84	3.85	3.78	3.86	3.81	-0.01	0.05	-0.02	0.02	0.06	-0.01	0.03	-0.07	-0.03	0.04
26	IIE3a	3.74	3.77	3.73	3.76	3.72	-0.04	0.01	-0.02	0.02	0.04	0.02	0.06	-0.02	0.01	0.04
27	IIE3b	3.83	3.81	3.84	3.84	3.76	0.01	-0.01	-0.01	0.06	-0.03	-0.03	0.05	0.00	0.08	0.08
28	IIE3c	3.81	3.83	3.75	3.83	3.78	-0.02	0.06	-0.03	0.02	0.08	-0.01	0.04	-0.08	-0.03	0.05
29	IIE3d	3.74	3.76	3.70	3.78	3.80	-0.02	0.05	-0.04	-0.05	0.07	-0.02	-0.03	-0.08	-0.10	-0.01
30	IIE3e	3.73	3.76	3.73	3.75	3.76	-0.02	0.00	-0.02	-0.02	0.03	0.00	0.00	-0.02	-0.02	0.00
31	IIE3f	3.76	3.79	3.75	3.75	3.82	-0.03	0.01	0.01	-0.06	0.04	0.04	-0.03	0.00	-0.07	-0.07
32	IIE4	3.81	3.84	3.86	3.83	3.76	-0.03	-0.05	-0.02	0.05	-0.02	0.01	0.08	0.03	0.10	0.07
33	IIE5	3.83	3.87	3.84	3.83	3.78	-0.04	-0.01	0.00	0.04	0.03	0.04	0.08	0.01	0.06	0.05
34	IIE6	3.77	3.78	3.78	3.80	3.80	-0.01	-0.01	-0.03	-0.03	0.00	-0.02	-0.02	-0.02	-0.02	0.00
35	IIE7a	3.78	3.80	3.82	3.82	3.76	-0.02	-0.04	-0.04	0.02	-0.02	-0.02	0.04	0.00	0.06	0.06
36	IIE7b	3.76	3.76	3.80	3.80	3.70	0.00	-0.04	-0.04	0.06	-0.04	-0.04	0.06	-0.01	0.10	0.11

Order	Element	Mean by Practice Setting					Mean Differences									
		Hospital outpatient facility (HF)	Inpatient facility (IF)	Mobile unit (MU)	Outpatient free-standing facility (OFSF)	Research facility (RF)	HF vs IF	HF vs MU	HF vs OFSF	HF vs RF	IF vs MU	IF vs OFSF	IF vs RF	MU vs OFSF	MU vs RF	OFSF vs RF
37	IIE7c	3.80	3.76	3.78	3.79	3.76	0.03	0.01	0.00	0.03	-0.02	-0.03	0.00	-0.01	0.02	0.03
38	IIE7d	3.71	3.73	3.65	3.75	3.72	-0.02	0.06	-0.04	-0.01	0.08	-0.02	0.01	-0.10	-0.06	0.04
39	IIE7e	3.85	3.87	3.65	3.82	3.83	-0.02	0.19*	0.03	0.02	0.22**	0.05	0.05	-0.17	-0.17	0.00
40	IIF1	3.81	3.79	3.86	3.78	3.81	0.02	-0.05	0.03	0.00	-0.06	0.01	-0.02	0.07	0.05	-0.03
41	IIF2	3.75	3.74	3.77	3.73	3.83	0.01	-0.02	0.02	-0.08	-0.03	0.01	-0.09	0.04	-0.06	-0.10
42	IIF3	3.74	3.76	3.84	3.73	3.70	-0.02	-0.09	0.02	0.04	-0.07	0.04	0.06	0.11	0.13	0.02
43	IIG	3.57	3.56	3.53	3.62	3.57	0.01	0.05	-0.04	0.00	0.04	-0.05	-0.01	-0.09	-0.05	0.04
44	IIH	3.65	3.64	3.57	3.69	3.66	0.01	0.08	-0.04	-0.01	0.07	-0.05	-0.02	-0.12	-0.09	0.03
45	III1	3.88	3.86	3.86	3.90	3.91	0.03	0.03	-0.02	-0.03	0.00	-0.05	-0.06	-0.04	-0.06	-0.01
46	III2	3.84	3.81	3.75	3.87	3.76	0.03	0.09	-0.03	0.08	0.06	-0.06	0.05	-0.12	-0.01	0.11
47	III3	3.74	3.72	3.69	3.77	3.72	0.02	0.05	-0.03	0.02	0.03	-0.05	0.00	-0.07	-0.03	0.05
48	IIJ	3.58	3.57	3.41	3.63	3.33	0.01	0.17	-0.06	0.25	0.16	-0.07	0.24	-0.22	0.08	0.31*
49	IIIA1a	3.15	3.09	3.05	3.18	3.52	0.07	0.11	-0.03	-0.37	0.04	-0.10	-0.44**	-0.13	-0.48	-0.34
50	IIIA1b	3.17	3.09	3.10	3.17	3.40	0.08	0.07	0.00	-0.24	0.00	-0.08	-0.31	-0.08	-0.31	-0.23
51	IIIA1ci	3.19	3.14	3.07	3.23	3.46	0.05	0.12	-0.04	-0.27	0.07	-0.09	-0.32	-0.16	-0.39	-0.23
52	IIIA1cii	3.00	2.95	2.88	3.15	3.20	0.04	0.11	-0.16	-0.20	0.07	-0.20*	-0.25	-0.27	-0.32	-0.05
53	IIIA2	3.79	3.81	3.65	3.81	3.89	-0.02	0.14	-0.02	-0.10	0.16	0.00	-0.08	-0.16	-0.24	-0.08
54	IIIB1a	3.55	3.63	3.58	3.54	3.56	-0.07	-0.03	0.02	0.00	0.05	0.09	0.07	0.04	0.02	-0.02
55	IIIB1b	3.60	3.61	3.54	3.57	3.64	-0.01	0.06	0.04	-0.04	0.07	0.05	-0.03	-0.03	-0.10	-0.08
56	IIIB1c	3.48	3.49	3.28	3.42	3.55	-0.02	0.20	0.05	-0.07	0.22	0.07	-0.06	-0.14	-0.27	-0.13
57	IIIB2a	3.53	3.55	3.51	3.51	3.67	-0.03	0.02	0.01	-0.14	0.04	0.04	-0.11	0.00	-0.16	-0.15
58	IIIB2b	3.43	3.45	3.37	3.39	3.53	-0.02	0.06	0.04	-0.10	0.08	0.06	-0.09	-0.03	-0.17	-0.14

Order	Element	Mean by Practice Setting					Mean Differences									
		Hospital outpatient facility (HF)	Inpatient facility (IF)	Mobile unit (MU)	Outpatient free-standing facility (OFSF)	Research facility (RF)	HF vs IF	HF vs MU	HF vs OFSF	HF vs RF	IF vs MU	IF vs OFSF	IF vs RF	MU vs OFSF	MU vs RF	OFSF vs RF
59	III B3	3.64	3.63	3.51	3.58	3.62	0.01	0.13	0.06	0.02	0.12	0.05	0.01	-0.07	-0.11	-0.04
60	III B4	3.58	3.60	3.48	3.53	3.64	-0.02	0.10	0.05	-0.06	0.12	0.07	-0.04	-0.05	-0.16	-0.11
61	III C1a	3.87	3.87	3.82	3.82	3.86	-0.01	0.05	0.04	0.00	0.05	0.05	0.01	-0.01	-0.04	-0.04
62	III C1b	3.50	3.57	3.51	3.59	3.70	-0.08	-0.01	-0.10	-0.20	0.06	-0.02	-0.13	-0.08	-0.19	-0.11
63	III C1c	3.83	3.85	3.72	3.78	3.86	-0.02	0.11	0.05	-0.03	0.13	0.07	-0.01	-0.06	-0.14	-0.08
64	III C1d	3.77	3.80	3.67	3.74	3.88	-0.03	0.10	0.03	-0.11	0.13	0.06	-0.08	-0.06	-0.21	-0.15
65	III C1e	3.85	3.87	3.74	3.78	3.90	-0.02	0.11	0.07	-0.05	0.13	0.09*	-0.03	-0.04	-0.16	-0.12
66	III C1f	3.82	3.83	3.72	3.73	3.81	-0.02	0.10	0.08	0.00	0.12	0.10*	0.02	-0.02	-0.10	-0.08
67	III C1g	3.83	3.85	3.72	3.76	3.91	-0.02	0.11	0.07	-0.07	0.13	0.09*	-0.06	-0.04	-0.18	-0.15
68	III C1h	3.78	3.81	3.64	3.72	3.84	-0.02	0.15	0.06	-0.05	0.17	0.08	-0.03	-0.08	-0.20	-0.11
69	III C1i	3.53	3.53	3.48	3.61	3.33	0.00	0.05	-0.08	0.19	0.05	-0.08	0.19	-0.13	0.14	0.27
70	III C1j	3.85	3.83	3.80	3.83	3.86	0.02	0.05	0.02	-0.01	0.03	0.00	-0.03	-0.03	-0.06	-0.03
71	III C1k	3.68	3.75	3.67	3.73	3.82	-0.07	0.02	-0.05	-0.14	0.08	0.02	-0.07	-0.06	-0.15	-0.09
72	III C1l	3.35	3.39	3.31	3.40	3.40	-0.05	0.03	-0.05	-0.05	0.08	0.00	-0.01	-0.09	-0.09	0.00
73	III C1m	3.57	3.62	3.42	3.51	3.65	-0.05	0.16	0.06	-0.08	0.20	0.11	-0.03	-0.10	-0.23	-0.14
74	III C1n	3.46	3.49	3.35	3.48	3.67	-0.04	0.11	-0.02	-0.21	0.14	0.02	-0.17	-0.13	-0.32	-0.19
75	III C1o	3.82	3.85	3.62	3.73	3.81	-0.02	0.20*	0.09*	0.01	0.23**	0.11**	0.03	-0.12	-0.20	-0.08
76	III C1p	3.48	3.42	3.38	3.48	3.24	0.06	0.10	0.00	0.24	0.04	-0.06	0.19	-0.10	0.14	0.24
77	III C1q	3.65	3.73	3.47	3.54	3.51	-0.08	0.18	0.11	0.14	0.26	0.19**	0.21	-0.07	-0.05	0.03
78	III C1r	3.50	3.54	3.38	3.35	3.34	-0.04	0.12	0.15	0.16	0.15	0.19*	0.20	0.03	0.04	0.01
79	III C2a	3.83	3.83	3.67	3.76	3.81	-0.01	0.15	0.06	0.02	0.16	0.07	0.02	-0.09	-0.14	-0.05
80	III C2b	3.84	3.84	3.65	3.78	3.88	-0.01	0.19	0.06	-0.04	0.19	0.07	-0.03	-0.13	-0.23	-0.10

Order	Element	Mean by Practice Setting					Mean Differences									
		Hospital outpatient facility (HF)	Inpatient facility (IF)	Mobile unit (MU)	Outpatient free-standing facility (OFSF)	Research facility (RF)	HF vs IF	HF vs MU	HF vs OFSF	HF vs RF	IF vs MU	IF vs OFSF	IF vs RF	MU vs OFSF	MU vs RF	OFSF vs RF
81	IIC2c	3.54	3.53	3.35	3.45	3.75	0.01	0.19	0.09	-0.21	0.18	0.09	-0.22	-0.10	-0.40	-0.30
82	IIC2d	3.36	3.35	3.30	3.39	3.54	0.01	0.06	-0.03	-0.17	0.05	-0.04	-0.18	-0.09	-0.23	-0.14
83	IIC2e	3.13	3.03	3.10	3.23	3.03	0.10	0.03	-0.11	0.10	-0.07	-0.21*	0.00	-0.14	0.07	0.21
84	IIC2f	3.40	3.42	3.12	3.35	3.40	-0.02	0.28	0.05	0.00	0.30	0.07	0.02	-0.23	-0.28	-0.05
85	IIC3a	3.59	3.64	3.31	3.53	3.51	-0.05	0.28	0.06	0.08	0.33*	0.11	0.13	-0.22	-0.20	0.02
86	IIC3b	3.36	3.50	2.95	3.38	3.37	-0.14*	0.41*	-0.02	-0.01	0.55**	0.12	0.13	-0.43**	-0.42	0.01
87	IIC3c	3.67	3.74	3.14	3.57	3.71	-0.06	0.53**	0.10	-0.04	0.60**	0.17**	0.02	-0.43**	-0.57**	-0.14
88	IIC3d	3.23	3.23	3.00	3.31	3.28	0.00	0.23	-0.08	-0.05	0.23	-0.08	-0.04	-0.31	-0.28	0.04
89	IIC3e	3.61	3.64	3.16	3.51	3.56	-0.02	0.45**	0.10	0.05	0.47**	0.12	0.07	-0.35**	-0.40*	-0.05
90	IIC4a	3.44	3.47	3.30	3.45	3.40	-0.03	0.14	-0.01	0.04	0.17	0.03	0.07	-0.14	-0.10	0.05
91	IIC4b	3.34	3.42	3.10	3.33	3.30	-0.08	0.24	0.01	0.04	0.32	0.09	0.12	-0.23	-0.20	0.03
92	IIC4c	3.53	3.59	3.28	3.45	3.56	-0.07	0.25	0.08	-0.04	0.32	0.14	0.03	-0.18	-0.29	-0.11
93	IIC4d	2.89	2.82	2.50	2.92	2.50	0.08	0.39	-0.03	0.39	0.32	-0.10	0.32	-0.42	0.00	0.42
94	IIC5a	3.80	3.79	3.83	3.77	3.91	0.01	-0.03	0.03	-0.11	-0.04	0.02	-0.12	0.05	-0.08	-0.14
95	IIC5b	3.23	3.23	3.23	3.29	3.29	0.00	0.00	-0.07	-0.06	0.00	-0.06	-0.06	-0.07	-0.07	0.00
96	IIC5c	3.29	3.31	3.40	3.37	3.37	-0.03	-0.11	-0.08	-0.09	-0.09	-0.06	-0.06	0.03	0.03	0.00
97	IIC5d	3.21	3.21	3.18	3.25	3.27	0.00	0.03	-0.04	-0.06	0.02	-0.05	-0.06	-0.07	-0.09	-0.02
98	IIC5e	3.46	3.50	3.60	3.47	3.40	-0.04	-0.14	-0.01	0.06	-0.11	0.03	0.10	0.13	0.21	0.08
99	IIC5f	3.33	3.39	3.29	3.50	3.35	-0.06	0.04	-0.17	-0.03	0.10	-0.11	0.03	-0.21	-0.07	0.15
100	IIC5g	3.23	3.21	3.07	3.25	3.24	0.01	0.15	-0.02	-0.01	0.14	-0.03	-0.02	-0.17	-0.16	0.01
101	IIC5h	3.25	3.24	3.20	3.20	3.31	0.02	0.05	0.05	-0.05	0.03	0.03	-0.07	0.00	-0.10	-0.10
102	IID1	3.13	3.12	2.93	3.26	3.05	0.01	0.20	-0.13	0.08	0.19	-0.14	0.07	-0.33	-0.13	0.21

