GILK RADIOLOGY CONSULTANTS

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Gilk Radiology Consultants
MRI Safety Policies & Procedures Checklist

1.0 MR Safety Policy Structure

MRI Safety Practices Review
Annual Review of Policies, Procedures, Practices
Annual (Re-)Endorsement of Clinical P&P by MR Clinical Head and / or MRMD
Annual (Re-)Endorsement of Operational P&P by MR Administrator
P&P Review Trigger Criteria (e.g., new clinical practice, or change to MR equipment)
Culture (protection of staff based on adhering to policies)

2.0 MRI Physical Environment Safety

Zones and Access Controls
- Four Zone Concept
- Controlled Access Areas
  - General Restriction
  - MRI Scanner Room (Zone IV) Restriction

Who is permitted within the MRI Controlled Access area(s) (Zones 3 and 4)
- Patients
- Visitors
- Associates
- MR Departmental Staff

Who is permitted within the MRI scanner room(s) (Zone 4)
Not During MR Scanning / During MR Scanning (Screening / Protection Required)
- Patients
- Visitors
- Clinical Associates (e.g., anesthesia)
- Non-clinical Associates (e.g., maintenance)
- MR Departmental Staff

3.0 MRI Safety Training & Staff Standards

Safety Training Levels
- Level 1 Safety Training
  - Allowed Access / Restrictions
  - Different Training for different needs (e.g., 1a, 1b, 1c, 1d…)
- Level 2 Safety Training
  - Allowed Access
  - Situational Authority
  - Different Training for different needs (e.g 2a, 2b…)

Safety Training Content / Frequency
- Level 1 (Associates)
  - Annual (Documented)
  - Training / Competency content by need / purpose
- Joint Commission Required Training
  - Annual (Documented)
- Level 2 (MR Staff)

- Annual (Documented)
- Training / Competency content by need / purpose

Structure of MR Safety Responsibility / Authority / Communication
- MRSO
- MRMD
- MRSE

Staff Pregnancy
- Working outside Zone 4 during scanning

4.0 Patient Referral & Subject Screening / Preparation Process

Patient Referrals
- Review / Protocol Exam Appropriateness
- Review / Protocol Contrast
- Remedial MR Exam Referral Criteria

Informed Consent
- Process: Anticipated need
- Process: Spontaneous need

Screening for MRI patients
- Referrer / Order-Entry
- Appointment Call Pre-Screen (Outpatients)
- Floor Pre-Screen (Inpatients)
- Appointment Call 'day of' instructions
- On-Site Clinical Screening Form
  - Non-English speaking / non-communicative patients
  - Minor Children with Parent / Guardian
- On-Site Physical Screening
  - Clinical screening Technologist Review
    - Minor Child Clinical Screening Review
  - Dressing / Gowning
  - Ferromagnetic Detection
- Review of screening form with patient
- "Unreliable Historians" (e.g. GCS Scores)

Emergent Patient Screening (e.g. Stroke Patients)

Screening for non-patients entering Controlled Access Areas with Emergent Patients (incl. Associates)

Screening for non-patients entering MRI Scanner Rooms
- Not During MR Scanning / During MR Scanning

[Atypical Magnet] Transverse Magnetic Field Risks & MR Conditional Labeling
- MRMD Direction
- Implant / Device Clearance

[Atypical Magnet] Atypical Static Magnetic Field Strength & MR Conditional Labeling
- MRMD Direction
- Implant / Device Clearance

Patient Screening
- Piercings / Dermal Implants
  - Within vs. Beyond Volume of RF Deposition
  - Potential Gradient-Induced Vibration
  - Sensitive Locations (e.g. facial, genitalia, etc…)
- Tattoos

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- Within vs. Beyond Volume of RF Deposition
- Sensitive Locations (e.g. facial, genitalia, etc…)
- Transdermal Patches
  - Within vs. Beyond Volume of RF Deposition
  - Temperature-sensitive drug delivery
- Implanted Medical Devices
  - Passive Device Policy
  - MR Conditional
  - Untested (but manufacturer information available)
  - Unidentified (or identified with no manufacturer information available)
- Active Device Policy
  - MR Conditional
  - Untested (but manufacturer information available)
  - Unidentified
  - Pre-exam Device Settings
    - Instructions to Patient ('bring charged programmer')
    - Performed by rep / clinical group (e.g., cardiac, neuro, etc…)
    - Facilitated by tech (rep remote setting)
    - Performed by tech
  - Post-exam Device Interrogation / Re-set
    - Instructions to Patient ('bring charged programmer')
    - Performed by rep / clinical group (e.g., cardiac, neuro, etc…)
    - Facilitated by tech (rep remote setting)
    - Performed by tech
- Categorical Device Policy (e.g. 'all coronary stents')
- [potential 'listed' implant safety approach]
  - Safety White List (Proceed with proscribed exam as indicated)
    - Joint Replacements
    - Spinal Hardware
  - Safety Grey List (Consult MRSO / Supervising Radiologist for Direction)
    - Implantable Medication Pump (e.g. Baclofen)
  - Safety Black List (Strong Contraindications)
    - Unidentified Cerebral Aneurysm Clips
- Retained Foreign Body (e.g. shrapnel, projectiles, etc…)
  - Foreign Body in Eye
  - History of Penetrating Eye Injury
- Pregnancy
  - All trimesters equal
  - See 'Contrast' for contrast policy for pregnant patients

