Improving Quality through Integrated Program Management in a Paediatric Tertiary Care Radiology Department

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Diagnostic Imaging Overview
DI Quality Management System (QMS)

A network of interdependent processes, organizational structure, and resources required to plan, implement, control, and continually improve quality

A framework for seamless integration of structured, systemic and planned activities designed to ensure quality and patient safety
**Key Measurement Questions**

- Why to measure?
- What to measure?
- Where to measure?
- When to measure?
- How often to measure?
- How to measure?
- Who to measure?
- How to analyze the data?
- Who is the recipient?
- Who has the authority?

**System Improvement starts with clarity**

**Desired Indicator Characteristics**

- Valid
- Important
- Dependable
- Consistent
- Sensitive
- Economical
- Manageable

**Right Mix**

- Leading
- Lagging
- Structure
- Process
- Outcomes
- Balancing
**Integrated Process Improvement Framework**

**Lean**
- Focus on waste reduction, speed, efficiency, and flow

**Six Sigma**
- Focus on variation reduction, quality, and effectiveness

**Human Factors**
- Focus on safe, reliable, and effective system design

**Project Management**
- Focus on effective planning and execution of projects

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**Tools and Techniques**

- Kaizen
- Value Stream Mapping
- Standardized Work
- Error proofing
- SS / Visual Management
- Kanban
- Single-Piece Flow
- Pull System
- Level Loading
- Spaghetti Diagram
- Rapid Changeover
- A3 Problem Solving
- Root Cause Analysis
- FMEA
- Stopping the Line
- Just-in-Time
- TPM
- MSA
- Design of Experiments
- Affinity Diagram
- Benchmarking
- Bottleneck Analysis
- Brainstorming
- Cause and Effect Diagram
- Check Sheet
- Cognitive Walkthrough
- Control Charts
- DMAIC Problem Solving
- Fault Tree Analysis
- Five Whys
- Flowchart
- Force Field Analysis
- Gantt Chart
- Heuristic Evaluation
- Histogram
- Impact/Effort Matrix
- Interviewing
- Kano Analysis
- Mind Mapping
- Multivoting
- Nominal Group Technique
- Paired Comparisons
- Pareto Chart
- PDSA Cycle
- Project Charter
- Project Schedule
- Relationship Diagram
- Risk Response Plan
- Run Chart
- Scatter Diagram
- SIPOC Diagram
- Six Thinking Hats
- Solution Selection Matrix
- Spider Chart
- Stakeholder Analysis
- Usability Testing
- CTQ Requirements
**Quality and Safety Leadership Walkarounds**

**Purpose**

Demonstrate commitment to building a culture of safety and continuous quality improvement.

Directly inform leaders about existing organizational barriers and quality, safety, process, equipment, and communication issues.
Program Management Definitions

**Program**
A group of related projects, subprograms and program activities that are managed in a coordinated way.

**Program Management**
The application of knowledge, skills, tools, and techniques to a program to meet the program requirements and to obtain benefits and control not available by managing projects individually.

*Project Management Institute (PMI)*

Benefits of Program Management

- Improved collaboration
- Consensus on key priorities
- Consistent execution of projects
- Effective allocation of resources
- Diminished organizational silos
- Increased capacity for innovation
- Effective communication
- Systematic risk management
- Effective change management
- Effective problem solving
- Increased staff engagement
- High return on investment
- Enhanced organizational capability
- Better decision making
Service Excellence Initiative

Factors Impacting Patient Experience

Factors Impacting Patient Experience:
- Interpersonal Dimensions
- Communication
- Appointment Wait Time
- Preparation for the Exam
- Privacy and Confidentiality
- Parking, Food and Directions
- Activities for Children
- Explanation of the Exam
- Wait Time After Arrival
- Quality of Care
- Environment / Facilities
- Discharge Instructions
### Strategic Projects

#### Diagnostic Imaging

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<th>Project / Initiative</th>
<th>Q &amp; S Excellence</th>
<th>Enable People</th>
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### Strategic Priorities

#### Strategic Directions

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**Diagnostic Imaging Repository (DI-r)**

- **Population:** 1,500,000
- **Exams/year:** 3,000,000

**DI-r:** A shared regional repository that provides access to patient diagnostic images for approximately 10,000 clinicians.