Order	Element	Mean by Practice Setting					Mean Differences									
		Hospital outpatient facility (HF)	Inpatient facility (IF)	Mobile unit (MU)	Outpatient free-standing facility (OFSF)	Research facility (RF)	HF vs IF	HF vs MU	HF vs OFSF	HF vs RF	IF vs MU	IF vs OFSF	IF vs RF	MU vs OFSF	MU vs RF	OFSF vs RF
103	IID2	3.14	3.13	2.93	3.23	3.05	0.02	0.22	-0.09	0.09	0.20	-0.10	0.07	-0.30	-0.13	0.17
104	IID3	3.71	3.75	3.34	3.60	3.58	-0.04	0.36**	0.10	0.12	0.41**	0.15**	0.17	-0.26	-0.24	0.02
105	IID4	3.24	3.19	3.07	3.24	3.23	0.05	0.17	0.00	0.02	0.12	-0.05	-0.04	-0.17	-0.15	0.01
106	IID5	3.39	3.38	3.08	3.28	3.38	0.00	0.31	0.11	0.01	0.31	0.10	0.00	-0.21	-0.31	-0.10
107	IID6	3.37	3.33	2.98	3.31	3.30	0.04	0.39*	0.06	0.07	0.36	0.02	0.03	-0.33	-0.32	0.01
108	IID7	3.07	3.00	2.90	3.13	2.58	0.08	0.18	-0.06	0.49*	0.10	-0.13	0.41	-0.24	0.31	0.55**
109	III E1	3.35	3.32	3.48	3.41	3.41	0.04	-0.13	-0.06	-0.06	-0.16	-0.09	-0.09	0.07	0.07	0.00
110	III E2	3.46	3.50	3.66	3.53	3.76	-0.04	-0.20	-0.07	-0.29	-0.16	-0.04	-0.26	0.13	-0.10	-0.22
111	III E3	3.50	3.52	3.60	3.57	3.64	-0.02	-0.10	-0.07	-0.14	-0.08	-0.05	-0.12	0.02	-0.04	-0.06
112	III E4	3.67	3.65	3.57	3.74	3.79	0.01	0.10	-0.07	-0.12	0.08	-0.08	-0.14	-0.17	-0.22	-0.05
113	III E5	3.84	3.84	3.69	3.82	3.91	0.00	0.15	0.02	-0.06	0.14	0.02	-0.07	-0.13	-0.21	-0.09
114	III E6	3.36	3.47	3.40	3.40	3.38	-0.11	-0.04	-0.04	-0.02	0.07	0.06	0.09	0.00	0.02	0.02
115	III E7	3.26	3.27	3.21	3.29	3.22	-0.01	0.05	-0.03	0.04	0.06	-0.03	0.05	-0.08	-0.01	0.07
116	III E8	3.70	3.76	3.55	3.55	3.77	-0.07	0.14	0.15**	-0.08	0.21	0.21**	-0.01	0.00	-0.22	-0.22
117	III E9	3.38	3.42	3.70	3.39	3.58	-0.04	-0.32	-0.01	-0.19	-0.28	0.03	-0.15	0.31	0.13	-0.18
118	III E10	3.13	3.23	3.19	3.18	3.03	-0.10	-0.06	-0.05	0.11	0.04	0.05	0.21	0.01	0.17	0.15
119	III E11	3.79	3.81	3.66	3.68	3.81	-0.02	0.13	0.11*	-0.02	0.15	0.13**	0.00	-0.02	-0.15	-0.14
120	III E12	3.58	3.65	3.45	3.45	3.55	-0.07	0.13	0.13	0.03	0.21	0.20**	0.11	0.00	-0.10	-0.10
121	III E13	3.14	3.24	3.05	3.17	3.08	-0.10	0.09	-0.02	0.07	0.19	0.07	0.16	-0.12	-0.03	0.09
122	III E14	3.27	3.30	2.95	3.20	3.05	-0.04	0.31	0.07	0.22	0.35	0.10	0.26	-0.25	-0.10	0.15
123	III E15	3.58	3.63	3.37	3.48	3.34	-0.05	0.21	0.11	0.24	0.26	0.16**	0.29*	-0.11	0.03	0.14
124	III E16	3.11	3.15	2.95	3.11	2.92	-0.05	0.15	-0.01	0.19	0.20	0.04	0.24	-0.16	0.04	0.20

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		Hospital outpatient facility (HF)	Inpatient facility (IF)	Mobile unit (MU)	Outpatient free-standing facility (OFSF)	Research facility (RF)	HF vs IF	HF vs MU	HF vs OFSF	HF vs RF	IF vs MU	IF vs OFSF	IF vs RF	MU vs OFSF	MU vs RF	OFSF vs RF
125	III E17	3.39	3.43	3.41	3.43	3.64	-0.04	-0.02	-0.04	-0.26	0.01	0.00	-0.22	-0.02	-0.23	-0.22
126	III E18	3.42	3.42	3.07	3.32	3.58	0.01	0.35*	0.10	-0.15	0.35	0.09	-0.16	-0.25	-0.51*	-0.25
127	III E19	3.47	3.53	3.35	3.37	3.41	-0.06	0.12	0.10	0.05	0.18	0.16*	0.11	-0.02	-0.07	-0.05
128	III E20	3.17	3.16	3.12	3.14	3.00	0.01	0.05	0.03	0.17	0.04	0.02	0.16	-0.02	0.12	0.14
129	III E21	3.12	3.14	3.12	3.14	3.11	-0.02	0.00	-0.01	0.02	0.02	0.00	0.03	-0.02	0.01	0.03
130	III E22	3.26	3.29	3.41	3.37	3.27	-0.03	-0.15	-0.11	-0.01	-0.12	-0.08	0.02	0.04	0.14	0.10
131	III E23	3.43	3.49	3.26	3.36	3.30	-0.06	0.17	0.07	0.13	0.23	0.13	0.19	-0.10	-0.04	0.06
132	III F1a	3.63	3.60	3.50	3.56	3.38	0.02	0.13	0.06	0.24	0.10	0.04	0.22	-0.06	0.12	0.18
133	III F1b	3.59	3.60	3.39	3.52	3.48	-0.01	0.20	0.07	0.11	0.22	0.09	0.13	-0.13	-0.09	0.04
134	III F1c	3.47	3.39	3.21	3.41	3.37	0.08	0.26	0.06	0.10	0.19	-0.02	0.03	-0.21	-0.16	0.05
135	III F1d	3.20	3.18	3.00	3.21	3.03	0.02	0.20	-0.01	0.17	0.18	-0.03	0.16	-0.21	-0.03	0.19
136	III F1e	3.68	3.65	3.59	3.62	3.62	0.03	0.10	0.06	0.06	0.06	0.03	0.03	-0.03	-0.03	0.00
137	III F1f	3.60	3.57	3.45	3.59	3.57	0.03	0.14	0.01	0.03	0.11	-0.02	0.00	-0.13	-0.12	0.01
138	III F2	3.16	3.08	2.93	3.10	2.95	0.08	0.23	0.05	0.21	0.15	-0.03	0.13	-0.18	-0.02	0.15
139	III F3	3.46	3.44	3.28	3.50	3.36	0.02	0.18	-0.04	0.10	0.16	-0.06	0.08	-0.22	-0.08	0.14
140	III F4	3.74	3.74	3.56	3.71	3.80	0.00	0.18	0.03	-0.06	0.18	0.03	-0.06	-0.15	-0.24	-0.09
141	III G1	3.90	3.90	3.88	3.87	3.91	-0.01	0.02	0.02	-0.02	0.03	0.03	-0.01	0.00	-0.04	-0.04
142	III G2	3.91	3.91	3.88	3.90	3.91	-0.01	0.03	0.01	-0.01	0.04	0.01	0.00	-0.03	-0.04	-0.01
143	III H1	3.94	3.93	3.94	3.95	3.98	0.01	-0.01	-0.01	-0.04	-0.02	-0.02	-0.05	0.00	-0.03	-0.03
144	III H2	3.86	3.84	3.83	3.88	3.91	0.02	0.03	-0.01	-0.05	0.01	-0.03	-0.07	-0.04	-0.08	-0.04
145	III H3	3.79	3.76	3.75	3.80	3.83	0.03	0.04	-0.01	-0.04	0.01	-0.04	-0.07	-0.05	-0.08	-0.03
146	III H4	3.75	3.72	3.76	3.74	3.76	0.03	-0.01	0.01	0.00	-0.04	-0.02	-0.04	0.02	0.00	-0.02

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147	IIH5	3.68	3.67	3.74	3.64	3.67	0.01	-0.06	0.04	0.01	-0.07	0.03	0.00	0.10	0.07	-0.03
148	IVA1a	3.76	3.76	3.63	3.71	3.76	-0.01	0.12	0.04	0.00	0.13	0.05	0.01	-0.08	-0.12	-0.04
149	IVA1b	3.40	3.44	3.24	3.37	3.47	-0.05	0.16	0.03	-0.07	0.20	0.07	-0.02	-0.13	-0.23	-0.09
150	IVA1c	3.25	3.30	3.20	3.24	3.37	-0.05	0.05	0.01	-0.12	0.10	0.06	-0.07	-0.04	-0.17	-0.13
151	IVA2a	3.82	3.88	3.87	3.84	3.81	-0.06	-0.05	-0.01	0.02	0.01	0.05	0.07	0.04	0.06	0.03
152	IVA2b	3.80	3.83	3.89	3.81	3.72	-0.03	-0.09	-0.01	0.08	-0.06	0.01	0.10	0.08	0.17	0.09
153	IVA3	3.77	3.80	3.80	3.77	3.84	-0.03	-0.03	0.01	-0.07	0.00	0.04	-0.04	0.03	-0.04	-0.08
154	IVB1a	3.89	3.93	3.88	3.92	3.89	-0.04	0.00	-0.03	0.00	0.04	0.01	0.04	-0.03	0.00	0.03
155	IVB1b	3.83	3.86	3.84	3.87	3.84	-0.03	-0.01	-0.04	-0.01	0.02	0.00	0.02	-0.02	0.00	0.02
156	IVB1c	3.88	3.91	3.87	3.92	3.89	-0.03	0.02	-0.04	-0.01	0.05	-0.01	0.02	-0.06	-0.02	0.03
157	IVB1d	3.75	3.77	3.75	3.71	3.68	-0.02	0.01	0.04	0.07	0.03	0.07	0.09	0.04	0.06	0.03
158	IVB1e	3.86	3.88	3.92	3.87	3.82	-0.02	-0.06	-0.01	0.04	-0.04	0.01	0.06	0.05	0.10	0.05
159	IVB1f	3.63	3.61	3.62	3.66	3.51	0.02	0.01	-0.03	0.12	-0.01	-0.05	0.10	-0.04	0.11	0.15
160	IVB1g	3.50	3.52	3.49	3.51	3.60	-0.03	0.01	-0.01	-0.10	0.04	0.02	-0.07	-0.02	-0.11	-0.09
161	IVB2a	3.76	3.78	3.80	3.70	3.79	-0.02	-0.05	0.05	-0.03	-0.03	0.07	-0.01	0.10	0.02	-0.08
162	IVB2bi	3.86	3.89	3.85	3.85	3.80	-0.03	0.01	0.01	0.06	0.04	0.04	0.09	0.00	0.05	0.05
163	IVB2bii	3.82	3.86	3.85	3.85	3.75	-0.03	-0.02	-0.03	0.07	0.01	0.01	0.11	0.00	0.10	0.10
164	IVB2biii	3.47	3.52	3.52	3.49	3.46	-0.05	-0.05	-0.02	0.01	0.00	0.03	0.06	0.03	0.06	0.03
165	IVB2biv	3.53	3.59	3.58	3.51	3.50	-0.06	-0.05	0.01	0.03	0.01	0.08	0.09	0.07	0.08	0.01
166	IVB2bv	3.77	3.82	3.80	3.80	3.72	-0.05	-0.04	-0.03	0.05	0.01	0.01	0.10	0.00	0.08	0.08
167	IVB3a	3.73	3.74	3.82	3.73	3.80	-0.01	-0.09	0.00	-0.07	-0.08	0.01	-0.06	0.09	0.03	-0.06
168	IVB3b	3.75	3.77	3.88	3.79	3.79	-0.03	-0.13	-0.05	-0.04	-0.10	-0.02	-0.02	0.09	0.09	0.00

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169	IVB4a	3.63	3.61	3.63	3.60	3.86	0.02	0.00	0.03	-0.23	-0.02	0.01	-0.25	0.03	-0.23	-0.26
170	IVB4b	3.61	3.59	3.67	3.59	3.74	0.02	-0.05	0.03	-0.13	-0.07	0.01	-0.15	0.08	-0.08	-0.16
171	IVB5	3.50	3.49	3.54	3.44	3.36	0.00	-0.05	0.06	0.13	-0.05	0.05	0.13	0.10	0.18	0.07
172	IVB6	3.59	3.54	3.53	3.49	3.41	0.05	0.06	0.10	0.18	0.01	0.06	0.13	0.04	0.12	0.08
173	IVC1	3.22	3.14	3.00	3.15	3.15	0.08	0.22	0.07	0.07	0.14	-0.02	-0.01	-0.15	-0.15	0.00
174	IVC2a	3.48	3.48	3.54	3.48	3.59	-0.01	-0.07	0.00	-0.11	-0.06	0.01	-0.11	0.07	-0.05	-0.12
175	IVC2b	3.60	3.59	3.60	3.62	3.60	0.01	0.00	-0.02	0.00	-0.01	-0.03	-0.01	-0.02	0.00	0.02
176	IVC2c	3.48	3.42	3.35	3.44	3.44	0.07	0.14	0.04	0.04	0.07	-0.03	-0.02	-0.10	-0.09	0.00
177	IVC2d	3.60	3.57	3.55	3.70	3.50	0.04	0.05	-0.09	0.10	0.02	-0.13*	0.07	-0.15	0.05	0.20
178	IVC2e	3.47	3.43	3.66	3.46	3.73	0.04	-0.19	0.01	-0.26	-0.23	-0.03	-0.29	0.20	-0.07	-0.27
179	IVC2f	3.57	3.53	3.48	3.62	3.59	0.04	0.09	-0.05	-0.02	0.05	-0.10	-0.06	-0.14	-0.11	0.04
180	IVC3a	3.53	3.62	3.23	3.49	3.41	-0.08	0.31	0.04	0.12	0.39**	0.12	0.21	-0.27	-0.19	0.08
181	IVC3b	3.70	3.70	3.48	3.58	3.71	-0.01	0.22	0.12*	-0.02	0.23	0.13*	-0.01	-0.10	-0.24	-0.14
182	IVC3c	3.53	3.46	3.51	3.57	3.42	0.07	0.01	-0.05	0.11	-0.05	-0.11	0.04	-0.06	0.09	0.15
183	VA1a	3.77	3.78	3.67	3.65	3.80	-0.01	0.09	0.12*	-0.04	0.11	0.13**	-0.02	0.02	-0.13	-0.15
184	VA1b	3.71	3.79	3.58	3.66	3.67	-0.08	0.13	0.05	0.04	0.21	0.13*	0.12	-0.08	-0.09	-0.01
185	VA1c	3.88	3.91	3.83	3.84	3.88	-0.03	0.05	0.04	0.00	0.09	0.07*	0.03	-0.01	-0.05	-0.04
186	VA1d	3.77	3.78	3.73	3.70	3.65	-0.01	0.05	0.07	0.12	0.05	0.08	0.13	0.03	0.08	0.05
187	VA2a	3.77	3.77	3.69	3.73	3.79	0.00	0.08	0.03	-0.02	0.08	0.03	-0.02	-0.05	-0.10	-0.05
188	VA2b	3.91	3.93	3.83	3.90	3.90	-0.02	0.08	0.02	0.01	0.09	0.03	0.02	-0.06	-0.07	-0.01
189	VA2c	3.90	3.90	3.77	3.87	3.88	-0.01	0.13	0.03	0.02	0.13	0.04	0.03	-0.10	-0.11	-0.01
190	VA2d	3.39	3.35	3.29	3.47	3.30	0.04	0.11	-0.08	0.09	0.06	-0.12	0.05	-0.19	-0.01	0.17

