Introduction

The ARRT offers two eligibility pathways for certification and registration: primary and postprimary. This report summarizes the results of exams taken through the postprimary eligibility pathway from July 2019 through June 2020 including Mammography, Computed Tomography, Magnetic Resonance Imaging, Cardiac-Interventional Radiography, Vascular-Interventional Radiography, Sonography, Vascular Sonography, Bone Densitometry, and Breast Sonography. This report uses an annual cycle from July to June that aligns with updates to the content specifications and clinical experience requirements for these exams. During the reported cycle, both the Sonography and Magnetic Resonance Imaging exams could be taken through either the primary or postprimary eligibility pathway. Only results for those taking the exams through the postprimary eligibility pathway are presented here.

This report summarizes the results for each examination separately. Each section presents a brief content outline for the exam and the number of items in each category. Specific results for July 2019 through June 2020 are presented including mean scaled section scores, mean total scaled scores, and pass rates. Charts with historical pass rates and candidate volumes for each exam are also presented.

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 general information to candidates regarding their 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 often based on a small 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 radiologic technologists. 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 interested in more detailed reporting, such as an explanation of ARRT's scaling procedures, or past years' reports are encouraged to visit the exam statistics page on the ARRT website.

Updates

The postprimary eligibility pathway for the Sonography exam was discontinued as of January 1, 2020. See this link for more information about the changes. Additionally, new content specifications for the MRI exam went into on January 1, 2020. Section mean scores are presented as two tables to reflect the change.

Summary Statistics

Exam Volume

Exam	First-time Candidates	Repeat	State	Reinstatement	Total
Mammography	1417	152	155	4	1728
Computed Tomography	3946	1373	0	8	5327
Magnetic Resonance Imaging	1649	503	0	11	2163
Sonography	12	5	0	0	17
Vascular Sonography	4	3	0	0	7
Bone Densitometry	255	59	0	0	314
Cardiac-Interventional	127	57	0	0	184
Vascular-Interventional	407	180	0	0	587
Breast Sonography	92	12	0	0	104

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.

First-time Candidate Exam Performance

Exam	Approximate % Correct to Pass	Mean Scaled Score	Pass %
Mammography	67	84.1	91.2
Computed Tomography	67	79.7	75.0
Magnetic Resonance Imaging	66	80.9	79.6
Sonography*	67	79.0	50.0
Vascular Sonography	66	78.2	50.0
Bone Densitometry	70	79.1	71.8
Cardiac-Interventional	67	76.0	60.6
Vascular-Interventional	68	76.3	59.2
Breast Sonography	66	82.5	84.8

*The Sonography exam requires a passing candidate to achieve a scaled score of 75 or greater on the whole exam, and in addition, achieve section scaled scores of 7.5 or greater in both the Abdominal and OB/GYN sections.
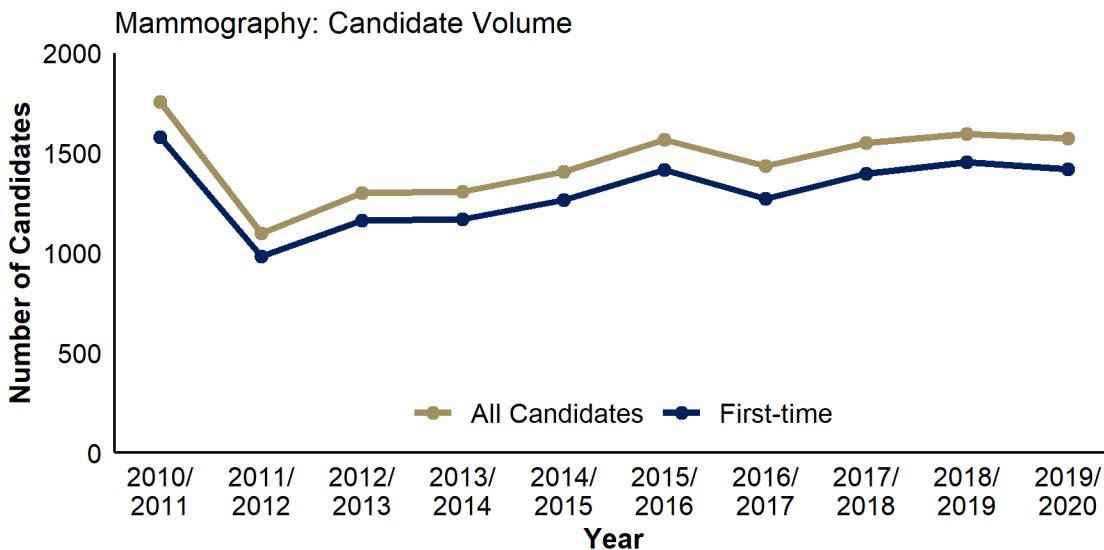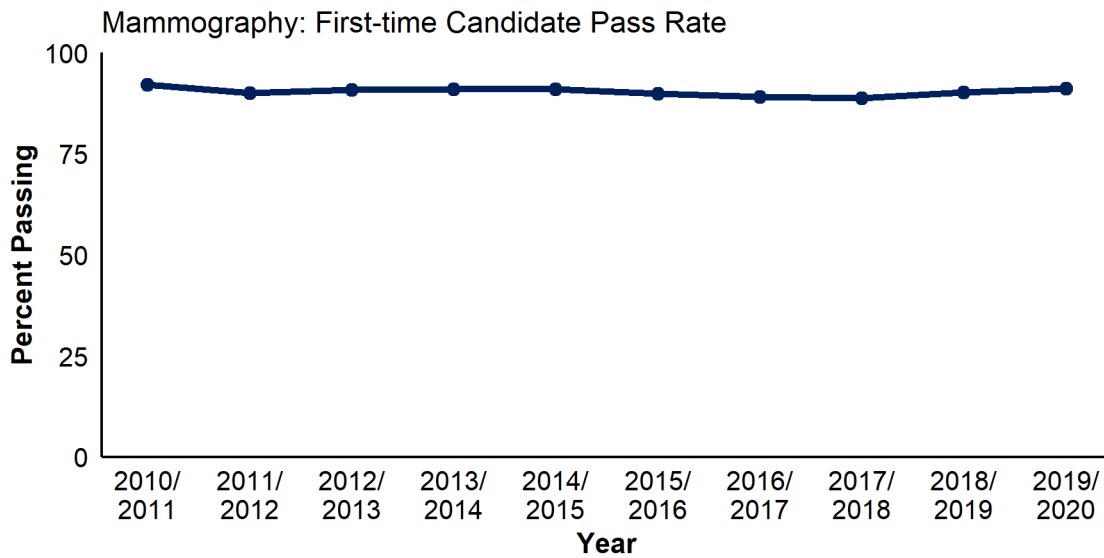
Exam Performance for Mammography

