



# ANNUAL REPORT OF POSTPRIMARY EXAMINATIONS 2017

## INTRODUCTION

The ARRT offers two categories of certification and registration: primary and postprimary. This report summarizes the results of the 2017 postprimary examinations, which includes Mammography, Computed Tomography, Magnetic Resonance Imaging, Quality Management, Cardiac-Interventional Radiography, Vascular-Interventional Radiography, Sonography, Vascular Sonography, Bone Densitometry, and Breast Sonography.

Candidates for postprimary certification and registration must meet three sets of eligibility requirements: certification and registration by ARRT in an appropriate supporting category, completion of clinical experience requirements, and 16 hours of structured education in the content covered by the examination. In some cases, a certificate from ARDMS or NMTCB will serve as a supporting category. The reader should consult an ARRT certification and registration handbook for specific requirements.

This report summarizes the results for each examination separately. Each page presents a brief content outline for the exam and the number of items in each category. Specific results for 2017 are presented including mean scaled section scores, total scaled score, and pass rate. Charts with historical pass rates and examinee volumes for each exam are also presented. The text below describes ARRT scaled scores and offers some suggestions for interpretation.

## INTERPRETATION OF SCORES

**Total Scaled Score.** The ARRT uses scaled scores to report exam results. A total scaled score can range from 1 to 99, and a total scaled score of 75 is required to pass an examination.

Scaled scores take into account any differences in difficulty between two or more versions of an exam. A scaled score of 75 represents the same level of exam performance, regardless of which version of an exam is taken. The use of scaled scores also permits comparison of exam results over time.

Scaled scores are sometimes mistaken for percent correct scores. This confusion probably arises because both scaled scores and percentages have a similar range of values. A scaled score of 75 does not mean that someone correctly answered 75% of the test questions.

**Section Scores.** Performance on each section of the exam is also reported using scaled scores. The primary purpose of the section scores is to provide general information to examinees regarding their strengths and weaknesses in particular content categories. Pass/fail decisions are not made for individual sections of the exam. The only score that is important for pass/fail decisions is the total scaled score. Sonography is an exception to this rule in that one must have scaled section scores of 7.5 or greater in sections C and D as well as have a total scaled score of 75 or greater to pass the exam.

Section scores can range from 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 questions. 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. Beginning in 2013, the Sonography exam also requires a section scaled score of 7.5 or greater in both sections C and D. 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 standard of performance required to obtain certification and registration. Those who exceed the standard pass the exam.

The scaled score required to pass remains constant at 75. Using scaled scores ensures that those taking different forms are not penalized for taking a slightly more difficult exam. The use of scaled scores adjusts for differences in exam difficulty such that a given scaled score corresponds to the same level of competence regardless of exam form.

## SUMMARY STATISTICS FOR 2017 POSTPRIMARY EXAMS

EXAM	EXAM VOLUME				PASS%	MEAN SCALED SCORE
	FIRST-TIME EXAMINEES	REPEAT	RE-REX	TOTAL		
Mammography	1,328	160	4	1,492	89.5%	83.8
Computed Tomography	5,328	1,409	14	6,751	78.6%	80.4
Magnetic Resonance Imaging	1,709	479	3	2,191	78.7%	81.5
Quality Management	31	16		47	54.8%	74.5
Sonography	6	3		9	83.3%	84.7
Vascular Sonography	7	0		7	71.4%	78.7
Bone Densitometry	279	49		328	75.6%	80.1
Cardiac-Interventional	100	32		132	64.0%	77.3
Vascular-Interventional	377	171		548	61.8%	76.5
Breast Sonography	88	7		95	87.5%	82.7