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191	VA2e	3.83	3.82	3.79	3.80	3.79	0.01	0.04	0.03	0.04	0.03	0.02	0.04	-0.02	0.00	0.02
192	VA2f	3.37	3.42	3.55	3.49	3.51	-0.05	-0.19	-0.12	-0.15	-0.14	-0.08	-0.10	0.06	0.04	-0.02
193	VA3a	3.37	3.39	3.42	3.42	3.25	-0.02	-0.06	-0.05	0.12	-0.03	-0.03	0.14	0.00	0.17	0.17
194	VA3b	3.29	3.29	3.19	3.29	3.26	0.00	0.10	0.00	0.03	0.11	0.01	0.03	-0.10	-0.08	0.03
195	VA3c	3.26	3.26	3.12	3.20	3.24	0.00	0.14	0.06	0.02	0.14	0.06	0.02	-0.08	-0.12	-0.04
196	VA3d	3.45	3.41	3.45	3.43	3.40	0.04	0.00	0.02	0.05	-0.04	-0.02	0.01	0.02	0.05	0.03
197	VA3e	3.77	3.79	3.60	3.56	3.70	-0.02	0.17	0.21**	0.07	0.20	0.23**	0.09	0.04	-0.11	-0.15
198	VA3f	3.81	3.78	3.78	3.75	3.84	0.03	0.03	0.05	-0.04	0.00	0.03	-0.06	0.02	-0.07	-0.09
199	VA3g	3.63	3.65	3.45	3.56	3.68	-0.02	0.18	0.07	-0.05	0.21	0.09	-0.03	-0.11	-0.24	-0.12
200	VA4a	3.35	3.41	3.26	3.40	3.37	-0.05	0.09	-0.05	-0.02	0.14	0.00	0.04	-0.14	-0.11	0.03
201	VA4b	3.74	3.80	3.56	3.65	3.61	-0.07	0.18	0.08	0.13	0.25*	0.15**	0.19	-0.10	-0.05	0.04
202	VA5a	3.20	3.10	3.24	3.17	2.92	0.10	-0.04	0.03	0.29	-0.14	-0.07	0.18	0.07	0.32	0.25
203	VA5b	3.35	3.24	3.34	3.31	3.00	0.11	0.01	0.05	0.35	-0.10	-0.06	0.24	0.03	0.34	0.31
204	VA5c	3.47	3.37	3.42	3.45	3.35	0.10	0.05	0.02	0.12	-0.05	-0.08	0.02	-0.03	0.07	0.10
205	VA5d	3.53	3.56	3.51	3.58	3.61	-0.03	0.02	-0.05	-0.08	0.05	-0.02	-0.05	-0.07	-0.10	-0.03
206	VA5e	3.76	3.78	3.59	3.74	3.76	-0.02	0.17	0.02	0.00	0.19	0.04	0.02	-0.15	-0.17	-0.02
207	VA5f	3.79	3.83	3.63	3.74	3.80	-0.04	0.16	0.05	-0.01	0.20*	0.09*	0.03	-0.11	-0.17	-0.06
208	VA5g	2.88	2.75	3.05	3.02	2.38	0.13	-0.17	-0.14	0.50	-0.30	-0.27*	0.37	0.03	0.66*	0.63**
209	VA6a	3.30	3.21	3.30	3.19	3.08	0.09	0.00	0.11	0.22	-0.08	0.02	0.13	0.11	0.21	0.11
210	VA6b	3.76	3.82	3.70	3.69	3.74	-0.06	0.05	0.06	0.02	0.12	0.12**	0.08	0.01	-0.04	-0.04
211	VA6c	3.86	3.87	3.76	3.82	3.90	-0.01	0.10	0.04	-0.04	0.11	0.05	-0.03	-0.06	-0.14	-0.08
212	VA6d	3.86	3.87	3.76	3.81	3.86	-0.01	0.10	0.05	0.00	0.11	0.06	0.01	-0.05	-0.10	-0.05

Order	Element	Mean by Practice Setting					Mean Differences									
		Hospital outpatient facility (HF)	Inpatient facility (IF)	Mobile unit (MU)	Outpatient free-standing facility (OFSF)	Research facility (RF)	HF vs IF	HF vs MU	HF vs OFSF	HF vs RF	IF vs MU	IF vs OFSF	IF vs RF	MU vs OFSF	MU vs RF	OFSF vs RF
213	VA6e	3.73	3.78	3.52	3.66	3.71	-0.05	0.21	0.07	0.02	0.26*	0.12*	0.07	-0.14	-0.19	-0.05
214	VA7a	3.17	3.12	2.97	3.15	2.92	0.06	0.20	0.03	0.25	0.14	-0.03	0.20	-0.17	0.05	0.23
215	VA7b	2.90	2.73	2.85	2.95	2.70	0.17	0.05	-0.05	0.20	-0.12	-0.22	0.03	-0.10	0.15	0.25
216	VA7c	3.03	2.93	2.89	3.05	2.79	0.10	0.14	-0.02	0.24	0.04	-0.12	0.15	-0.16	0.11	0.26
217	VA8a	3.38	3.35	3.43	3.38	3.34	0.02	-0.05	0.00	0.04	-0.07	-0.03	0.01	0.04	0.08	0.04
218	VA8b	3.90	3.92	3.86	3.92	3.95	-0.02	0.04	-0.02	-0.05	0.06	0.00	-0.03	-0.06	-0.09	-0.03
219	VA8c	3.91	3.92	3.80	3.90	3.83	-0.01	0.11	0.01	0.08	0.12	0.01	0.08	-0.10	-0.03	0.07
220	VA8d	3.30	3.29	3.43	3.32	3.31	0.01	-0.12	-0.02	-0.01	-0.14	-0.03	-0.02	0.11	0.12	0.01
221	VA8e	3.69	3.75	3.54	3.65	3.67	-0.06	0.15	0.05	0.02	0.21	0.10	0.08	-0.11	-0.13	-0.03
222	VA8f	3.51	3.45	3.47	3.44	3.38	0.06	0.04	0.07	0.13	-0.02	0.01	0.07	0.02	0.09	0.06
223	VA8g	3.55	3.48	3.36	3.51	3.35	0.07	0.19	0.04	0.20	0.12	-0.03	0.13	-0.15	0.01	0.16
224	VA8h	3.13	3.07	3.24	3.13	2.92	0.06	-0.11	0.00	0.21	-0.17	-0.06	0.15	0.11	0.32	0.21
225	VA8i	3.52	3.49	3.49	3.42	3.34	0.02	0.03	0.10	0.17	0.00	0.08	0.15	0.07	0.15	0.08
226	VA8j	3.35	3.27	3.18	3.28	3.08	0.08	0.17	0.07	0.27	0.09	-0.01	0.19	-0.10	0.10	0.20
227	VA8k	3.56	3.51	3.36	3.47	3.55	0.04	0.20	0.09	0.01	0.16	0.05	-0.04	-0.11	-0.19	-0.08
228	VA8l	3.53	3.48	3.53	3.61	3.59	0.05	0.00	-0.08	-0.06	-0.06	-0.13	-0.11	-0.07	-0.06	0.02
229	VA9a	3.10	3.04	3.00	3.07	2.76	0.06	0.10	0.03	0.34	0.04	-0.04	0.28	-0.07	0.24	0.32
230	VA9b	3.82	3.84	3.73	3.69	3.67	-0.02	0.08	0.13**	0.15	0.11	0.16**	0.17	0.05	0.07	0.02
231	VA9c	3.31	3.23	3.29	3.27	3.08	0.09	0.03	0.04	0.24	-0.06	-0.04	0.15	0.01	0.21	0.20
232	VA9d	3.79	3.86	3.58	3.69	3.88	-0.07	0.21*	0.10*	-0.09	0.29**	0.17**	-0.02	-0.12	-0.30*	-0.19
233	VA9e	3.38	3.31	3.19	3.35	3.24	0.07	0.20	0.03	0.15	0.12	-0.04	0.07	-0.16	-0.05	0.11
234	VA9f	3.85	3.87	3.67	3.78	3.81	-0.02	0.19	0.08	0.04	0.20*	0.09*	0.06	-0.11	-0.14	-0.03

Order	Element	Mean by Practice Setting					Mean Differences									
		Hospital outpatient facility (HF)	Inpatient facility (IF)	Mobile unit (MU)	Outpatient free-standing facility (OFSF)	Research facility (RF)	HF vs IF	HF vs MU	HF vs OFSF	HF vs RF	IF vs MU	IF vs OFSF	IF vs RF	MU vs OFSF	MU vs RF	OFSF vs RF
235	VA9g	3.15	3.06	2.95	3.14	2.84	0.09	0.20	0.01	0.31	0.11	-0.08	0.22	-0.19	0.11	0.30
236	VA9h	3.25	3.21	2.85	3.06	2.92	0.04	0.40	0.19	0.33	0.35	0.14	0.28	-0.21	-0.07	0.14
237	VA9i	3.41	3.40	3.32	3.45	3.26	0.01	0.09	-0.04	0.15	0.08	-0.05	0.14	-0.13	0.06	0.19
238	VA9j	3.35	3.36	3.27	3.25	3.07	-0.01	0.08	0.09	0.27	0.09	0.11	0.29	0.02	0.19	0.18
239	VA9k	2.97	2.91	2.98	3.00	2.78	0.06	-0.01	-0.03	0.19	-0.07	-0.09	0.13	-0.02	0.19	0.21
240	VA9l	2.88	2.78	2.67	2.89	2.53	0.10	0.21	0.00	0.35	0.12	-0.10	0.26	-0.22	0.14	0.36
241	VA10a	3.51	3.65	3.30	3.46	3.57	-0.15**	0.21	0.04	-0.07	0.35*	0.19**	0.08	-0.16	-0.27	-0.11
242	VA10b	3.46	3.49	3.33	3.44	3.60	-0.02	0.14	0.02	-0.14	0.16	0.04	-0.12	-0.12	-0.28	-0.16
243	VA10c	3.30	3.40	3.03	3.27	3.28	-0.10	0.27	0.03	0.02	0.37	0.13	0.12	-0.24	-0.26	-0.02
244	VA10d	3.33	3.36	3.05	3.17	3.29	-0.03	0.28	0.15	0.04	0.31	0.18*	0.07	-0.13	-0.24	-0.11
245	VA10e	3.28	3.28	3.03	3.19	3.24	-0.01	0.25	0.08	0.03	0.26	0.09	0.04	-0.17	-0.22	-0.05
246	VA10f	3.25	3.26	3.03	3.17	3.10	0.00	0.23	0.08	0.15	0.23	0.08	0.16	-0.15	-0.07	0.07
247	VA10g	3.53	3.51	3.55	3.51	3.67	0.02	-0.02	0.02	-0.14	-0.04	0.00	-0.16	0.05	-0.12	-0.17
248	VA11a	2.84	2.82	2.73	3.01	2.64	0.03	0.11	-0.17	0.21	0.09	-0.20	0.18	-0.28	0.09	0.38
249	VA11b	2.82	2.80	2.70	2.97	2.58	0.02	0.12	-0.15	0.25	0.10	-0.17	0.23	-0.27	0.12	0.40
250	VA11c	3.76	3.84	3.55	3.72	3.80	-0.07	0.22	0.04	-0.04	0.29**	0.12*	0.03	-0.17	-0.26	-0.08
251	VA11d	3.56	3.60	3.29	3.47	3.46	-0.05	0.27	0.08	0.09	0.32	0.13	0.14	-0.19	-0.18	0.01
252	VA11e	3.19	3.18	2.95	3.18	3.13	0.01	0.24	0.00	0.06	0.22	-0.01	0.05	-0.23	-0.18	0.06
253	VA11f	3.28	3.27	2.93	3.10	3.18	0.01	0.36	0.18	0.10	0.35	0.17	0.09	-0.18	-0.26	-0.08
254	VA11g	3.00	2.98	2.81	3.00	2.61	0.03	0.19	0.00	0.40	0.17	-0.02	0.37	-0.19	0.20	0.39
255	VA12a	3.64	3.60	3.66	3.54	3.88	0.03	-0.02	0.09	-0.24	-0.06	0.06	-0.28	0.12	-0.22	-0.34*
256	VA12b	3.45	3.33	3.42	3.43	3.41	0.12	0.03	0.02	0.04	-0.09	-0.10	-0.08	-0.01	0.01	0.02

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257	VB1	3.66	3.67	3.76	3.60	3.60	-0.01	-0.10	0.06	0.06	-0.09	0.07	0.07	0.16	0.16	0.00
258	VB2	3.64	3.67	3.67	3.58	3.49	-0.02	-0.03	0.06	0.15	-0.01	0.08	0.18	0.09	0.18	0.09
259	VB3	3.65	3.66	3.71	3.62	3.53	-0.02	-0.07	0.03	0.11	-0.05	0.05	0.13	0.09	0.18	0.08
260	VC	3.69	3.68	3.68	3.65	3.66	0.01	0.01	0.03	0.03	0.00	0.03	0.02	0.03	0.02	-0.01
261	VD	3.80	3.81	3.70	3.75	3.87	-0.01	0.10	0.05	-0.07	0.12	0.06	-0.06	-0.06	-0.17	-0.12
262	VE1	3.89	3.89	3.84	3.86	3.87	0.00	0.05	0.03	0.02	0.05	0.03	0.02	-0.02	-0.03	-0.01
263	VE2	3.81	3.77	3.76	3.80	3.82	0.04	0.04	0.01	-0.01	0.01	-0.03	-0.05	-0.03	-0.06	-0.02
264	VE3	3.84	3.82	3.81	3.76	3.78	0.02	0.03	0.08	0.06	0.00	0.06	0.04	0.05	0.04	-0.01
265	VE4a	3.65	3.63	3.49	3.57	3.61	0.01	0.16	0.08	0.03	0.14	0.07	0.02	-0.08	-0.12	-0.05
266	VE4b	3.70	3.69	3.56	3.63	3.57	0.01	0.13	0.07	0.13	0.12	0.06	0.12	-0.07	0.00	0.06
267	VE4c	3.47	3.47	3.28	3.31	3.47	0.00	0.19	0.15*	0.00	0.19	0.15*	0.00	-0.04	-0.19	-0.15
268	VE4d	3.64	3.62	3.43	3.57	3.70	0.02	0.21	0.08	-0.05	0.19	0.05	-0.07	-0.14	-0.27	-0.13
269	VE5	3.89	3.88	3.77	3.87	3.87	0.01	0.12	0.01	0.02	0.11	0.00	0.01	-0.10	-0.10	0.01
270	VE6a	3.89	3.90	3.84	3.90	3.89	0.00	0.05	0.00	0.01	0.06	0.00	0.01	-0.06	-0.05	0.01
271	VE6b	3.79	3.81	3.75	3.83	3.82	-0.01	0.05	-0.04	-0.03	0.06	-0.02	-0.01	-0.08	-0.07	0.01
272	VE6c	3.75	3.75	3.67	3.79	3.78	0.00	0.08	-0.04	-0.02	0.08	-0.04	-0.03	-0.12	-0.11	0.01
273	VE6d	3.77	3.76	3.76	3.79	3.81	0.01	0.00	-0.02	-0.05	0.00	-0.03	-0.05	-0.03	-0.05	-0.02
274	VE6e	3.71	3.72	3.63	3.65	3.51	-0.01	0.08	0.06	0.20	0.09	0.07	0.21	-0.02	0.12	0.14
275	VE7	3.84	3.82	3.80	3.88	3.86	0.02	0.04	-0.04	-0.02	0.02	-0.06	-0.04	-0.08	-0.06	0.02
276	VF1	3.97	3.94	3.89	3.95	3.89	0.03	0.08	0.02	0.08	0.05	-0.01	0.05	-0.06	0.00	0.06
277	VF2	3.96	3.94	3.89	3.95	3.89	0.02	0.07	0.01	0.07	0.05	0.00	0.05	-0.06	0.00	0.05
278	VG	3.89	3.88	3.85	3.90	3.85	0.01	0.03	-0.01	0.04	0.03	-0.02	0.03	-0.04	0.00	0.05

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279	VH	3.92	3.89	3.85	3.94	3.87	0.03	0.07	-0.02	0.05	0.03	-0.05	0.01	-0.08	-0.02	0.07
280	VI1	3.88	3.87	3.75	3.83	3.83	0.01	0.13	0.05	0.05	0.12	0.04	0.04	-0.08	-0.08	0.00
281	VI2	3.88	3.86	3.75	3.84	3.82	0.02	0.13	0.04	0.06	0.11	0.02	0.04	-0.10	-0.07	0.02
282	VJ1	3.89	3.90	3.80	3.90	3.77	-0.01	0.09	-0.01	0.13	0.10	0.00	0.14	-0.10	0.04	0.13
283	VJ2	3.89	3.90	3.82	3.88	3.87	-0.02	0.06	0.01	0.01	0.08	0.02	0.03	-0.06	-0.05	0.01
284	VJ3	3.76	3.76	3.71	3.70	3.84	0.00	0.05	0.06	-0.09	0.06	0.06	-0.08	0.01	-0.14	-0.15
285	VJ4	3.81	3.80	3.71	3.73	3.76	0.01	0.10	0.09*	0.05	0.09	0.07	0.04	-0.01	-0.05	-0.03
286	VK	3.71	3.72	3.65	3.67	3.69	-0.01	0.06	0.04	0.02	0.06	0.05	0.03	-0.02	-0.03	-0.02
287	VL	3.76	3.74	3.69	3.70	3.68	0.02	0.07	0.06	0.08	0.05	0.03	0.05	-0.02	0.00	0.02
288	VM1	3.69	3.67	3.64	3.71	3.52	0.02	0.04	-0.03	0.16	0.03	-0.04	0.15	-0.07	0.12	0.19
289	VM2	3.71	3.69	3.69	3.66	3.65	0.02	0.02	0.04	0.05	0.00	0.02	0.03	0.02	0.03	0.01
290	VM3	3.81	3.78	3.73	3.82	3.76	0.03	0.08	-0.01	0.05	0.05	-0.04	0.01	-0.09	-0.03	0.06
291	VM4	3.70	3.69	3.65	3.67	3.67	0.01	0.06	0.04	0.04	0.04	0.02	0.02	-0.02	-0.02	0.00
292	VM5a	3.77	3.80	3.60	3.72	3.70	-0.03	0.17	0.05	0.07	0.20	0.07	0.09	-0.13	-0.11	0.02
293	VM5b	3.70	3.73	3.43	3.64	3.66	-0.03	0.28*	0.06	0.04	0.30**	0.09	0.07	-0.21	-0.23	-0.02
294	VM5c	3.66	3.65	3.50	3.60	3.55	0.00	0.16	0.06	0.10	0.15	0.05	0.10	-0.10	-0.05	0.05
295	VM6	3.71	3.74	3.55	3.65	3.66	-0.02	0.16	0.06	0.05	0.19	0.09	0.08	-0.10	-0.11	-0.01
296	VN1a	3.51	3.49	3.48	3.60	3.64	0.02	0.03	-0.09	-0.13	0.02	-0.11	-0.14	-0.12	-0.16	-0.03
297	VN1b	3.56	3.52	3.47	3.63	3.66	0.05	0.09	-0.06	-0.10	0.05	-0.11	-0.14	-0.16	-0.19	-0.03
298	VN1c	3.55	3.50	3.51	3.63	3.60	0.05	0.04	-0.08	-0.05	-0.01	-0.13*	-0.10	-0.12	-0.09	0.03
299	VN2	3.69	3.66	3.48	3.72	3.64	0.04	0.21	-0.03	0.06	0.18	-0.07	0.02	-0.24	-0.16	0.08
300	VN3a	3.73	3.68	3.68	3.77	3.85	0.04	0.05	-0.05	-0.12	0.00	-0.09	-0.17	-0.09	-0.17	-0.08

