



MAGNETIC RESONANCE CURRICULUM ANALYSIS

I. General Information	
Program Name	
JRCERT Program Number	
Date	

DIRECTIONS: Determine the course(s) in which each of the following content areas is covered and enter the course number(s) and/or title(s). For guidance in what should be covered for each content area, please refer to the Magnetic Resonance Curriculum (2020) developed in collaboration by the American Society of Radiologic Technologists (ASRT), Association of Educators in Imaging and Radiologic Sciences (AEIRS), and the Society for MR Radiographers & Technologists (SMRT), a Section of the International Society for Magnetic Resonance in Medicine (ISMRM).

II. Fundamentals of Imaging Science and Health Care	
Professional Curriculum	Program Course(s)
The Health Science Professions	
The Health Care Continuum	
Hospital Organization	
Radiology Organization	

Accreditation	
Continuing Education Requirements	
Regulatory Agencies	
Professional Credentialing	
Professional Organizations	
Professional Development and Advancement	

III. Clinical Practice and Patient Management	
Professional Curriculum	Program Course(s)
Clinical Practice	
Procedural Performance	
Infection Control	
Medical Emergencies	
Tubes, Catheters, Lines and Infusion Devices	
Imaging Procedures	
ARRT Clinical Experience Requirements	

IV. Pharmacology and Drug Administration

Professional Curriculum	Program Course(s)
Drug Nomenclature	
Methods of Drug Classification	
General Pharmacologic Principles	
Six Rights of Drug Safety	
Drug Categories of Relevance to MRI (Adverse Effects, Uses and Impacts on Medical Imaging)	
Classification of Contrast Agents	
Routes of Drug Administration	
Intravenous Drug Therapy	
MR Contrast Administration	
Current Practice Status	

V. Ethics and Law in the Imaging Sciences

Professional Curriculum	Program Course(s)
Ethics and Ethical Behavior	
Ethical Considerations in Health Care	

Legal Issues	
Compliance	

VI. Computers in Imaging and Medical Informatics	
Professional Curriculum	Program Course(s)
Computer Fundamentals	
Health Care Informatics	
Regulations, Laws, and Standards	
Decision Making	
Health Care Informatics Applications	
Digital Imaging	

VII. MR Safety	
Professional Curriculum	Program Course(s)
Introduction	
Static Magnetic Field	
Time-varying Radio Frequency (RF) Magnetic Field	
Time-varying Gradient Magnetic Fields	

Patient and Personnel Safety Screening in MR	
Equipment Safety Screening in MR Environment	
Emergencies in the MR Environment	
Safety in MR Contrast Administration	

VIII. MR Instrumentation and Imaging	
Professional Curriculum	Program Course(s)
Magnetism	
Magnets	
Shim Systems	
Radiofrequency Systems	
Gradient Systems	
Ancillary Equipment	
Operational Flow	
Scanning System Maintenance	

IX. MR Physical Principles

Professional Curriculum	Program Course(s)
History of MR	
Matter	
Nuclear Magnetism	
MR Signal Production	
MR Signal Induction/Sampling/Conversion	
MR Image Contrast Characteristics	
Introduction to MR Image Formation	
Imaging Planes	
K-Space and Image Formation	

X. MR Parameters and Imaging Options

Professional Curriculum	Program Course(s)
MR Imaging Parameter and Sequence Selections	
Imaging Options	
Artifacts	

XI. MR Pulse Sequences, Image Formation, and Image Contrast

Professional Curriculum	Program Course(s)
Intrinsic Contrast Characteristics (Tissue Characteristics)	
Extrinsic Contrast Characteristics (User-Selection Parameters for Image Contrast)	
Pulse Sequences	
Image Contrast Characteristics	
MR Contrast Media	
MR Image Formation	
Post-Processing	

XII. MR Imaging Procedures

Professional Curriculum	Program Course(s)
Preprocedural Considerations	
Procedural Considerations for Contrast Studies	
Considerations for MR Procedures	
Imaging Considerations	
Positioning and Procedural Considerations	

XIII. Sectional Anatomy

Professional Curriculum	Program Course(s)
Head and Brain	
Neck	
Spine	
Chest and Mediastinum	
Abdomen	
Pelvis	
Musculoskeletal	

XIV. Pathology

Professional Curriculum	Program Course(s)
Neurological	
Body	
Musculoskeletal	

XV. Quality Assurance and Quality Control

Professional Curriculum	Program Course(s)
Purpose of Quality Assurance	
Components of Quality Assurance Program	
Quality Improvement	
Quality Control (QC)	

OPTIONAL CONTENT

XVI. Cardiac MRI

Professional Curriculum	Program Course(s)
Equipment Requirements for Cardiac Imaging	
MR Advantages over other Imaging Modalities	
MR Presentation of Normal Cardiac Anatomy	
Imaging Techniques	
Evaluating Common Errors	
Techniques for Demonstrating Common Cardiomyopathies	
Techniques for Patient Monitoring and Communication	

Patient Safety and Emergency Care	
Postprocedure Patient Instructions	

OPTIONAL CONTENT	
XVII. Image Post-Processing	
Professional Curriculum	Program Course(s)
Image Postprocessing	
Retrieval and Exporting Image Data	
Viewing 3-D Images	
Postprocessing Techniques	
Quantitative Analysis	
Technical Errors in Postprocessing	

OPTIONAL CONTENT	
XVIII. Procedures for Image Post Processing	
Professional Curriculum	Program Course(s)
Indications for 3-D Procedures	
Contrast Media Selection	

Selection of Proper Imaging Tools	
Storage/Retrieval of Images	
Imaging Procedures	

OPTIONAL CONTENT

XIX. Advanced Imaging Techniques and Emerging Trends

Professional Curriculum	Program Course(s)
Artificial Intelligence (AI)/Machine Learning (ML)	
Fusion Imaging	
Quantitative MR (e.g. fingerprinting, elastography)	
Neurography	
3-D Printing and Modeling	
MR Lymphangiogram	
Remote Scanning	