## Exam Performance for Mammography

### Major Exam Content Categories and First-Time Examinee Mean Scaled Scores (January 1, 2017 – June 30, 2017; N = 644)

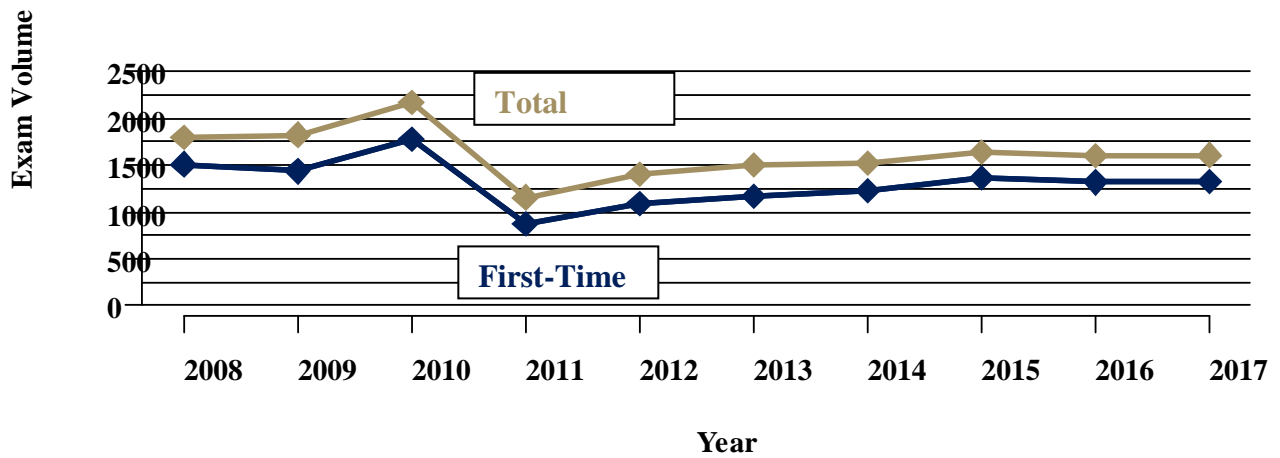
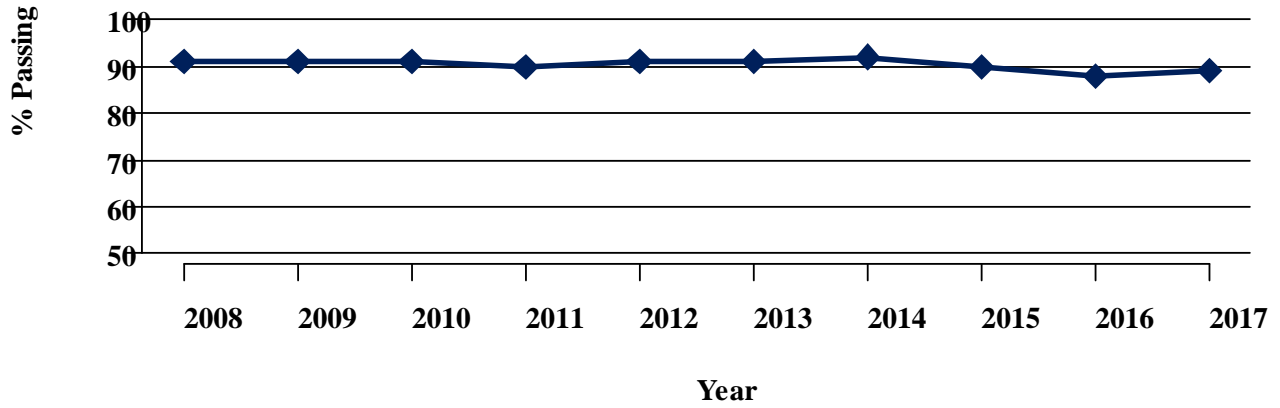
Content Categories	# Questions	Mean Score
A. Patient Factors	35	8.4
B. Instrumentation	43	8.3
C. Breast Imaging Procedures	<u>37</u>	<u>8.6</u>
<b>Total</b>	115	84.1
<b>Pass Rate</b>		91.1%

### Major Exam Content Categories and First-Time Examinee Mean Scaled Scores (July 1, 2017 – December 31, 2017; N = 684)

Content Categories	# Questions	Mean Score
Patient Care: Education and Assessment	12	8.3
Image Production: Equipment Operation and Quality Assurance	43	8.3
Procedures: Anatomy, Physiology, and Pathology	23	8.2
Procedures: Mammographic Positioning, Special Needs, and Imaging Procedures	<u>37</u>	<u>8.4</u>
<b>Total</b>	115	83.4
<b>Pass Rate</b>		87.9%



## Exam Performance for Mammography



## Exam Performance for Computed Tomography

### Major Exam Content Categories and First-Time Examinee Mean Scaled Scores (January 1, 2017 – June 30, 2017; N = 2,381)

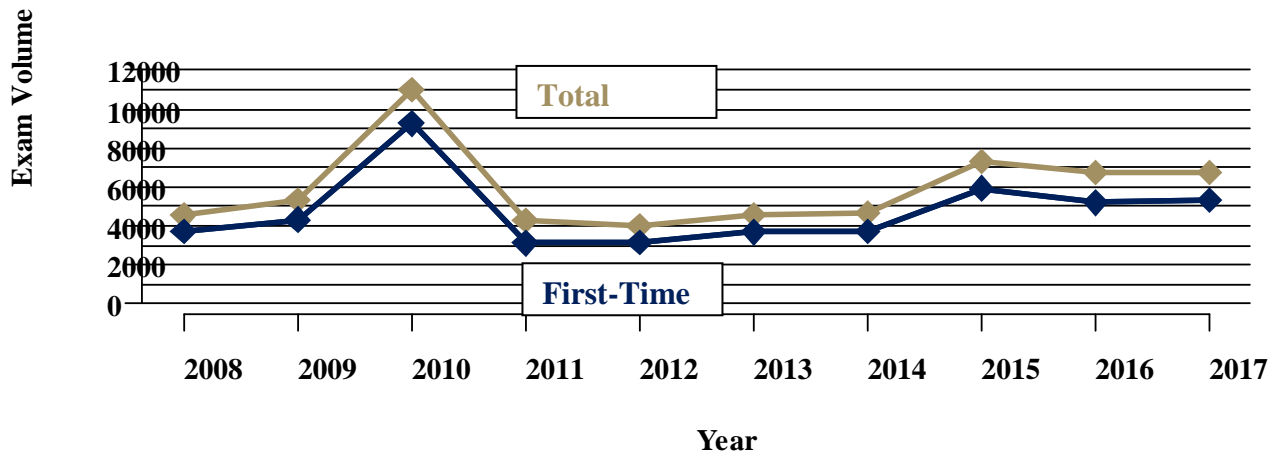
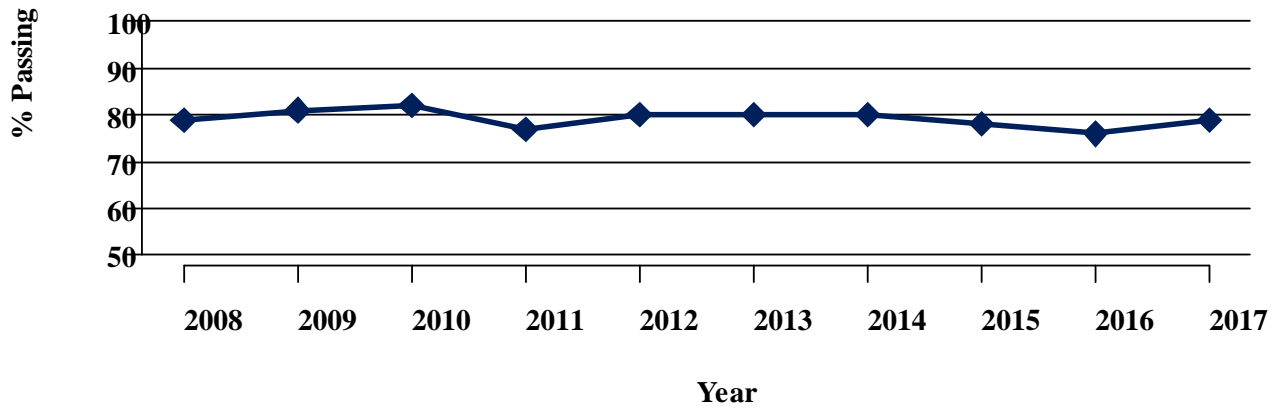
Content Categories	# Questions	Mean Score
A. Patient Care and Safety	36	8.1
B. Imaging Procedures	75	8.2
C. Physics and Instrumentation	<u>54</u>	<u>7.9</u>
<b>Total</b>	165	80.9
<b>Pass Rate</b>		81.0%