Order	Element	Mean by Practice Setting					Mean Differences									
		Hospital outpatient facility (HF)	Inpatient facility (IF)	Mobile unit (MU)	Outpatient free-standing facility (OFSF)	Research facility (RF)	HF vs IF	HF vs MU	HF vs OFSF	HF vs RF	IF vs MU	IF vs OFSF	IF vs RF	MU vs OFSF	MU vs RF	OFSF vs RF
301	VN3b	3.68	3.62	3.64	3.73	3.78	0.06	0.04	-0.05	-0.10	-0.02	-0.11*	-0.16	-0.09	-0.14	-0.05
302	VN4a	3.83	3.80	3.82	3.86	3.81	0.03	0.02	-0.02	0.02	-0.01	-0.06	-0.01	-0.04	0.00	0.05
303	VN4b	3.84	3.82	3.80	3.85	3.84	0.02	0.04	-0.01	0.00	0.02	-0.02	-0.02	-0.05	-0.04	0.01
304	VN4c	3.88	3.86	3.82	3.87	3.84	0.01	0.05	0.01	0.04	0.04	0.00	0.02	-0.04	-0.02	0.03
305	VN4d	3.80	3.77	3.76	3.81	3.81	0.03	0.03	-0.01	-0.02	0.00	-0.04	-0.05	-0.05	-0.05	0.00
306	VN4e	3.78	3.74	3.76	3.79	3.77	0.04	0.02	-0.01	0.01	-0.02	-0.06	-0.03	-0.04	-0.01	0.03
307	VN4f	3.76	3.72	3.73	3.80	3.74	0.03	0.03	-0.04	0.01	-0.01	-0.08	-0.02	-0.07	-0.02	0.06
308	VO1	3.45	3.37	3.55	3.39	3.21	0.08	-0.10	0.06	0.24	-0.19	-0.03	0.15	0.16	0.34	0.18
309	VO2	3.44	3.38	3.45	3.39	3.36	0.05	-0.01	0.05	0.08	-0.06	0.00	0.03	0.06	0.09	0.03
310	VO3	3.42	3.34	3.41	3.37	3.32	0.08	0.01	0.05	0.10	-0.07	-0.03	0.03	0.04	0.10	0.05
311	VP1	3.35	3.27	3.33	3.29	3.20	0.08	0.01	0.06	0.15	-0.07	-0.02	0.07	0.05	0.14	0.09
312	VP2	3.40	3.32	3.30	3.31	3.22	0.08	0.10	0.09	0.18	0.02	0.01	0.10	-0.02	0.08	0.09
313	VQ	3.55	3.53	3.49	3.48	3.65	0.02	0.07	0.08	-0.10	0.05	0.06	-0.12	0.01	-0.16	-0.17

TABLE H-5 Average Importance Ratings by Capacity

Rating Scale
 1 = Not Important
 2 = Low Importance
 3 = Moderate Importance
 4 = Extremely Important

Key:
 *=Significant at the .05 level
 **=Significant at the .01 level

Order	Element	Mean by Capacity					Mean Differences									
		Full-time (1)	I am not currently working as a Nuclear Medicine Technologist (2)	Part-time (3)	Per-diem (4)	Retired (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
1	IA1ai	3.86	3.80	3.85	3.86	3.95	0.05	0.01	0.00	-0.09	-0.05	-0.06	-0.14	-0.01	-0.10	-0.09
2	IA1aai	3.26	3.43	3.25	3.41	3.51	-0.17*	0.01	-0.15	-0.26	0.18	0.02	-0.09	-0.16	-0.26	-0.11
3	IA1aiii	2.88	3.10	2.95	3.01	3.26	-0.22*	-0.07	-0.13	-0.38	0.15	0.09	-0.16	-0.06	-0.31	-0.25
4	IA1aiv	3.58	3.56	3.52	3.66	3.82	0.02	0.05	-0.08	-0.25	0.04	-0.10	-0.26	-0.14	-0.30	-0.16
5	IA2a	3.10	3.28	3.11	3.26	3.33	-0.18*	-0.01	-0.17	-0.24	0.17	0.01	-0.06	-0.15	-0.22	-0.07
6	IA2b	3.02	3.17	3.00	3.16	3.49	-0.15	0.02	-0.13	-0.46**	0.17	0.01	-0.32	-0.16	-0.49*	-0.33
7	IB	3.72	3.72	3.76	3.72	3.94	0.00	-0.04	0.00	-0.22	-0.04	0.00	-0.22	0.05	-0.18	-0.23
8	IC	3.49	3.54	3.59	3.59	3.75	-0.05	-0.10	-0.09	-0.26	-0.05	-0.04	-0.21	0.00	-0.16	-0.16
9	ID	3.70	3.70	3.68	3.75	3.84	0.00	0.02	-0.05	-0.14	0.02	-0.05	-0.14	-0.08	-0.16	-0.08
10	IE	3.21	3.21	3.12	3.14	3.62	0.01	0.09	0.08	-0.41*	0.09	0.07	-0.41*	-0.01	-0.50**	-0.49*
11	IIA	3.72	3.75	3.71	3.73	3.94	-0.02	0.01	-0.01	-0.22	0.03	0.01	-0.20	-0.02	-0.23	-0.21
12	IIB1	3.90	3.87	3.92	3.89	3.94	0.03	-0.02	0.01	-0.05	-0.05	-0.02	-0.07	0.03	-0.03	-0.06
13	IIB2	3.88	3.89	3.90	3.87	3.94	-0.01	-0.02	0.01	-0.07	-0.02	0.02	-0.06	0.03	-0.04	-0.07

Order	Element	Mean by Capacity					Mean Differences									
		Full-time (1)	I am not currently working as a Nuclear Medicine Technologist (2)	Part-time (3)	Per-diem (4)	Retired (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
14	IIB3	3.85	3.84	3.89	3.86	3.94	0.01	-0.04	-0.02	-0.09	-0.05	-0.02	-0.10	0.03	-0.05	-0.08
15	IIC1a	3.89	3.83	3.90	3.87	3.89	0.06	-0.01	0.01	0.00	-0.07	-0.04	-0.06	0.03	0.01	-0.02
16	IIC1b	3.71	3.71	3.68	3.69	3.81	0.00	0.03	0.02	-0.09	0.03	0.02	-0.10	-0.01	-0.13	-0.11
17	IIC1c	3.75	3.72	3.71	3.66	3.83	0.03	0.04	0.09	-0.08	0.01	0.06	-0.12	0.05	-0.12	-0.18
18	IIC2	3.82	3.75	3.87	3.85	3.86	0.08	-0.05	-0.03	-0.04	-0.12*	-0.10	-0.12	0.02	0.01	-0.01
19	IIC3	3.84	3.85	3.87	3.81	3.94	-0.01	-0.03	0.03	-0.10	-0.02	0.05	-0.09	0.07	-0.07	-0.14
20	IIC4a	3.72	3.73	3.74	3.69	3.92	-0.01	-0.03	0.02	-0.20	-0.01	0.04	-0.19	0.05	-0.17	-0.23
21	IIC4b	3.71	3.74	3.72	3.71	3.92	-0.03	-0.02	0.00	-0.21	0.02	0.03	-0.18	0.01	-0.19	-0.21
22	IIC4c	3.60	3.62	3.66	3.58	3.80	-0.02	-0.07	0.01	-0.20	-0.04	0.04	-0.18	0.08	-0.14	-0.22
23	IID	3.92	3.87	3.92	3.90	3.97	0.05	0.00	0.03	-0.05	-0.05	-0.02	-0.10	0.03	-0.05	-0.08
24	IIE1	3.71	3.72	3.72	3.75	3.78	0.00	-0.01	-0.03	-0.06	0.00	-0.03	-0.06	-0.03	-0.06	-0.03
25	IIE2	3.84	3.84	3.87	3.83	3.89	0.00	-0.03	0.00	-0.05	-0.03	0.00	-0.05	0.03	-0.02	-0.05
26	IIE3a	3.75	3.73	3.79	3.74	3.97	0.02	-0.04	0.00	-0.22*	-0.06	-0.02	-0.24*	0.05	-0.18	-0.23
27	IIE3b	3.82	3.81	3.83	3.82	3.97	0.01	-0.01	0.00	-0.15	-0.01	-0.01	-0.16	0.00	-0.15	-0.15
28	IIE3c	3.82	3.88	3.83	3.79	3.97	-0.06	-0.01	0.03	-0.16	0.05	0.09	-0.10	0.04	-0.15	-0.18
29	IIE3d	3.76	3.81	3.75	3.75	3.92	-0.05	0.01	0.01	-0.16	0.06	0.06	-0.11	0.00	-0.17	-0.17
30	IIE3e	3.74	3.75	3.79	3.72	3.95	0.00	-0.04	0.02	-0.20	-0.04	0.02	-0.20	0.06	-0.16	-0.22
31	IIE3f	3.77	3.78	3.78	3.77	3.89	-0.01	-0.01	0.01	-0.12	0.00	0.02	-0.11	0.02	-0.11	-0.13
32	IIE4	3.82	3.85	3.86	3.79	3.97	-0.02	-0.03	0.03	-0.15	-0.01	0.05	-0.13	0.06	-0.12	-0.18
33	IIE5	3.84	3.86	3.86	3.80	3.97	-0.02	-0.02	0.04	-0.13	0.00	0.06	-0.11	0.06	-0.11	-0.17

Order	Element	Mean by Capacity					Mean Differences									
		Full-time (1)	I am not currently working as a Nuclear Medicine Technologist (2)	Part-time (3)	Per-diem (4)	Retired (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
34	IIE6	3.78	3.81	3.77	3.77	3.97	-0.02	0.01	0.02	-0.19	0.04	0.04	-0.17	0.00	-0.20	-0.21
35	IIE7a	3.80	3.76	3.80	3.78	3.92	0.04	0.00	0.02	-0.12	-0.04	-0.02	-0.16	0.02	-0.12	-0.14
36	IIE7b	3.77	3.73	3.77	3.74	3.95	0.04	0.00	0.03	-0.18	-0.04	-0.01	-0.21	0.03	-0.17	-0.20
37	IIE7c	3.78	3.76	3.78	3.77	3.95	0.02	0.00	0.01	-0.16	-0.02	0.00	-0.18	0.01	-0.16	-0.18
38	IIE7d	3.72	3.70	3.74	3.72	3.86	0.02	-0.02	0.00	-0.14	-0.04	-0.02	-0.16	0.02	-0.12	-0.14
39	IIE7e	3.84	3.81	3.84	3.88	3.92	0.03	0.00	-0.04	-0.08	-0.03	-0.07	-0.11	-0.04	-0.08	-0.03
40	IIF1	3.80	3.78	3.82	3.78	3.92	0.01	-0.03	0.02	-0.12	-0.04	0.01	-0.13	0.05	-0.10	-0.14
41	IIF2	3.75	3.74	3.75	3.68	3.84	0.02	0.01	0.08	-0.09	-0.01	0.06	-0.10	0.07	-0.09	-0.16
42	IIF3	3.75	3.72	3.76	3.71	3.89	0.03	-0.01	0.04	-0.14	-0.04	0.01	-0.17	0.05	-0.13	-0.18
43	IIG	3.57	3.58	3.61	3.60	3.78	-0.01	-0.04	-0.03	-0.22	-0.03	-0.02	-0.20	0.01	-0.17	-0.18
44	IIH	3.64	3.65	3.71	3.65	3.86	-0.01	-0.07	0.00	-0.22	-0.06	0.01	-0.21	0.06	-0.16	-0.22
45	III1	3.87	3.83	3.92	3.85	3.89	0.04	-0.04	0.02	-0.02	-0.09	-0.02	-0.06	0.06	0.02	-0.04
46	III2	3.82	3.77	3.87	3.82	3.92	0.05	-0.04	0.00	-0.09	-0.10	-0.05	-0.15	0.05	-0.05	-0.10
47	III3	3.73	3.69	3.78	3.72	3.89	0.04	-0.05	0.01	-0.16	-0.09	-0.03	-0.20	0.06	-0.11	-0.16
48	IIJ	3.57	3.46	3.60	3.53	3.59	0.11	-0.03	0.04	-0.02	-0.14	-0.07	-0.14	0.07	0.00	-0.06
49	IIIA1a	3.14	3.27	3.17	3.08	3.43	-0.12	-0.03	0.06	-0.29	0.10	0.18	-0.16	0.09	-0.26	-0.35
50	IIIA1b	3.15	3.31	3.17	3.09	3.54	-0.16	-0.02	0.06	-0.40*	0.14	0.22	-0.23	0.08	-0.38	-0.45*
51	IIIA1ci	3.19	3.35	3.21	3.04	3.60	-0.16	-0.02	0.15	-0.41*	0.14	0.30*	-0.25	0.17	-0.39	-0.56**
52	IIIA1cii	3.03	3.18	3.01	2.92	3.49	-0.16	0.01	0.11	-0.46*	0.17	0.27	-0.30	0.10	-0.47*	-0.57**
53	IIIA2	3.80	3.80	3.83	3.74	3.92	0.00	-0.03	0.06	-0.12	-0.03	0.06	-0.12	0.09	-0.09	-0.17