Content Categories and First-time Candidate Scores

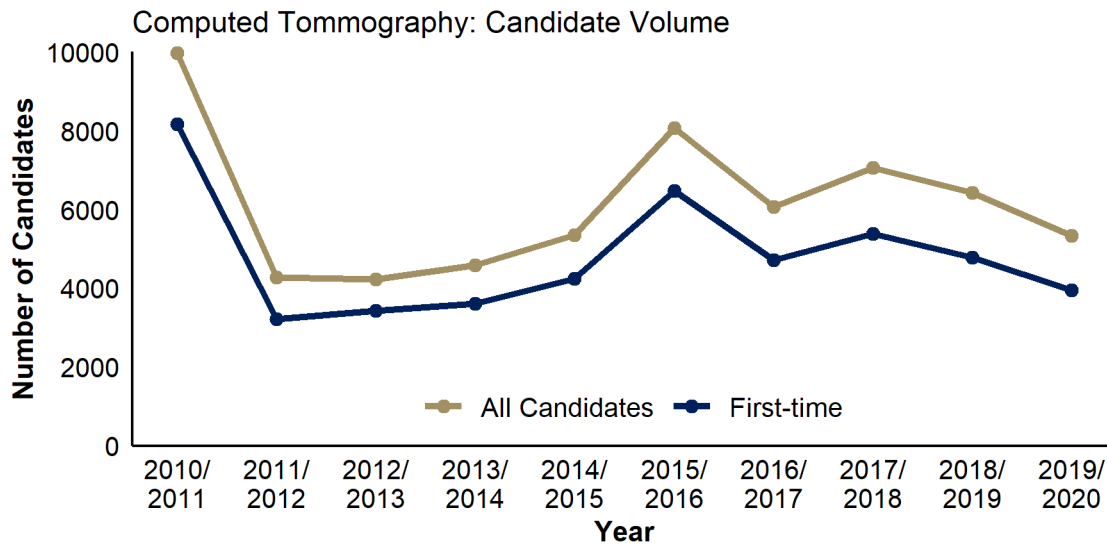| Content Categories	# Items	Mean Score
Patient Care: Education and Assessment	12	8.5
Image Production: Equipment Operation and Quality Assurance	43	8.0
Procedures: Anatomy, Physiology, and Pathology	23	8.6
Procedures: Mammographic Positioning, Special Needs, and Imaging Procedures	<u>37</u>	<u>8.7</u>
Total	115	84.1