### Major Exam Content Categories and First-Time Examinee Mean Scaled Scores (July 1, 2017 – December 31, 2017; N = 2,947)

Content Categories	# Questions	Mean Score
Patient Care: Patient Interactions and Management	22	8.4
Safety: Radiation Safety and Dose	20	7.9
Image Production: Image Formation	30	7.8
Image Production: Image Evaluation and Archiving	25	7.7
Procedures: Head, Spine, and Musculoskeletal	24	8.1
Procedures: Neck and Chest	20	8.1
Procedures: Abdomen and Pelvis	<u>24</u>	<u>8.0</u>
<b>Total</b>	165	80.0
<b>Pass Rate</b>		76.8%



## Exam Performance for Computed Tomography



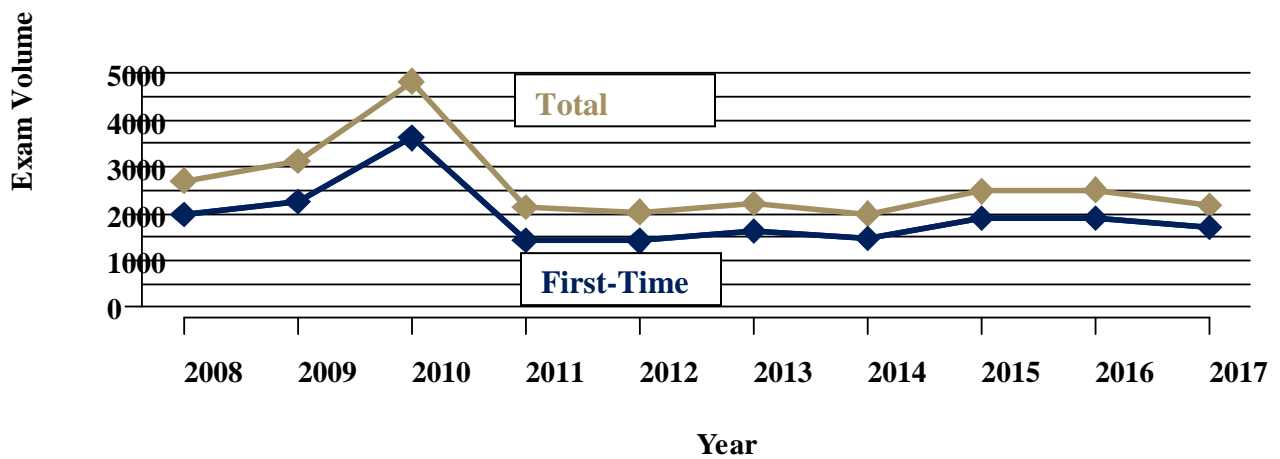
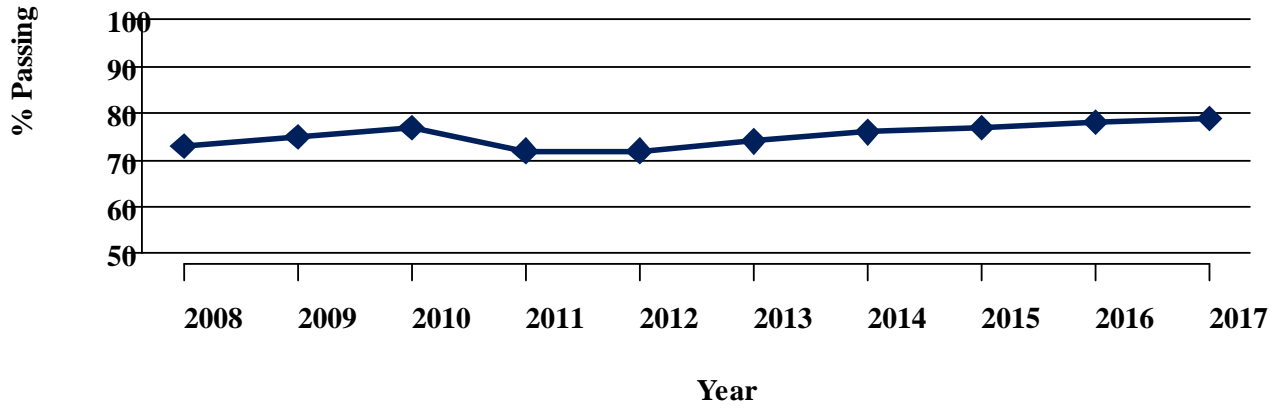
## Exam Performance for Magnetic Resonance Imaging

