



Annual Exam Report - 2023

Introduction

This report first summarizes exam volume, exam performance, individual percentile ranks, and education program percentile ranks (as applicable) for each examination separately. Each following section then presents a brief content outline for the exam and the number of items in each category. Specific results for 2024 include mean scaled section scores, mean total scaled scores, and pass rates as well as charts with historical pass rates and candidate volumes for each exam. Finally, if the exam has a primary eligibility pathway, the section will include a map detailing candidate volume, mean scaled score, and percent passing for educational programs in each state.

Unless otherwise specified, this report presents statistics based each candidate's first attempt. ARRT uses the first attempt because it is the only one that all candidates are guaranteed to see. Including repeat attempts would overrepresent a subpopulation of candidates and bias the report.

Data in this report are not intended to be used as the sole source for educational program evaluation. When interpreting performance at the educational program or state level, it is important to acknowledge that these results are sensitive to multiple factors. These factors may include but are not limited to the number of candidates upon which the means are computed, characteristics of those candidates, educational program admissions criteria, and the emphasis of an educational program's curriculum.

Interpretation of Scores

Total Scaled Score: The ARRT uses scaled scores to report exam results. Total scaled scores can range from 1 to 99.

Scaled scores are desirable because they account for any differences in difficulty between two or more versions of an exam. The use of scaled scores adjusts for differences in exam difficulty such that a given scaled score corresponds to the same level of performance regardless of exam form and permits comparison of exam results over time. Using scaled scores also ensures that those taking different forms are not penalized for taking a slightly more difficult exam.

Scaled scores are sometimes mistaken for percent correct scores. This confusion likely arises because ARRT scaled scores and percentages share a similar range of values. However, a scaled score of 75 does not mean that a candidate correctly answered 75% of the test items.

Section Scores: Scaled scores are used to report performance on each section of the exam. The primary purpose of the section scores is to provide information to candidates regarding their relative strengths and weaknesses in particular content categories. Section scores can range from 0.1 to 9.9 and are reported in one-tenth point intervals (e.g., 8.1, 8.6). Section scores are intentionally placed on a narrower scale because they are derived from a smaller number of test items. Therefore, section scores are not as reliable as the total scaled score and should be interpreted with some caution.



Passing Score: A total scaled score of 75 is required to pass all ARRT exams. This pass-fail point, called the “cut score,” is established by ARRT’s Board of Trustees through a process called standard setting. During the standard setting process, the Board receives input from a panel representing a broad constituency of subject matter experts. The cut score represents the performance standard required to obtain certification and registration; those who meet or exceed the standard pass the exam. Beginning in 2013, the Sonography exam also requires a section scaled score of 7.5 or greater in both the Abdomen and OB/GYN sections.

Readers are encouraged to visit the [exam statistics](#) page of the ARRT website for additional reporting, such as past years’ reports or an explanation of ARRT’s scaling procedures.

Updates

Starting with this report, all ARRT exam statistics will be published together in a single annual report and technical appendix. Previous reports, split by primary and postprimary eligibility pathway, will remain on the [exam statistics](#) page of ARRT.org for their normal duration.

Updated content specifications for the Radiologist Assistant exam went into effect January 2023. Notably, these content specifications replaced the case study essay responses with objectively scored items. You can read more in the [Updated R.R.A. Documents](#) news release or the [exam content specifications](#) page at ARRT.org. With the discontinuation of essay response items, Radiologist Assistant exam statistics will be presented in this annual report and the technical appendix rather than as a separate publication.

Updated content specifications went into effect July 2023 for both Cardiac Interventional and Vascular Interventional Radiography. You can read more in the [Updated Cardiac Interventional Radiography Documents](#) and [Updated Vascular Interventional Radiography Documents](#) news releases at ARRT.org. Separate section-level performance tables are included for those that took the exam before and after the update. Please note that, due to the change in content, these tables are not directly comparable.



Summary Statistics

Exam Volume

Exam	First-time Candidates	Repeat	State	Reinstatement	Total
Radiography	11489	2392	34	429	14344
Nuclear Medicine Technology	390	82	1	10	483
Radiation Therapy	945	214	2	28	1189
Sonography	554	220	0	4	778
Magnetic Resonance Imaging	2768	923	0	20	3711
Mammography	1826	244	144	7	2221
Computed Tomography	4365	1646	0	11	6022
Vascular Sonography	19	6	0	0	25
Bone Densitometry	318	90	0	0	408
Cardiac Interventional	128	53	0	0	181
Vascular Interventional	425	249	0	0	674
Breast Sonography	150	16	0	1	167
Radiologist Assistant	36	9	0	0	45

Note: The "State" category includes non-ARRT candidates who take an exam only for state licensure. The "Reinstatement" category includes all reinstatement by re-examination candidates.

Exam Performance

Exam	Approximate % Correct to Pass	Mean Scaled Score	Pass %
Radiography	67	82.0	84.4
Nuclear Medicine Technology	64	81.7	82.6
Radiation Therapy	69	81.8	85.5
Sonography*	68	77.1	56.0
Magnetic Resonance Imaging	67	79.6	73.8
Mammography	66	83.6	87.9
Computed Tomography	66	79.1	73.1
Vascular Sonography	67	72.5	42.1
Bone Densitometry	70	78.9	72.6
Cardiac Interventional	66	75.6	57.0
Vascular Interventional	70	74.7	52.9
Breast Sonography	66	82.4	72.6
Radiologist Assistant	66	77.1	66.7

*Sonography candidates must achieve a scaled score of 75 or greater overall scaled score, as well as section scaled scores of 7.5 or greater in both the Abdominal and OB/GYN sections to pass the exam.



Individual Performance Percentiles

Percentile Rank	Scaled Score												
	RAD	NMT	THR	SON	MRI	MAM	CT	VS	BD	CI	VI	BS	RA
95	93	93	93	91	92	94	91		93	88	87	94	
90	91	91	91	88	90	92	89		90	86	85	91	86
85	90	90	89	87	89	91	87		88	84	83	89	
80	89	89	88	85	88	90	86		86	82	82	88	83
75	88	88	87	84	87	89	85	80	85	81	80	87	
70	87	87	86	82	85	88	84		84	79	79	87	80
65	86	86	85	82	84	87	83		83	79	79	86	
60	85	85	84	81	83	87	82		82	78	77	85	79
55	84	84	83	80	82	85	81		81	77	76	85	
50	83	83	82	78	81	85	80	74	80	76	75	84	78
45	82	82	81	77	80	84	79		78	75	74	83	
40	81	80	81	76	78	83	78		78	74	73	81	76
35	80	79	80	74	77	82	77		77	73	72	81	
30	79	78	79	73	76	80	75		75	71	71	80	72
25	77	77	78	72	74	79	74	67	74	70	69	78	
20	76	75	76	70	72	78	73		71	69	68	77	70
15	74	73	75	68	70	76	71		68	69	66	76	
10	72	71	72	64	67	74	68		65	65	64	74	68
5	67	67	69	61	62	70	65		62	61	60	71	

Note: This percentile rank indicates the percentage of candidates scoring below a specified scaled score. Exams with fewer than 60 candidates are reported with fewer percentile categories.



Educational Program Mean Performance Percentiles

Percentile Rank	Scaled Score				
	RAD (N = 702)	NMT (N = 55)	THR (N = 92)	SON (N = 70)	MRI (N = 46)
95	88		87	86	
90	87	90	87	83	89
85	87		85	82	
80	86	86	84	81	86
75	85		84	81	
70	85	85	83	81	84
65	84		83	80	
60	84	84	83	79	83
55	83		83	78	
50	83	83	82	77	81
45	82		82	75	
40	82	81	82	75	79
35	81		81	75	
30	80	79	80	74	78
25	80		80	73	
20	79	78	79	70	76
15	78		79	69	
10	77	72	77	68	74
5	74		76	59	

Note: This percentile rank indicates the percentage of educational programs below a specified scaled score. Exams with fewer than 60 educational programs are reported with fewer percentile categories. "N" signifies the number of educational programs represented in the report year.



