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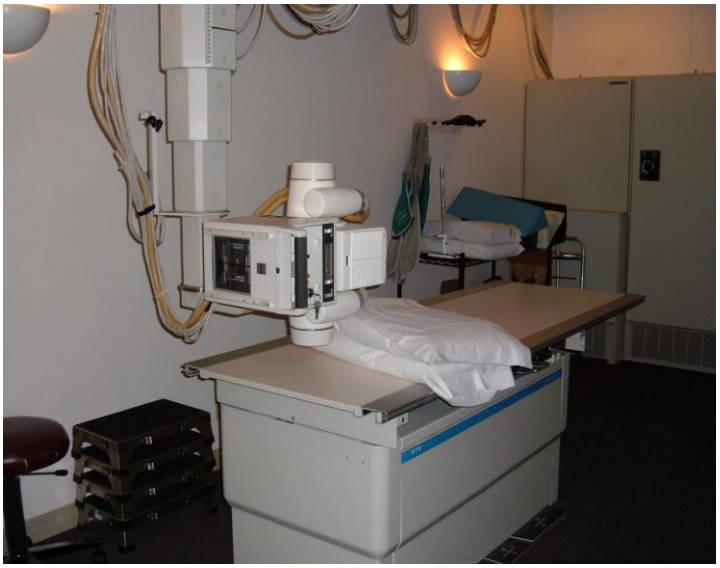

Radiology Services Manual

1.0 INTRODUCTION

The Department of Radiology and Imaging Services is a core clinical support service of the hospital, responsible for providing comprehensive, safe, timely, and evidence-based diagnostic imaging services that support clinical decision-making across all specialties. The department functions as an integral component of the patient care continuum and ensures seamless coordination with outpatient, inpatient, and emergency and critical care services.

The scope of services provided by the department includes Diagnostic X-ray (fixed and mobile), Handheld Dental X-ray, Ultrasound (USG), Doppler studies, 2D Echocardiography including Tran thoracic (TTE) and Transesophageal Echocardiography (TEE), Computed Tomography (CT), and Magnetic Resonance Imaging (MRI). Cathlab services are excluded from this manual and are governed under a separate departmental policy.

All imaging services are delivered under the clinical supervision of qualified Radiologists, supported by trained Radiology Technicians, ensuring adherence to defined clinical protocols, patient safety standards, and regulatory requirements. The department ensures that all imaging investigations are performed based on clinical indication, with due consideration to appropriateness, risk-benefit assessment, and patient-specific factors.

The department operates in alignment with the requirements of NABH 6th Edition standards, particularly Access, Assessment and Continuity of Care (AAC), ensuring availability, accessibility, and continuity of imaging services. The department ensures

that imaging services are available as per the needs of the patients, including emergency situations, and are integrated with clinical workflows for timely diagnosis and treatment planning.

Patient safety forms the cornerstone of all imaging services. The department implements structured processes for patient identification, screening, informed consent (where applicable), radiation safety, contrast safety, infection prevention and control, and emergency preparedness. Special attention is given to vulnerable patient groups including pregnant women, pediatric patients, and critically ill patients.

The department complies with all applicable statutory and regulatory requirements, including but not limited to the Atomic Energy Act, AERB guidelines for radiation safety, PCPNDT Act for ultrasound services, and Biomedical Waste Management Rules. All licenses, registrations, and approvals are maintained valid and are periodically review.

The department is committed to continuous quality improvement through monitoring of defined quality indicators, periodic audits, staff competency assessment, and implementation of corrective and preventive actions. All imaging records, reports, and related documentation are maintained in accordance with established policies on information management, confidentiality, and medico-legal requirements.

The organizational structure of the department is defined as:

- Medical Director → Head of Department (Radiology & Imaging Services) → Radiologists → Radiology Technicians, ensuring clear lines of responsibility, accountability, and supervision.

1.3 NABH STANDARD MAPPING

[Standard: AAC.8, OE: 1, 2] – Imaging services are available, defined, and integrated into care

[Standard: AAC.9, OE: 1] – Diagnostic services are organized and directed

[Cross Ref: COP.1, PRE.1, FMS.6, HRM.1, IMS.1]

2.0 OBJECTIVES

The Department of Radiology and Imaging Services is committed to delivering safe, accurate, timely, and clinically appropriate diagnostic imaging services that support effective patient care and clinical decision-making across all specialties of the hospital.