Pass Rate: 91.2%

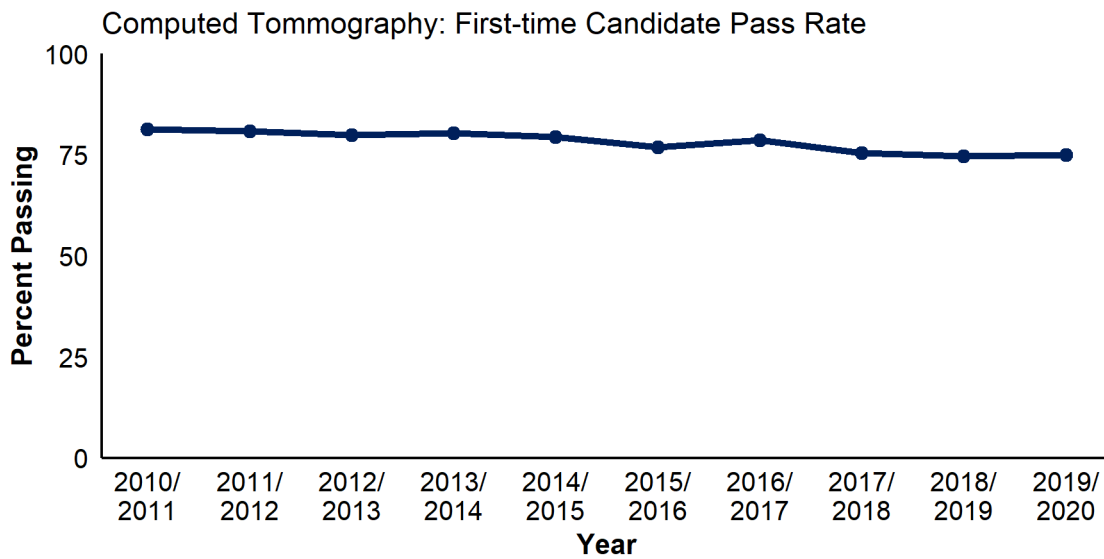Mammography: First-time Candidate Pass Rate

Mammography: Candidate Volume

Exam Performance for Computed Tomography

Content Categories and First-time Candidate Scores

Content Categories	# Items	Mean Score
Patient Care: Patient Interactions and Management	22	8.2
Safety: Radiation Safety and Dose	20	8.2
Image Production: Image Formation	30	7.8
Image Production: Image Evaluation and Archiving	25	7.7
Procedures: Head, Spine, and Musculoskeletal	24	7.9
Procedures: Neck and Chest	20	8.1
Procedures: Abdomen and Pelvis	24	8.0
Total	165	79.7

Pass Rate: 75.0%

Computed Tommography: First-time Candidate Pass Rate

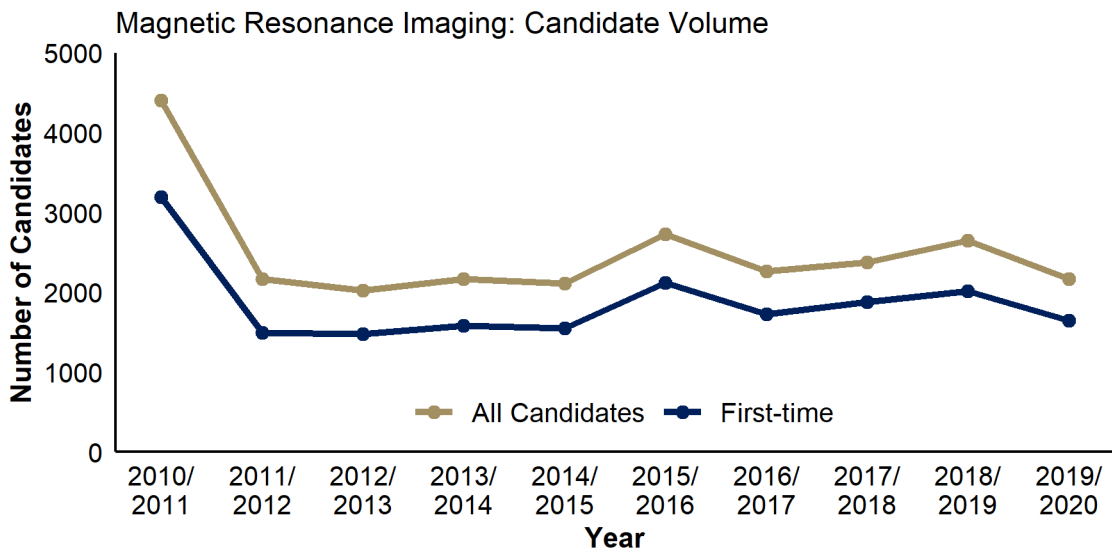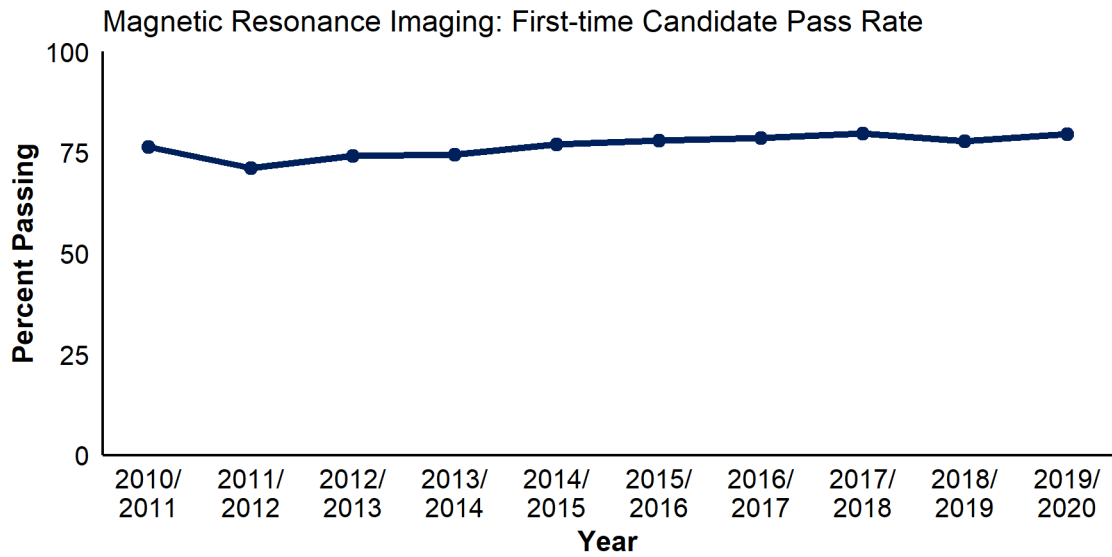Computed Tommography: Candidate Volume

