



# ANNUAL REPORT OF POST-PRIMARY EXAMINATIONS 2016

## INTRODUCTION

The ARRT offers two categories of certification and registration: primary and post-primary. This report summarizes the results of the 2016 post-primary 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 post-primary 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 2016 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 2016  
POST-PRIMARY EXAMS**

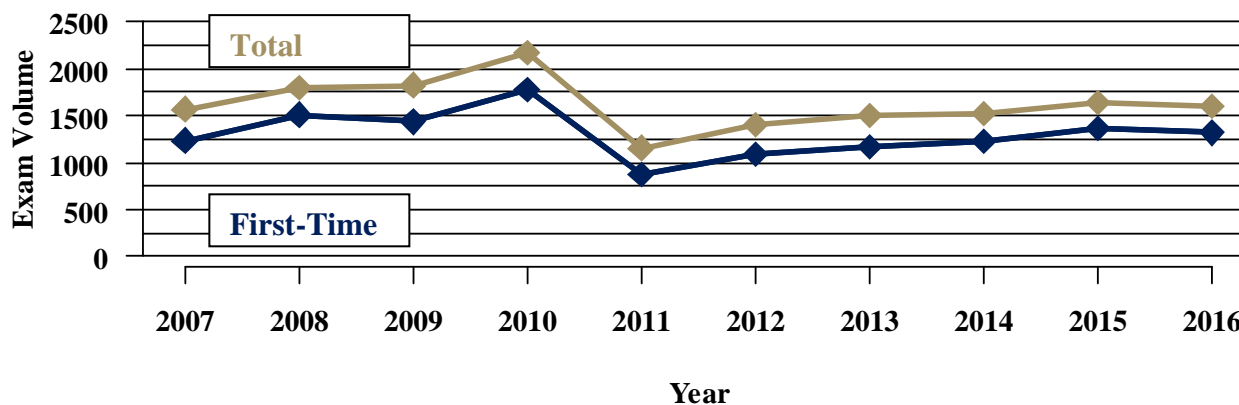
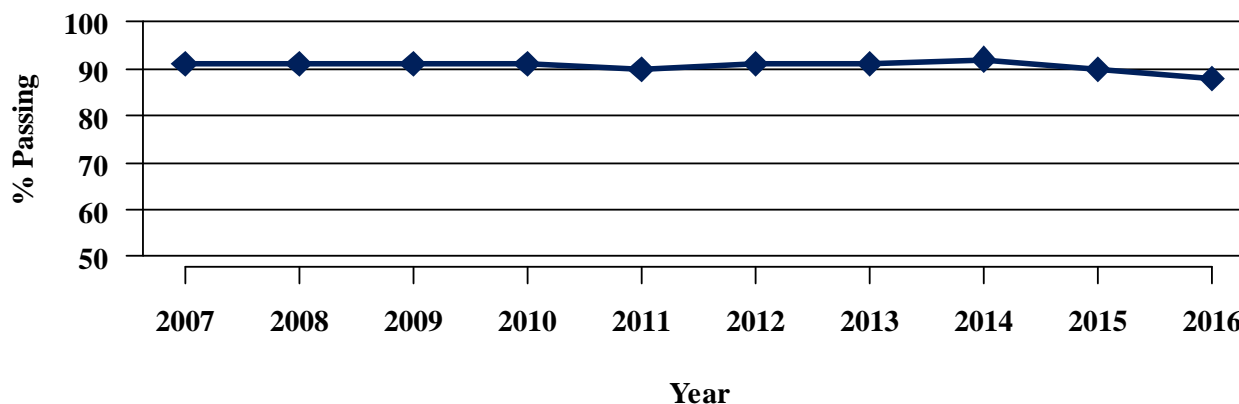
EXAM	EXAM VOLUME				PASS%	MEAN SCALED SCORE
	FIRST-TIME EXAMINEES	REPEAT	RE-REX	TOTAL		
Mammography	1,320	154	5	1,479	88.5%	83.9
Computed Tomography	5,199	1,557	11	6,767	75.9%	79.9
Magnetic Resonance Imaging	1,917	581	12	2,510	77.7%	80.6
Quality Management	47	22		69	51.1%	74.7
Sonography	12	5		17	83.3%	87.9
Vascular Sonography	11	3		14	100.0%	82.5
Bone Densitometry	280	53		333	73.2%	80.1
Cardiac-Interventional	133	41		174	60.2%	75.8
Vascular-Interventional	423	184		607	57.2%	75.4
Breast Sonography	108	9		117	88.0%	83.0



