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# **RESULTS OF THE 2017 PRIMARY EXAMINATION IN MAGNETIC RESONANCE IMAGING**



**January 2018**

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## **INTRODUCTION**

The ARRT offers two pathways for certification and registration in Magnetic Resonance Imaging (MRI): primary and postprimary. MRI has been offered as a postprimary exam since March 1995 and as a primary exam since January 2006. This 2017 report summarizes performance of the 360 first-time primary candidates for MRI in 2017 and contrasts it to the 1,709 first-time postprimary candidates.

Each MRI exam consists of 200 scored test questions. The content categories and number of questions are listed below. New content specifications went into effect in January 2014, the result of a practice analysis study that was conducted in 2012 and 2013. The content was not changed but was reorganized into the following categories in 2017. There were five section scores reported in years prior to 2017, and in 2017 scores were reported for the eight sections listed in the table below.

### **Magnetic Resonance Imaging Exam Content 2017**

Section	# Questions
Patient Care (PC)	
Patient Interactions and Management	17
Safety (S)	
MRI Screening and Safety	15
Image Production (IP)	
Physical Principles of Image Formation	40
Sequence Parameters and Options	38
Data Acquisition and Processing	34
Procedures (P)	
Neuro	26
Body	20
Musculoskeletal	10
Total	200

## **EXAM VOLUME**

The number of candidates taking the MRI exam through the primary pathway has steadily increased since the pathway was introduced in 2006. The primary volume is still small compared to postprimary volume, but it has increased as a portion of total MRI exam volume every year.

## INTERPRETATION OF SCORES

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

Scaled scores adjust for 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 a candidate is administered. 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.** Scaled scores are also used to report performance for each of the content sections of the exam. The purpose of the section scores is to provide additional information to examinees regarding their strengths and weaknesses across the content categories.

Section scores range from 0.1 to 9.9 and are reported in one-tenth point intervals (e.g., 8.1, 8.6). Each section score can be considered as a separate score. For example, a section scaled score of 7.9 would indicate that *if* that section had been the entire test, the total score would have been a 79. It is important to note that pass/fail decisions are based on the *total number* of items correct and *not* on individual section scores. Because the MRI exam sections have different numbers of items, a simple average of section scaled scores will not re-create the total scaled score. Since section scores are based on fewer test questions, they are not as reliable as the total scaled score and should be interpreted with caution.

**Comparing Scores.** The total exam score from 2017 is directly comparable to the total score from previous years. Prior to 2017 there were five section scores reported and that was changed to eight section scores in 2017. Because of this change any comparison between section scores from 2017 to those of previous years should be done with caution. The section scores reported in the 2017 Image Processing section are largely the same as identically titled sections from previous years, but the other sections were reorganized for 2017 and so comparisons of those section scores to scores from previous years is discouraged.

**Passing Score.** A total test scaled score of 75 or greater is required to pass the ARRT MRI exam. 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 received input from a panel representing a broad constituency of MRI technologists. The cut score represents the standard of performance required to obtain certification and registration. Those who exceed the standard pass the exam.



## EXAMINEE RESULTS

The results for regular first-time primary and postprimary examinees are shown in the table below. The means and standard deviations are reported in scaled score units. The section score data provides a frame of reference for evaluating scores obtained by individual examinees. If, for example, a primary candidate received a score of 7.6 on the Neuro section (P1), that examinee's performance would be below average by 0.9 scaled score units. Note that 0.9 is also the standard deviation for P1. In other words, this hypothetical examinee scored one standard deviation (0.9) below the mean on P1.

### Performance of Regular, First-Time Examinees in 2017

Section	Primary (N = 360)		Postprimary (N = 1,709)	
	Mean	Std Dev	Mean	Std Dev
PC	8.0	1.1	8.5	0.9
S	8.7	1.1	8.6	1.1
IP1	8.2	1.0	7.9	1.1
IP2	8.6	1.0	8.3	1.0
IP3	8.1	1.1	7.9	1.1
P1	8.5	0.9	8.3	1.0
P2	8.2	1.1	8.1	1.0
P3	8.4	1.3	8.4	1.2
<b>Total</b>	<b>83.2</b>	<b>8.6</b>	<b>81.5</b>	<b>8.3</b>
<b>Passing %</b>	<b>85.6%</b>		<b>78.7%</b>	

The table also provides comparisons between primary and postprimary candidate scores. Note that for the total test primary candidates had a higher pass rate and mean score than postprimary candidates. Primary candidates also had higher mean section scores for Sections S, IP1, IP2, IP3, P1, & P2. Postprimary candidates had a higher mean score for Section PC, and the mean scores were equal for Section P3.

**School Summary Reports.** There were 37 educational programs that had three or more candidates take the MRI exam through the primary pathway in 2017. Mean scaled scores for these programs ran from 67.2 to 94.8; 17 of the 37 programs had 100% pass rates. Educators may always produce summary reports for their program, at their convenience, at the ARRT website, ARRT.ORG under Educators/Program Directors' website [Educator Website Login Page](#).