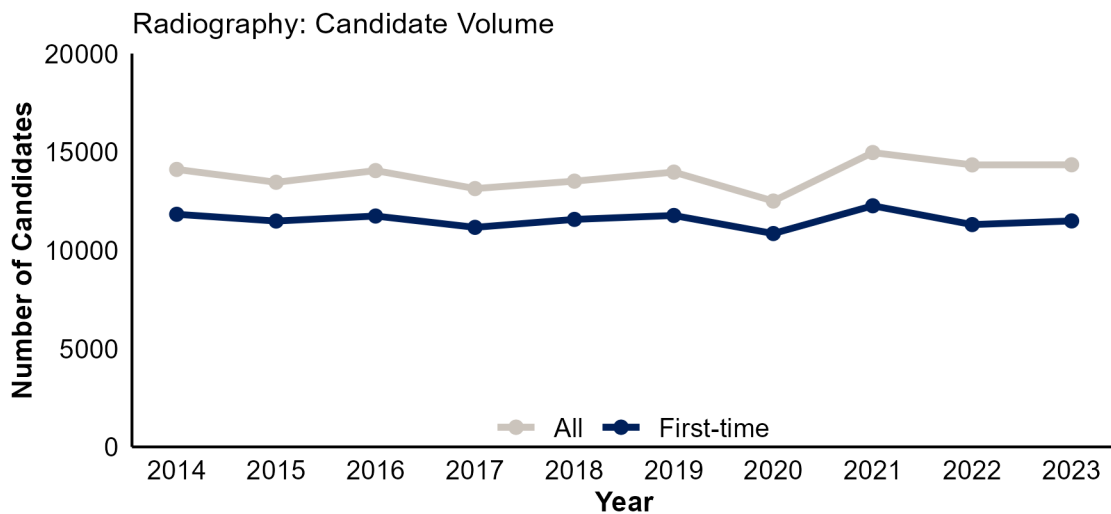
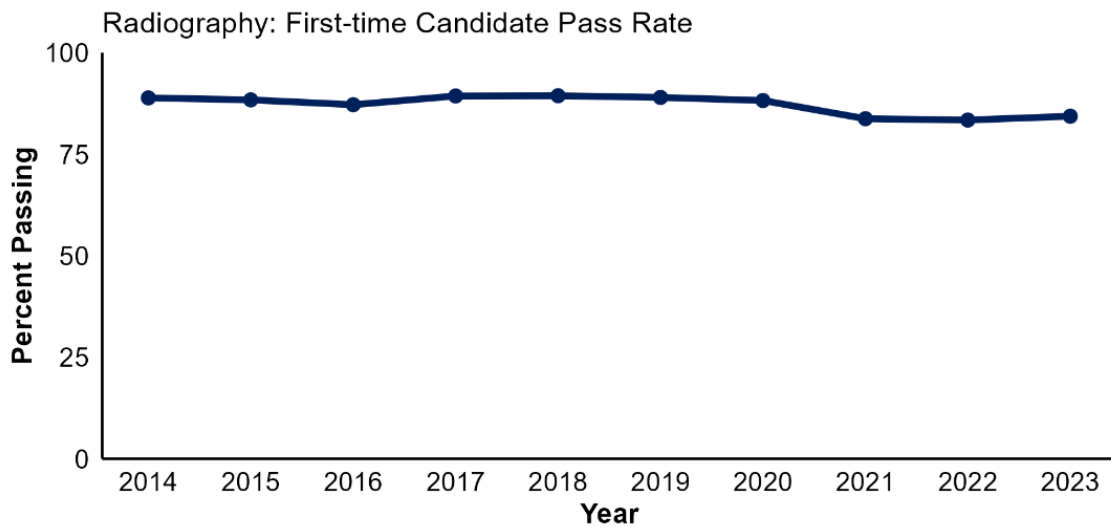
Radiography (RAD)

Section Performance

Content Categories	# Items	Mean Score
Patient Interactions and Management	33	8.2
Radiation Physics and Radiobiology	21	8.2
Radiation Protection	29	8.2
Image Acquisition and Evaluation	26	8.3
Equipment Operation and Quality Assurance	25	8.3
Head, Spine, and Pelvis Procedures	18	8.1
Thorax and Abdomen Procedures	20	8.0
Extremity Procedures	<u>28</u>	<u>8.2</u>
Total	200	82.0

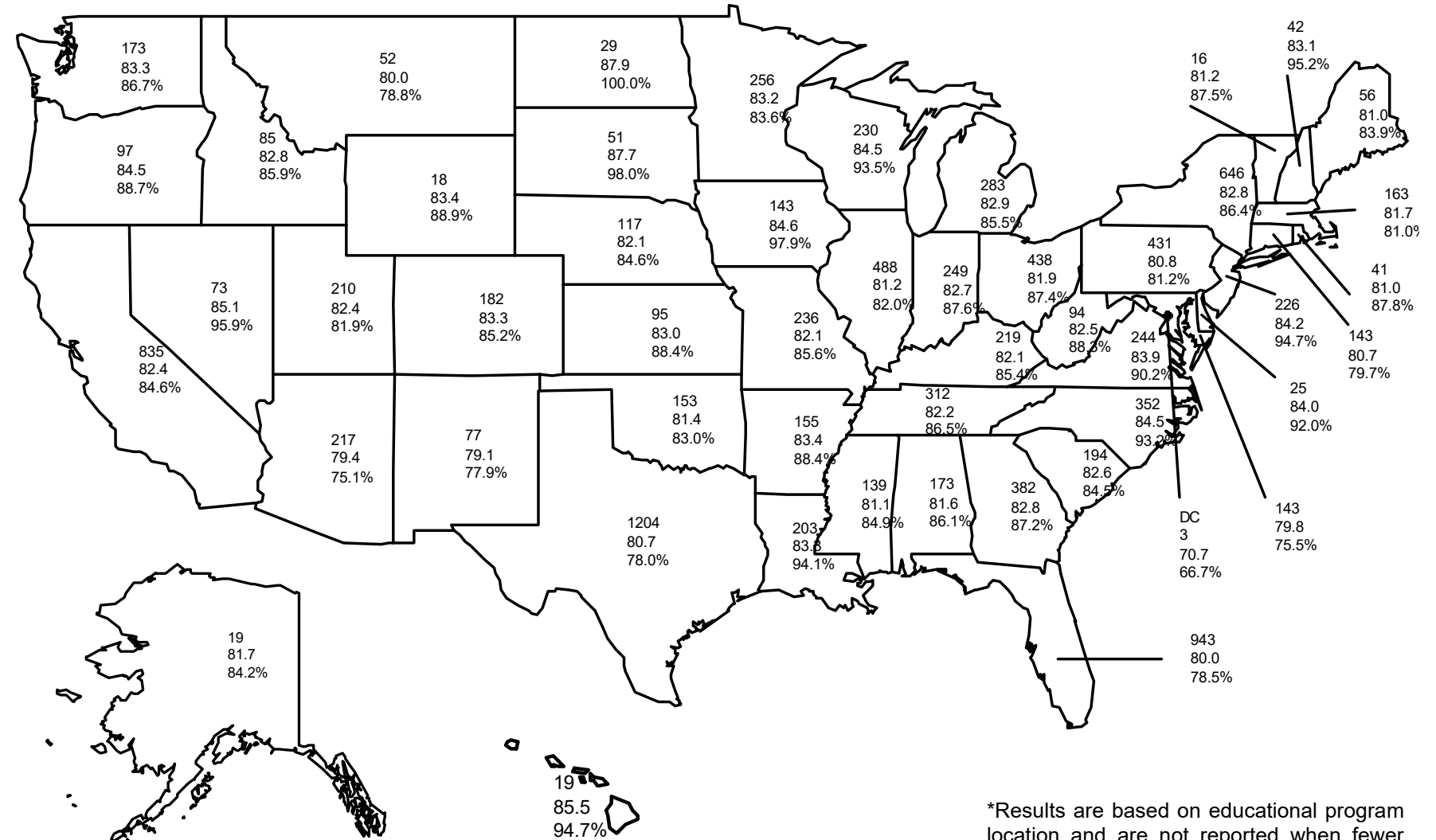
Pass Rate: 84.4%

Historical Exam Volume and Pass Rate



Radiography

Number of First-time Candidates, Mean Scaled Score, and Percentage Passing*



*Results are based on educational program location and are not reported when fewer than three candidates from a state took the examination.



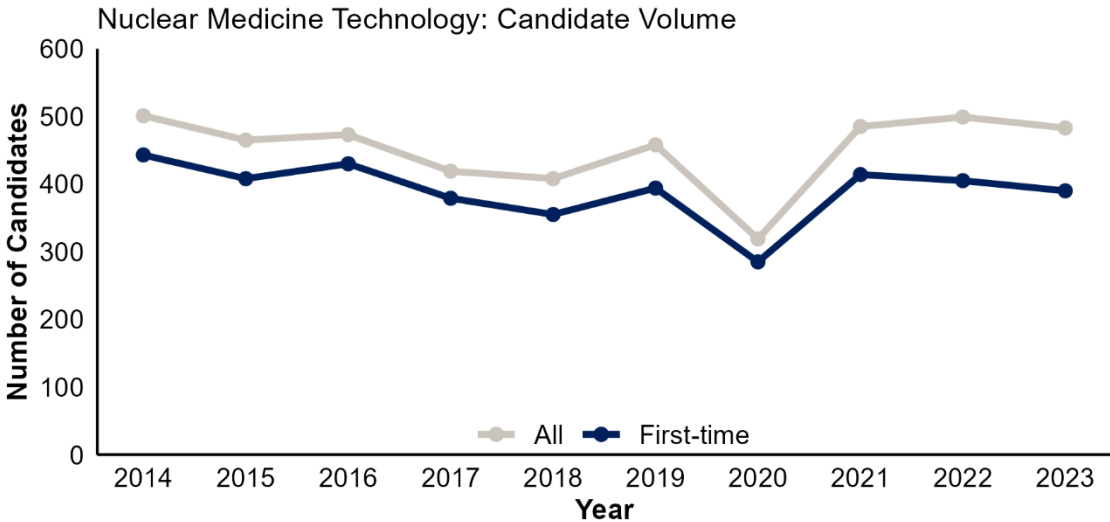
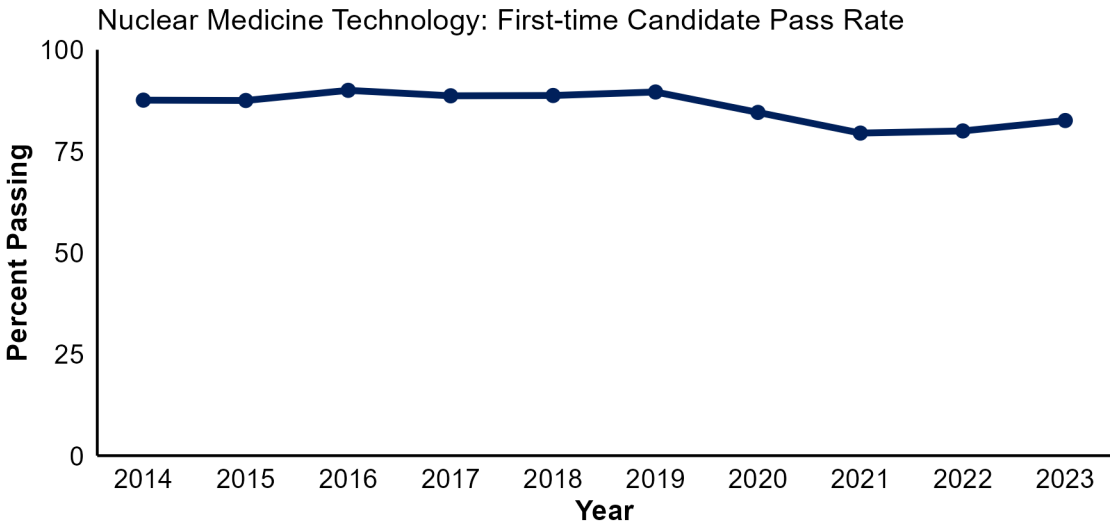
Nuclear Medicine Technology (NMT)