## Exam Performance for Mammography

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

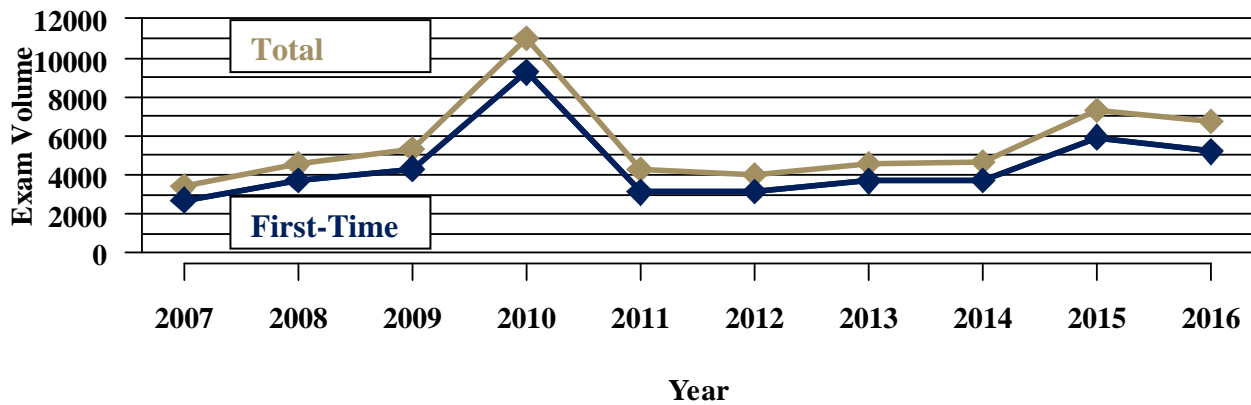
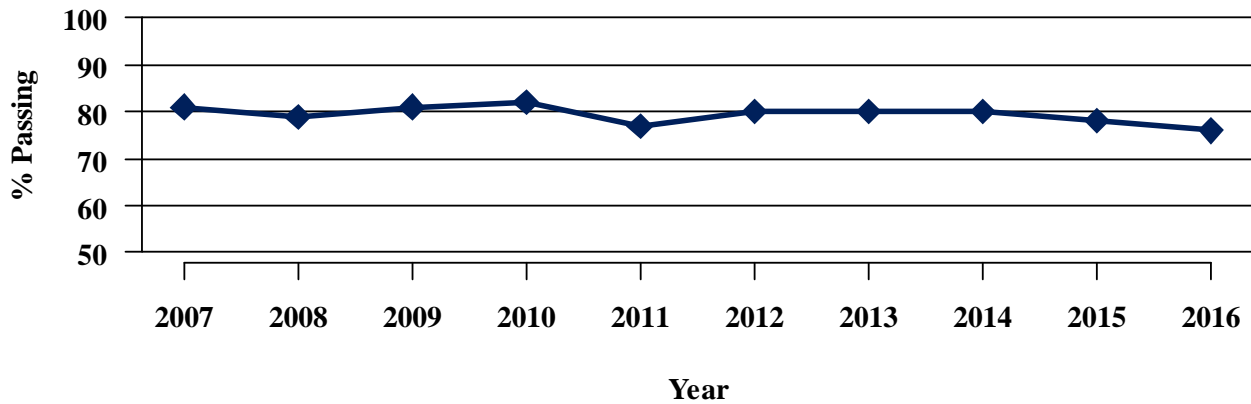
Content Categories	# Questions	Mean Score
A. Patient Factors	35	8.4
B. Instrumentation	43	8.2
C. Breast Imaging Procedures	<u>37</u>	<u>8.5</u>
<b>Total</b>	115	83.9
<b>Pass Rate</b>		88.5%