Exam Performance for Magnetic Resonance Imaging

Content Categories and First-time Candidate Scores

Content Categories (July 2019 – December 2019)		# Items	Mean Score
Patient Care: Patient Interactions and Management		17	8.3
Safety: MRI Screening and Safety		15	8.0
Image Production: Physical Principles of Image Formation		40	8.0
Image Production: Sequence Parameters and Options		38	8.0
Image Production: Data Acquisition and Processing		34	7.6
Procedures: Neuro		26	8.5
Procedures: Body		20	8.0
Procedures: Musculoskeletal		<u>10</u>	<u>8.4</u>
	Total	200	80.5

Content Categories (January 2020 – June 2020)		# Items	Mean Score
Patient Care: Patient Interactions and Management		18	8.4
Safety: MRI Screening and Safety		20	8.2
Image Production: Physical Principles of Image Formation		39	8.0
Image Production: Sequence Parameters and Options		36	8.1
Image Production: Data Acquisition and Processing		30	7.9
Procedures: Neurological		25	8.3
Procedures: Body		15	8.2
Procedures: Musculoskeletal		<u>17</u>	<u>8.4</u>
	Total	200	81.4

Pass Rate: 79.6%

Magnetic Resonance Imaging: First-time Candidate Pass Rate

Magnetic Resonance Imaging: Candidate Volume

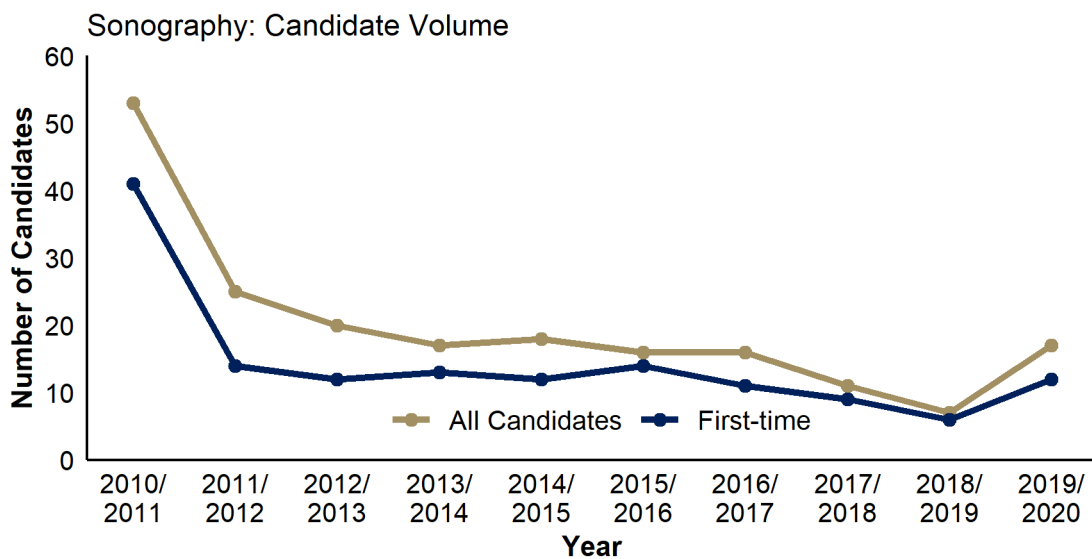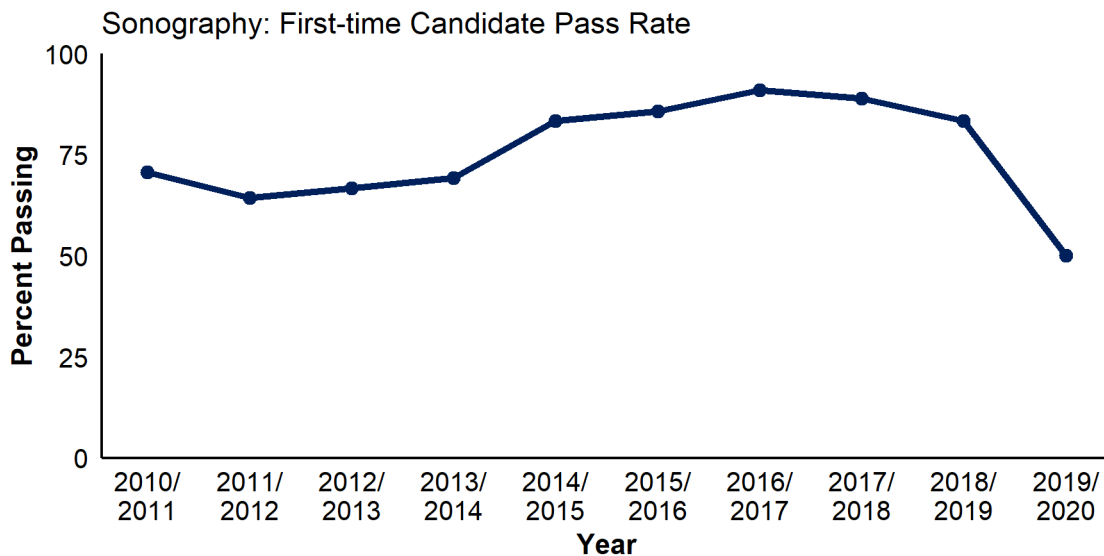# Exam Performance for Sonography