Section Performance

Content Categories	# Items	Mean Score
Patient Interactions and Management	24	8.5
Radiation Physics, Radiobiology, and Regulations	25	8.1
Instrumentation	33	7.9
Radionuclides and Radiopharmaceuticals	28	8.1
Cardiac Procedures	25	8.2
Endocrine and Oncology Procedures	25	8.3
Gastrointestinal and Genitourinary Procedures	18	8.3
Other Imaging Procedures	<u>22</u>	<u>8.1</u>
Total	200	81.7

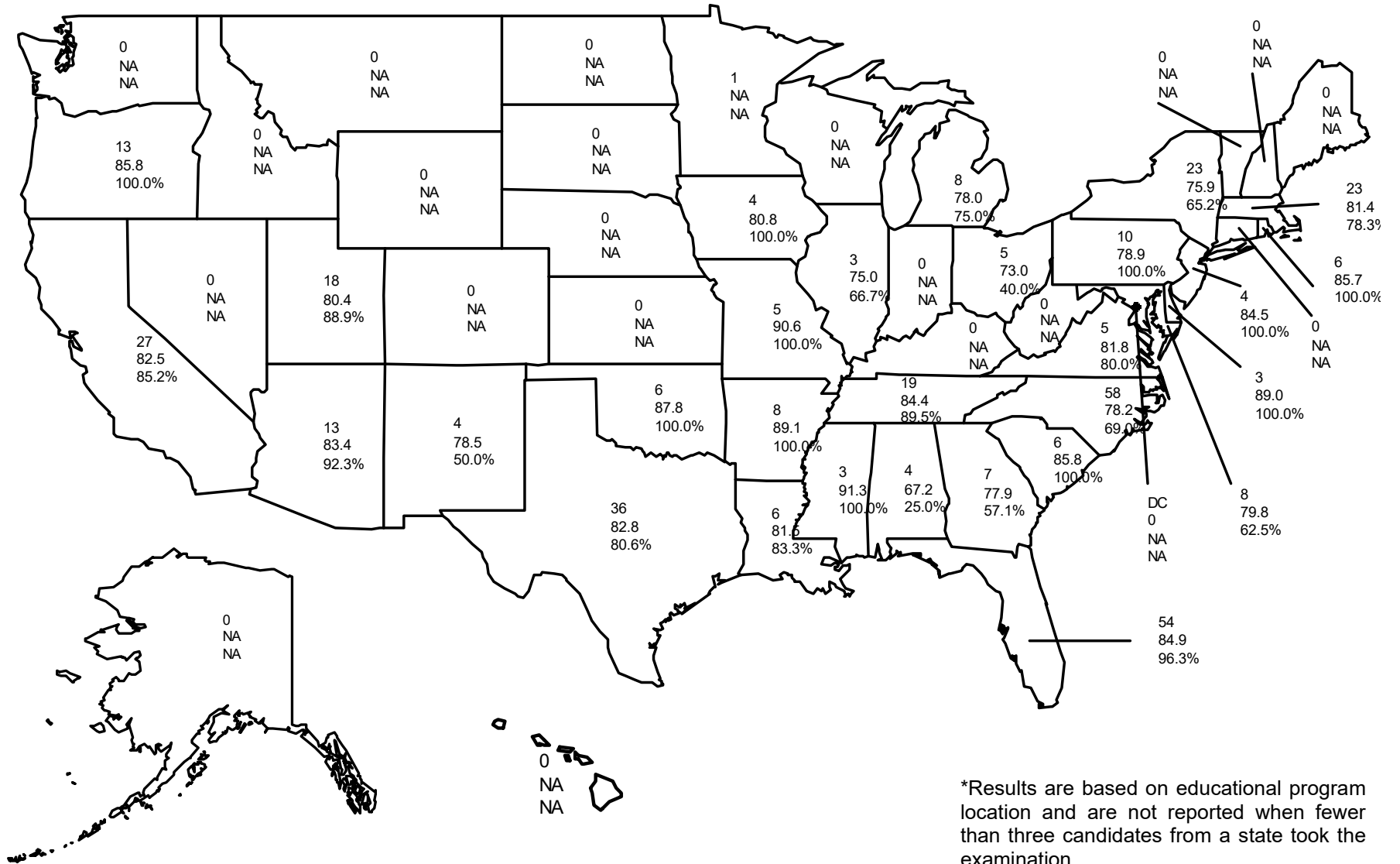
Pass Rate: 82.6%

Historical Exam Volume and Pass Rate



Nuclear Medicine

Number of First-time Candidates, Mean Scaled Score, and Percentage Passing*



*Results are based on educational program location and are not reported when fewer than three candidates from a state took the examination.



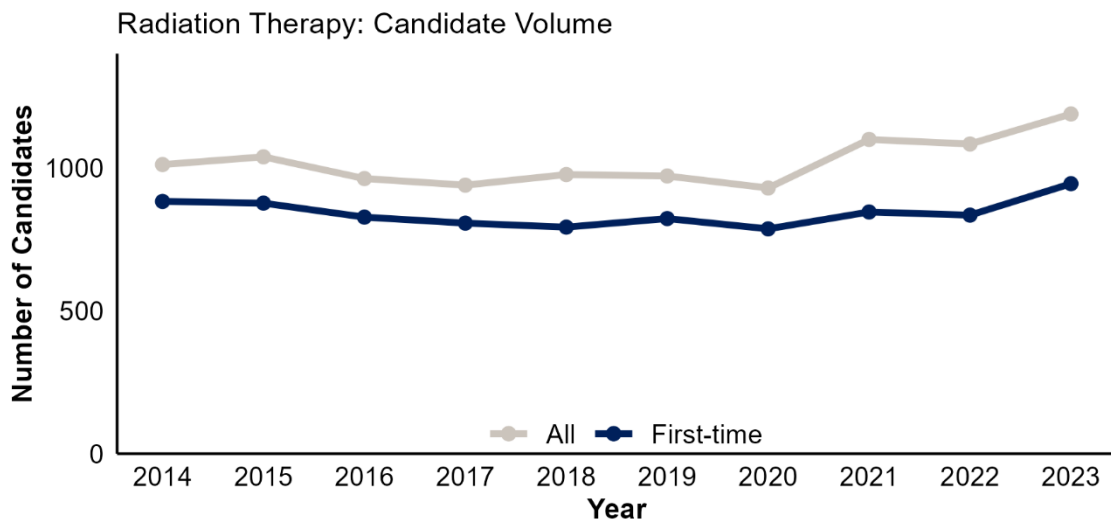
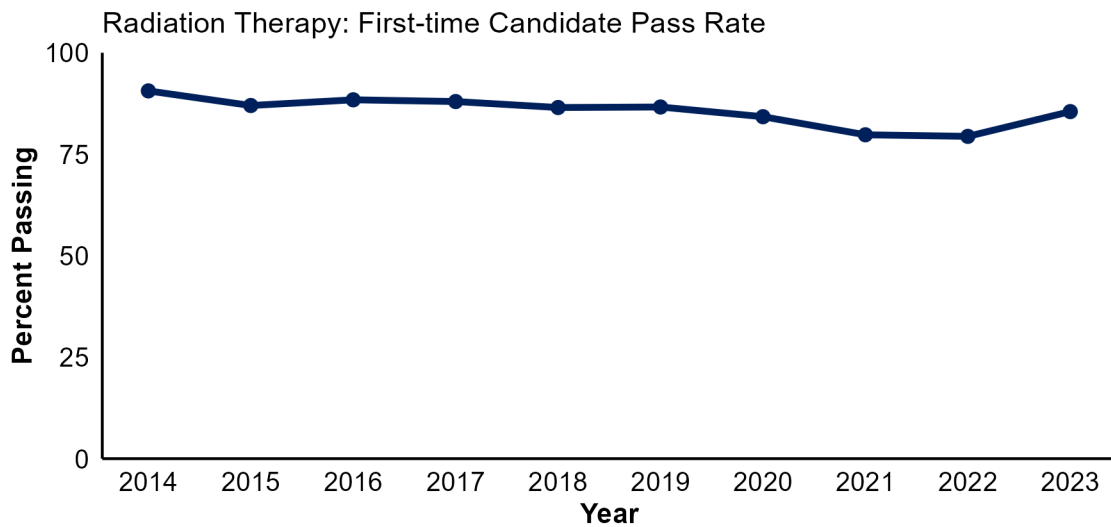
Radiation Therapy (THR)