## Exam Performance for Computed Tomography

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

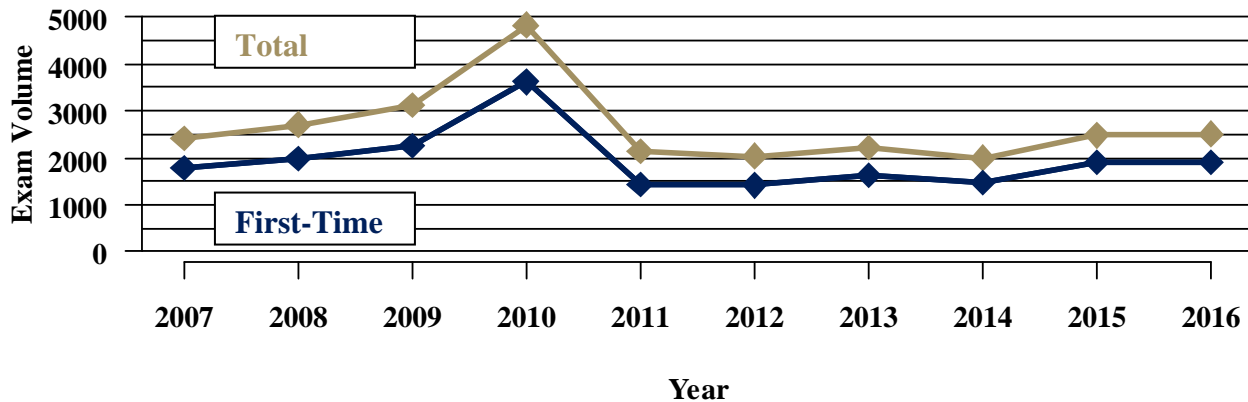
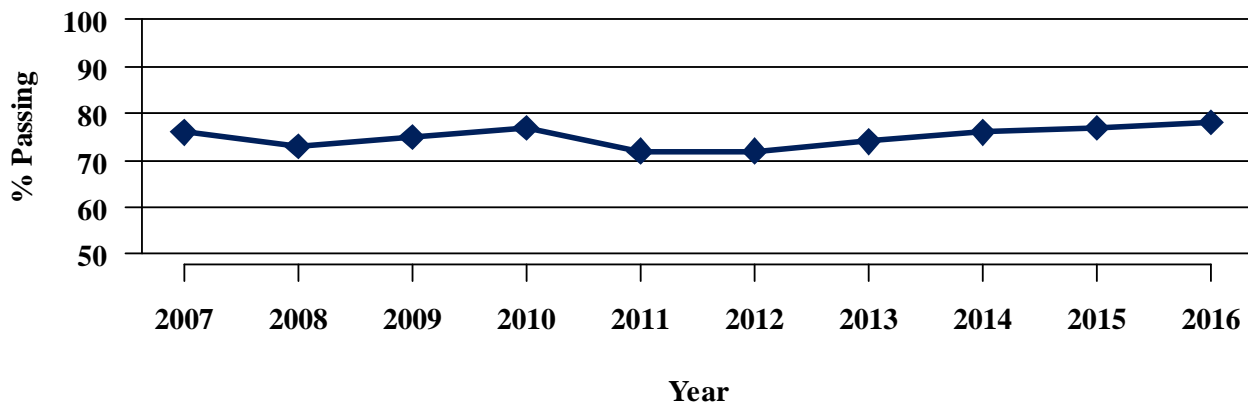
Content Categories	# Questions	Mean Score
A. Patient Care and Safety	36	8.1
B. Imaging Procedures	75	8.1
C. Physics and Instrumentation	<u>54</u>	<u>7.8</u>
<b>Total</b>	165	79.9
<b>Pass Rate</b>		75.9%