Content Categories and First-time Candidate Scores

Content Categories	# Items	Mean Score
Patient Care: Patient Interactions and Management	29	8.2
Image Production: Basic Principles of Ultrasound	50	7.3
Image Production: Image Formation	44	7.8
Image Production: Evaluation and Selection of Representative Images	21	8.0
Procedures: Abdomen	75	7.9
Procedures: OB/GYN	109	8.2
Procedures: Superficial Structures and Other Sonographic Procedures	32	7.9
Total	360	79.0

Pass Rate: 50.0%

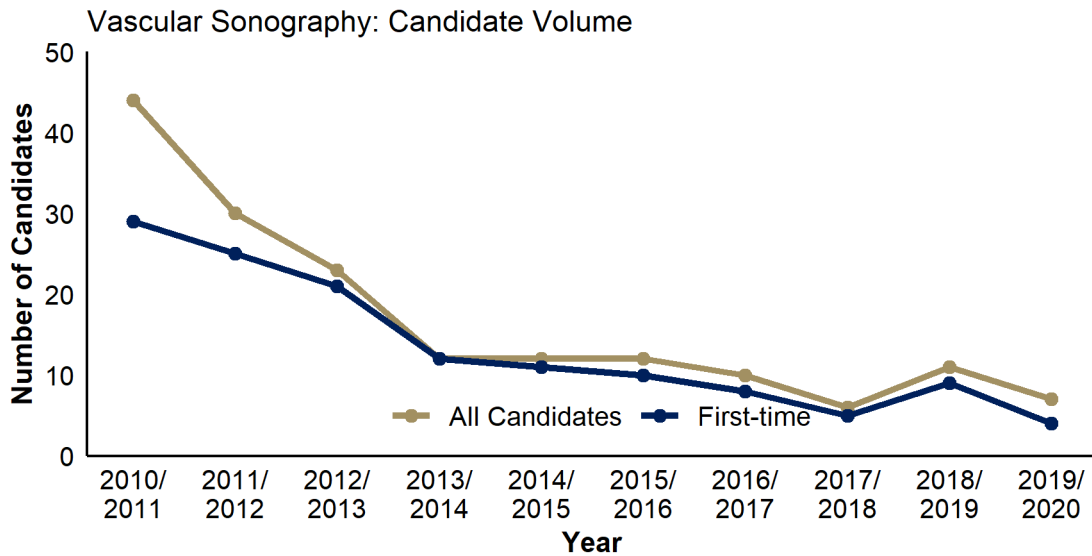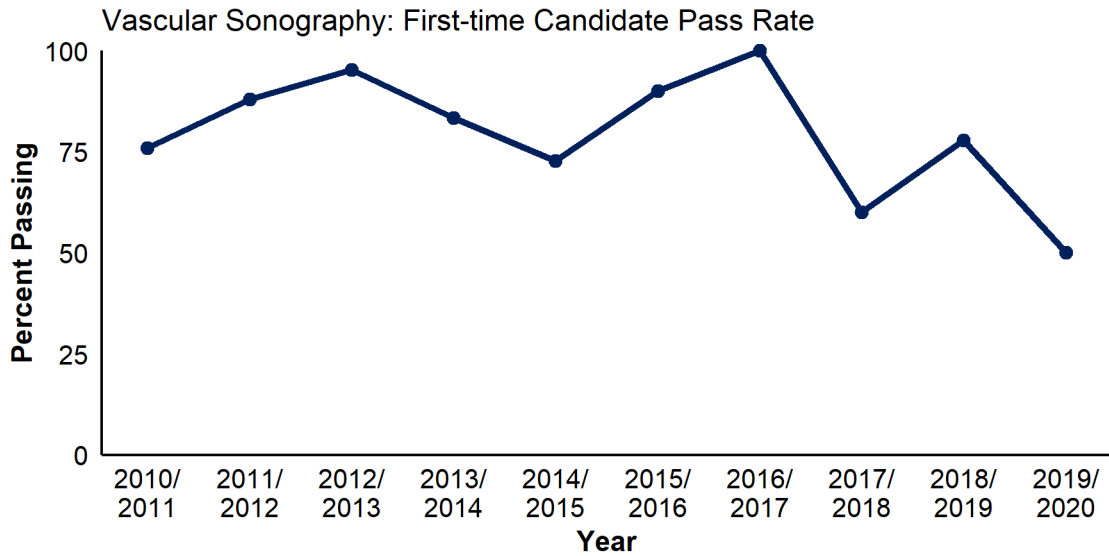Sonography: First-time Candidate Pass Rate