Patient Contact / Visualization During Study
- Visual Observation (interruptable)
- Auditory Monitoring During Pulse Sequences
- Patient Contact Between Pulse Sequences
- Patient Alert (Squeeze Ball)

Hearing Protection
- Patient Instruction
- Verify Fit & Function
- Alternative Methods
- Declination (Waiver of Liability)

Diffuse Heating

- Heating risk factors (febrile patients, beta-blockers)
- SED / SAE Alerts

Prevention of Burns
- Removal of all Superfluous Potential Electrical Conductors
- Use of Separation Padding
- Patient Positioning To Prevent Large-Calibre Body Loops
- Use of Insulating Materials
- Use of Heat-Sinks

Medical Supervision / Authorization For First Level
- RF
- Time-Varying Gradients

Bariatric (Patients of Size)
- Patient lift / positioning
- Bore diameter
- Patient table weight limits
- Padding

Contrast
- Contrast Risk Factors, Screening and Administration Criteria
  - Elderly
  - Pediatric
  - Pregnant
  - eGFR
  - Prior Allergic-Like Reaction
- Indications for Greater Than Single (Weight-Based) Dose
- Contrast Reaction
- Patient Information Form (FDA required for outpatients)
- Refusal of Contrast (Waiver of Liability)
- Patient Questions Regarding Contrast

Claustrophobia

Sedation / Analgesia / Anesthesia
- Patient Self-Medication
  - Discharge to self-drive?
- Allied Clinical Services (Sedation / Anesthesia)
  - Screening
  - Training

Clinical Monitoring / Clinical Support of MR Patients
- EKG / ECG
- Pulse Oximetry
- Infusion Pumps
- Ventilation
- Anesthesia

MR-Guided Procedures
- Breast Biopsy
- Catheterization

Infection Control
- ABHR vs. Handwashing
- Contagious Patient (e.g. active TB)
- Reverse Quarantine Patient (e.g. immuno suppressed)
- Interventional MR Procedures
- Terminal Cleaning Procedures

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Use of MR Conditional Equipment
- Tested and Labeled
- MR Safe, MR Conditional, MR Unsafe
- Labeled Objects Within Zone 3

Environmental Services In MRI
- Restricted Access Cleaning
- MRI Scanner Room Cleaning

Facilities / Maintenance Services in MRI
- Restricted Access Maintenance
- MRI Scanner Room Maintenance
- Rooftop / Quench Pipe Discharge area
- Quench Pipe Annual Inspection

Emergency Response
- Code Blue (Cardiopulmonary Arrest)
  - Hazard to Code Team (inability to execute screening)
  - Call Code
  - Restrict Code Team From Access to MRI Scanner Room
  - Extricate Patient from MRI Scanner Room
  - Initiate Resuscitation
- Code Red (Fire)
  - Fire in MRI, Activate Alarm
  - Evacuation of Patients / Associates from MR Suite
  - Use of Portable MR Conditional Fire Extinguishers
  - Restriction of MRI Scanner Rooms
  - Identification of Fire Department Incident Command Coordination for Firefighter Safety
  - Security Services Coordination with Fire Response
- Emergency Power Off
- MRI Magnetic Entrapment
- MRI Magnet Quench
  - Intentional Quench
  - Spontaneous Quench

Ferromagnetic (suspected) Object Discovered During Imaging

5.0 Adverse Event Reporting

Adverse Event Reporting / Documentation
- Joint Commission Required PI Data Collection
- Adverse Event Reporting to Device Manufacturers (MR system, external device, implanted device)
- Adverse Event Reporting to FDA
- Internal Hospital / Enterprise Adverse Event Reporting
- Adverse Event Reporting to State DoH (as indicated)

6.0 After-Event Aftercare

Aftercare (after suspect event)

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