## Exam Performance for Magnetic Resonance Imaging

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

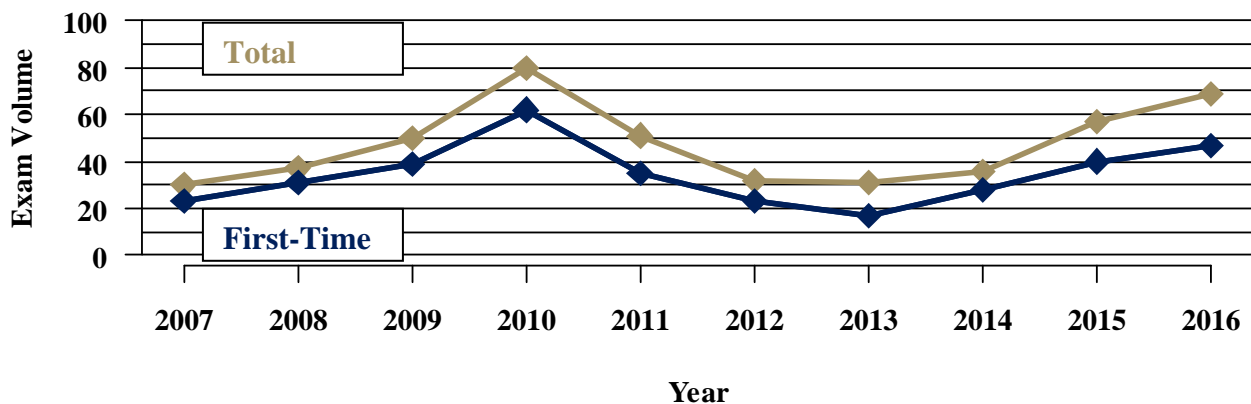
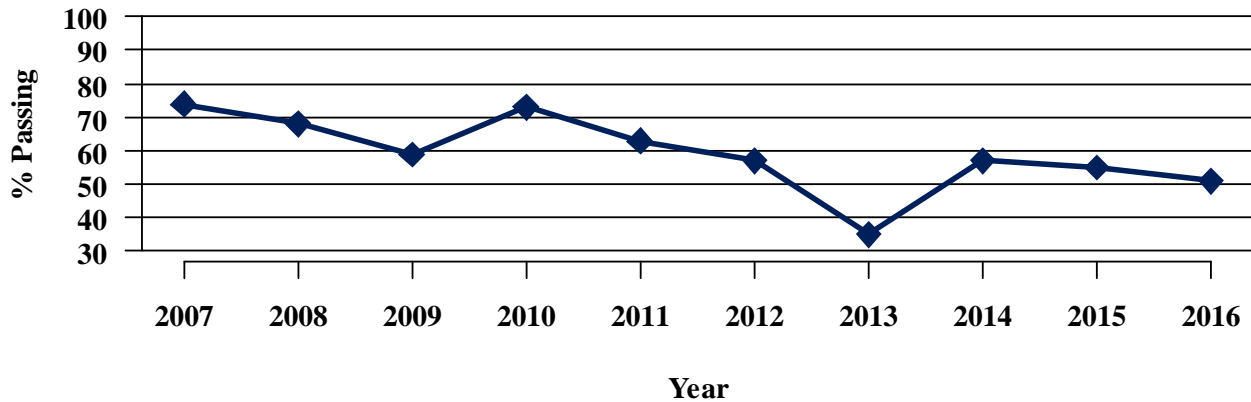
Content Categories	# Questions	Mean Score
A. Patient Care	32	8.4
B. Imaging Procedures	56	8.4
C. Sequence Parameters and Options	38	8.0
D. Data Acquisition and Processing	34	7.7
E. Physical Principles of Image Formation	<u>40</u>	<u>7.8</u>
<b>Total</b>	200	80.6
<b>Pass Rate</b>		77.7%



## Exam Performance for Quality Management

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

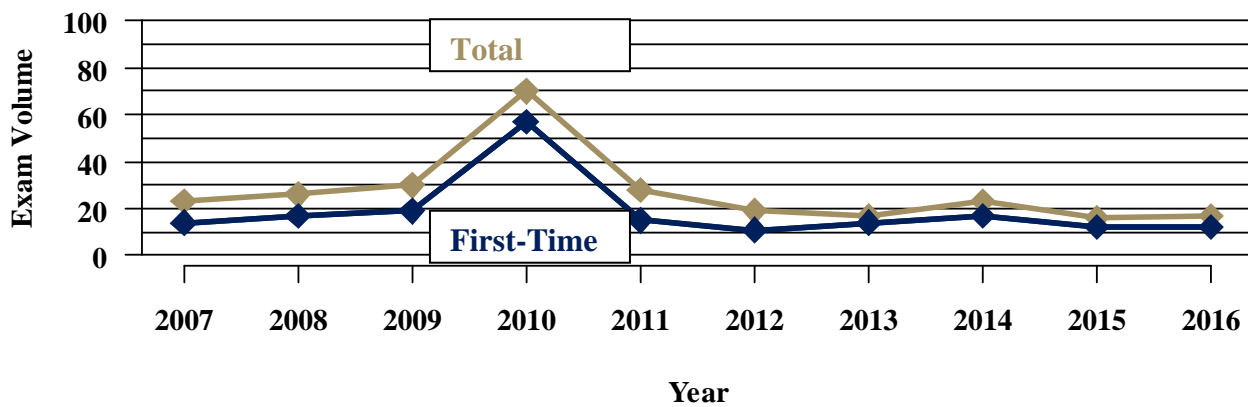
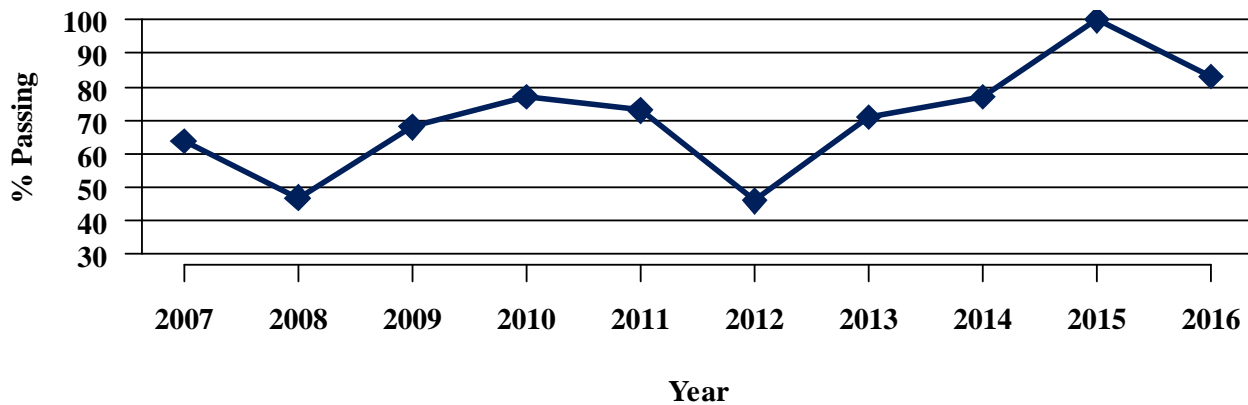
Content Categories	# Questions	Mean Score
A. Equipment Quality Control	64	7.2
B. Quality Improvement Management and Administration	61	8.0
C. Laws, Regulations, Standards, and Guidelines	<u>40</u>	<u>7.1</u>
<b>Total</b>	165	74.7
<b>Pass Rate</b>		51.1%