Order	Element	Mean by Capacity					Mean Differences									
		Full-time (1)	I am not currently working as a Nuclear Medicine Technologist (2)	Part-time (3)	Per-diem (4)	Retired (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
54	IIIB1a	3.57	3.69	3.65	3.61	3.86	-0.12	-0.08	-0.04	-0.29	0.04	0.08	-0.17	0.04	-0.21	-0.25
55	IIIB1b	3.59	3.70	3.67	3.61	3.89	-0.11	-0.08	-0.03	-0.30*	0.03	0.08	-0.19	0.05	-0.22	-0.27
56	IIIB1c	3.46	3.59	3.55	3.44	3.77	-0.13	-0.09	0.02	-0.31	0.04	0.15	-0.18	0.11	-0.22	-0.33
57	IIIB2a	3.54	3.55	3.57	3.47	3.83	-0.01	-0.03	0.07	-0.29	-0.01	0.09	-0.28	0.10	-0.26	-0.37*
58	IIIB2b	3.43	3.50	3.49	3.33	3.80	-0.07	-0.06	0.10	-0.37*	0.01	0.17	-0.30	0.16	-0.31	-0.47**
59	IIIB3	3.61	3.70	3.67	3.64	3.86	-0.09	-0.06	-0.02	-0.25	0.03	0.07	-0.16	0.04	-0.19	-0.23
60	IIIB4	3.57	3.65	3.64	3.59	3.92	-0.08	-0.07	-0.02	-0.35*	0.01	0.06	-0.27	0.05	-0.28	-0.33
61	IIIC1a	3.85	3.88	3.87	3.88	3.95	-0.03	-0.02	-0.02	-0.09	0.01	0.00	-0.07	0.00	-0.07	-0.07
62	IIIC1b	3.57	3.60	3.45	3.55	3.94	-0.03	0.12	0.01	-0.37*	0.15	0.05	-0.34	-0.10	-0.49**	-0.39
63	IIIC1c	3.82	3.83	3.83	3.87	3.94	0.00	-0.01	-0.04	-0.12	-0.01	-0.04	-0.12	-0.03	-0.11	-0.08
64	IIIC1d	3.78	3.79	3.77	3.83	3.94	-0.02	0.00	-0.05	-0.17	0.02	-0.04	-0.15	-0.06	-0.17	-0.11
65	IIIC1e	3.84	3.86	3.85	3.88	3.94	-0.02	0.00	-0.04	-0.10	0.02	-0.02	-0.08	-0.04	-0.10	-0.06
66	IIIC1f	3.80	3.80	3.84	3.81	3.94	0.00	-0.04	0.00	-0.14	-0.04	0.00	-0.14	0.03	-0.11	-0.14
67	IIIC1g	3.82	3.84	3.85	3.83	3.94	-0.02	-0.03	-0.01	-0.12	-0.01	0.00	-0.11	0.01	-0.10	-0.11
68	IIIC1h	3.78	3.81	3.80	3.79	3.89	-0.03	-0.02	-0.01	-0.11	0.02	0.02	-0.07	0.00	-0.09	-0.10
69	IIIC1i	3.52	3.60	3.54	3.66	3.81	-0.08	-0.02	-0.14	-0.28	0.06	-0.06	-0.20	-0.12	-0.27	-0.15
70	IIIC1j	3.84	3.84	3.85	3.86	3.84	0.00	-0.01	-0.03	0.00	-0.01	-0.03	0.00	-0.01	0.01	0.03
71	IIIC1k	3.71	3.78	3.74	3.76	3.89	-0.07	-0.02	-0.04	-0.17	0.05	0.03	-0.10	-0.02	-0.15	-0.13
72	IIIC1l	3.37	3.46	3.36	3.40	3.86	-0.08	0.01	-0.03	-0.48**	0.09	0.05	-0.40	-0.04	-0.49**	-0.45*
73	IIIC1m	3.59	3.59	3.53	3.57	3.86	0.00	0.06	0.02	-0.27	0.06	0.01	-0.27	-0.04	-0.33	-0.29

Order	Element	Mean by Capacity					Mean Differences									
		Full-time (1)	I am not currently working as a Nuclear Medicine Technologist (2)	Part-time (3)	Per-diem (4)	Retired (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
74	IIIC1n	3.49	3.57	3.37	3.53	3.78	-0.08	0.12	-0.04	-0.29	0.20*	0.04	-0.21	-0.16	-0.41*	-0.25
75	IIIC1o	3.81	3.82	3.78	3.82	3.89	0.00	0.03	0.00	-0.08	0.04	0.00	-0.07	-0.04	-0.11	-0.07
76	IIIC1p	3.46	3.54	3.41	3.39	3.72	-0.08	0.06	0.07	-0.26	0.13	0.15	-0.18	0.01	-0.31	-0.33
77	IIIC1q	3.65	3.72	3.60	3.74	3.89	-0.07	0.05	-0.09	-0.24	0.12	-0.03	-0.17	-0.15	-0.29	-0.14
78	IIIC1r	3.50	3.53	3.42	3.43	3.79	-0.03	0.08	0.06	-0.30	0.11	0.09	-0.27	-0.02	-0.38	-0.36
79	IIIC2a	3.81	3.84	3.82	3.83	3.94	-0.03	-0.01	-0.02	-0.13	0.02	0.01	-0.10	-0.01	-0.12	-0.11
80	IIIC2b	3.82	3.86	3.83	3.86	3.94	-0.04	-0.01	-0.04	-0.12	0.03	0.00	-0.08	-0.03	-0.11	-0.08
81	IIIC2c	3.53	3.61	3.50	3.48	3.83	-0.08	0.03	0.05	-0.30	0.10	0.13	-0.22	0.02	-0.33	-0.35
82	IIIC2d	3.36	3.49	3.36	3.43	3.73	-0.12	0.01	-0.06	-0.36	0.13	0.06	-0.24	-0.07	-0.37	-0.30
83	IIIC2e	3.11	3.19	3.09	3.11	3.50	-0.08	0.02	0.01	-0.39	0.11	0.09	-0.31	-0.02	-0.41	-0.39
84	IIIC2f	3.41	3.45	3.27	3.42	3.72	-0.04	0.14	-0.01	-0.31	0.18	0.03	-0.27	-0.14	-0.45*	-0.30
85	IIIC3a	3.58	3.66	3.62	3.61	3.85	-0.08	-0.03	-0.03	-0.27	0.05	0.05	-0.19	0.00	-0.24	-0.24
86	IIIC3b	3.42	3.47	3.40	3.30	3.82	-0.06	0.02	0.12	-0.40*	0.08	0.18	-0.34	0.10	-0.42*	-0.52**
87	IIIC3c	3.68	3.71	3.66	3.61	3.89	-0.03	0.02	0.07	-0.21	0.05	0.10	-0.18	0.05	-0.22	-0.28
88	IIIC3d	3.23	3.38	3.35	3.25	3.59	-0.16	-0.12	-0.02	-0.36	0.03	0.13	-0.21	0.10	-0.24	-0.34
89	IIIC3e	3.59	3.56	3.63	3.60	3.80	0.03	-0.04	-0.01	-0.21	-0.07	-0.04	-0.24	0.03	-0.17	-0.20
90	IIIC4a	3.44	3.52	3.45	3.55	3.81	-0.07	-0.01	-0.10	-0.36*	0.07	-0.03	-0.29	-0.10	-0.36*	-0.26
91	IIIC4b	3.35	3.50	3.41	3.47	3.76	-0.15	-0.07	-0.12	-0.42*	0.08	0.03	-0.27	-0.05	-0.35	-0.30
92	IIIC4c	3.52	3.61	3.56	3.63	3.67	-0.09	-0.04	-0.11	-0.15	0.05	-0.02	-0.06	-0.07	-0.11	-0.04
93	IIIC4d	2.84	3.00	2.89	2.84	3.30	-0.16	-0.06	-0.01	-0.46	0.11	0.16	-0.30	0.05	-0.41	-0.46

Order	Element	Mean by Capacity					Mean Differences									
		Full-time (1)	I am not currently working as a Nuclear Medicine Technologist (2)	Part-time (3)	Per-diem (4)	Retired (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
94	IIIC5a	3.79	3.80	3.82	3.83	3.75	-0.01	-0.03	-0.04	0.04	-0.02	-0.03	0.05	-0.01	0.07	0.08
95	IIIC5b	3.25	3.30	3.25	3.19	3.54	-0.05	-0.01	0.06	-0.29	0.04	0.11	-0.24	0.07	-0.28	-0.35
96	IIIC5c	3.34	3.33	3.28	3.21	3.50	0.01	0.06	0.13	-0.16	0.06	0.13	-0.17	0.07	-0.22	-0.29
97	IIIC5d	3.23	3.29	3.21	3.15	3.50	-0.06	0.01	0.07	-0.28	0.08	0.14	-0.21	0.06	-0.29	-0.35
98	IIIC5e	3.48	3.48	3.49	3.42	3.63	0.01	-0.01	0.06	-0.15	-0.01	0.06	-0.15	0.07	-0.14	-0.21
99	IIIC5f	3.39	3.36	3.33	3.38	3.58	0.03	0.06	0.01	-0.18	0.03	-0.02	-0.22	-0.05	-0.25	-0.20
100	IIIC5g	3.24	3.28	3.15	3.17	3.50	-0.04	0.09	0.06	-0.26	0.13	0.10	-0.22	-0.02	-0.35	-0.33
101	IIIC5h	3.26	3.28	3.16	3.15	3.50	-0.02	0.10	0.11	-0.24	0.12	0.13	-0.22	0.01	-0.34	-0.35
102	IIID1	3.14	3.29	3.16	3.11	3.55	-0.14	-0.02	0.04	-0.41	0.13	0.18	-0.26	0.05	-0.39	-0.44
103	IIID2	3.14	3.31	3.18	3.15	3.59	-0.17	-0.04	-0.01	-0.45*	0.13	0.16	-0.27	0.03	-0.41	-0.44
104	IIID3	3.69	3.75	3.66	3.79	3.84	-0.06	0.03	-0.10	-0.15	0.09	-0.04	-0.09	-0.13	-0.18	-0.05
105	IIID4	3.21	3.36	3.21	3.29	3.56	-0.14	0.01	-0.08	-0.34	0.15	0.07	-0.20	-0.08	-0.35	-0.27
106	IIID5	3.36	3.49	3.33	3.41	3.38	-0.13	0.04	-0.05	-0.02	0.17	0.08	0.11	-0.09	-0.06	0.03
107	IIID6	3.34	3.39	3.34	3.24	3.61	-0.05	0.00	0.10	-0.27	0.06	0.15	-0.21	0.09	-0.27	-0.37
108	IIID7	3.02	3.16	3.08	3.12	3.54	-0.14	-0.06	-0.10	-0.52*	0.08	0.04	-0.37	-0.04	-0.46	-0.42
109	IIIE1	3.32	3.47	3.44	3.57	3.56	-0.16	-0.12	-0.26**	-0.24	0.03	-0.10	-0.08	-0.13	-0.11	0.02
110	IIIE2	3.48	3.63	3.55	3.63	3.70	-0.14	-0.06	-0.15	-0.22	0.08	0.00	-0.08	-0.08	-0.16	-0.07
111	IIIE3	3.51	3.60	3.54	3.67	3.65	-0.09	-0.03	-0.16	-0.14	0.07	-0.07	-0.05	-0.14	-0.11	0.03
112	IIIE4	3.67	3.62	3.70	3.77	3.75	0.04	-0.03	-0.11	-0.08	-0.07	-0.15	-0.13	-0.07	-0.05	0.02
113	IIIE5	3.83	3.77	3.84	3.85	3.75	0.06	-0.01	-0.02	0.08	-0.08	-0.08	0.02	-0.01	0.09	0.10

Order	Element	Mean by Capacity					Mean Differences									
		Full-time (1)	I am not currently working as a Nuclear Medicine Technologist (2)	Part-time (3)	Per-diem (4)	Retired (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
114	IIIE6	3.40	3.54	3.44	3.53	3.69	-0.14	-0.05	-0.13	-0.30	0.09	0.01	-0.16	-0.09	-0.25	-0.16
115	IIIE7	3.26	3.37	3.23	3.36	3.61	-0.11	0.04	-0.10	-0.34	0.14	0.01	-0.24	-0.13	-0.38	-0.24
116	IIIE8	3.68	3.75	3.71	3.80	3.78	-0.07	-0.03	-0.12	-0.10	0.04	-0.05	-0.03	-0.09	-0.07	0.01
117	IIIE9	3.39	3.56	3.51	3.50	3.50	-0.17*	-0.12	-0.11	-0.11	0.04	0.06	0.06	0.02	0.01	0.00
118	IIIE10	3.16	3.34	3.23	3.24	3.50	-0.17	-0.07	-0.08	-0.34	0.10	0.09	-0.16	-0.01	-0.27	-0.26
119	IIIE11	3.77	3.78	3.75	3.87	3.84	-0.01	0.02	-0.10	-0.07	0.03	-0.09	-0.06	-0.12	-0.09	0.03
120	IIIE12	3.58	3.64	3.54	3.71	3.71	-0.06	0.04	-0.13	-0.14	0.09	-0.08	-0.08	-0.17	-0.17	0.00
121	IIIE13	3.17	3.30	3.19	3.26	3.59	-0.13	-0.02	-0.09	-0.42*	0.11	0.04	-0.29	-0.07	-0.40	-0.33
122	IIIE14	3.24	3.36	3.24	3.38	3.61	-0.11	0.00	-0.14	-0.36	0.12	-0.02	-0.25	-0.14	-0.37	-0.23
123	IIIE15	3.56	3.61	3.63	3.66	3.69	-0.05	-0.07	-0.11	-0.13	-0.02	-0.06	-0.08	-0.04	-0.06	-0.02
124	IIIE16	3.11	3.22	3.10	3.17	3.35	-0.11	0.02	-0.05	-0.24	0.13	0.06	-0.13	-0.07	-0.26	-0.19
125	IIIE17	3.42	3.54	3.33	3.55	3.68	-0.12	0.09	-0.13	-0.26	0.20	-0.02	-0.14	-0.22	-0.34	-0.12
126	IIIE18	3.39	3.47	3.40	3.44	3.67	-0.08	-0.01	-0.04	-0.27	0.07	0.03	-0.20	-0.03	-0.26	-0.23
127	IIIE19	3.45	3.59	3.50	3.57	3.63	-0.14	-0.05	-0.12	-0.18	0.08	0.02	-0.04	-0.07	-0.12	-0.06
128	IIIE20	3.13	3.23	3.22	3.30	3.29	-0.10	-0.09	-0.17	-0.17	0.01	-0.07	-0.07	-0.08	-0.08	0.00
129	IIIE21	3.11	3.20	3.19	3.31	3.30	-0.10	-0.08	-0.20	-0.20	0.01	-0.11	-0.10	-0.12	-0.12	0.01
130	IIIE22	3.28	3.42	3.33	3.47	3.39	-0.14	-0.06	-0.19	-0.12	0.08	-0.05	0.03	-0.13	-0.06	0.07
131	IIIE23	3.43	3.49	3.41	3.51	3.60	-0.06	0.02	-0.08	-0.17	0.08	-0.02	-0.11	-0.10	-0.19	-0.09
132	IIIF1a	3.58	3.60	3.66	3.60	3.67	-0.01	-0.07	-0.01	-0.08	-0.06	0.00	-0.07	0.06	-0.01	-0.07
133	IIIF1b	3.56	3.54	3.60	3.65	3.67	0.03	-0.04	-0.09	-0.10	-0.07	-0.11	-0.13	-0.05	-0.06	-0.02

Order	Element	Mean by Capacity					Mean Differences									
		Full-time (1)	I am not currently working as a Nuclear Medicine Technologist (2)	Part-time (3)	Per-diem (4)	Retired (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
134	IIIF1c	3.41	3.43	3.43	3.49	3.67	-0.02	-0.02	-0.07	-0.25	0.00	-0.05	-0.23	-0.06	-0.24	-0.18
135	IIIF1d	3.19	3.27	3.21	3.15	3.42	-0.09	-0.02	0.03	-0.23	0.07	0.12	-0.15	0.05	-0.21	-0.27
136	IIIF1e	3.65	3.66	3.67	3.72	3.75	-0.02	-0.03	-0.07	-0.10	-0.01	-0.06	-0.09	-0.05	-0.08	-0.03
137	IIIF1f	3.57	3.63	3.63	3.60	3.66	-0.06	-0.07	-0.03	-0.09	-0.01	0.02	-0.03	0.03	-0.02	-0.05
138	IIIF2	3.10	3.15	3.17	3.08	3.27	-0.05	-0.07	0.02	-0.17	-0.02	0.07	-0.12	0.09	-0.10	-0.19
139	IIIF3	3.44	3.50	3.51	3.44	3.77	-0.06	-0.07	0.00	-0.33	-0.01	0.06	-0.27	0.07	-0.26	-0.33
140	IIIF4	3.72	3.72	3.76	3.77	3.86	0.00	-0.04	-0.05	-0.14	-0.04	-0.05	-0.14	-0.01	-0.10	-0.09
141	IIIG1	3.89	3.90	3.90	3.93	3.95	-0.01	-0.01	-0.04	-0.06	0.01	-0.03	-0.04	-0.04	-0.05	-0.01
142	IIIG2	3.90	3.89	3.90	3.97	3.95	0.01	0.00	-0.06	-0.04	-0.01	-0.08	-0.06	-0.06	-0.04	0.02
143	IIIH1	3.94	3.92	3.93	3.95	3.97	0.02	0.01	-0.01	-0.03	0.00	-0.03	-0.05	-0.03	-0.05	-0.02
144	IIIH2	3.85	3.86	3.86	3.88	3.95	0.00	-0.01	-0.03	-0.09	0.00	-0.03	-0.09	-0.02	-0.08	-0.06
145	IIIH3	3.78	3.78	3.76	3.77	3.88	0.00	0.03	0.01	-0.10	0.02	0.00	-0.10	-0.02	-0.13	-0.11
146	IIIH4	3.73	3.75	3.75	3.74	3.86	-0.01	-0.01	-0.01	-0.12	0.00	0.01	-0.11	0.00	-0.11	-0.12
147	IIIH5	3.67	3.67	3.66	3.69	3.77	0.01	0.01	-0.02	-0.10	0.00	-0.03	-0.11	-0.03	-0.11	-0.08
148	IVA1a	3.76	3.74	3.66	3.80	3.97	0.02	0.09	-0.05	-0.22	0.07	-0.06	-0.23	-0.14	-0.31*	-0.17
149	IVA1b	3.41	3.47	3.37	3.49	3.77	-0.06	0.04	-0.08	-0.36	0.10	-0.02	-0.30	-0.12	-0.40*	-0.29
150	IVA1c	3.28	3.35	3.19	3.30	3.72	-0.06	0.09	-0.02	-0.44*	0.15	0.05	-0.38	-0.11	-0.53**	-0.43
151	IVA2a	3.85	3.79	3.87	3.85	3.92	0.06	-0.02	0.00	-0.07	-0.08	-0.05	-0.13	0.02	-0.05	-0.07
152	IVA2b	3.81	3.78	3.83	3.84	3.94	0.02	-0.02	-0.03	-0.14	-0.05	-0.05	-0.16	-0.01	-0.11	-0.11
153	IVA3	3.79	3.74	3.73	3.80	3.89	0.05	0.06	-0.01	-0.09	0.01	-0.06	-0.14	-0.07	-0.15	-0.08