The primary objective of the department is to ensure that all imaging investigations are performed based on valid clinical indications and are aligned with evidence-based practices, thereby facilitating accurate diagnosis, treatment planning, and continuity of care.

The department aims to ensure availability and accessibility of imaging services across all modalities, including X-ray, CT, MRI, Ultrasound, Doppler, and Echocardiography, with defined turnaround times for reporting, ensuring that clinical teams receive timely and actionable information.

A key objective of the department is to ensure patient safety through the implementation of structured protocols for patient identification, screening, informed consent, radiation protection, contrast safety, infection prevention and control, and management of adverse events. The department ensures adherence to the ALARA (As Low As Reasonably Achievable) principle for radiation exposure and implements safeguards for vulnerable patient groups.

The department is committed to ensuring effective communication of imaging findings, particularly critical or life-threatening results, through defined

communication protocols that ensure immediate notification to the treating clinician and appropriate documentation.

The department ensures compliance with all statutory and regulatory requirements, including AERB guidelines, PCPNDT Act provisions, and Biomedical Waste Management Rules, and maintains all necessary licenses, records, and documentation as required.

The department strives for continuous quality improvement through the establishment and monitoring of defined quality indicators, including report turnaround time, repeat imaging rates, contrast reaction rates, and equipment uptime. Data is periodically reviewed, and corrective and preventive actions are implemented as necessary.

Another key objective is to ensure that all personnel working in the department are appropriately qualified, trained, and competent to perform their assigned responsibilities. The department ensures ongoing training, competency assessment, and skill enhancement in imaging techniques, patient safety, and emergency response.

The department also aims to ensure effective management of imaging records and information, including secure storage, retrieval, and confidentiality of patient data, in accordance with hospital policies and applicable legal requirements.

2.1 NABH STANDARD MAPPING

[Standard: AAC.8, OE: 3] – Services are planned and aligned to patient needs

[Standard: AAC.9, OE: 3, 6] – Diagnostic services are quality-driven and monitored

[Cross Ref: COP.2, PRE.2, PSQ.1, FMS.6, HRM.2, IMS.2]

3.0 POLICY ON PROVIDING IMAGING SERVICES

The Department of Radiology and Imaging Services shall provide comprehensive diagnostic imaging services to all eligible patients of the hospital, including outpatients, inpatients, emergency cases, and referred cases, in accordance with defined clinical protocols, patient safety requirements, and regulatory guidelines.

All imaging services shall be provided based on a valid, documented requisition from a registered medical practitioner, clearly indicating the clinical indication and relevant patient history. The department shall ensure that imaging investigations are justified, appropriate, and aligned with the clinical needs of the patient.

The department shall ensure availability of imaging services across all defined modalities, including X-ray, CT, MRI, Ultrasound, Doppler, and Echocardiography, either on a routine or emergency basis, with prioritization based on clinical urgency.

Imaging requests shall be categorized as routine, urgent, or emergency, and handled accordingly to ensure timely service delivery.

3.1 Patient Identification and Verification

Prior to conducting any imaging procedure, patient identification shall be verified using at least two identifiers, such as patient name and hospital identification number, in accordance with hospital patient safety policies. Any discrepancy shall be immediately escalated and resolved before proceeding with the investigation.

3.2 Clinical Appropriateness and Justification

All imaging procedures shall be performed only after assessing clinical appropriateness. The Radiologist shall have the authority to review, modify, defer, or reject any imaging request that is not clinically justified or poses undue risk to the patient. Alternative imaging modalities may be suggested where appropriate.

3.3 Informed Consent Policy

Informed consent shall be obtained prior to performing the following procedures:

- Contrast-enhanced CT and MRI studies
- MRI procedures involving risk factors
- Transesophageal Echocardiography (TEE)
- Any procedure involving sedation or invasive components

The consent process shall include explanation of the procedure, risks, benefits, alternatives, and potential complications. Consent shall be documented in writing and form part of the patient record.

3.4 Pre-Procedure Screening and Safety Checks

All patients shall undergo appropriate pre-procedure screening, including but not limited to:

- Assessment of renal function for contrast studies
- Evaluation of history of allergy, asthma, or previous contrast reactions
- Screening for pregnancy in women of reproductive age
- MRI safety screening for metallic implants, devices, or foreign bodies

Any identified risk factors shall be evaluated by the Radiologist before proceeding, and appropriate precautions or alternative investigations shall be considered.

3.5 Patient Preparation and Procedure Protocols

The department shall follow standardized protocols for patient preparation and imaging procedures for each modality. These protocols shall include instructions related to fasting, hydration, medication adjustments, positioning, and post-procedure care.