Section Performance

Content Categories	# Items	Mean Score
Patient Interactions and Management	29	8.5
Patient and Medical Record Management	17	8.4
Radiation Physics and Radiobiology	21	8.0
Radiation Protection, Equipment Operation, and Quality Assurance	30	8.1
Treatment Sites and Tumors	26	8.1
Treatment Volume Localization	18	8.4
Prescription and Dose Calculation	24	7.9
Treatments	<u>35</u>	<u>8.1</u>
Total	200	81.8

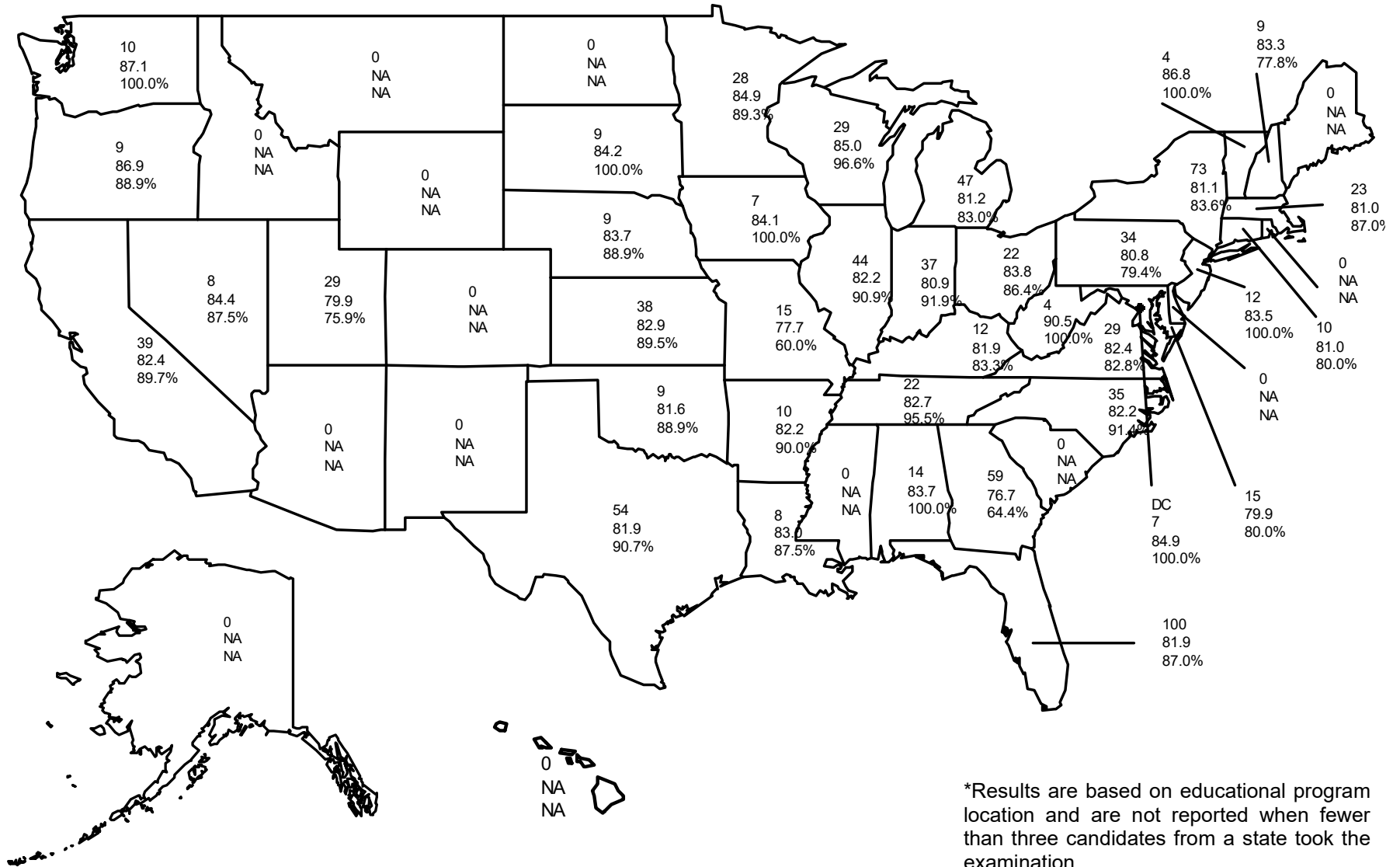
Pass Rate: 85.5%

Historical Exam Volume and Pass Rate



Radiation Therapy

Number of First-time Candidates, Mean Scaled Score, and Percentage Passing*



*Results are based on educational program location and are not reported when fewer than three candidates from a state took the examination.



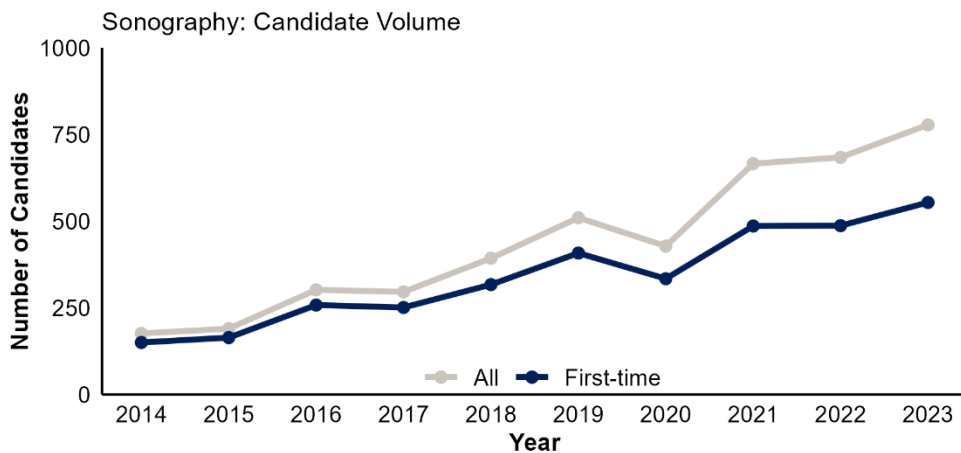
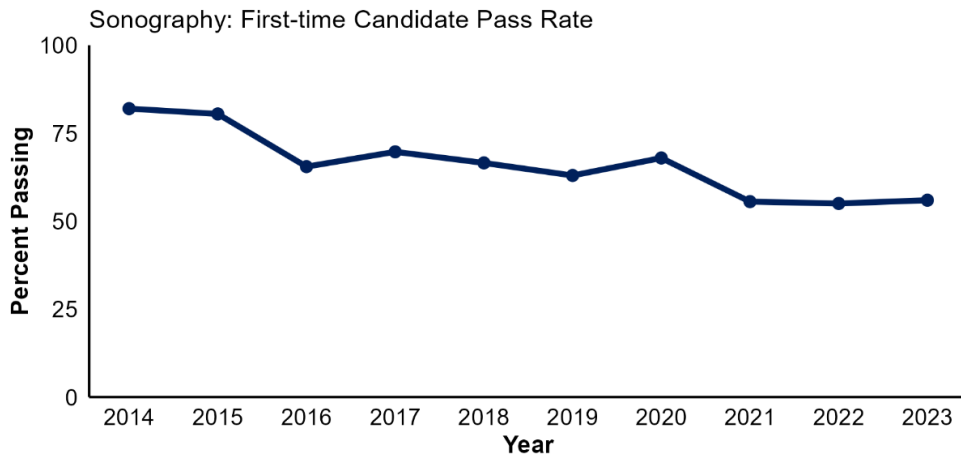
Sonography (SON)