Order	Element	Mean by Capacity					Mean Differences									
		Full-time (1)	I am not currently working as a Nuclear Medicine Technologist (2)	Part-time (3)	Per-diem (4)	Retired (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
154	IVB1a	3.91	3.91	3.92	3.90	3.95	0.00	-0.01	0.00	-0.04	-0.01	0.01	-0.04	0.01	-0.03	-0.04
155	IVB1b	3.85	3.86	3.88	3.82	3.91	-0.01	-0.03	0.03	-0.06	-0.03	0.04	-0.06	0.07	-0.03	-0.10
156	IVB1c	3.90	3.87	3.91	3.86	3.92	0.03	-0.01	0.04	-0.01	-0.04	0.01	-0.04	0.05	0.00	-0.05
157	IVB1d	3.74	3.76	3.76	3.79	3.83	-0.02	-0.01	-0.05	-0.09	0.01	-0.03	-0.07	-0.04	-0.08	-0.04
158	IVB1e	3.87	3.87	3.87	3.85	3.95	0.01	0.00	0.02	-0.07	0.00	0.02	-0.08	0.02	-0.07	-0.10
159	IVB1f	3.62	3.69	3.69	3.63	3.83	-0.07	-0.07	-0.01	-0.21	0.00	0.06	-0.14	0.06	-0.14	-0.20
160	IVB1g	3.51	3.58	3.55	3.49	3.80	-0.08	-0.05	0.02	-0.29	0.03	0.10	-0.22	0.07	-0.25	-0.31
161	IVB2a	3.76	3.86	3.73	3.77	3.94	-0.10	0.03	-0.01	-0.18	0.12	0.08	-0.09	-0.04	-0.21	-0.17
162	IVB2bi	3.87	3.87	3.86	3.89	3.97	0.00	0.00	-0.02	-0.11	0.00	-0.02	-0.11	-0.02	-0.11	-0.09
163	IVB2bii	3.84	3.85	3.85	3.84	3.95	-0.01	-0.01	0.00	-0.11	0.01	0.01	-0.09	0.00	-0.10	-0.10
164	IVB2biii	3.49	3.67	3.53	3.54	3.81	-0.18**	-0.05	-0.05	-0.32	0.14	0.13	-0.14	-0.01	-0.27	-0.27
165	IVB2biv	3.55	3.63	3.53	3.56	3.80	-0.08	0.02	-0.01	-0.25	0.10	0.07	-0.17	-0.03	-0.27	-0.24
166	IVB2bv	3.79	3.81	3.80	3.80	3.89	-0.02	-0.01	-0.01	-0.10	0.01	0.01	-0.08	0.00	-0.09	-0.09
167	IVB3a	3.74	3.73	3.70	3.78	3.86	0.02	0.04	-0.04	-0.12	0.03	-0.05	-0.14	-0.08	-0.16	-0.08
168	IVB3b	3.77	3.78	3.73	3.81	3.93	0.00	0.05	-0.04	-0.15	0.05	-0.04	-0.15	-0.08	-0.20	-0.11
169	IVB4a	3.63	3.61	3.61	3.65	3.75	0.02	0.02	-0.02	-0.12	0.00	-0.04	-0.14	-0.04	-0.14	-0.10
170	IVB4b	3.61	3.59	3.58	3.60	3.70	0.02	0.03	0.01	-0.09	0.01	-0.01	-0.11	-0.02	-0.12	-0.10
171	IVB5	3.47	3.41	3.57	3.46	3.67	0.06	-0.10	0.01	-0.20	-0.16	-0.06	-0.26	0.10	-0.10	-0.20
172	IVB6	3.53	3.35	3.63	3.57	3.67	0.18**	-0.10	-0.04	-0.13	-0.28**	-0.22*	-0.32	0.06	-0.03	-0.09
173	IVC1	3.16	3.22	3.26	3.14	3.49	-0.07	-0.11	0.01	-0.33	-0.04	0.08	-0.26	0.12	-0.22	-0.35

Order	Element	Mean by Capacity					Mean Differences									
		Full-time (1)	I am not currently working as a Nuclear Medicine Technologist (2)	Part-time (3)	Per-diem (4)	Retired (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
174	IVC2a	3.47	3.46	3.52	3.54	3.75	0.02	-0.05	-0.06	-0.28	-0.07	-0.08	-0.29	-0.01	-0.23	-0.21
175	IVC2b	3.59	3.49	3.63	3.64	3.65	0.10	-0.04	-0.05	-0.06	-0.14	-0.15	-0.16	-0.01	-0.02	-0.01
176	IVC2c	3.44	3.38	3.47	3.51	3.67	0.06	-0.04	-0.07	-0.23	-0.10	-0.13	-0.29	-0.03	-0.19	-0.16
177	IVC2d	3.59	3.58	3.65	3.68	3.75	0.01	-0.06	-0.09	-0.16	-0.08	-0.10	-0.17	-0.02	-0.10	-0.07
178	IVC2e	3.45	3.50	3.50	3.55	3.67	-0.04	-0.05	-0.09	-0.21	-0.01	-0.05	-0.17	-0.04	-0.16	-0.12
179	IVC2f	3.56	3.50	3.59	3.60	3.75	0.05	-0.04	-0.05	-0.19	-0.09	-0.10	-0.25	-0.01	-0.16	-0.15
180	IVC3a	3.54	3.58	3.58	3.59	3.73	-0.05	-0.04	-0.05	-0.19	0.00	-0.01	-0.15	-0.01	-0.15	-0.14
181	IVC3b	3.67	3.70	3.70	3.65	3.86	-0.03	-0.02	0.02	-0.19	0.01	0.05	-0.16	0.05	-0.16	-0.21
182	IVC3c	3.49	3.41	3.54	3.57	3.61	0.08	-0.05	-0.08	-0.12	-0.13	-0.16	-0.20	-0.03	-0.07	-0.04
183	VA1a	3.76	3.73	3.75	3.63	3.83	0.04	0.01	0.13	-0.06	-0.03	0.09	-0.10	0.12	-0.08	-0.19
184	VA1b	3.72	3.69	3.71	3.77	3.79	0.03	0.01	-0.05	-0.07	-0.02	-0.08	-0.10	-0.06	-0.08	-0.02
185	VA1c	3.88	3.85	3.89	3.90	3.94	0.04	-0.01	-0.02	-0.06	-0.04	-0.06	-0.10	-0.01	-0.05	-0.04
186	VA1d	3.76	3.76	3.77	3.73	3.89	0.01	-0.01	0.03	-0.13	-0.01	0.02	-0.13	0.03	-0.12	-0.16
187	VA2a	3.75	3.78	3.84	3.72	3.89	-0.03	-0.10	0.03	-0.14	-0.07	0.05	-0.11	0.12	-0.04	-0.17
188	VA2b	3.91	3.91	3.93	3.93	3.97	0.00	-0.02	-0.02	-0.06	-0.02	-0.02	-0.06	-0.01	-0.05	-0.04
189	VA2c	3.89	3.88	3.91	3.89	3.94	0.00	-0.02	0.00	-0.06	-0.03	0.00	-0.06	0.02	-0.03	-0.06
190	VA2d	3.40	3.50	3.34	3.30	3.71	-0.10	0.07	0.10	-0.30	0.16	0.20	-0.21	0.03	-0.37	-0.40
191	VA2e	3.81	3.88	3.85	3.82	3.97	-0.06	-0.04	0.00	-0.16	0.03	0.06	-0.09	0.03	-0.12	-0.15
192	VA2f	3.43	3.40	3.30	3.47	3.59	0.03	0.14	-0.03	-0.16	0.11	-0.06	-0.19	-0.17	-0.30	-0.13
193	VA3a	3.38	3.49	3.36	3.47	3.78	-0.11	0.02	-0.09	-0.40*	0.13	0.03	-0.28	-0.10	-0.42*	-0.31

Order	Element	Mean by Capacity					Mean Differences									
		Full-time (1)	I am not currently working as a Nuclear Medicine Technologist (2)	Part-time (3)	Per-diem (4)	Retired (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
194	VA3b	3.30	3.43	3.25	3.26	3.67	-0.13	0.05	0.03	-0.37	0.18	0.17	-0.24	-0.02	-0.42*	-0.40
195	VA3c	3.28	3.34	3.12	3.14	3.61	-0.07	0.15	0.14	-0.34	0.22	0.20	-0.27	-0.02	-0.49*	-0.47*
196	VA3d	3.43	3.55	3.43	3.51	3.56	-0.12	0.00	-0.08	-0.14	0.12	0.04	-0.02	-0.08	-0.13	-0.05
197	VA3e	3.74	3.75	3.73	3.74	3.83	-0.01	0.01	0.01	-0.09	0.02	0.02	-0.08	0.00	-0.09	-0.09
198	VA3f	3.79	3.80	3.75	3.82	3.69	-0.01	0.04	-0.03	0.10	0.05	-0.02	0.11	-0.07	0.06	0.13
199	VA3g	3.64	3.63	3.53	3.62	3.81	0.01	0.11	0.03	-0.17	0.10	0.01	-0.18	-0.09	-0.28	-0.20
200	VA4a	3.38	3.45	3.35	3.48	3.74	-0.08	0.03	-0.10	-0.36	0.10	-0.03	-0.28	-0.13	-0.39	-0.26
201	VA4b	3.75	3.77	3.71	3.73	3.91	-0.02	0.04	0.02	-0.16	0.06	0.04	-0.14	-0.02	-0.20	-0.18
202	VA5a	3.16	3.28	3.13	3.13	3.63	-0.12	0.03	0.03	-0.46*	0.15	0.15	-0.35	0.00	-0.50*	-0.49*
203	VA5b	3.30	3.38	3.27	3.31	3.68	-0.09	0.02	-0.01	-0.38	0.11	0.07	-0.29	-0.04	-0.40	-0.37
204	VA5c	3.42	3.57	3.45	3.46	3.76	-0.15	-0.03	-0.04	-0.35	0.12	0.11	-0.20	-0.01	-0.32	-0.31
205	VA5d	3.55	3.66	3.61	3.49	3.86	-0.11	-0.06	0.06	-0.31	0.05	0.17	-0.20	0.12	-0.25	-0.37
206	VA5e	3.76	3.78	3.79	3.70	3.89	-0.02	-0.03	0.06	-0.13	-0.02	0.08	-0.11	0.09	-0.09	-0.19
207	VA5f	3.80	3.83	3.77	3.83	3.94	-0.03	0.03	-0.04	-0.15	0.06	0.00	-0.11	-0.07	-0.18	-0.11
208	VA5g	2.84	3.03	2.85	2.91	3.24	-0.18	0.00	-0.07	-0.40	0.18	0.12	-0.21	-0.06	-0.39	-0.33
209	VA6a	3.24	3.29	3.24	3.19	3.62	-0.04	0.00	0.06	-0.37	0.04	0.10	-0.33	0.06	-0.37	-0.43
210	VA6b	3.77	3.76	3.78	3.79	3.94	0.01	-0.01	-0.03	-0.18	-0.02	-0.03	-0.19	-0.02	-0.17	-0.15
211	VA6c	3.85	3.89	3.87	3.90	3.92	-0.04	-0.02	-0.05	-0.07	0.02	-0.01	-0.03	-0.03	-0.05	-0.02
212	VA6d	3.85	3.89	3.86	3.89	3.92	-0.04	-0.02	-0.04	-0.07	0.02	0.00	-0.03	-0.03	-0.05	-0.03
213	VA6e	3.75	3.74	3.67	3.69	3.89	0.01	0.08	0.06	-0.14	0.07	0.05	-0.14	-0.02	-0.21	-0.19

Order	Element	Mean by Capacity					Mean Differences									
		Full-time (1)	I am not currently working as a Nuclear Medicine Technologist (2)	Part-time (3)	Per-diem (4)	Retired (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
214	VA7a	3.15	3.22	3.04	3.12	3.53	-0.07	0.12	0.04	-0.38	0.18	0.10	-0.31	-0.08	-0.49*	-0.41
215	VA7b	2.83	2.98	2.84	2.90	3.17	-0.14	0.00	-0.07	-0.33	0.14	0.07	-0.19	-0.07	-0.33	-0.26
216	VA7c	2.98	3.06	2.97	3.07	3.19	-0.08	0.01	-0.09	-0.21	0.09	-0.01	-0.13	-0.10	-0.22	-0.12
217	VA8a	3.36	3.47	3.36	3.49	3.69	-0.11	0.00	-0.13	-0.33	0.11	-0.02	-0.22	-0.13	-0.33	-0.20
218	VA8b	3.91	3.89	3.91	3.95	3.97	0.02	0.00	-0.04	-0.07	-0.02	-0.06	-0.08	-0.04	-0.06	-0.02
219	VA8c	3.90	3.91	3.92	3.92	3.97	-0.01	-0.02	-0.02	-0.07	-0.01	-0.01	-0.06	0.00	-0.05	-0.05
220	VA8d	3.30	3.49	3.30	3.38	3.81	-0.19*	0.00	-0.08	-0.51**	0.19	0.11	-0.32	-0.08	-0.51*	-0.43
221	VA8e	3.71	3.75	3.65	3.72	3.89	-0.04	0.06	-0.01	-0.18	0.10	0.03	-0.14	-0.07	-0.24	-0.17
222	VA8f	3.46	3.56	3.46	3.56	3.86	-0.10	0.01	-0.09	-0.40*	0.10	0.00	-0.30	-0.10	-0.40*	-0.31
223	VA8g	3.51	3.56	3.49	3.59	3.83	-0.05	0.02	-0.09	-0.33	0.07	-0.03	-0.27	-0.10	-0.34	-0.24
224	VA8h	3.10	3.35	3.09	3.24	3.69	-0.25**	0.00	-0.14	-0.59**	0.26	0.11	-0.34	-0.14	-0.59**	-0.45
225	VA8i	3.49	3.53	3.46	3.42	3.73	-0.03	0.03	0.07	-0.23	0.06	0.10	-0.20	0.04	-0.26	-0.30
226	VA8j	3.30	3.44	3.26	3.23	3.63	-0.14	0.04	0.07	-0.32	0.18	0.21	-0.19	0.03	-0.37	-0.40
227	VA8k	3.53	3.56	3.43	3.51	3.86	-0.03	0.10	0.02	-0.33	0.13	0.05	-0.30	-0.08	-0.42*	-0.35
228	VA8l	3.53	3.52	3.49	3.53	3.56	0.01	0.04	0.00	-0.02	0.04	-0.01	-0.03	-0.04	-0.07	-0.02
229	VA9a	3.07	3.19	2.99	3.05	3.42	-0.12	0.08	0.02	-0.35	0.20	0.13	-0.24	-0.07	-0.44	-0.37
230	VA9b	3.79	3.79	3.80	3.84	3.86	0.00	-0.01	-0.05	-0.07	-0.02	-0.05	-0.07	-0.04	-0.06	-0.02
231	VA9c	3.28	3.33	3.22	3.26	3.54	-0.06	0.05	0.02	-0.27	0.11	0.08	-0.21	-0.03	-0.32	-0.29
232	VA9d	3.80	3.76	3.80	3.80	3.89	0.04	0.00	0.01	-0.09	-0.05	-0.04	-0.13	0.01	-0.08	-0.09
233	VA9e	3.35	3.40	3.25	3.35	3.69	-0.05	0.10	0.00	-0.34	0.15	0.05	-0.29	-0.10	-0.45*	-0.34