All imaging procedures shall be performed by trained and competent personnel under the supervision of a Radiologist, ensuring adherence to safety and quality standards.

3.6 Contrast Administration and Safety

Administration of contrast media shall be carried out under defined protocols. Emergency drugs and resuscitation equipment shall be readily available in areas where contrast is administered.

Patients shall be monitored during and after contrast administration for any adverse reactions. In case of a contrast reaction, immediate management shall be initiated as per established emergency protocols, and the event shall be documented and reported.

3.7 Emergency Preparedness

The department shall maintain readiness to manage medical emergencies occurring during imaging procedures, including contrast reactions, vasovagal episodes, and cardiac events. A functional crash cart, oxygen supply, emergency drugs, and trained personnel shall be available at all times.

All staff shall be trained in basic life support (BLS), and escalation protocols shall be clearly defined.

3.8 Imaging Reporting and Turnaround Time

All imaging studies shall be interpreted by qualified Radiologists. Reports shall be generated in a standardized format and made available within defined turnaround times based on the type and urgency of the investigation.

3.9 Critical Result Communication

Any critical, urgent, or life-threatening findings identified during imaging shall be immediately communicated to the treating clinician. Such communication shall be documented in the designated critical value register, including date, time, name of the clinician informed, and the person communicating the finding.

3.10 Documentation and Record Management

All imaging procedures, findings, and communications shall be appropriately documented. Imaging records shall be stored in PACS or equivalent systems, and reports shall be maintained as part of the patient medical record.

All documentation shall be legible, complete, and retrievable, ensuring compliance with medico-legal and regulatory requirements.

3.11 Roles and Responsibilities

The Radiologist shall be responsible for clinical decision-making, protocol approval, reporting, and communication of critical findings.

Radiology Technicians shall be responsible for patient preparation, execution of imaging procedures, and adherence to safety protocols.

The Head of Department shall ensure implementation of policies, supervision of staff, quality assurance, and regulatory compliance.

3.12 Regulatory Compliance

All imaging services shall comply with applicable statutory requirements, including AERB regulations for radiation safety, PCPNDT Act provisions for ultrasound services, and Biomedical Waste Management Rules.

All required licenses, registrations, and approvals shall be maintained valid and shall be periodically reviewed.

3.13 Sedation and Anaesthesia in Imaging Services

3.13.1 Policy Statement

Sedation and anaesthesia, when required for imaging procedures, shall be administered in a controlled, safe, and standardized manner in accordance with hospital policies on procedural sedation and anaesthesia services. The department shall ensure that all sedation-related practices comply with applicable NABH standards and are aligned with patient safety requirements.

Sedation or anaesthesia may be required in specific situations including pediatric imaging, uncooperative or anxious patients, patients with altered mental status, patients undergoing prolonged imaging procedures such as MRI, and during procedures such as Transesophageal Echocardiography (TEE) or other semi-invasive interventions.

3.13.2 Authorization and Responsibility

Administration of sedation or anaesthesia shall be carried out only by qualified and credentialed personnel authorized as per hospital privileging policy. Moderate to deep sedation and all forms of anaesthesia shall be administered under the supervision of an Anaesthesiologist or a trained and privileged medical practitioner as per hospital policy.

The Radiologist shall be responsible for identifying the need for sedation in consultation with the treating clinician and coordinating with the anaesthesia team.

The Anaesthesia team shall be responsible for pre-sedation assessment, drug administration, monitoring, and post-procedure recovery.

3.13.3 Pre-Sedation Assessment

All patients requiring sedation or anaesthesia shall undergo a documented pre-sedation assessment, which shall include:

- Clinical evaluation and relevant medical history
- Assessment of comorbid conditions
- Airway assessment and risk stratification
- Review of fasting status as per established guidelines
- Review of current medications and allergies

Patients shall be classified based on risk status, and suitability for sedation shall be determined prior to the procedure. High-risk patients shall be managed in consultation with the anaesthesia team and may require additional precautions or alternative approaches.

3.13.4 Informed Consent

Informed consent specific to sedation or anaesthesia shall be obtained prior to the procedure. The consent process shall include explanation of:

- Nature and purpose of sedation/anaesthesia
- Potential risks and complications
- Alternatives and expected outcomes

The consent shall be documented and retained as part of the patient medical record.