## Exam Performance for Sonography

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

Content Categories	# Questions	Mean Score
A. Patient Care	29	8.7
B. Physical Principles of Ultrasound	115	8.9
C. Abdominal Procedures	76	8.9
D. Obstetrical and Gynecological Procedures	108	8.8
E. Superficial Structures and Other Sonographic Procedures	<u>32</u>	<u>8.3</u>
<b>Total</b>	360	87.9
<b>Pass Rate</b>		83.3%



## Exam Performance for Vascular Sonography

### Major Exam Content Categories and First-Time Examinee Mean Scaled Scores (January 1, 2016 – June 30, 2016; N = 5)

Content Categories	# Questions	Mean Score
A. Physics and Instrumentation	40	7.7
B. Image Production and Evaluation	35	7.9
C. Vascular Sonographic Procedures	<u>85</u>	<u>8.3</u>
<b>Total</b>	160	80.4
<b>Pass Rate</b>		100.0%

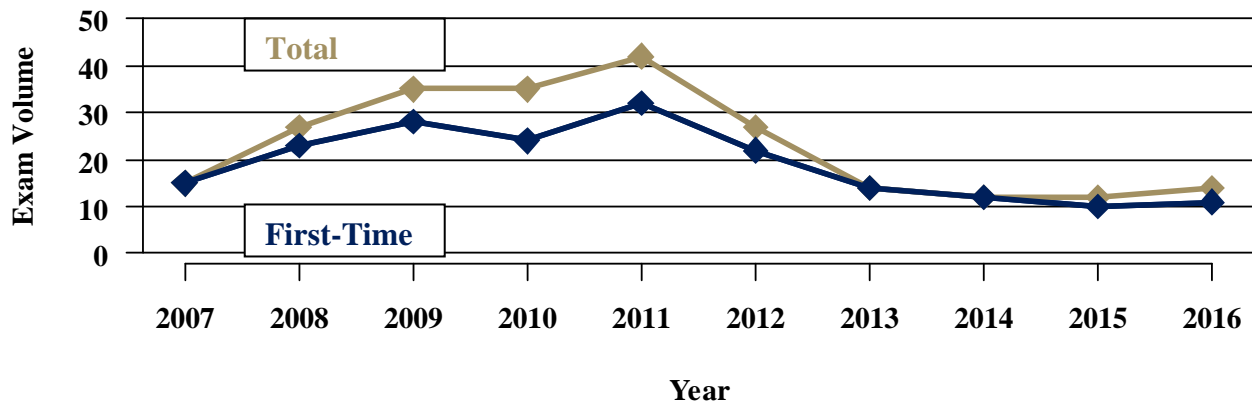
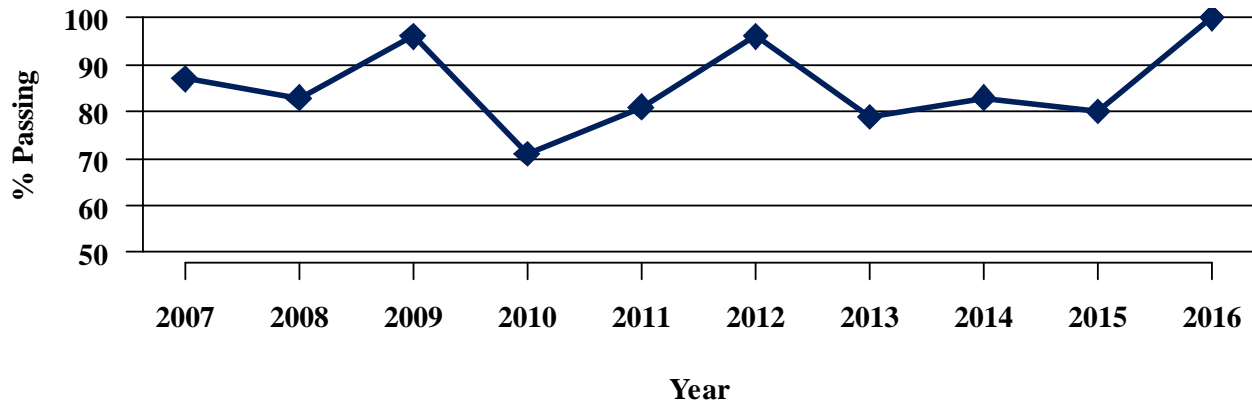
### Major Exam Content Categories and First-Time Examinee Mean Scaled Scores (July 1, 2016 – December 31, 2016; N = 6)