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**Ultrasound Measures for Appendicitis**

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<tr>
<th>US</th>
<th>Appendicitis</th>
<th>Sn= TP/TP+FN</th>
<th>Sp= TN/FP+TN</th>
<th>PPV= TP/TP+FP</th>
<th>NPV= TN/FN+TN</th>
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<td>+</td>
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<td>69</td>
<td>9</td>
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- Sn= sensitivity, Sp=specificity, PPV=positive predictive value, NPV=negative predictive value, Acc=accuracy

- Negative appendectomy rate= 2/73 = 2.7%
- 66% of US requested ≥ Normal
- 34.4% ≥ Positive for appendicitis

**Timeframe:** 3 months; 206 consecutive requests; 105 daytime; 101 after hours; Follow up in 177
Access to MRI

- Improved patient preparation
- Optimized patient flow
- Improved average start time
- Reduced room turnover time
- Increased room utilization rate
- Standardized exam protocols
- Weekly performance measures
- Collaboration with Anaesthesia

MR Safety

- Varying Gradient Field
- Radio Frequency Signal
- Cryogen-Related Hazards
- Acoustic Noise
- Strong Magnetic Field

Safe MR Practices

- Screening
- Zoning
- Education
- Policies
- Emergency
- Equipment
MR Safety Improvement Plan

MRI safety organization
Safety screening processes
Access control to Zone III / IV
MRI safety training programs
Policies and procedures
Warning signs / demarcation
Equipment storage
Emergency preparedness
Equipment categorization

MRI Emergency Procedures

Fire in MRI Suite - Emergency Procedure

- WARNING: MAGNET IS ALWAYS ON
  - Only enter MRI magnet room when authorized personnel.
  - Remove all personal objects and contents of pockets such as cell phones, keys, coins, etc.

- Before entering MRI magnet room, screening of non-patients will be properly screened as per MRI screening of non-patients policy.

- Respiratory Therapy will assess the need to shut off oxygen source.

- If it is necessary to stand in water, MRI Field Engineer is required to reach the power switch, call MR Field Engineer to shut down power.

- If the water reaches the magnet, MRI technologist or authorized individual will shut down electrical power to the magnet.

- If the water does not reach the magnet, MRI technologist or authorized individual will leave the MRI magnet room.

- The water shut off valve must be turned off.

- Medical staff proceed with hospital Flood Response procedure.

- Magnetic field is still present even after shutting down electrical power.

- Arrange for MR Field Engineer to service MRI equipment ASAP, and notify On-Call MRI Radiologist.

- Radiologist will review if there is any suspicion of fire in the MRI magnet room.

- Locating: 7500
- Protection Services: 7122
- Plant Operations: 7111
- Environmental Services/Housekeeping: 416-530-7254

- Housekeeping, CDIU, Research MRI

- LOCATIONS
  - Water shut off valve: Room S720A
  - Power button: MRI Control Room
  - Circuit breaker: Room S792

- Fire Department is dispatched.

- Locating transfers calls to Protection Services Supervisor.

- Manager On-Call: 416-237-3795
- MRI Tech On-Call: 416-589-8514

- Flood in MRI Suite - Emergency Procedure

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  - Only enter MRI magnet room when authorized personnel.
  - Remove all personal objects and contents of pockets such as cell phones, keys, coins, etc.

- Before entering MRI magnet room, screening of non-patients will be properly screened as per MRI screening of non-patients policy.

- MR Field Engineer completes service MRI equipment.

- Plant Operations in consultation with system manufacturer to determine if service MRI equipment.

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- In collaboration with MRI technologist, reach the power switch, call MR Field Engineer to shut down power.

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- LOCATIONS
  - Water shut off valve: Room S747 – S747D – S750
  - Water shut off valve: Room 4150B – S721C

- Flood identified in MRI Suite.

- Does flood extend into MRI magnet room?

- Yes
  - Redirect traffic as required.
  - Turn off all operating cabinets.
  - Close water shut off valve.
  - Do not shut down power to research MRI.
  - Lock the MRI magnet room door.
  - Turn off all operating cabinets.
  - Do not shut down power to research MRI.
  - Lock the MRI magnet room door.

- No
  - Is there an actual fire in the MRI magnet room?
    - Yes
      - Attempt to extinguish the fire using MR safe fire extinguisher.
    - No
      - Has the fire been extinguished?
        - Yes
          - Resume normal operations.
        - No
          - If the fire alarm originates from after hours, Protection Services informs Fire Department.
          - Fire alarm is generated in a specified room.
          - Hospital Emergency Response Team enters MRI Suite to investigate the area.
          - Initial investigation for evidence of fire involves looking through the window without entering the MRI magnet room.
          - Di Manager On-Call: 416-237-3795
          - MRI Tech On-Call: 416-589-8514
          - Plant Operations: 7111
          - Protection Services: 7122
          - Locating: 7500

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Innovation Projects

Video game - helping children stay still and relaxed during their MRI exam
The use of nitrous oxide during the cecostomy tube changes
Multi-Modality Dose Measurement
Modified MR sequences to study different disease processes in unique and innovative ways:
  - Vessel wall imaging
  - Multiparametric MR imaging for epilepsy
  - Fast MR brain scan

Thank you.