3.13.5 Monitoring During Sedation

All patients receiving sedation or anaesthesia shall be continuously monitored throughout the procedure. Monitoring shall include, as applicable:

- Heart rate
- Blood pressure
- Respiratory rate
- Oxygen saturation
- Level of consciousness

Appropriate monitoring equipment shall be available and functional in the imaging area where sedation is administered.

3.13.6 Emergency Preparedness

The department shall ensure readiness to manage sedation-related complications, including respiratory depression, airway obstruction, allergic reactions, and cardiovascular instability.

A fully functional crash cart, airway management equipment, oxygen supply, suction apparatus, and emergency drugs shall be readily available in all areas where sedation is administered.

All personnel involved in sedation procedures shall be trained in Basic Life Support (BLS), and escalation protocols for advanced life support shall be clearly defined.

3.13.7 Post-Procedure Recovery and Discharge

Patients receiving sedation shall be monitored in a designated recovery area until they meet defined discharge criteria. Recovery monitoring shall include assessment of vital signs, consciousness level, and overall clinical stability.

Discharge from the recovery area shall be authorized by a qualified medical practitioner after ensuring that the patient meets established recovery criteria.

Appropriate post-procedure instructions shall be provided to the patient or caregiver.

13.8 Documentation and Records

All aspects of sedation and anaesthesia shall be documented, including:

- Pre-sedation assessment
- Consent
- Drugs administered (type, dose, time)
- Monitoring parameters
- Adverse events, if any
- Recovery status and discharge details

All records shall be maintained as part of the patient medical record and shall be available for audit and review.

3.13.9 Cross-Reference to Hospital Policies

This policy shall be read in conjunction with:

- Hospital Anaesthesia Policy
- Procedural Sedation and Analgesia Policy
- Medication Management Policy
- Emergency Response and Code Blue Policy

3.3NABH STANDARD MAPPING

[Standard: AAC.8, OE: 5, 6] – Safe delivery of services including high-risk procedures

[Standard: AAC.9, OE: 4] – Diagnostic services are performed safely

[Cross Ref: COP.2, COP.13, COP.14, MOM.1,PRE.3,FMS.6,FMS.8,HRM.3 HRM.5, IMS.2]

4.0 MAINTENANCE OF RADIOLOGY EQUIPMENT

The Department of Radiology and Imaging Services shall ensure that all imaging equipment is maintained in safe, functional, and optimal working condition at all times through a structured maintenance and quality assurance program. The department shall implement defined processes for preventive maintenance, corrective maintenance, calibration, validation, and regulatory compliance for all imaging equipment.

All equipment shall be uniquely identified and included in the hospital's equipment inventory, with details including equipment name, make, model, serial number, location, date of installation, and maintenance history. Equipment records shall be maintained and updated periodically.

4.1 Preventive Maintenance

All imaging equipment shall undergo preventive maintenance at defined intervals as per manufacturer recommendations and biomedical engineering protocols. Preventive maintenance schedules shall be documented and adhered to, ensuring that all equipment is serviced periodically irrespective of its operational status. Preventive maintenance activities shall include inspection, cleaning, functional checks, and replacement of components as required. Records of preventive maintenance shall be maintained, including date of service, details of work performed, and certification of equipment fitness for use.

4.2 Corrective Maintenance and Breakdown Management

Any equipment malfunction or breakdown shall be immediately reported to the Biomedical Engineering Department and documented. Corrective maintenance shall be initiated without delay to restore functionality.

The department shall maintain a log of all equipment breakdowns, including nature of fault, date and time of occurrence, corrective action taken, time to resolution, and responsible personnel. Equipment downtime shall be monitored and analyzed periodically to identify recurring issues and implement corrective and preventive actions.

In case of equipment failure affecting patient care, alternative arrangements shall be made to ensure continuity of services, including use of backup equipment or referral to alternate facilities as per hospital policy.

4.3 Calibration and Quality Assurance

All imaging equipment shall undergo periodic calibration and quality assurance testing to ensure accuracy, reliability, and consistency of imaging results. Calibration shall be carried out by authorized personnel or certified agencies at defined intervals. Quality assurance programs shall include modality-specific checks such as image quality assessment, radiation dose monitoring, and equipment performance evaluation. Records of calibration and quality assurance shall be maintained and made available for audit.

4.4 Equipment Validation and Fitness for Use

All new equipment shall undergo installation qualification, operational qualification, and performance validation prior to being put into clinical use. Similarly, after major repairs or maintenance, equipment shall be validated before resuming patient services.

Only equipment that has been certified as functional and safe shall be used for patient care.