Content Categories	# Questions	Mean Score
Image Production	75	8.3
Procedures	<u>85</u>	<u>8.5</u>
<b>Total</b>	160	84.2
<b>Pass Rate</b>		100.0%





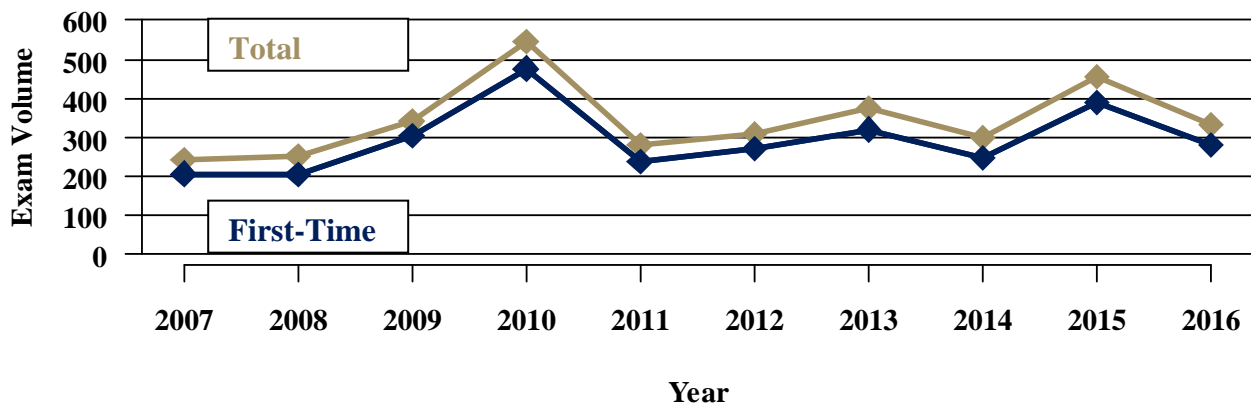
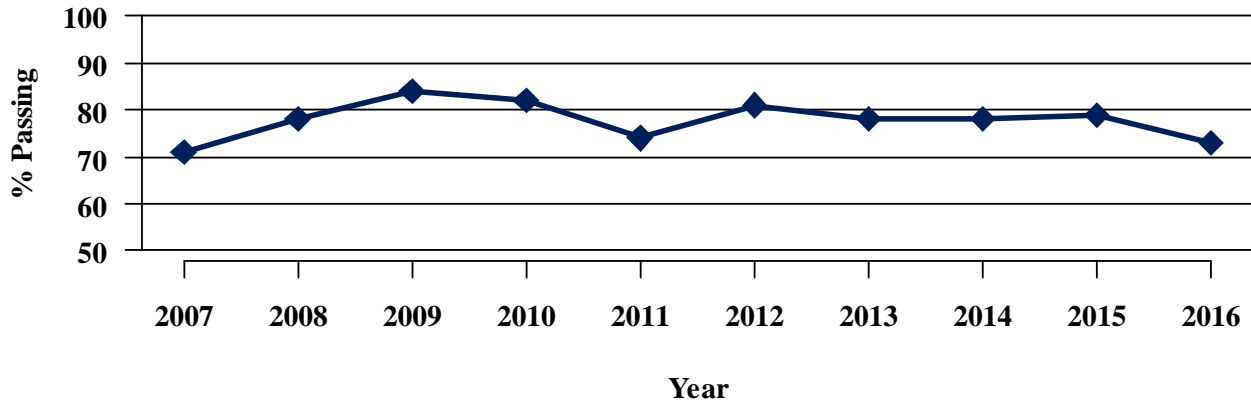
## Exam Performance for Vascular Sonography