Section Performance

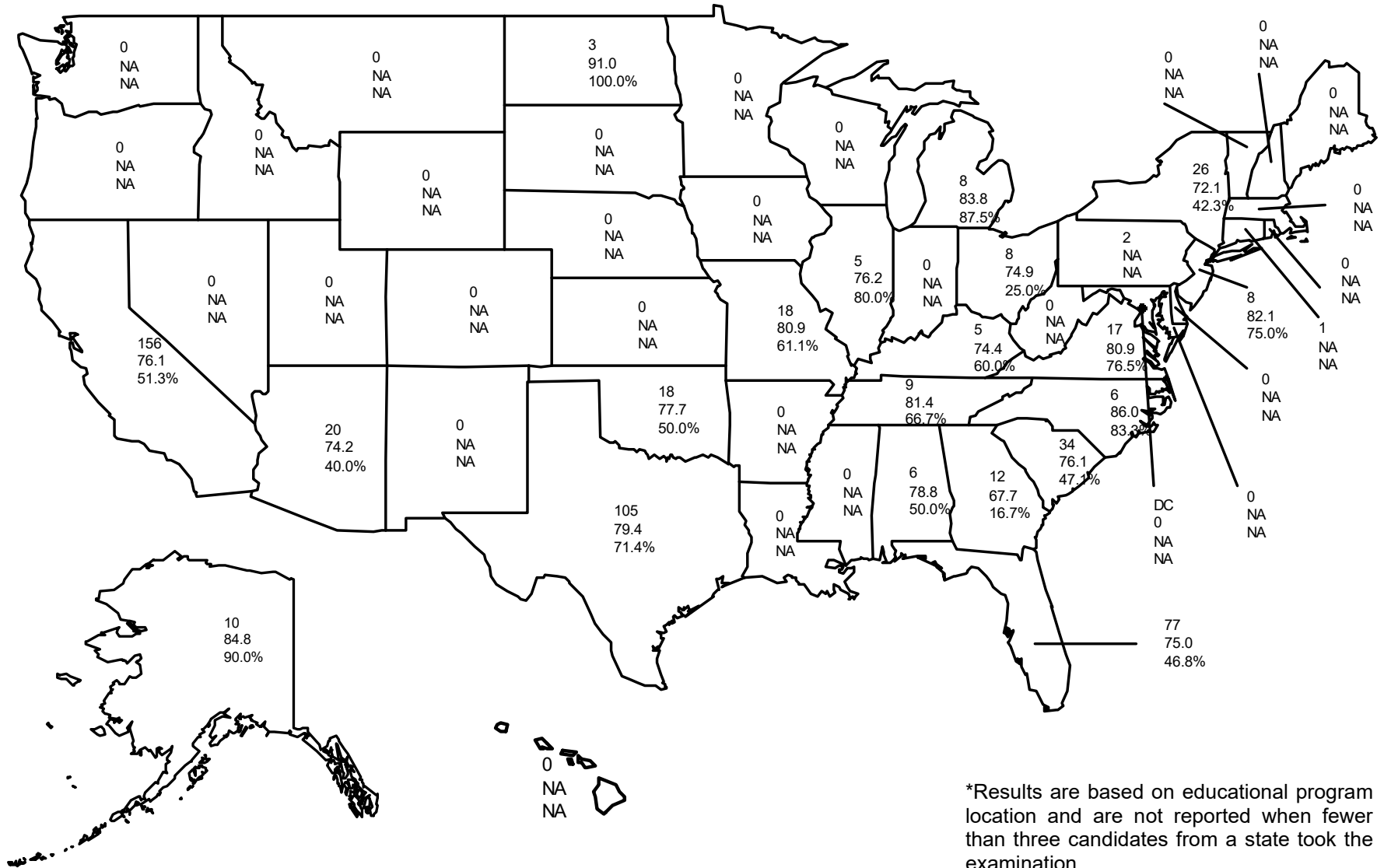
Content Categories	# Items	Mean Score
Patient Interactions and Management	29	7.4
Basic Principles of Ultrasound	50	7.7
Image Formation	44	7.6
Evaluation and Selection of Representative Images	21	7.8
Abdomen	75	7.8
OB/GYN*	109	7.8
<i>First Trimester Obstetrics</i>	18	7.8
<i>Second/Third Trimester and High Risk Obstetrics</i>	61	7.7
<i>Gynecology</i>	30	8.1
Superficial Structures and Other Sonographic Procedures	<u>32</u>	<u>7.6</u>
Total	360	77.1
Pass Rate: 56.0%		

* The OBGYN score is a composite of the First Trimester Obstetrics, Second/Third Trimester and High Risk Obstetrics, and Gynecology sections.

Historical Exam Volume and Pass Rate



Sonography Number of First-time Candidates, Mean Scaled Score, and Percentage Passing*



*Results are based on educational program location and are not reported when fewer than three candidates from a state took the examination.



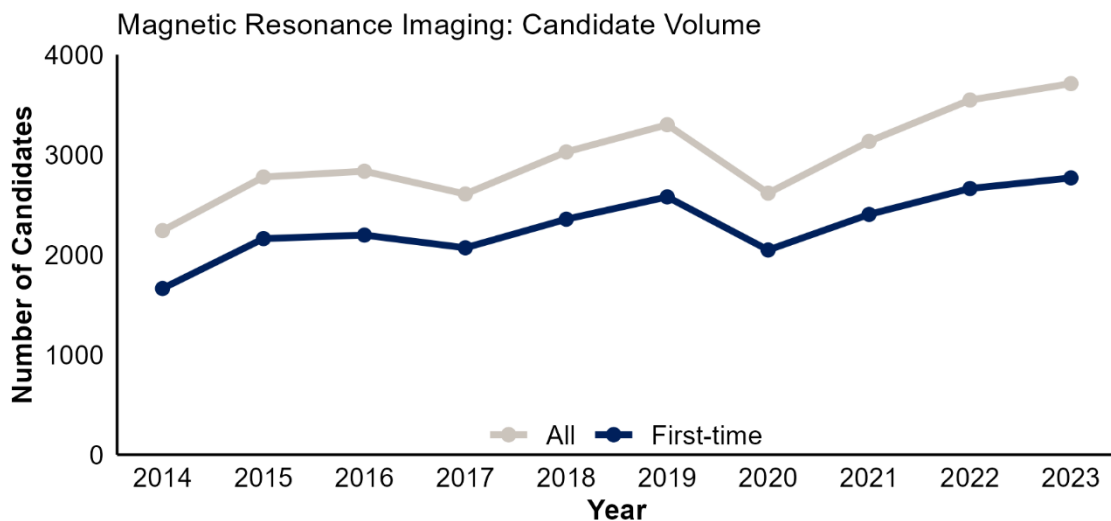
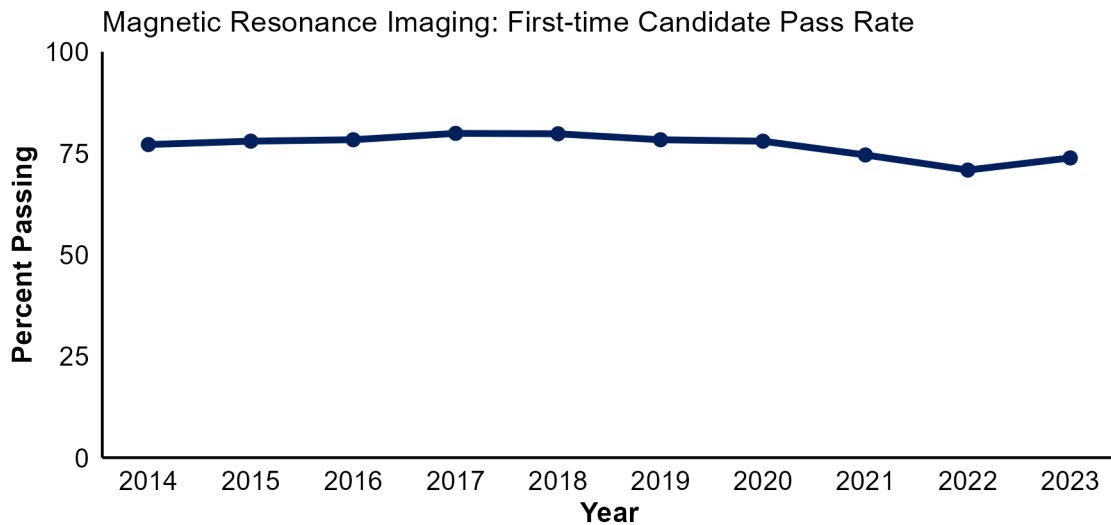
Magnetic Resonance Imaging (MRI)

Section Performance

Content Categories	# Items	Mean Score
Patient Interactions and Management	18	8.1
MRI Screening and Safety	20	8.2
Physical Principles of Image Formation	39	8.0
Sequence Parameters and Options	36	8.0
Data Acquisition, Processing, and Storage	30	7.5
Neurological	25	8.1
Body	15	7.7
Musculoskeletal	<u>17</u>	<u>8.0</u>
Total	200	79.6

Pass Rate: 73.8%

Historical Exam Volume and Pass Rate



**Magnetic Resonance Imaging
Number of First-time Candidates, Mean Scaled Score, and Percentage Passing***



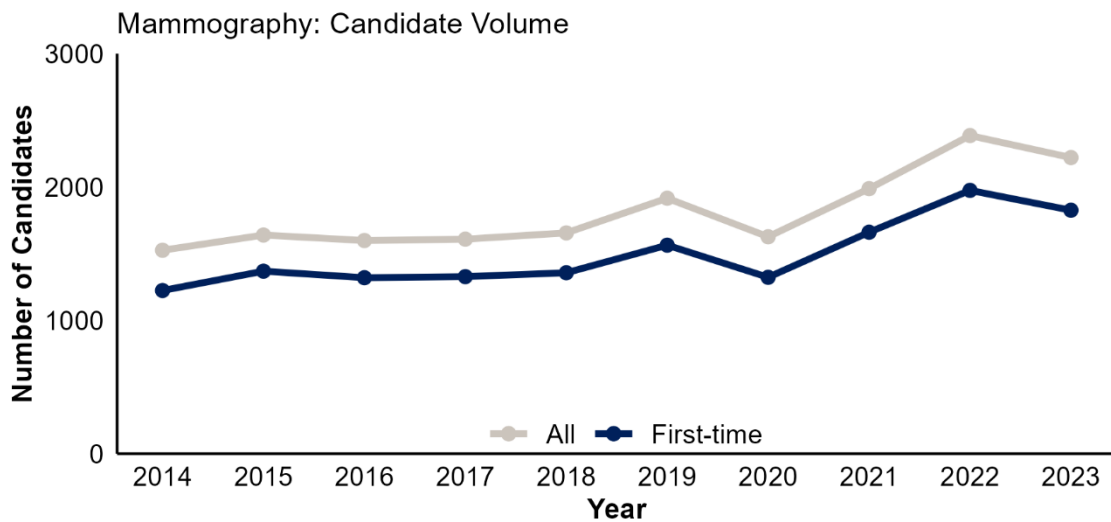
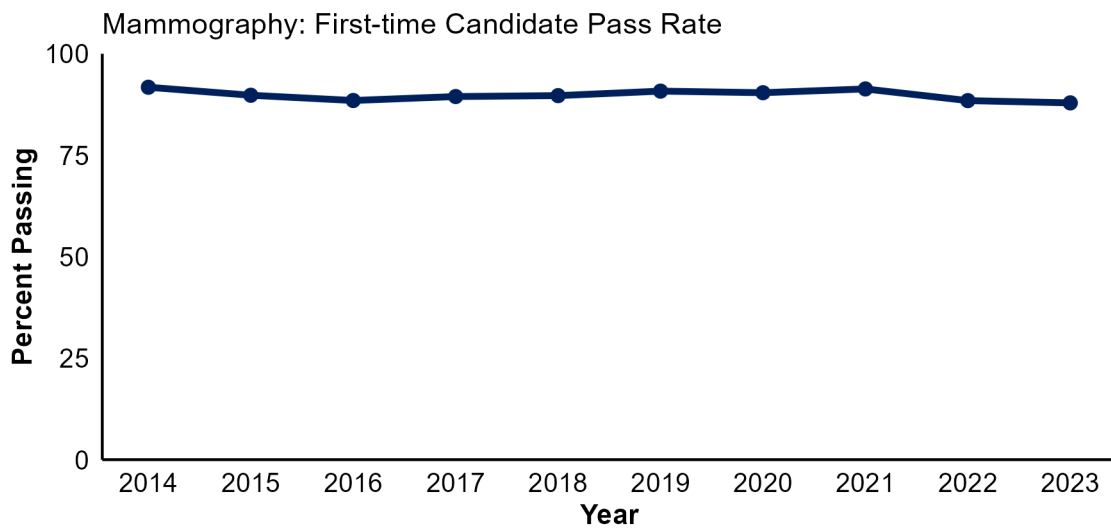
Mammography (MAM)