4.5 AERB Compliance for Radiation Equipment

All radiation-emitting equipment shall comply with the requirements of the Atomic Energy Regulatory Board (AERB). This includes obtaining necessary approvals for installation, operation, and periodic inspection.

Radiation safety surveys, leakage testing, and shielding adequacy assessments shall be conducted as per regulatory requirements. All relevant certificates and approvals shall be maintained valid and available for inspection.

4.6 Annual Maintenance Contracts (AMC) and Service Agreements

All major imaging equipment shall be covered under Annual Maintenance Contracts (AMC) or Comprehensive Maintenance Contracts (CMC) with authorized service providers.

The department shall ensure timely renewal of such contracts and monitor service performance, including response time and quality of service.

4.7 Roles and Responsibilities

The Head of Department shall be responsible for overall oversight of equipment maintenance and ensuring compliance with maintenance policies.

The Biomedical Engineering Department shall be responsible for planning, executing, and documenting preventive and corrective maintenance activities.

Radiology Technicians shall be responsible for routine equipment checks prior to use, basic troubleshooting, and reporting any abnormalities.

4.8 Documentation and Records

The department shall maintain the following records related to equipment maintenance:

- Equipment inventory register
- Preventive maintenance schedule and records
- Breakdown and corrective maintenance log
- Calibration and quality assurance records
- AERB compliance documents
- AMC/CMC agreements and service reports

All records shall be maintained in a systematic and retrievable manner and shall be available for audit and review.

4.3 NABH STANDARD MAPPING

[Standard: AAC.9, OE: 5] – Diagnostic equipment is maintained and functional

[Cross Ref: FMS.6, FMS.7, FMS.8, IMS.2]

5.0 INVENTORY MANAGEMENT IN RADIOLOGY SERVICES

The Department of Radiology and Imaging Services shall maintain a structured and controlled system for management of all inventory items, including consumables, contrast media, imaging films, emergency drugs, and related materials required for safe and effective delivery of imaging services.

The inventory management system shall ensure continuous availability of required materials, prevent stock-outs, minimize wastage, and ensure patient safety through proper storage, handling, and traceability.

5.1 Scope of Inventory

The inventory under the Radiology Department shall include, but not be limited to:

- X-ray films and printing media
- Contrast media used for CT, MRI, and other imaging procedures
- Emergency drugs used for management of contrast reactions and sedation
- Consumables such as syringes, IV sets, catheters, and disposables
- Protective equipment such as lead aprons and shielding accessories

All inventory items shall be accounted for and managed under defined inventory control processes.

5.2 Stock Level Management

The department shall define minimum, maximum, and reorder levels for all critical inventory items based on workload, consumption patterns, and lead time for procurement.

Stock levels shall be reviewed periodically, and replenishment shall be initiated in a timely manner to ensure uninterrupted service delivery.

5.3 Storage and Handling

All inventory items shall be stored under appropriate conditions as per manufacturer recommendations. Contrast media and drugs requiring temperature control shall be stored under defined cold chain conditions, with temperature monitoring and documentation.

Items shall be stored in a clean, organized, and secure manner to prevent damage, contamination, or misuse.

5.4 Expiry and Batch Control

All inventory items shall be monitored for expiry, and a “first-expiry-first-out” (FEFO) system shall be followed.

Batch numbers and lot details of contrast media and critical drugs shall be recorded and maintained to ensure traceability in case of adverse reactions or product recalls.

Expired or near-expiry items shall be identified and removed from usable stock in a timely manner and disposed of as per biomedical waste management rules.

5.5 Contrast Media and Drug Control

Contrast media and emergency drugs used within the Radiology Department shall be managed in coordination with the hospital's Medication Management System. Storage, dispensing, administration, and documentation of contrast agents shall comply with established medication safety policies. High-risk drugs used for emergency management shall be readily available and regularly checked for availability and expiry.

5.6 Issuance and Control of Imaging Films

Where imaging films are used for providing diagnostic images to patients, the department shall ensure proper documentation of film issuance.

Films shall be labeled with patient identifiers and handed over to the patient or authorized representative against acknowledgment. In medico-legal cases or where required, copies or records shall be retained by the hospital.

The department shall ensure that film usage is monitored and wastage is minimized through appropriate control measures.

5.7 Digital Image Storage (VNA-PACS Integration)

All imaging studies shall be stored in the hospital's Vendor Neutral Archive (VNA) and Picture Archiving and Communication System (PACS), which shall serve as the primary repository of imaging records.