## Exam Performance for Bone Densitometry

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

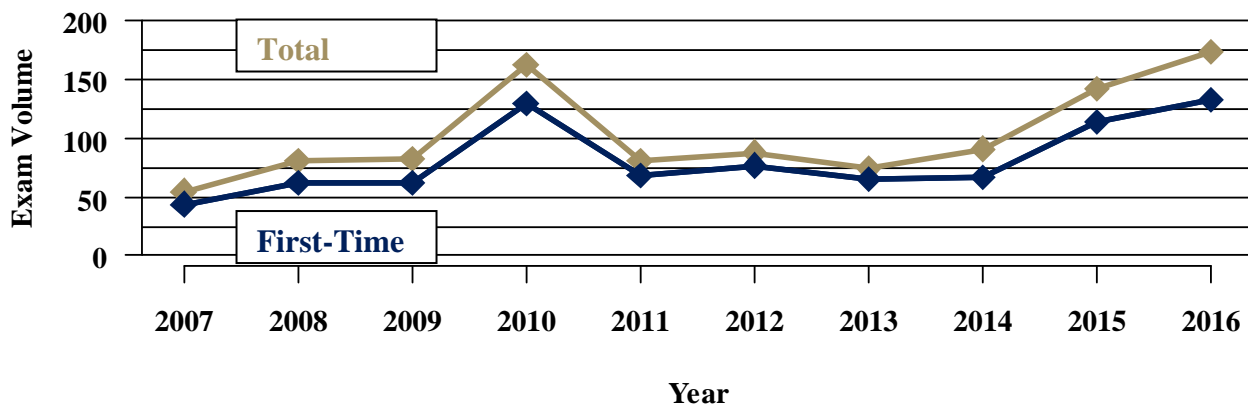
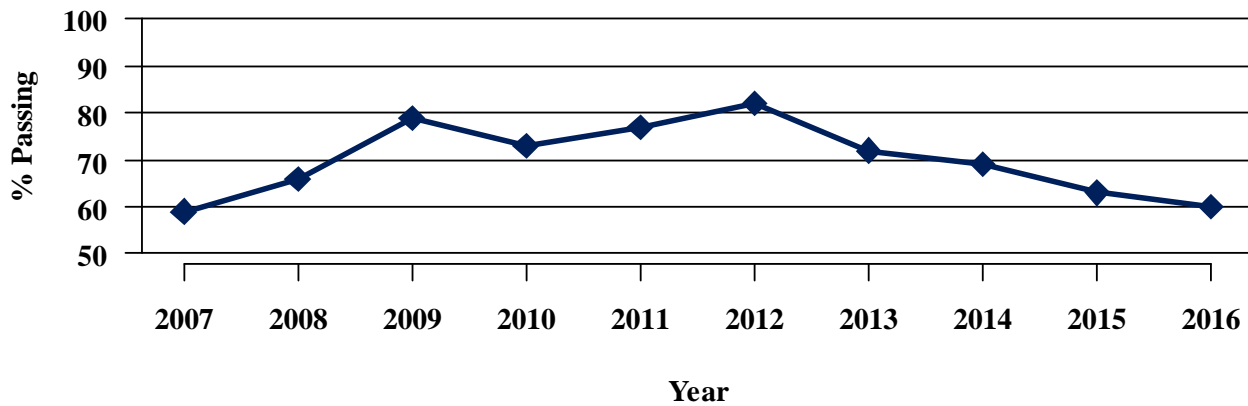
Content Categories	# Questions	Mean Score
A. Patient Factors and Instrumentation	37	7.9
B. DXA Procedures	<u>38</u>	<u>8.1</u>
<b>Total</b>	75	80.1
<b>Pass Rate</b>		73.2%