First-time Section Performance

Content Categories	# Items	Mean Score
Patient Interactions and Management	14	8.4
Image Acquisition and Quality Assurance	33	8.3
Anatomy, Physiology, and Pathology	26	8.5
Mammographic Positioning, Special Needs, and Imaging Procedures	<u>42</u>	<u>8.3</u>
Total	115	83.6

Pass Rate: 87.9%

Historical Exam Volume and Pass Rate



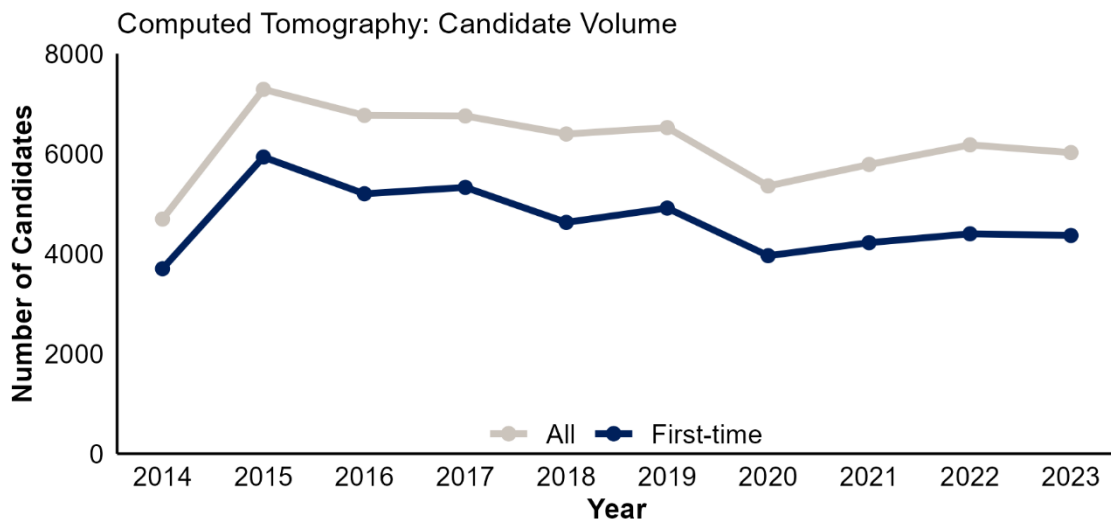
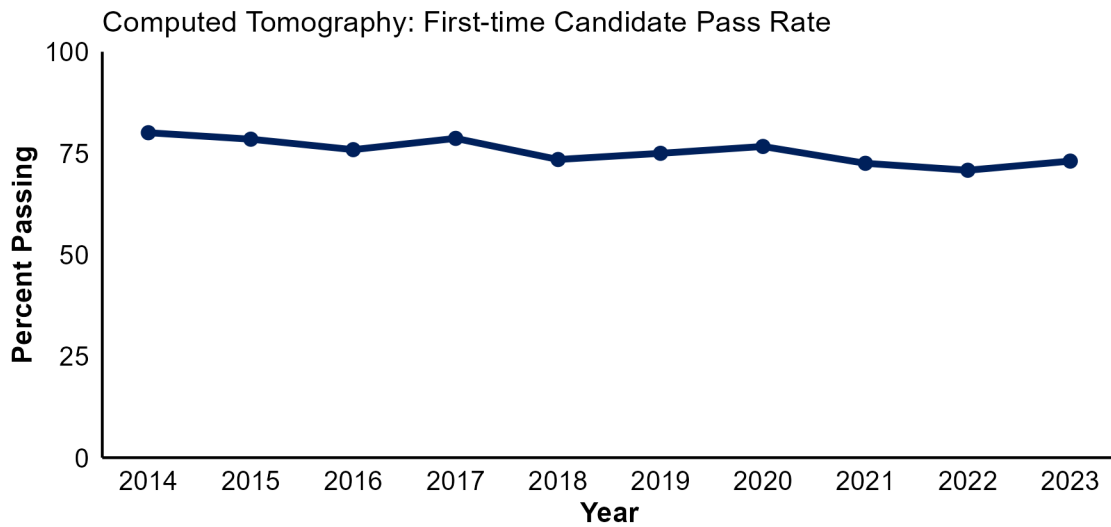
Computed Tomography (CT)

Section Performance

Content Categories	# Items	Mean Score
Patient Interactions and Management	22	8.1
Radiation Safety and Dose	22	8.2
Image Formation	28	7.8
Image Evaluation and Archiving	22	7.9
Head, Spine, and Musculoskeletal	25	7.9
Neck and Chest	21	7.9
Abdomen and Pelvis	<u>25</u>	<u>7.7</u>
Total	165	79.1

Pass Rate: 73.1%

Historical Exam Volume and Pass Rate



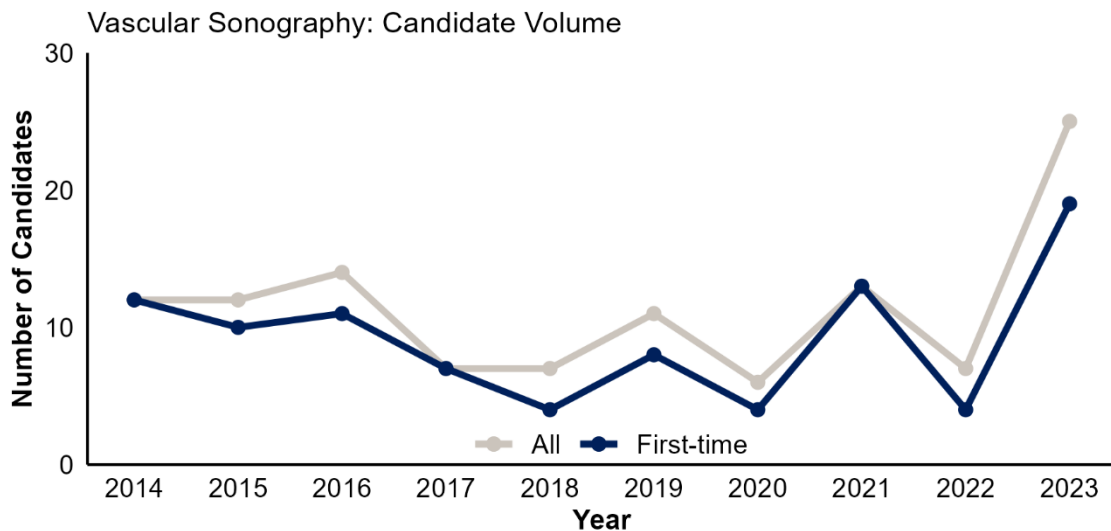
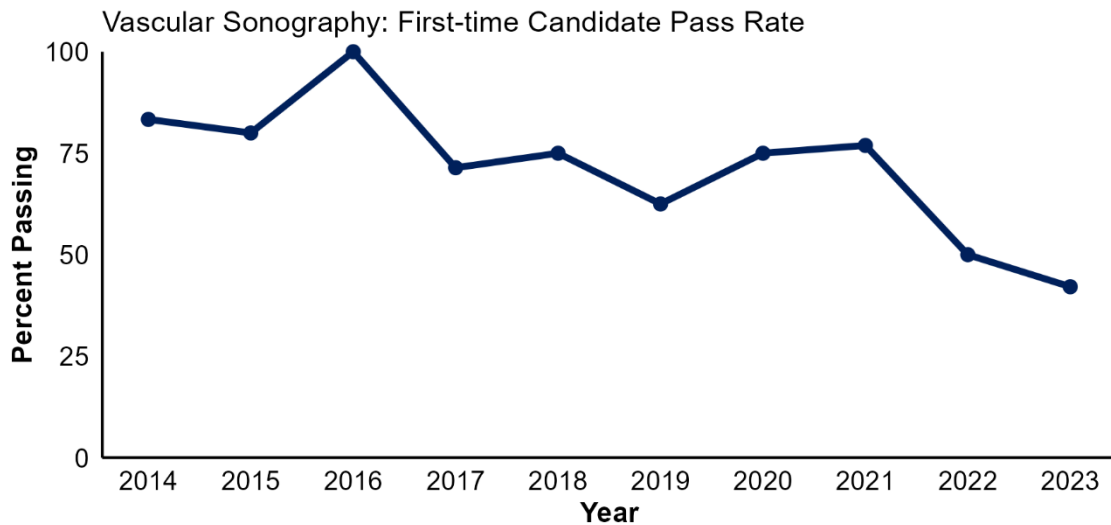
Vascular Sonography (VS)