Digital storage shall ensure secure, retrievable, and long-term preservation of imaging data. Access to digital images shall be controlled through role-based authorization, and audit trails shall be maintained.

Film printing shall be considered a secondary output for patient convenience, and the digital record shall be treated as the official medical record.

5.8 Record Retention and Medico-Legal Compliance

All imaging records, whether in digital or film format, shall be retained as per hospital policy and applicable legal requirements.

In medico-legal cases, original records shall be preserved and released only as per defined protocols. Proper documentation shall be maintained for any release of records.

5.9 Documentation and Inventory Records

The department shall maintain records related to inventory management, including:

- Stock registers for consumables and films
- Contrast media usage log with batch tracking
- Drug inventory and emergency drug checklist
- Temperature monitoring records (where applicable)
- Film issuance register
- Disposal records for expired or damaged items

All records shall be maintained in a systematic and retrievable manner and shall be available for audit and review.

5.3 NABH STANDARD MAPPING

[Standard: AAC.9, OE: 5] – Diagnostic services supported with required resources

[Cross Ref: FMS.5, FMS.6, MOM.2, IMS.2, IMS.4]

6.0 STAFF QUALIFICATION AND COMPETENCY

The Department of Radiology and Imaging Services shall ensure that all personnel working within the department are appropriately qualified, trained, credentialed, and competent to perform their assigned responsibilities. The department shall function in alignment with the hospital's Human Resource Management policies related to recruitment, credentialing, privileging, training, and performance evaluation.

All personnel shall have documented evidence of qualification, registration (where applicable), training, and competency, and such records shall be maintained and periodically reviewed.

6.1 Qualification Requirements

Radiologists shall possess recognized postgraduate qualifications in Radiology (MD/DNB or equivalent) and shall be registered with the relevant medical council.

Additional qualifications or training in subspecialties such as CT, MRI, or Echocardiography shall be considered for modality-specific responsibilities.

Radiology Technicians shall possess a recognized diploma or degree in Radiography or Imaging Technology and shall be trained in operation of imaging equipment relevant to their assigned modality.

Personnel involved in echocardiography shall have appropriate training and competency in performing cardiac imaging procedures.

All staff shall meet the minimum qualification requirements as defined by statutory bodies and hospital policy.

6.2 Credentialing and Verification

All staff shall undergo a formal credentialing process prior to appointment, which shall include verification of educational qualifications, professional registration, work experience, and references.

Copies of all relevant documents shall be maintained in the personnel file and shall be subject to periodic verification as per hospital policy.

6.3 Privileging of Radiologists

Radiologists shall be granted clinical privileges based on their qualifications, training, experience, and demonstrated competency. Privileges shall be modality-specific and may include, but are not limited to:

- X-ray reporting
- Ultrasound and Doppler studies
- CT scan interpretation and protocol supervision
- MRI interpretation and protocol supervision
- Echocardiography (TTE/TEE), where applicable

Privileges shall be approved by the appropriate hospital authority and shall be reviewed periodically or when there is a change in scope of practice.
Radiologists shall not perform or report procedures beyond their granted privileges.

6.4 Competency Assessment

All personnel shall undergo initial competency assessment prior to independent functioning and periodic reassessment thereafter.

Competency assessment shall include evaluation of:

- Technical skills related to imaging procedures
- Knowledge of safety protocols including radiation safety and infection control
- Ability to handle equipment and troubleshoot basic issues
- Response to emergency situations

Competency records shall be documented and maintained.

6.5 Training and Continuing Education

All staff shall undergo structured training programs, including:

- Induction training at the time of joining
- Modality-specific technical training
- Radiation safety training
- Infection prevention and control training
- Basic Life Support (BLS) training
- Periodic refresher training

Continuing education and skill enhancement shall be encouraged, and participation shall be documented.

6.6 Staffing and Coverage

The department shall ensure availability of adequate and qualified staff to meet service requirements, including provision for 24x7 services where applicable.

At least one qualified Radiology Technician shall be available during all operational hours. Radiologist availability shall be ensured either on-site or on-call, depending on service requirements.

6.7 Roles and Responsibilities

The Head of Department shall be responsible for overall supervision, quality assurance, staff competency, and regulatory compliance.

Radiologists shall be responsible for clinical decision-making, imaging protocols, interpretation of studies, and communication of critical findings.

Radiology Technicians shall be responsible for performing imaging procedures, patient preparation, and adherence to safety protocols.