### Major Exam Content Categories and First-Time Examinee Mean Scaled Scores

Content Categories	# Questions	Mean Score
Patient Care: Patient Interactions and Management	17	8.5
Safety: MRI Screening and Safety	15	8.6
Image Production: Physical Principles of Image Formation	40	7.9
Image Production: Sequence Parameters and Options	38	8.3
Image Production: Data Acquisition and Processing	34	7.9
Procedures: Neuro	26	8.3
Procedures: Body	20	8.1
Procedures: Musculoskeletal	<u>10</u>	<u>8.4</u>
<b>Total</b>	200	81.5
<b>Pass Rate</b>		78.7%



## Exam Performance for Magnetic Resonance Imaging

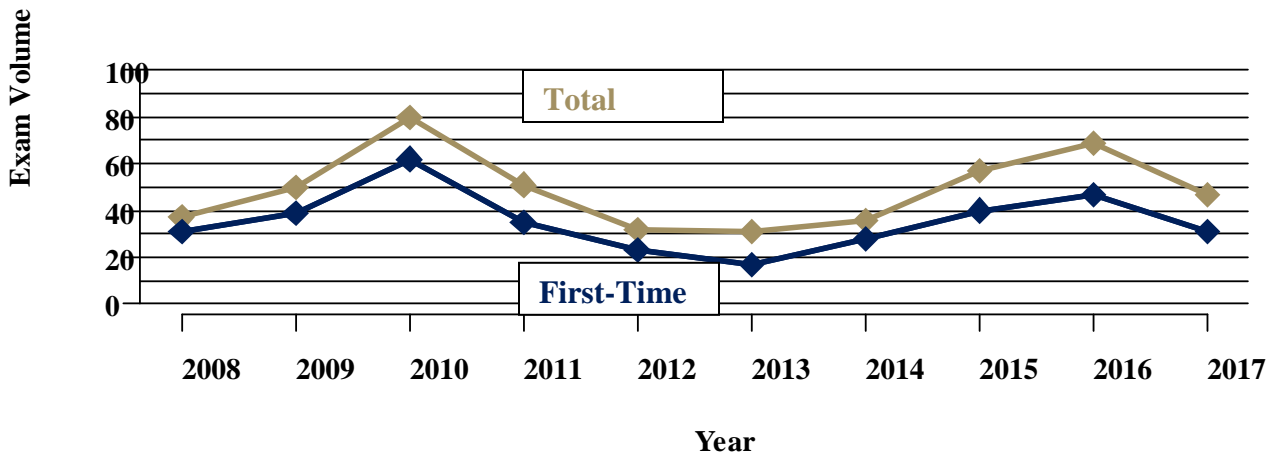
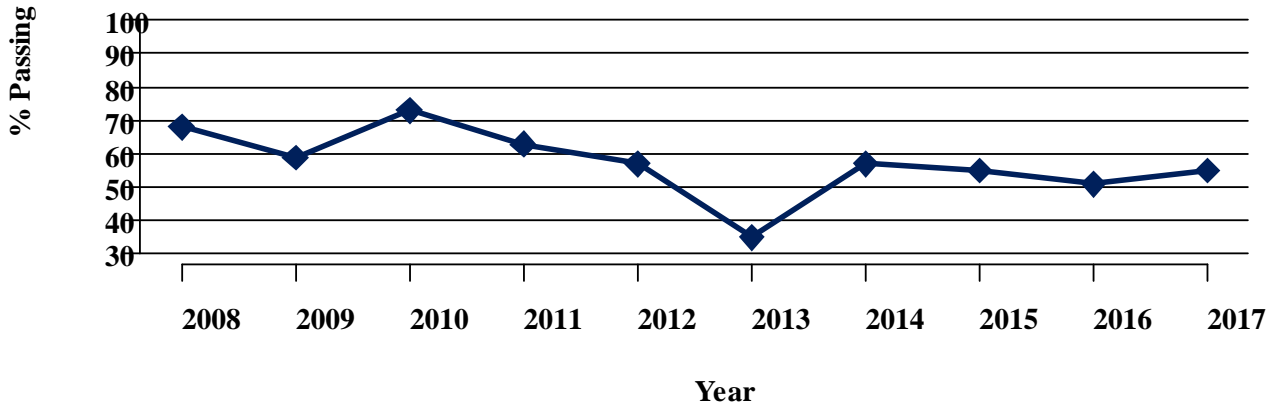