Sonography: Candidate Volume

Exam Performance for Vascular Sonography

Content Categories and First-time Candidate Scores

Content Categories		# Items	Mean Score
Image Production		75	7.4
Procedures		85	8.2
	Total	160	78.2
	Pass Rate: 50.0%		

Vascular Sonography: First-time Candidate Pass Rate

Vascular Sonography: Candidate Volume

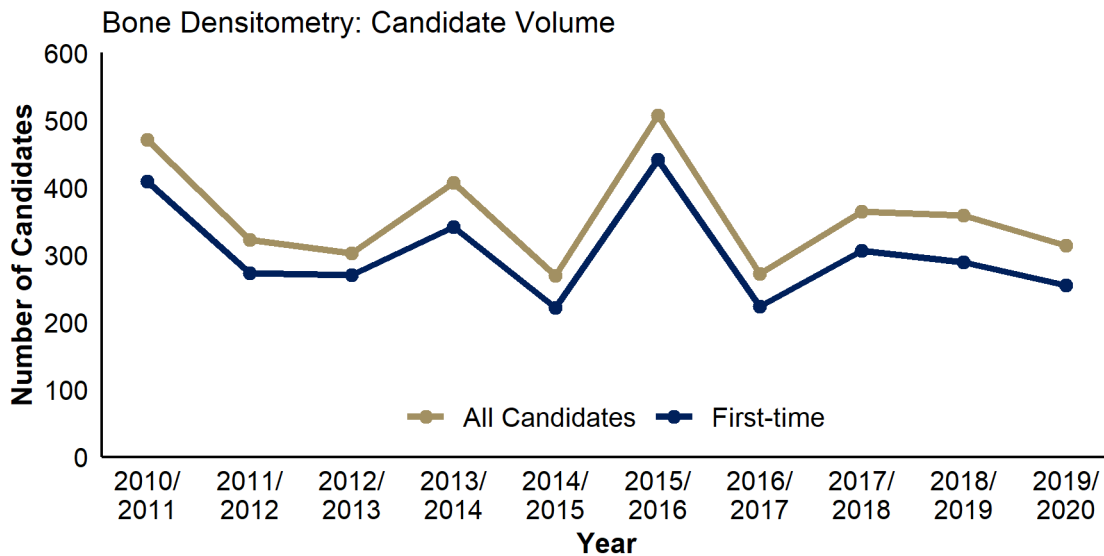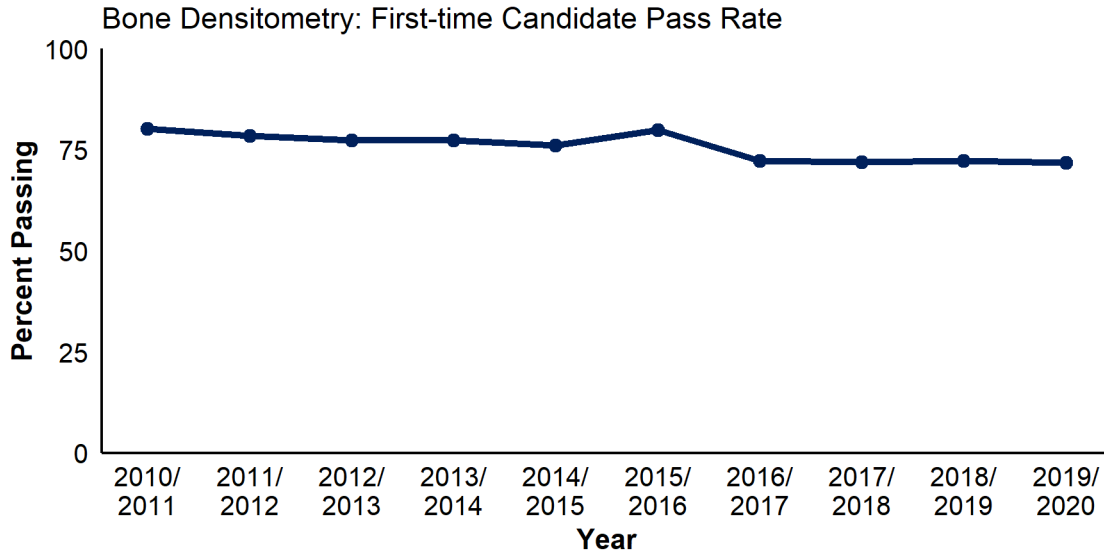# Exam Performance for Bone Densitometry

Content Categories and First-time Candidate Scores

Content Categories	# Items	Mean Score
Patient Care: Patient Bone Health, Care, and Radiation Principles	16	8.3
Image Production: Equipment Operation and Quality Control	21	7.8
Procedures: DXA Scanning	<u>38</u>	<u>7.8</u>
Total	75	79.1
Pass Rate: 71.8%		