6.8 Documentation and Records

The department shall maintain records related to:

- Staff qualifications and certifications
- Credentialing and privileging documents
- Competency assessment records
- Training and attendance records

All records shall be maintained in a structured and retrievable manner and shall be available for audit.

6.3 NABH STANDARD MAPPING

[Standard: AAC.8, OE: 6] – Qualified and competent personnel provide services

[Cross Ref: HRM.2, HRM.3, HRM.5, IMS.2]

7.0 TRAINING AND DEVELOPMENT

The Department of Radiology and Imaging Services shall establish and implement a structured training and development program to ensure that all personnel are adequately trained, competent, and capable of performing their assigned responsibilities safely and effectively.

The training program shall be aligned with hospital Human Resource policies and shall focus on enhancing technical skills, patient safety practices, regulatory compliance, and emergency preparedness.

7.1 Induction Training

All newly appointed staff shall undergo a structured induction training program prior to assuming independent responsibilities. The induction program shall include:

- Orientation to hospital policies and departmental procedures
- Introduction to imaging equipment and workflow processes
- Training on patient identification and safety protocols
- Infection prevention and control practices
- Radiation safety principles and precautions
- Emergency response procedures including Code Blue

Completion of induction training shall be documented, and staff shall be assessed for readiness before independent functioning.

7.2 Modality-Specific Training

All Radiology Technicians and relevant staff shall receive modality-specific training for the equipment and procedures they are assigned to perform. This shall include:

- Operation of X-ray, CT, MRI, Ultrasound, and Echocardiography equipment
- Patient positioning and preparation protocols
- Safety precautions specific to each modality
- Recognition and reporting of abnormalities or technical issues

Staff shall not independently operate any imaging modality unless they have been trained and assessed as competent for that modality.

7.3 Mandatory Training Programs

All personnel shall undergo mandatory training at defined intervals on the following:

- Radiation safety and protection measures
- Infection prevention and control practices
- Basic Life Support (BLS) and emergency response
- Contrast safety and management of adverse reactions
- Sedation safety (where applicable)
- Biomedical waste management

Refresher training shall be conducted periodically, and attendance shall be mandatory.

7.4 Continuing Education and Skill Enhancement

The department shall encourage continuous professional development through participation in workshops, seminars, conferences, and internal academic sessions. Radiologists and technical staff shall be encouraged to update their knowledge and skills in evolving imaging technologies and best practices.

7.5 Training Effectiveness and Competency Linkage

Training effectiveness shall be evaluated through assessments, observations, and competency evaluations. Staff performance shall be monitored to ensure that training objectives are achieved.

Training outcomes shall be linked with competency assessment, and additional training shall be provided where gaps are identified.

7.6 Training Planning and Responsibility

The Head of Department, in coordination with the Human Resource Department and Quality Team, shall be responsible for planning, implementing, and monitoring the training program.

An annual training calendar shall be prepared, and compliance with the training schedule shall be monitored.

7.7 Documentation and Records

The department shall maintain records of all training activities, including:

- Training schedules and calendars
- Attendance records
- Training content and materials
- Assessment and evaluation records

All training records shall be maintained in a structured and retrievable manner and shall be available for audit and review.

7.3 NABH STANDARD MAPPING

[Standard: AAC.8, OE: 6] – Personnel are trained to provide safe services

[Cross Ref: HRM.5, HRM.6, PSQ.2]

8.0 STAFF AND ORGANIZATIONAL STRUCTURE

The Department of Radiology and Imaging Services shall maintain a clearly defined organizational structure to ensure effective governance, accountability, supervision, and coordination of all imaging services. The structure shall define reporting relationships, roles, and responsibilities of all personnel within the department.

The organizational structure of the department shall be as follows:

Medical Director → Head of Department (Radiology & Imaging Services) → Radiologists → Radiology Technicians

This structure ensures appropriate clinical oversight, operational control, and technical execution of imaging services.

8.1 Medical Director

The Medical Director shall have overall administrative and clinical oversight of the Radiology Department and shall be responsible for ensuring that imaging services are aligned with hospital policies, regulatory requirements, and quality standards. The Medical Director shall ensure availability of adequate resources, approve policies, and provide strategic direction for the department.

8.2 Head of Department (Radiology & Imaging Services)

The Head of Department shall be responsible for the overall functioning of the Radiology Department, including clinical governance, operational management, quality assurance, and regulatory compliance.