Order	Element	Mean by Capacity					Mean Differences									
		Full-time (1)	I am not currently working as a Nuclear Medicine Technologist (2)	Part-time (3)	Per-diem (4)	Retired (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
234	VA9f	3.84	3.83	3.86	3.85	3.83	0.00	-0.02	-0.02	0.00	-0.03	-0.02	0.00	0.01	0.03	0.02
235	VA9g	3.11	3.23	3.06	3.00	3.55	-0.12	0.05	0.11	-0.43	0.17	0.23	-0.31	0.06	-0.48*	-0.55*
236	VA9h	3.20	3.24	3.10	3.17	3.38	-0.04	0.10	0.03	-0.18	0.14	0.07	-0.14	-0.08	-0.28	-0.20
237	VA9i	3.41	3.52	3.39	3.37	3.75	-0.10	0.03	0.05	-0.34	0.13	0.15	-0.23	0.02	-0.36	-0.38
238	VA9j	3.34	3.40	3.29	3.27	3.60	-0.06	0.05	0.07	-0.26	0.11	0.13	-0.20	0.02	-0.31	-0.33
239	VA9k	2.96	3.05	2.92	2.91	3.30	-0.10	0.03	0.05	-0.35	0.13	0.14	-0.25	0.01	-0.38	-0.39
240	VA9l	2.84	2.90	2.80	2.82	3.13	-0.07	0.04	0.02	-0.30	0.11	0.08	-0.23	-0.02	-0.34	-0.31
241	VA10a	3.57	3.63	3.48	3.58	3.62	-0.06	0.09	-0.01	-0.05	0.16	0.05	0.01	-0.11	-0.14	-0.04
242	VA10b	3.48	3.63	3.41	3.51	3.71	-0.15	0.07	-0.04	-0.23	0.22*	0.12	-0.07	-0.10	-0.29	-0.19
243	VA10c	3.33	3.37	3.24	3.38	3.61	-0.04	0.09	-0.04	-0.27	0.13	-0.01	-0.24	-0.13	-0.36	-0.23
244	VA10d	3.33	3.44	3.21	3.23	3.60	-0.11	0.12	0.11	-0.27	0.24*	0.22	-0.16	-0.02	-0.39	-0.37
245	VA10e	3.28	3.41	3.13	3.21	3.56	-0.13	0.15	0.07	-0.27	0.28**	0.20	-0.15	-0.08	-0.43*	-0.35
246	VA10f	3.26	3.39	3.13	3.13	3.64	-0.13	0.13	0.13	-0.38	0.25*	0.25	-0.25	0.00	-0.50*	-0.50*
247	VA10g	3.53	3.62	3.44	3.57	3.65	-0.09	0.09	-0.03	-0.12	0.18	0.06	-0.03	-0.12	-0.21	-0.09
248	VA11a	2.87	2.99	2.87	2.75	3.19	-0.13	0.00	0.12	-0.33	0.12	0.24	-0.20	0.12	-0.32	-0.44
249	VA11b	2.84	3.05	2.88	2.72	3.14	-0.21	-0.05	0.11	-0.30	0.16	0.32	-0.09	0.16	-0.25	-0.41
250	VA11c	3.78	3.79	3.79	3.82	3.85	-0.01	-0.01	-0.04	-0.07	0.00	-0.03	-0.06	-0.03	-0.06	-0.03
251	VA11d	3.56	3.63	3.56	3.48	3.66	-0.07	0.00	0.07	-0.10	0.07	0.15	-0.03	0.07	-0.10	-0.17
252	VA11e	3.18	3.31	3.15	3.15	3.46	-0.13	0.04	0.03	-0.28	0.17	0.16	-0.15	-0.01	-0.32	-0.31
253	VA11f	3.25	3.41	3.19	3.18	3.50	-0.16	0.06	0.07	-0.25	0.22	0.23	-0.09	0.01	-0.31	-0.32

Order	Element	Mean by Capacity					Mean Differences									
		Full-time (1)	I am not currently working as a Nuclear Medicine Technologist (2)	Part-time (3)	Per-diem (4)	Retired (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
254	VA11g	2.99	3.08	2.93	2.93	3.33	-0.09	0.06	0.06	-0.34	0.15	0.15	-0.25	0.00	-0.40	-0.40
255	VA12a	3.63	3.60	3.52	3.68	3.48	0.02	0.10	-0.05	0.15	0.08	-0.07	0.12	-0.15	0.04	0.19
256	VA12b	3.39	3.43	3.42	3.40	3.40	-0.03	-0.02	-0.01	-0.01	0.01	0.03	0.03	0.01	0.02	0.00
257	VB1	3.65	3.57	3.65	3.65	3.76	0.08	0.00	0.00	-0.10	-0.08	-0.08	-0.19	0.00	-0.10	-0.10
258	VB2	3.63	3.63	3.66	3.68	3.81	0.00	-0.03	-0.05	-0.18	-0.03	-0.04	-0.18	-0.02	-0.15	-0.13
259	VB3	3.64	3.62	3.66	3.70	3.81	0.02	-0.02	-0.06	-0.17	-0.04	-0.08	-0.19	-0.04	-0.14	-0.11
260	VC	3.68	3.65	3.66	3.67	3.86	0.03	0.02	0.01	-0.18	-0.01	-0.03	-0.22	-0.01	-0.21	-0.19
261	VD	3.79	3.81	3.80	3.83	3.84	-0.02	-0.02	-0.05	-0.05	0.01	-0.02	-0.03	-0.03	-0.03	0.00
262	VE1	3.88	3.87	3.87	3.90	3.89	0.02	0.01	-0.01	-0.01	0.00	-0.03	-0.02	-0.03	-0.02	0.01
263	VE2	3.79	3.71	3.79	3.79	3.78	0.08	0.00	0.00	0.01	-0.08	-0.08	-0.06	0.00	0.01	0.02
264	VE3	3.81	3.78	3.81	3.87	3.86	0.03	0.01	-0.06	-0.05	-0.03	-0.09	-0.08	-0.06	-0.06	0.01
265	VE4a	3.61	3.59	3.62	3.72	3.71	0.02	-0.01	-0.11	-0.10	-0.03	-0.13	-0.12	-0.10	-0.09	0.01
266	VE4b	3.66	3.61	3.70	3.75	3.73	0.05	-0.04	-0.09	-0.07	-0.10	-0.14	-0.12	-0.05	-0.03	0.02
267	VE4c	3.42	3.44	3.45	3.55	3.58	-0.02	-0.03	-0.12	-0.16	-0.01	-0.10	-0.14	-0.09	-0.13	-0.04
268	VE4d	3.60	3.62	3.61	3.76	3.68	-0.02	-0.01	-0.15*	-0.07	0.01	-0.13	-0.05	-0.15	-0.07	0.08
269	VE5	3.87	3.82	3.86	3.93	3.94	0.06	0.01	-0.06	-0.07	-0.04	-0.11	-0.13	-0.07	-0.08	-0.01
270	VE6a	3.89	3.87	3.88	3.93	3.95	0.02	0.01	-0.04	-0.05	-0.02	-0.06	-0.08	-0.05	-0.06	-0.01
271	VE6b	3.80	3.79	3.83	3.80	3.89	0.01	-0.03	0.00	-0.09	-0.04	-0.02	-0.10	0.03	-0.06	-0.09
272	VE6c	3.76	3.77	3.76	3.74	3.92	-0.01	0.00	0.02	-0.16	0.00	0.02	-0.15	0.02	-0.16	-0.18
273	VE6d	3.78	3.82	3.76	3.74	3.94	-0.04	0.01	0.03	-0.17	0.05	0.07	-0.13	0.02	-0.18	-0.20

Order	Element	Mean by Capacity					Mean Differences									
		Full-time (1)	I am not currently working as a Nuclear Medicine Technologist (2)	Part-time (3)	Per-diem (4)	Retired (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
274	VE6e	3.70	3.70	3.68	3.72	3.91	0.00	0.02	-0.02	-0.22	0.03	-0.01	-0.21	-0.04	-0.24	-0.20
275	VE7	3.84	3.83	3.84	3.86	3.94	0.01	0.00	-0.02	-0.10	-0.01	-0.03	-0.12	-0.02	-0.10	-0.09
276	VF1	3.95	3.92	3.96	3.97	4.00	0.03	-0.01	-0.02	-0.05	-0.03	-0.05	-0.08	-0.02	-0.04	-0.03
277	VF2	3.95	3.92	3.96	3.97	4.00	0.02	-0.01	-0.02	-0.05	-0.03	-0.04	-0.08	-0.01	-0.04	-0.03
278	VG	3.88	3.84	3.91	3.93	4.00	0.04	-0.03	-0.05	-0.12	-0.07	-0.09	-0.16	-0.02	-0.09	-0.07
279	VH	3.91	3.85	3.92	3.91	3.97	0.06	-0.02	-0.01	-0.07	-0.07	-0.06	-0.13	0.01	-0.05	-0.06
280	VI1	3.86	3.82	3.88	3.88	3.95	0.04	-0.02	-0.02	-0.09	-0.06	-0.06	-0.13	0.00	-0.07	-0.07
281	VI2	3.85	3.81	3.87	3.90	3.97	0.04	-0.02	-0.04	-0.12	-0.06	-0.08	-0.16	-0.02	-0.10	-0.08
282	VJ1	3.89	3.83	3.90	3.90	3.95	0.06	-0.02	-0.02	-0.06	-0.08	-0.08	-0.12	0.00	-0.04	-0.04
283	VJ2	3.88	3.86	3.91	3.95	3.97	0.02	-0.03	-0.06	-0.09	-0.05	-0.08	-0.11	-0.04	-0.06	-0.03
284	VJ3	3.74	3.72	3.78	3.76	3.84	0.02	-0.04	-0.02	-0.10	-0.06	-0.04	-0.12	0.02	-0.07	-0.08
285	VJ4	3.78	3.80	3.84	3.80	3.94	-0.02	-0.06	-0.02	-0.17	-0.04	-0.01	-0.15	0.03	-0.11	-0.14
286	VK	3.70	3.71	3.72	3.68	3.92	0.00	-0.01	0.02	-0.22	-0.01	0.02	-0.21	0.03	-0.20	-0.23
287	VL	3.73	3.74	3.77	3.76	3.97	-0.02	-0.05	-0.03	-0.25	-0.03	-0.01	-0.23	0.02	-0.20	-0.22
288	VM1	3.67	3.63	3.71	3.72	3.84	0.04	-0.04	-0.05	-0.17	-0.08	-0.09	-0.21	-0.01	-0.12	-0.12
289	VM2	3.68	3.61	3.72	3.71	3.86	0.07	-0.04	-0.03	-0.18	-0.10	-0.10	-0.25	0.00	-0.15	-0.15
290	VM3	3.79	3.74	3.79	3.83	3.89	0.06	0.00	-0.03	-0.10	-0.05	-0.09	-0.15	-0.04	-0.10	-0.06
291	VM4	3.70	3.64	3.63	3.74	3.86	0.06	0.07	-0.04	-0.17	0.01	-0.10	-0.22	-0.11	-0.23	-0.12
292	VM5a	3.76	3.77	3.76	3.77	3.92	0.00	0.00	-0.01	-0.15	0.01	0.00	-0.15	-0.01	-0.16	-0.15
293	VM5b	3.70	3.71	3.68	3.68	3.89	-0.01	0.02	0.02	-0.19	0.03	0.03	-0.18	0.00	-0.21	-0.21

Order	Element	Mean by Capacity					Mean Differences									
		Full-time (1)	I am not currently working as a Nuclear Medicine Technologist (2)	Part-time (3)	Per-diem (4)	Retired (5)	1 vs 2	1 vs 3	1 vs 4	1 vs 5	2 vs 3	2 vs 4	2 vs 5	3 vs 4	3 vs 5	4 vs 5
294	VM5c	3.65	3.63	3.59	3.62	3.83	0.02	0.06	0.03	-0.18	0.04	0.00	-0.21	-0.03	-0.24	-0.21
295	VM6	3.71	3.66	3.67	3.71	3.85	0.05	0.04	0.00	-0.14	-0.01	-0.05	-0.19	-0.04	-0.18	-0.15
296	VN1a	3.52	3.52	3.55	3.57	3.61	0.00	-0.04	-0.05	-0.09	-0.03	-0.05	-0.09	-0.02	-0.05	-0.04
297	VN1b	3.55	3.59	3.58	3.64	3.65	-0.04	-0.03	-0.10	-0.10	0.01	-0.06	-0.06	-0.06	-0.07	0.00
298	VN1c	3.53	3.58	3.60	3.64	3.68	-0.05	-0.07	-0.11	-0.15	-0.01	-0.05	-0.10	-0.04	-0.08	-0.04
299	VN2	3.66	3.69	3.75	3.76	3.69	-0.03	-0.09	-0.10	-0.04	-0.06	-0.07	0.00	-0.01	0.05	0.06
300	VN3a	3.71	3.71	3.78	3.75	3.75	0.00	-0.07	-0.05	-0.04	-0.07	-0.05	-0.04	0.03	0.03	0.00
301	VN3b	3.66	3.67	3.72	3.72	3.71	-0.02	-0.06	-0.07	-0.06	-0.05	-0.05	-0.04	0.00	0.01	0.01
302	VN4a	3.82	3.81	3.85	3.88	3.92	0.01	-0.03	-0.06	-0.10	-0.05	-0.07	-0.11	-0.02	-0.07	-0.04
303	VN4b	3.83	3.82	3.84	3.86	3.92	0.01	-0.01	-0.03	-0.09	-0.02	-0.04	-0.10	-0.02	-0.08	-0.06
304	VN4c	3.86	3.86	3.89	3.86	3.92	0.01	-0.03	0.00	-0.06	-0.03	-0.01	-0.06	0.03	-0.03	-0.06
305	VN4d	3.78	3.76	3.82	3.82	3.92	0.02	-0.04	-0.04	-0.14	-0.06	-0.06	-0.16	0.00	-0.10	-0.10
306	VN4e	3.76	3.78	3.78	3.77	3.89	-0.02	-0.02	-0.01	-0.13	0.00	0.01	-0.11	0.01	-0.11	-0.12
307	VN4f	3.75	3.73	3.75	3.76	3.86	0.01	0.00	-0.02	-0.12	-0.02	-0.03	-0.13	-0.01	-0.11	-0.10
308	VO1	3.40	3.45	3.39	3.50	3.66	-0.05	0.01	-0.10	-0.26	0.06	-0.05	-0.21	-0.11	-0.27	-0.16
309	VO2	3.41	3.48	3.39	3.42	3.78	-0.07	0.02	-0.01	-0.37*	0.09	0.06	-0.30	-0.03	-0.39*	-0.36
310	VO3	3.37	3.43	3.38	3.41	3.75	-0.05	0.00	-0.03	-0.38*	0.05	0.02	-0.32	-0.03	-0.37	-0.34
311	VP1	3.29	3.34	3.31	3.39	3.66	-0.05	-0.02	-0.10	-0.37	0.03	-0.05	-0.32	-0.07	-0.34	-0.27
312	VP2	3.33	3.42	3.39	3.42	3.74	-0.09	-0.06	-0.10	-0.41*	0.04	0.00	-0.32	-0.04	-0.36	-0.32
313	VQ	3.52	3.61	3.59	3.62	3.71	-0.09	-0.07	-0.11	-0.20	0.02	-0.01	-0.11	-0.03	-0.13	-0.09

Appendix I: Final Content Outline with Weighting

NMTCB Nuclear Medicine Technologist Certification Board Examination Content Outline

I. Domain I: Radiation Physics and Detection

A. Physical properties

1. Radioactive materials
 - a. Modes of decay
 - i. Gamma emitters
 - ii. Beta emitters
 - iii. Alpha emitters
 - iv. Positron emitters
 2. X-ray production
 - a. Bremsstrahlung
 - b. Characteristic x-ray