Bone Densitometry: First-time Candidate Pass Rate
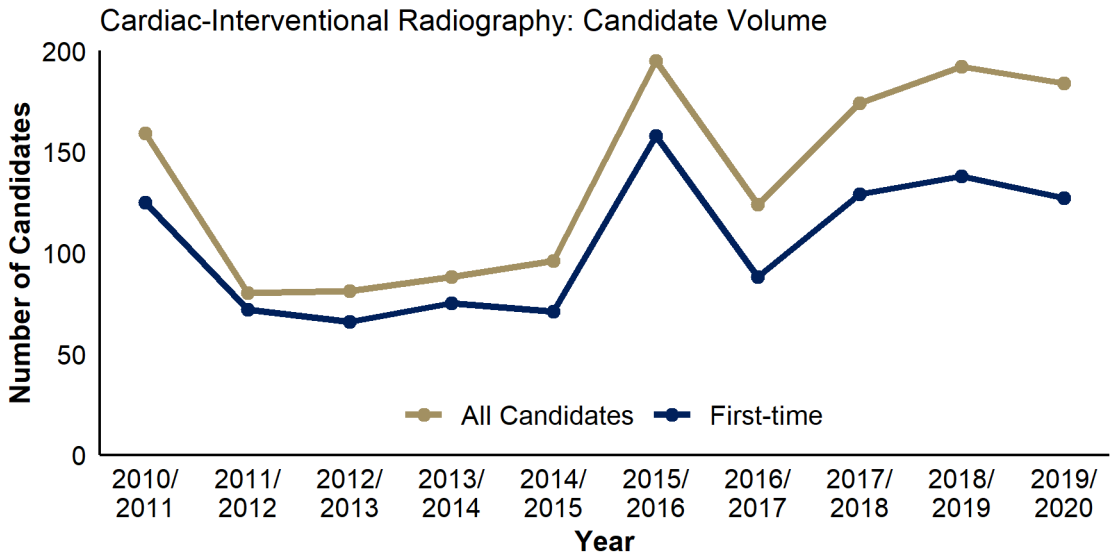
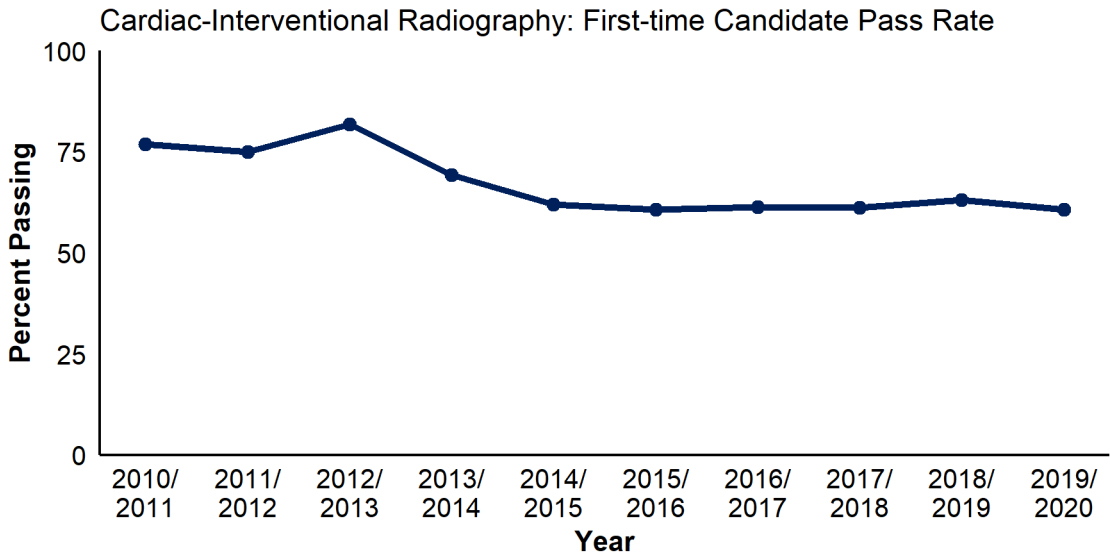

Bone Densitometry: Candidate Volume

Exam Performance for Cardiac-Interventional Radiography

Content Categories and First-time Candidate Scores

Content Categories	# Items	Mean Score
Patient Care: Patient Interactions and Management	35	7.6
Image Production: Image Acquisition and Equipment	30	7.5
Procedures: Diagnostic and Conduction System Studies	36	7.6
Procedures: Hemodynamics, Calculations, and Percutaneous Intervention	<u>44</u>	<u>7.7</u>
Total	145	76.0