Section Performance

Content Categories	# Items	Mean Score
Patient Interactions and Management	20	7.4
Basic Principles of Ultrasound	26	7.1
Image Formation	14	7.2
Evaluation and Selection of Representative Images	35	7.2
Abdominal/Pelvic Vasculature	23	7.2
Arterial Peripheral Vasculature	21	7.6
Venous Peripheral Vasculature	18	7.1
Extracranial Cerebral Vasculature and Other Sonographic Procedures	<u>18</u>	<u>7.3</u>
Total	175	72.5

Pass Rate: 42.1%

Historical Exam Volume and Pass Rate



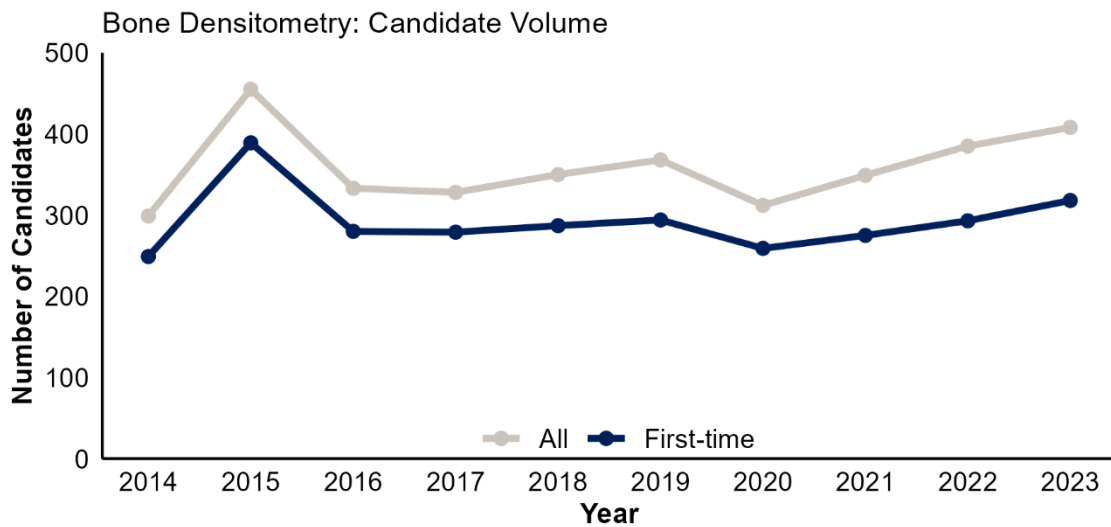
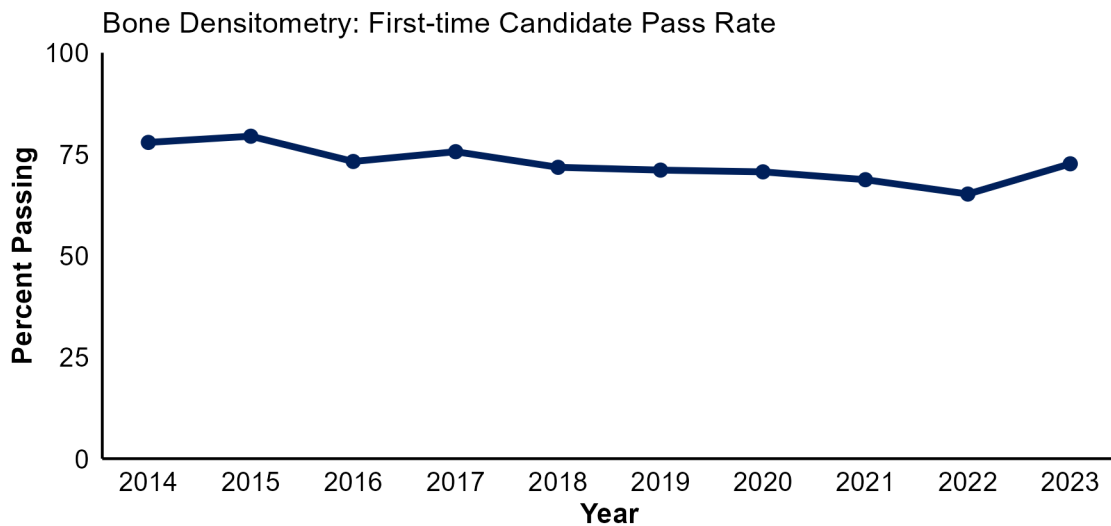
Bone Densitometry (BD)

Section Performance

Content Categories	# Items	Mean Score
Patient Bone Health, Care, and Radiation Principles	17	8.0
Equipment Operation and Quality Control	20	7.7
DXA Scanning	<u>38</u>	<u>7.9</u>
Total	75	78.9

Pass Rate: 72.6%

Historical Exam Volume and Pass Rate



Cardiac Interventional Radiography (CI)

Section Performance

January 1, 2023 – June 30, 2023 (n = 84)

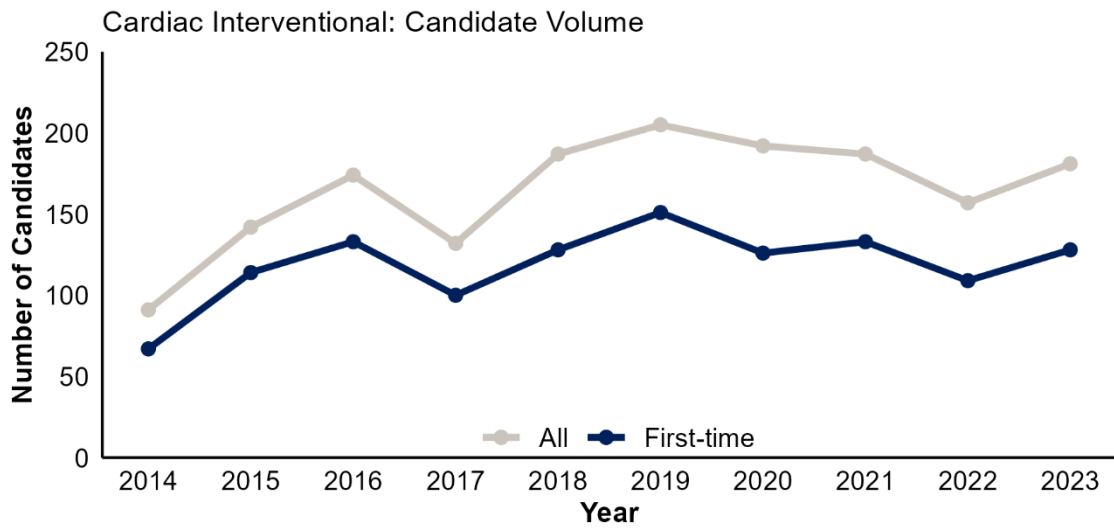
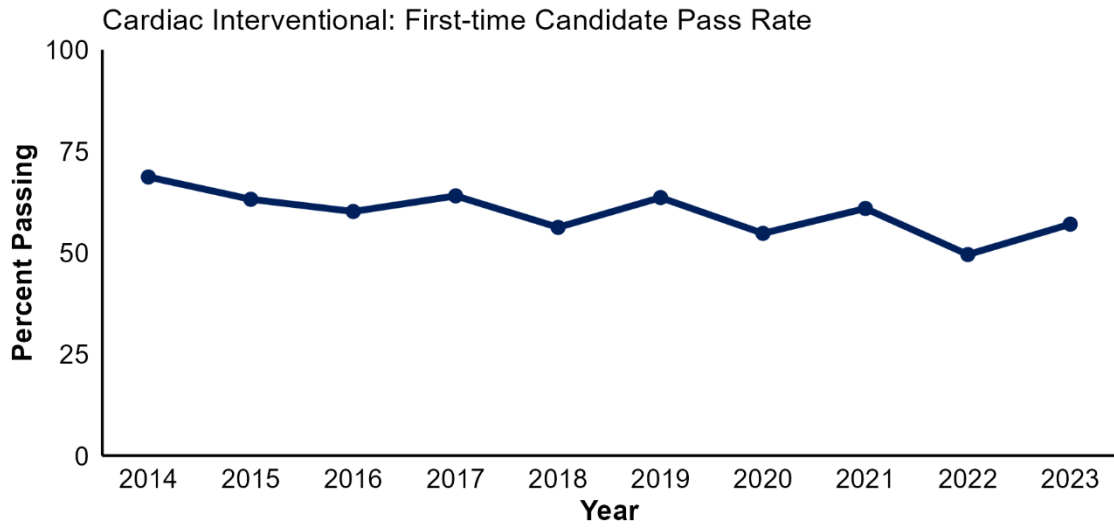
Content Categories (January – June 2023)	# Items	Mean Score
Patient Interactions and Management	35	7.5
Image Acquisition and Equipment	30	7.6
Diagnostic and Conduction System Studies	36	7.8
Hemodynamics, Calculations, and Percutaneous Intervention	<u>44</u>	<u>7.6</u>
Total	145	76.4
Pass Rate: 64.3%		

July 1, 2023 – December 31, 2023 (n = 44)

Content Categories (July – December 2023)	# Items	Mean Score
Patient Interactions and Management	40	7.3
Image Acquisition and Equipment	20	7.4
Diagnostic and Electrophysiology Procedures	35	7.4
Interventional Procedures	<u>50</u>	<u>7.5</u>
Total	145	74.0
Pass Rate: 43.2%		



Historical Exam Volume and Pass Rate



Vascular Interventional Radiography (VI)