## Exam Performance for Quality Management

### Major Exam Content Categories and First-Time Examinee Mean Scaled Scores

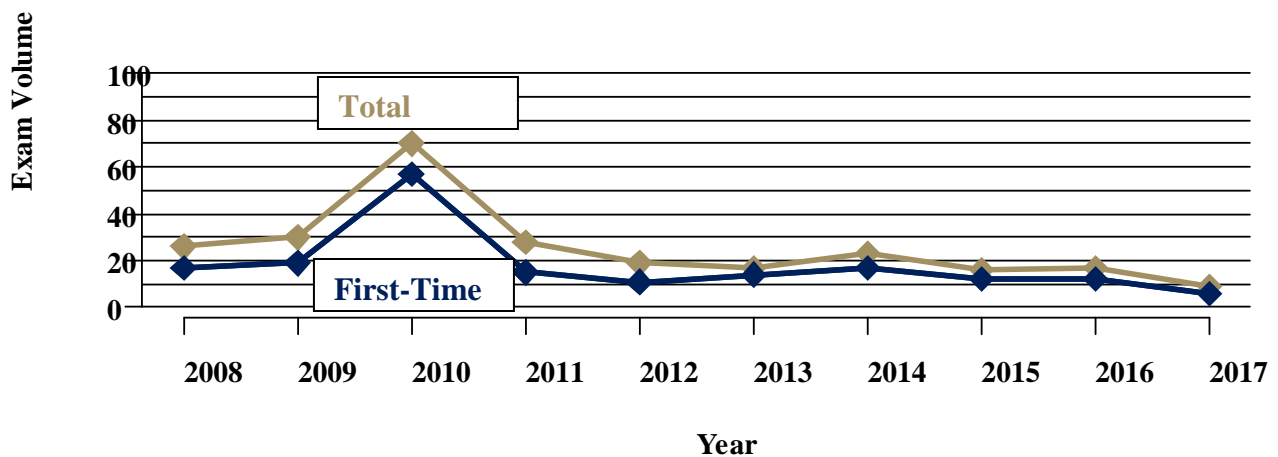
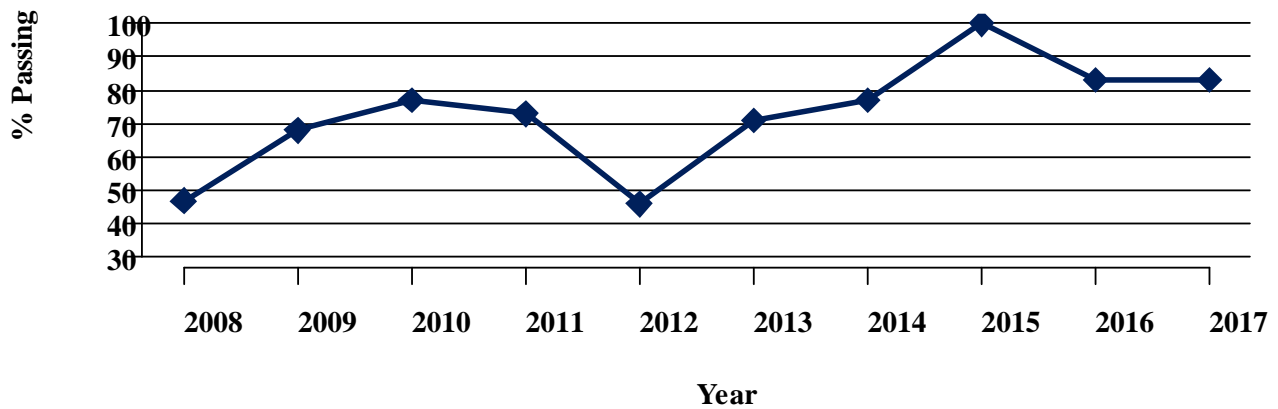
Content Categories	# Questions	Mean Score
A. Equipment Quality Control	64	7.1
B. Quality Improvement Management and Administration	61	8.1
C. Laws, Regulations, Standards, and Guidelines	<u>40</u>	<u>7.0</u>
<b>Total</b>	165	74.5
<b>Pass Rate</b>		54.8%



## Exam Performance for Sonography

### Major Exam Content Categories and First-Time Examinee Mean Scaled Scores

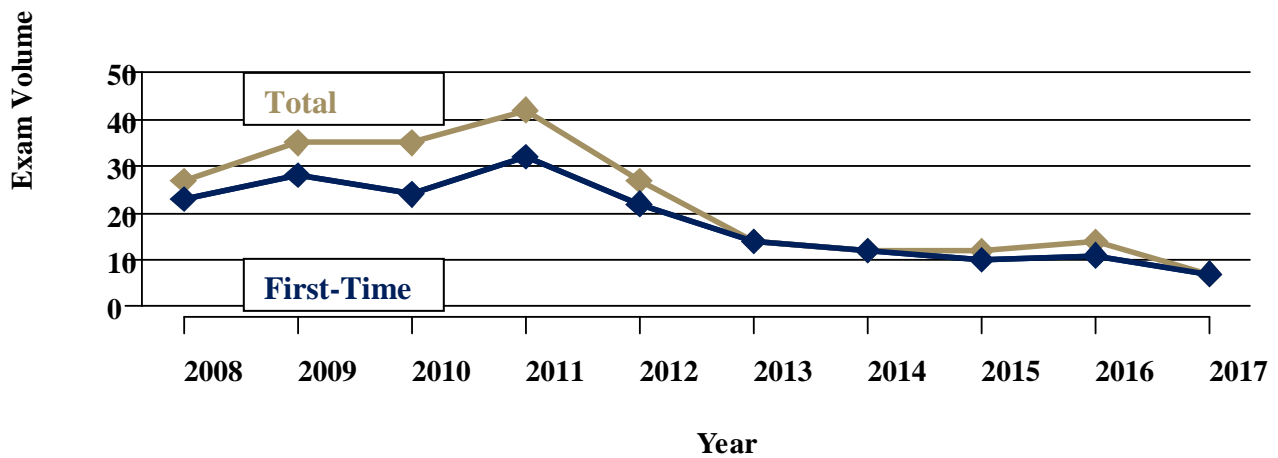
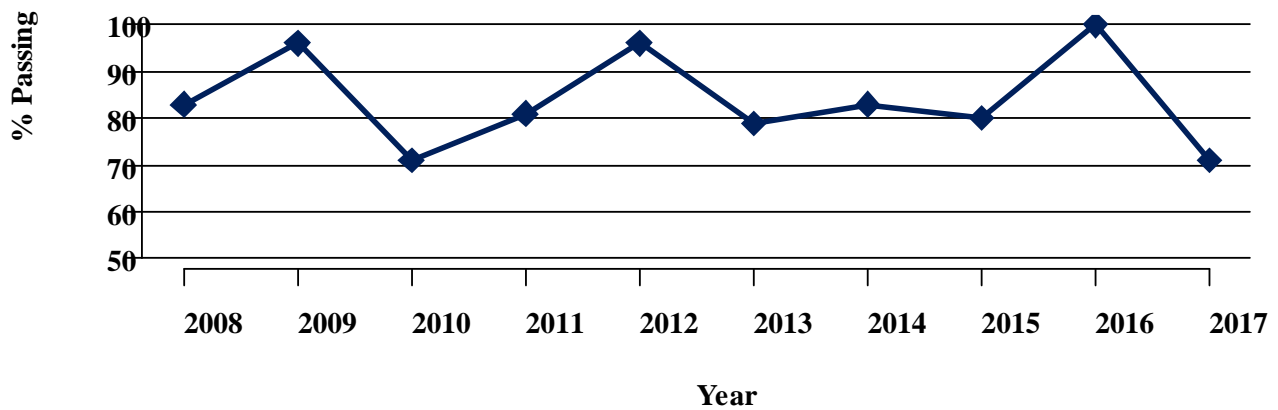
Content Categories	# Questions	Mean Score
A. Patient Care	29	9.0
B. Physical Principles of Ultrasound	115	8.2
C. Abdominal Procedures	76	8.7
D. Obstetrical and Gynecological Procedures	108	8.5
E. Superficial Structures and Other Sonographic Procedures	<u>32</u>	<u>8.4</u>
<b>Total</b>	360	84.7
<b>Pass Rate</b>		83.3%