## Exam Performance for Cardiac-Interventional Radiography

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

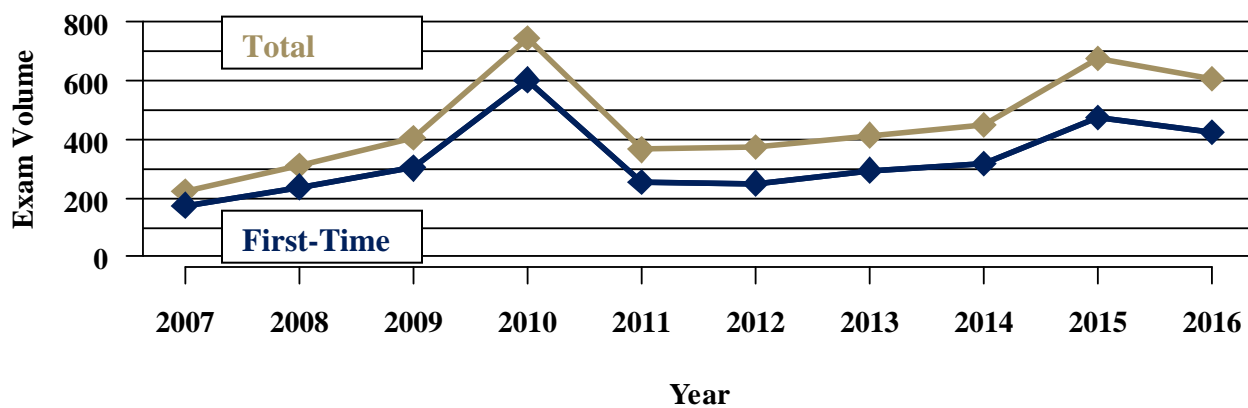
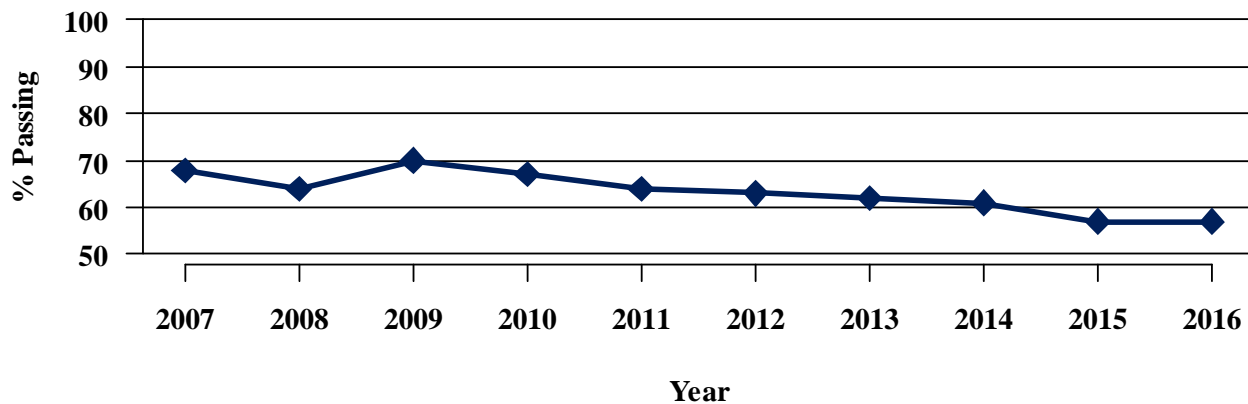
Content Categories	# Questions	Mean Score
A. Equipment and Instrumentation	30	7.6
B. Patient Care	35	7.5
C. Cardiac-Interventional Procedures		
Diagnostic Cardiac Studies and Conduction System Studies	36	7.6
Percutaneous Intervention	24	7.7
Hemodynamics and Calculations	<u>20</u>	<u>7.6</u>
<b>Total</b>	145	75.8
<b>Pass Rate</b>		60.2%



## Exam Performance for Vascular-Interventional Radiography

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

Content Categories	# Questions	Mean Score
A. Equipment and Instrumentation	24	7.9
B. Patient Care	28	7.8
C. Vascular-Interventional Procedures	<u>108</u>	<u>7.4</u>
<b>Total</b>	160	75.4
<b>Pass Rate</b>		57.2%



## Exam Performance for Breast Sonography

### Major Exam Content Categories and First-Time Examinee Mean Scaled Scores (January 1, 2016 – June 30, 2016; N = 62)

Content Categories	# Questions	Mean Score
A. Physics, Instrumentation, and Equipment Operation	52	7.3
B. Clinical Image Production and Evaluation	63	8.5
C. Anatomy, Physiology, and Pathology	57	8.8
D. Interventional Breast Sonography Procedures	<u>13</u>	<u>8.8</u>
<b>Total</b>	185	82.9
<b>Pass Rate</b>		90.3%

### Major Exam Content Categories and First-Time Examinee Mean Scaled Scores (July 1, 2016 – December 31, 2016; N = 46)

Content Categories	# Questions	Mean Score
Patient Care	14	9.0
Image Production	101	7.9
Procedures	<u>70</u>	<u>8.7</u>
<b>Total</b>	185	83.0
<b>Pass Rate</b>		84.8%



## Exam Performance for Breast Sonography