Pass Rate: 60.6%

Cardiac-Interventional Radiography: First-time Candidate Pass Rate

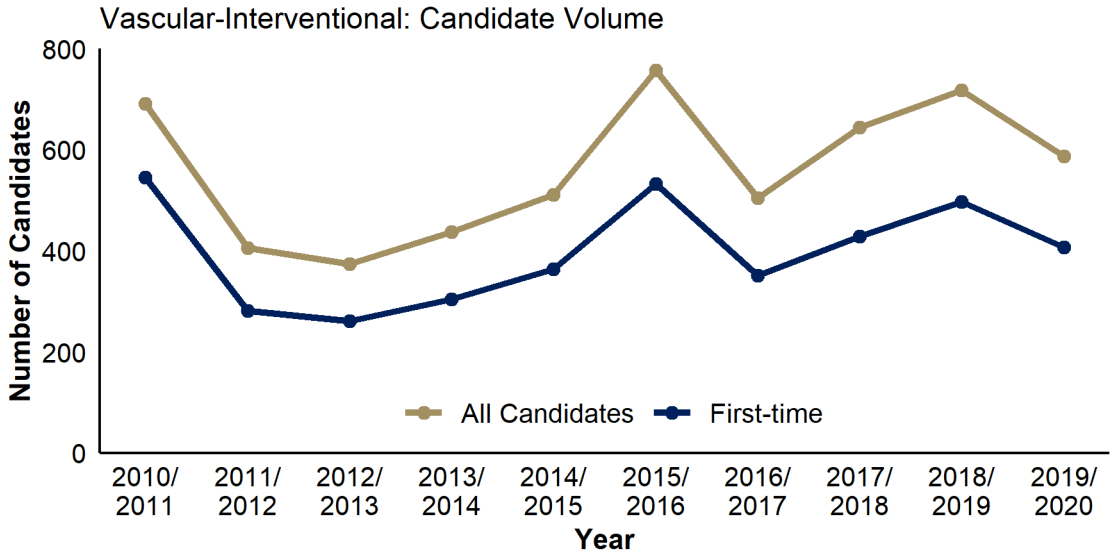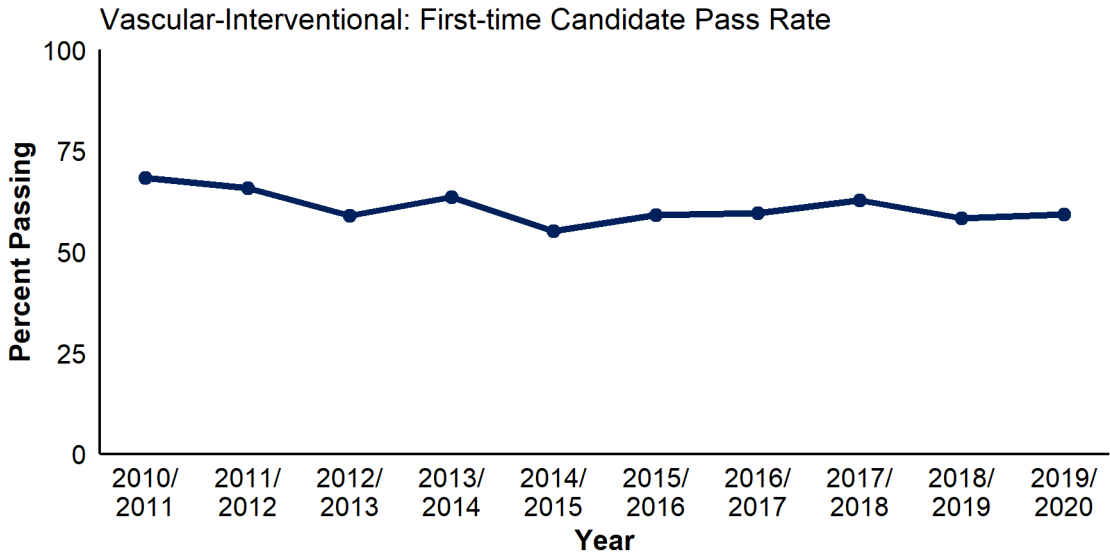Cardiac-Interventional Radiography: Candidate Volume

Exam Performance for Vascular-Interventional Radiography

Content Categories and First-time Candidate Scores

Content Categories	# Items	Mean Score
Patient Care: Patient Interactions and Management	30	7.6
Image Production: Image Acquisition and Equipment	25	7.7
Procedures: Vascular Diagnostic Procedures	50	7.6
Procedures: Vascular Interventional Procedures	35	7.5
Procedures: Nonvascular Procedures	20	7.7
Total	160	76.3

Pass Rate: 59.2%

Vascular-Interventional: First-time Candidate Pass Rate

Vascular-Interventional: Candidate Volume

Exam Performance for Breast Sonography

Content Categories and First-time Candidate Scores

Content Categories	# Items	Mean Score
Patient Care: Patient Interactions and Management	14	8.9
Image Production: Basic Principles of Ultrasound and Equipment	42	7.5
Image Production: Image Formation	27	8.2
Image Production: Evaluation and Selection of Representative Images	32	8.2
Procedures: Anatomy and Physiology	17	8.8
Procedures: Pathology	33	8.4
Procedures: Surgical/Treatment Changes and Interventional Procedures	20	8.8
Total	185	82.5

Pass Rate: 84.8%

Breast Sonography: First-time Candidate Pass Rate

Breast Sonography: Candidate Volume