## Exam Performance for Vascular Sonography

### Major Exam Content Categories and First-Time Examinee Mean Scaled Scores

Content Categories	# Questions	Mean Score
Image Production	75	7.5
Procedures	<u>85</u>	<u>8.1</u>
<b>Total</b>	160	78.7
<b>Pass Rate</b>		71.4%



## Exam Performance for Bone Densitometry

### Major Exam Content Categories and First-Time Examinee Mean Scaled Scores (January 1, 2017 – June 30, 2017; N = 127)

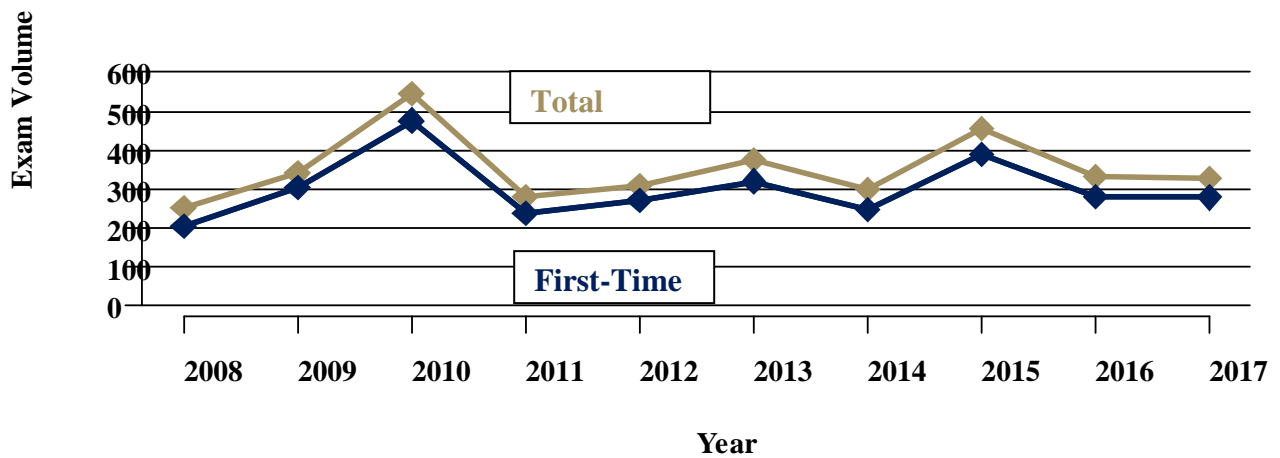
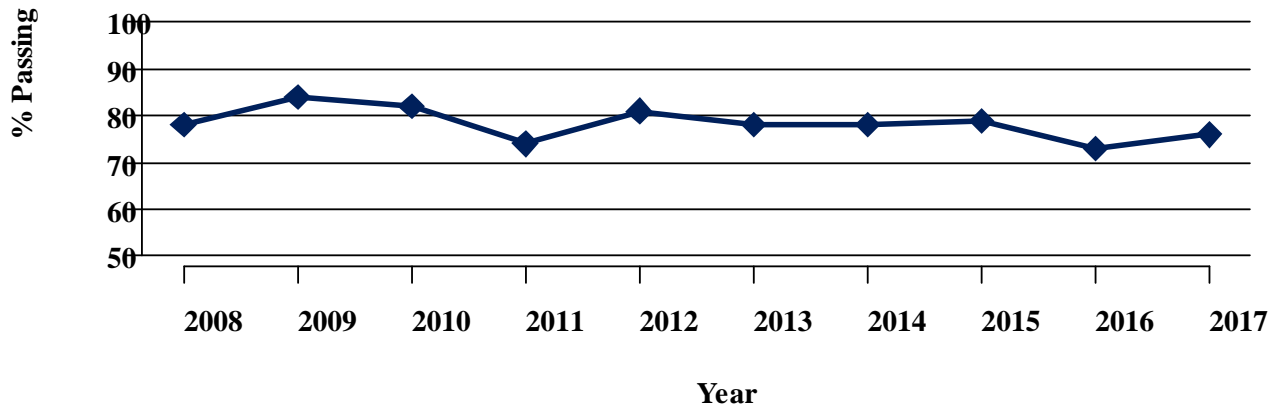
Content Categories	# Questions	Mean Score
A. Patient Factors and Instrumentation	37	8.0
B. DXA Procedures	<u>38</u>	<u>8.1</u>
<b>Total</b>	75	80.5
<b>Pass Rate</b>		76.4%