Section Performance

January 1, 2023 – June 30, 2023 (n = 232)

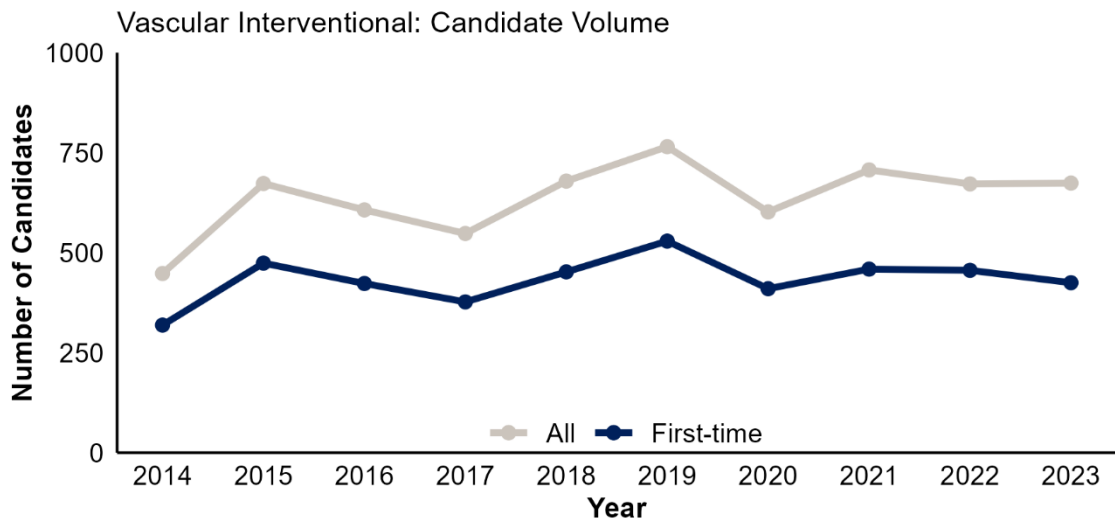
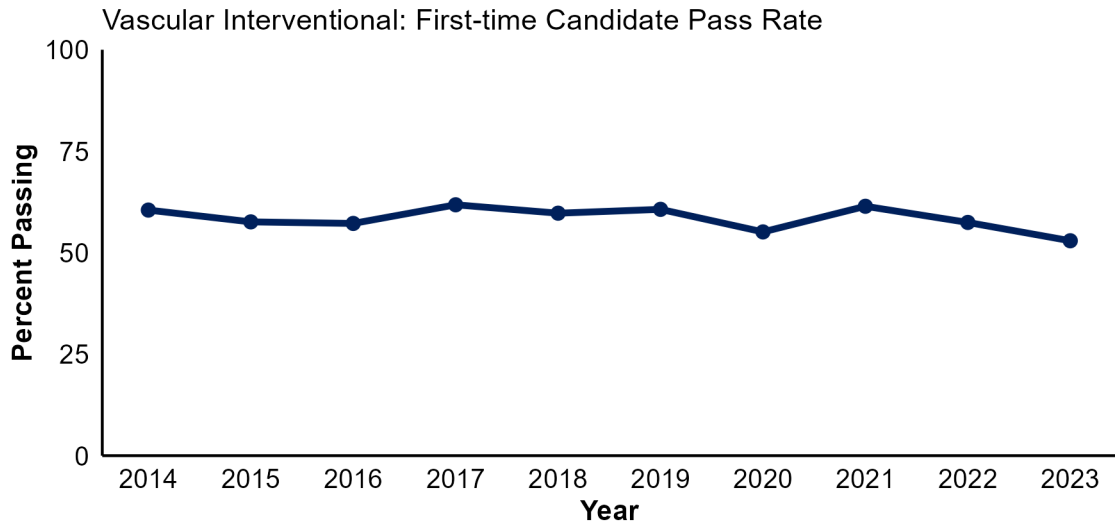
Content Categories	# Items	Mean Score
Patient Interactions and Management	30	7.5
Image Acquisition and Equipment	25	7.5
Vascular Diagnostic Procedures	50	7.5
Vascular Interventional Procedures	35	7.5
Nonvascular Procedures	<u>20</u>	<u>7.8</u>
Total	160	75.3
Pass Rate: 55.6%		

July 1, 2023 – December 31, 2023 (n = 193)

Content Categories	# Items	Mean Score
Patient Interactions and Management	22	7.5
Image Acquisition and Equipment	26	7.3
Vascular Diagnostic Procedures	41	7.1
Vascular Interventional Procedures	41	7.4
Nonvascular Procedures	<u>30</u>	<u>7.6</u>
Total	160	74.0
Pass Rate: 49.7%		



Historical Exam Volume and Pass Rate



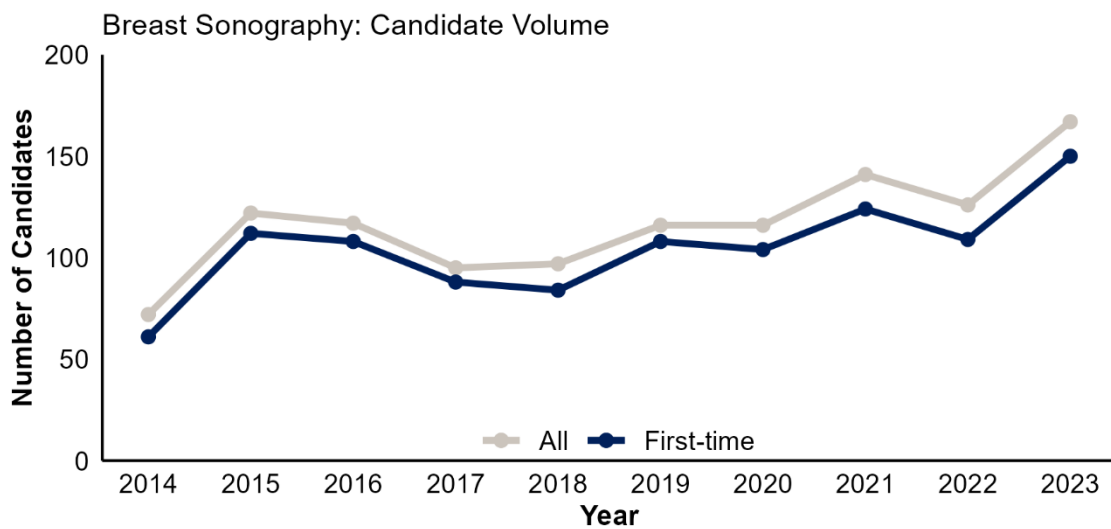
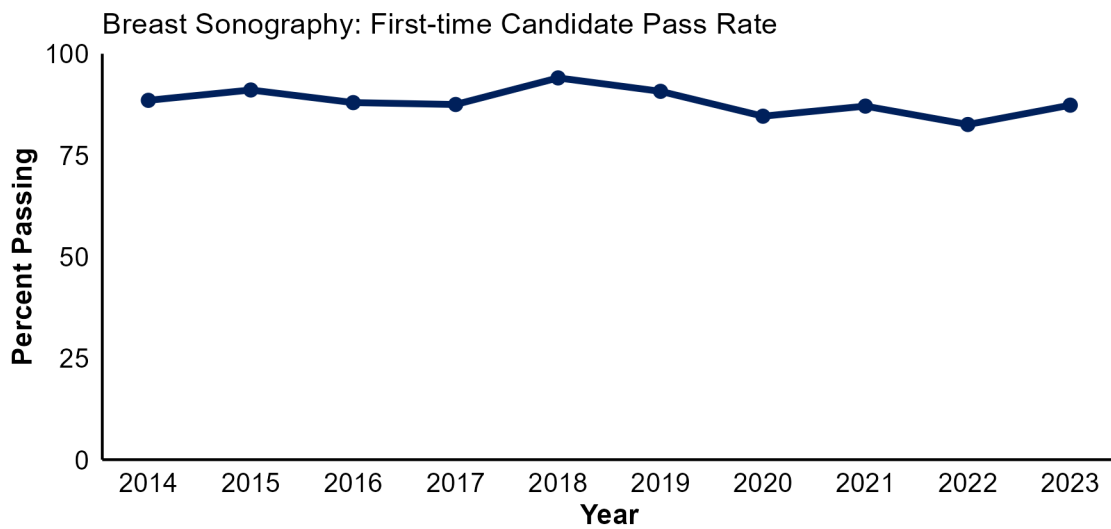
Breast Sonography (BS)

Section Performance

Content Categories	# Items	Mean Score
Patient Interactions and Management	18	8.4
Basic Principles of Ultrasound	37	7.7
Image Formation	32	8.3
Evaluation and Selection of Representative Images	33	8.3
Anatomy and Physiology	15	8.4
Pathology	35	8.4
Breast Interventions	<u>15</u>	<u>8.5</u>
Total	185	82.4

Pass Rate: 72.6%

Historical Exam Volume and Pass Rate



Radiologist Assistant (RA)

Section Performance

Content Categories	% of Exam*	Mean Score
Patient Management	14	8.2
Pharmacology	7	7.3
Patient Safety, Radiation Protection, and Equipment Operation	11	7.6
Abdominal Section	16	8.0
Thoracic Section	9	7.5
Musculoskeletal and Endocrine Sections	9	7.0
Neurological, Vascular, and Lymphatic Sections	9	7.7
Case Study	<u>25</u>	<u>7.7</u>
Total	100	77.1

Pass Rate: 66.7%

*The number of case study items varies based on the individual cases selected, but the section always accounts for twenty-five percent of the total exam points.

Historical Exam Volume and Pass Rate