B. Measurement of radioactivity and decay calculations

C. Interactions of radiation with matter

D. Radiation detector types and basic principles

E. Counting statistics

II. Domain II: Radiation Safety and Regulations

A. Biological effects of radiation exposure

B. Protection techniques and calculations

1. Time
2. Distance (inverse square law)
3. Shielding (shielding equations)

C. Monitoring protocols and requirements (e.g., timing and frequency)

1. Radiation surveys (area monitoring) including:
 - a. Survey meters and well counters
 - b. Choice of radiation detection devices (e.g., Geiger Counters, sodium iodide detectors)
 - c. Frequency and limits of wipe surveys
2. Personal monitoring devices
3. Personal protective equipment (e.g., lab coat, gloves, syringe shields)
4. Effective dose equivalent limits for:
 - a. Radiation workers
 - b. Pregnant radiation workers
 - c. General public

D. Practice and adhere to ALARA

E. Nuclear Regulatory Commission (NRC)

1. Posting warning and informational signs delineating restricted and unrestricted areas
2. Surveying, inspecting, and inventorying radioactive materials
3. Responding to adverse events
 - a. Trigger levels and monitoring methods
 - b. Radiation exposure
 - c. Radiation spills

- d. Protection during adverse events
- e. Personnel, patient and/or public decontamination
- f. Area/equipment decontamination
- 4. Adhere to radioactive waste storage requirements
- 5. Dispose of radioactive materials (e.g., liquids, solids, gasses, contaminated materials)
- 6. Identify recordable and reportable events
- 7. Maintain records as required for:
 - a. Receipt, storage and disposal of radioactive materials
 - b. Radiation monitoring and reporting
 - c. Equipment calibration and maintenance
 - d. Staff, patient, occupational and public exposure
 - e. Nuclear medicine diagnostic and therapeutic procedures

F. Department of Transportation (DOT) – radiopharmaceutical transport

- 1. Use of shielding containers
- 2. Labeling requirements (e.g., transportation index, name, concentration, expiration date/time, total activity, assay date/time)
- 3. Package monitoring/receiving/returning

G. Environmental Protection Agency (EPA)

H. Occupational Safety and Health Administration (OSHA)

I. Health and Human Services (HHS)/Health Insurance Portability and Accountability Act (HIPAA)

- 1. Protecting patient rights and privacy
- 2. Maintaining patient records
- 3. Releasing information to authorized parties

J. Knowledge of institutional and departmental accreditation organizations

III. Domain III: Pharmaceutical and Radiopharmaceutical Agents

A. Elute radionuclide generator, perform and evaluate quality control tests

- 1. Types of generators (e.g., $^{99}\text{Mo}/^{99\text{m}}\text{Tc}$, $^{82}\text{Sr}/\text{Rb}^{82}$, etc.)
 - a. Elution
 - b. Generator yield – volume and activity
 - c. Quality control procedures
 - i. $^{99}\text{Mo}/^{99\text{m}}\text{Tc}$ (^{99}Mo breakthrough and AL +3 content)
 - ii. $^{82}\text{Sr}/\text{Rb}^{82}$ (measured activity and levels of ^{82}Sr and ^{85}Sr)
- 2. Dose calibrator operation / units of radioactivity

B. Prepare radiopharmaceutical kits, perform quality control, and evaluate results

- 1. Radiopharmaceutical kits
 - a. Preparation techniques including particle size and number
 - b. Activity and volume limitations
 - c. Activity calculations
- 2. Radiopharmaceutical quality control
 - a. Visual inspection – color and clarity
 - b. Radiochemical purity
- 3. Labeling kits

4. Storage of kits before and after reconstitution
- C. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of diagnostic radiopharmaceuticals**
1. Tc99m labeled radiopharmaceuticals
 - a. Tc99m sodium pertechnetate
 - b. Tc99m oxidronate/HDP
 - c. Tc99m medronate/MDP
 - d. Tc99m pentetate/DTPA
 - e. Tc99m macroaggregated albumin/MAA
 - f. Tc99m sulfur colloid
 - g. Tc99m disofenin/mebrofenin (Choletec®)
 - h. Tc99m mertiatide/MAG3
 - i. Tc99m pyrophosphate/PYP
 - j. Tc99m sestamibi/MIBI (Cardiolite®)
 - k. Tetrofosmin (Myoview®)
 - l. Tc99m succimer (DMSA)
 - m. Tc99m exametazime/HMPAO (Ceretek®)
 - n. Tc99m bicisate/ECD (Neurolite®)
 - o. Tc99m labeled RBCs
 - p. Tc99m HMPAO tagged WBCs
 - q. Tc99m tilmanocept (Lymphoseek®)
 2. Iodine labeled radiopharmaceuticals
 - a. I-123 sodium iodide
 - b. I-131 sodium iodide
 - c. I-123 MIBG
 - d. I-131 MIBG
 - e. I-123 Ioflupane (DaTscan®)
 3. Indium labeled radiopharmaceuticals
 - a. In-111 Pentetate (DTPA)
 - b. In-111 chloride
 - c. In-111 oxine labeled WBCs
 - d. In-111 Pentetreotide (Octreoscan®)
 4. Miscellaneous diagnostic radiopharmaceuticals
 - a. TI201 thallous chloride
 - b. Ga67 gallium citrate
 - c. Xe133 gas
 5. Positron Emission Tomography
 - a. F-18 FDG
 - b. F-18 Florbetaben (Neuraceq®)
 - c. F-18 Florbetapir (Amyvid®)
 - d. F-18 Flutemetamol (Vizamyl®)
 - e. F-18 Sodium Fluoride (NaF)
 - f. Rb82 chloride
 - g. N13 ammonia
 - h. Ga-68 Dotatate

D. Understand the characteristics (i.e., mechanism of localization), indications, contraindications and administration of therapeutic radiopharmaceuticals

1. Sr89 chloride (Metastron®)
2. Sm153 EDTMP leixidronam (Quadramet®)
3. I-131 sodium iodide
4. Y90 ibritumomab tiuxetan (Zevalin®)
5. Y90 microspheres (SIR-Spheres®, TheraSphere®)
6. Ra223 Radium dichloride (Xofigo®)
7. I-125 Seeds

E. Understand the indications, contraindications, and administration of interventional and adjunct pharmaceutical agents used in conjunction with nuclear medicine procedures

1. Dipyridamole (Persantine®)
2. Adenosine
3. Dobutamine
4. Aminophylline
5. Regadenoson (Lexiscan®)
6. Captopril
7. Enalaprilat
8. Furosemide (Lasix®)
9. Insulin
10. Acetazolamide
11. Cholecystokinen/sincalide/CCK
12. Morphine
13. Cimetidine/ranitidine/famotidine
14. ACD solution
15. Heparin
16. Contrast media (oral and IV)
17. Lugol's solution/SSKI
18. Thyroid stimulating hormone (TSH)
19. Lidocaine
20. Lidocaine (EMLA) cream
21. Atropine
22. Recombinant human TSH (Thyrogen®)

F. Label blood components with radiopharmaceutical according to protocol

1. Labeling procedures
 - a. Required lab equipment and supplies
 - b. Anticoagulants and other additives
 - c. Chemical reactions
 - d. Cell washing
 - e. Required radiopharmaceuticals
 - f. Method: invivo or invitro
2. Calculation of labeling efficiency and administered dosage
3. Reinjection patient and sample verification

G. Understand the routes of administration

1. Administration modes

2. Administration techniques (e.g., bolus, venipuncture, IV)

H. Prepare and administer non-radioactive agents

1. Follow aseptic technique
2. Adverse side-effects and treatment
3. Antidote medications
4. Interventional pharmaceuticals
5. Non-radioactive agents (e.g., ACD solution, heparin, contrast media, TSH, atropine, etc.)

IV. Domain IV: Instrument Operations and Quality Control

A. Non-imaging equipment, components and operation

1. Perform and evaluate quality control on well counters and probes
 - a. Calibrate and perform quality control on the sodium iodide scintillation detector
 - b. Conduct a gamma ray spectra and pulse height analysis
 - c. Apply formulas (e.g., energy resolution, sensitivity, Chi-square statistics, etc.)
2. Determine operational status of survey meter
 - a. Survey meter operations and components
 - b. Survey meter quality control
3. Perform and evaluate dose calibrator consistency, accuracy, linearity, and geometry tests

B. Imaging equipment, components, and operation

1. Gamma Camera quality control
 - a. Uniformity
 - b. Spatial resolution and linearity
 - c. Visual image quality
 - d. Phantoms
 - e. Artifacts
 - f. Assess system sensitivity
 - g. Pulse height analysis
2. SPECT and SPECT/CT imaging system
 - a. Attenuation correction
 - b. SPECT camera quality control
 - i. Center of rotation
 - ii. Field of uniformity requirements
 - iii. Pixel calibration
 - iv. 3-D uniformity and resolution (e.g., Jaczak phantom)
 - v. Artifacts
3. PET and PET/CT imaging systems
 - a. Application of attenuation corrections
 - b. PET quality control (e.g., daily blank scan, normalization scan, 2-D/3-D well counter, artifacts, etc.)
4. CT imaging systems
 - a. Co-registration of images
 - b. CT quality control (e.g., contrast and spatial resolution, noise, uniformity, artifacts, etc.)

5. Computer equipment (e.g., monitors, matrix sizes, printers, etc.)
6. Networking and information systems (i.e., PACS and RIS)

C. Auxiliary equipment

1. Laboratory equipment (e.g., pipette, fume hoods)
2. Patient care equipment
 - a. Intravenous infusion pump
 - b. ECG monitor
 - c. Pulse oximeter
 - d. Defibrillator
 - e. Glucose meter
 - f. Blood pressure equipment
3. Non-imaging equipment
 - a. Xenon delivery system and trap
 - b. Aerosol delivery system
 - c. Treadmill

V. Domain V: Clinical Procedures

A. Knowledge and performance of nuclear medicine procedures

1. Pulmonary
 - a. Radioaerosol ventilation
 - b. Gas ventilation
 - c. Perfusion
 - d. Perfusion/ventilation quantitation
2. Bone/Musculoskeletal scans
 - a. Limited
 - b. Whole-body
 - c. 3-phase
 - d. 4-phase
 - e. SPECT
 - f. NaF PET
3. Oncology
 - a. Ga67 tumor imaging, planar and SPECT
 - b. Monoclonal antibody imaging
 - c. Peptide imaging
 - d. Breast imaging
 - e. Lymphoscintigraphy/sentinel lymph node localization
 - f. Timor imaging, PET
 - g. Neuroendocrine tumor imaging
4. Infection
 - a. Ga67 infection imaging
 - b. Tagged WBC imaging
5. Renal/Genitourinary
 - a. Cystogram, direct
 - b. Effective renal plasma flow (ERPF)
 - c. Glomerular filtration rate (GFR)
 - d. Renal anatomy, planar, SPECT
 - e. Renal flow

- f. Renogram (Lasix® and ACE inhibitors)
- 6. Endocrine
 - a. Adrenal imaging
 - b. Parathyroid imaging, planar, and SPECT
 - c. Thyroid imaging
 - d. Thyroid uptake
 - e. Whole body survey for thyroid metastases
- 7. Hematopoietic
 - a. Bone marrow imaging
- 8. Cardiovascular
 - a. Myocardial perfusion, planar
 - b. Myocardial perfusion, SPECT, attenuation and non-attenuation
 - c. Myocardial perfusion, gated SPECT
 - d. First pass for EF and wall motion
 - e. Gated cardiac blood pool, rest
 - f. Gated cardiac blood pool, stress
 - g. Gated cardiac blood pool, SPECT
 - h. Cardiac shunt
 - i. Cardiac CT SPECT
 - j. MIBG
 - k. Myocardial viability (thallium, FDG)
 - l. Cardiac PET
- 9. Gastrointestinal
 - a. Gastric emptying (liquid/solid)
 - b. Gastroesophageal reflux
 - c. Gastrointestinal bleeding
 - d. Hemangioma
 - e. Hepatobiliary with and without GBEF
 - f. Peritoneal venous shunt patency
 - g. Liver-lung shunt mapping (arterial)
 - h. Liver-spleen imaging, planar and SPECT
 - i. Meckel's diverticulum
- 10. Central Nervous System
 - a. Brain flow, brain death
 - b. Brain imaging, planar and SPECT
 - c. Dopamine receptor DaT scan
 - d. Cisternogram
 - e. CSF leak
 - f. CSF shunt patency
 - g. Brain PET
- 11. Radionuclide therapy
 - a. Thyroid
 - b. Metastatic bone
 - c. Monoclonal antibody therapy (Zevalin®)
 - d. Embolic radiotherapy (labeled microspheres)
- 12. CT Imaging Procedures

- a. Attenuation correction / anatomical localization
- b. Diagnostic
- B. Schedule patient studies to accommodate sequencing of multiple procedures and special orders**
 - 1. Schedule the camera time
 - 2. Schedule multiple radionuclide procedures for a single patient
 - 3. Schedule same-day multiple modality procedures for a single patient
- C. Procure supply of radiopharmaceuticals, considering license possession limits and schedule**
- D. Instruct patient, family, and personnel concerning procedures and precautions**
- E. Receive, prepare, and provide care to patient**
 - 1. Protect patient information and privacy according to the Healthcare Insurance Portability and Accountability Act (HIPAA)
 - 2. Perform basic patient care (e.g., vital signs, basic first aid)
 - 3. Practice correct patient transferring techniques
 - 4. Use and accommodate patient support devices
 - a. Intravenous infusion pump/lines
 - b. Supplemental oxygen
 - c. Foley catheter and drainage bag
 - d. ECG monitor
 - 5. Receive and prepare patient, verify patient identification and written orders for study
 - 6. Perform pre-examination screening including review of:
 - a. Verify patient preparations and identify contraindications
 - b. Medical history
 - c. Current medications
 - d. Allergic and adverse reaction history
 - e. Review relevant lab values
 - 7. Verify that informed consent as been obtained
- F. Select and administer prescribed radiopharmaceutical**
 - 1. Verify patient identification
 - 2. Calculate appropriate volume to deliver prescribed dosage when needed
 - 3. Administer radiopharmaceutical using appropriate route and technique
- G. Monitor and assess patient condition**
- H. Implement emergency procedures (e.g., in case of fainting, seizure, cardiopulmonary arrest, etc.)**
- I. Prepare equipment and perform examinations**
 - 1. Position patient using anatomical markers and immobilization techniques
 - 2. Establish imaging parameters for data acquisition
- J. Evaluate image quality**
 - 1. Normal and abnormal scan patterns
 - 2. Identify artifacts and causes
 - 3. Co-registration of images (SPECT/CT and PET/CT)
 - 4. Repeat study and/or perform additional views
- K. Perform post-procedure assessment**

- L. Provide patient / caregiver education concerning discharge instructions and cautions**
- M. Process and evaluate computer generated data**
 - 1. Data storage, transfer and retrieval
 - 2. Image formation (static, dynamic, ERNA, list mode)
 - 3. Image reconstruction (SPECT, PET)
 - 4. Image enhancement (e.g., filters, matrix, intensity, etc.)
 - 5. Quantitative analysis
 - a. Regions of interest and quantification
 - b. Curve generation and analysis
 - c. Image normalization and subtraction
 - 6. Display formatting (image size, number of images, intensity adjustments)
- N. Prepare and perform cardiac monitoring and/or assist with stress testing**
 - 1. Basic electrocardiography (ECG)
 - a. Cardiac conduction system
 - b. Components of a normal ECG wave form
 - c. Recognizing and responding to changes on a resting or stress ECG
 - 2. ECG lead placements
 - 3. Treadmill stress techniques (i.e., Bruce and modified Bruce) and bicycle stress techniques
 - a. Contraindications
 - b. Duration/termination parameters
 - 4. Pharmacological stress protocols
 - a. Contraindications
 - b. Timing of pharmacological stress agent
 - c. Timing of radiopharmaceutical injection
 - d. Duration/termination parameters
 - e. Drug side-effects and appropriate treatment
 - f. Reversal agents and techniques
- O. Obtain samples and/or data for non-imaging studies**
 - 1. Data specimen collection techniques, including timing, methods, containers, and storage
 - 2. Background correction
 - 3. External counting techniques
- P. Calculate and evaluate the results of non-imaging studies**
 - 1. Error analysis
 - 2. Calculations
- Q. Prepare, survey, and clean radiotherapy administration and/or isolation room**

NMTCB Examination Domain Weighting

Domain I Radiation Physics & Detection - 7%

Domain II Radiation safety and Regulations – 13%

Domain III Pharmaceutical and Radiopharmaceutical Agents – 25%

Domain IV Instrumentation Operation & Quality Control – 15%

Domain V Clinical Procedures – 40%