### Major Exam Content Categories and First-Time Examinee Mean Scaled Scores (July 1, 2017 – December 31, 2017; N = 152)

Content Categories	# Questions	Mean Score
Patient Care: Patient Bone Health, Care, and Radiation Principles	16	7.9
Image Production: Equipment Operation and Quality Control	21	8.0
Procedures: DXA Scanning	<u>38</u>	<u>8.0</u>
<b>Total</b>	75	79.9
<b>Pass Rate</b>		75.0%



## Exam Performance for Bone Densitometry



## Exam Performance for Cardiac-Interventional Radiography

### Major Exam Content Categories and First-Time Examinee Mean Scaled Scores (January 1, 2017 – June 30, 2017; N = 41)

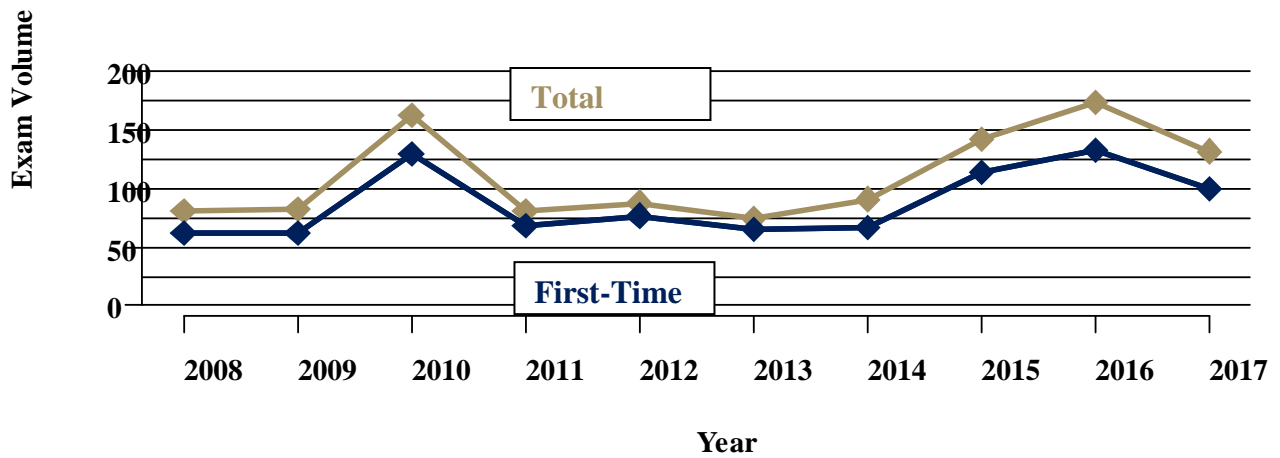
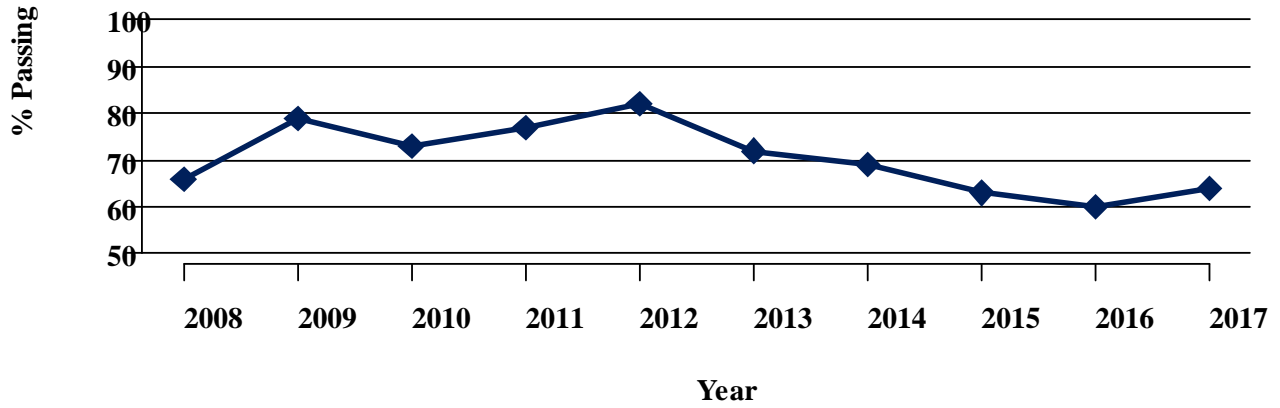
Content Categories	# Questions	Mean Score
A. Equipment and Instrumentation	30	7.5
B. Patient Care	35	7.6
C. Cardiac-Interventional Procedures		
Diagnostic Cardiac Studies and Conduction System Studies	36	7.5
Percutaneous Intervention	24	7.7
Hemodynamics and Calculations	<u>20</u>	<u>7.7</u>
<b>Total</b>	145	75.7
<b>Pass Rate</b>		61.0%

### Major Exam Content Categories and First-Time Examinee Mean Scaled Scores (July 1, 2017 – December 31, 2017; N = 59)

Content Categories	# Questions	Mean Score
Patient Care: Patient Interactions and Management	35	7.9
Image Production: Image Acquisition and Equipment	30	7.7
Procedures: Diagnostic and Conduction System Studies	36	7.9
Procedures: Hemodynamics, Calculations, and Percutaneous Intervention	<u>44</u>	<u>7.8</u>
<b>Total</b>	145	78.4
<b>Pass Rate</b>		66.1%



## Exam Performance for Cardiac-Interventional Radiography



## Exam Performance for Vascular-Interventional Radiography

### Major Exam Content Categories and First-Time Examinee Mean Scaled Scores (January 1, 2017 – June 30, 2017; N = 181)

Content Categories	# Questions	Mean Score
A. Equipment and Instrumentation	24	7.6
B. Patient Care	28	7.9
C. Vascular-Interventional Procedures	<u>108</u>	<u>7.4</u>
<b>Total</b>	160	75.4
<b>Pass Rate</b>		60.8%

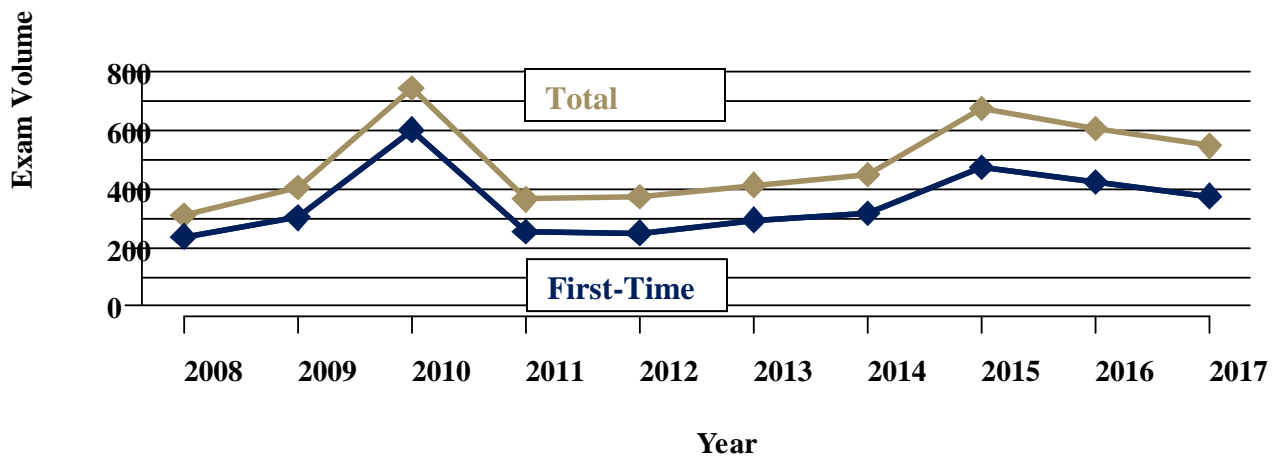
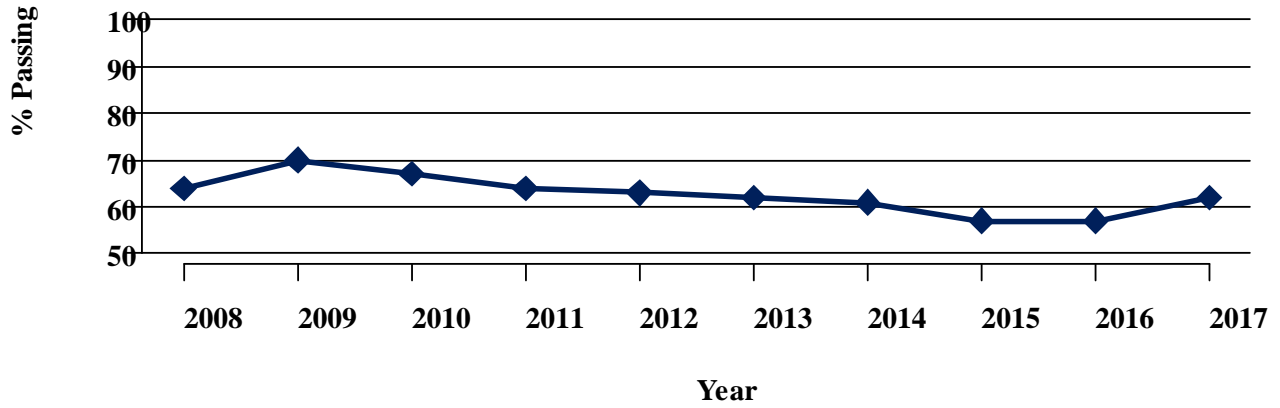
### Major Exam Content Categories and First-Time Examinee Mean Scaled Scores (July 1, 2017 – December 31, 2017; N = 196)

Content Categories	# Questions	Mean Score
Patient Care: Patient Interactions and Management	30	8.0
Image Production: Image Acquisition and Equipment	25	7.7
Procedures: Vascular Diagnostic Procedures	50	7.6
Procedures: Vascular Interventional Procedures	35	8.0
Procedures: Nonvascular Procedures	<u>20</u>	<u>7.6</u>
<b>Total</b>	160	77.6
<b>Pass Rate</b>		62.8%





## Exam Performance for Vascular-Interventional Radiography



## Exam Performance for Breast Sonography

### Major Exam Content Categories and First-Time Examinee Mean Scaled Scores

Content Categories	# Questions	Mean Score
Patient Care	14	9.0
Image Production	101	7.8
Procedures	<u>70</u>	<u>8.8</u>
<b>Total</b>	185	82.7
<b>Pass Rate</b>		87.5%