The Head of Department shall ensure implementation of departmental policies and procedures, supervise staff, monitor performance indicators, and coordinate with other departments for effective service delivery.

The Head of Department shall also be responsible for ensuring compliance with AERB, PCPNDT, and other statutory requirements.

8.3 Radiologists

Radiologists shall function under the supervision of the Head of Department and shall be responsible for clinical aspects of imaging services.

Their responsibilities shall include reviewing imaging requests for appropriateness, supervising imaging protocols, interpreting imaging studies, generating reports, and communicating critical findings.

Radiologists shall also contribute to protocol development, quality assurance activities, and training of staff.

8.4 Radiology Technicians

Radiology Technicians shall be responsible for performing imaging procedures, patient preparation, equipment operation, and adherence to safety protocols. They shall work under the supervision of Radiologists and shall ensure that all procedures are conducted as per defined protocols and standards.

Technicians shall also be responsible for routine equipment checks, maintaining cleanliness of imaging areas, and assisting in emergency situations.

8.5 Functional Coordination

The Radiology Department shall function in coordination with other departments including Emergency, ICU, OPD, Wards, Anaesthesia, and Biomedical Engineering to ensure timely and efficient delivery of imaging services.

Clear communication channels shall be maintained to facilitate coordination, especially in urgent and emergency cases.

8.6 Supervision and Escalation

All imaging procedures shall be performed under appropriate supervision. Any deviation from standard protocols, equipment malfunction, or patient safety concern shall be immediately escalated to the Radiologist or Head of Department. Escalation pathways shall be clearly defined and communicated to all staff.

8.7 Staffing Adequacy

The department shall ensure that adequate numbers of qualified staff are available to meet the workload and service requirements, including provision for emergency services.

Staffing levels shall be periodically reviewed based on workload, service expansion, and operational requirements.

8.8 Radiation Safety Officer (RSO)

A designated Radiation Safety Officer (RSO), qualified and certified as per Atomic Energy Regulatory Board (AERB) requirements, shall be appointed for the Radiology Department. For the current scope of services, an RSO Level-I shall be designated.

The RSO shall function under the overall supervision of the Head of Department and shall be responsible for implementation and monitoring of radiation safety practices within the department.

The responsibilities of the RSO shall include ensuring compliance with AERB regulations, monitoring radiation exposure levels of staff through TLD badge reports, maintaining radiation safety records, overseeing safe use of radiation equipment, and conducting periodic radiation safety audits.

The RSO shall also be responsible for ensuring availability and proper use of radiation protective devices, conducting training and awareness programs on radiation safety, and coordinating with regulatory authorities for licensing, inspections, and reporting.

The RSO shall have the authority to intervene and stop any practice that is unsafe or non-compliant with radiation safety standards.

8.3 NABH STANDARD MAPPING

[Standard: AAC.9, OE: 1] – Diagnostic services are organized and directed

[Cross Ref: HRM.1, HRM.3, ROM.1]

9.0 ORGANIZATION STRUCTURE

The Department of Radiology and Imaging Services shall maintain a clearly defined organizational structure that reflects the hierarchy, reporting relationships, and functional responsibilities of all personnel within the department. The organizational structure shall be consistent with the roles and responsibilities defined in Section 8.0 and shall be communicated to all staff.

The organizational structure ensures appropriate clinical oversight, operational management, radiation safety governance, and technical execution of imaging services.

9.1 Departmental Organogram (Textual Representation)

The organizational structure of the department shall be as follows:

Medical Director

↓

Head of Department – Radiology & Imaging Services

↓

Radiologists

↓

Radiology Technicians

The Radiation Safety Officer (RSO) shall function as a designated safety authority within the department and shall operate under the administrative control of the Head of Department, with functional responsibility for radiation safety compliance across all imaging modalities involving ionizing radiation.

The RSO shall have an independent reporting pathway for matters related to radiation safety and regulatory compliance, and shall have the authority to escalate concerns directly to the Medical Director if required.

9.2 Functional Relationships

The Radiology Department shall maintain functional coordination with the following departments:

- Emergency Department for urgent imaging requirements
- Intensive Care Units for critically ill patients
- Anaesthesia Department for sedation and procedural support
- Biomedical Engineering Department for equipment maintenance
- Medical Records Department for documentation and record management
- Quality Department for monitoring quality indicators and audits

These functional relationships shall ensure seamless service delivery, patient safety, and compliance with hospital policies.

9.3 Governance and Reporting

All personnel shall report through defined hierarchical lines as per the organizational structure. Clinical decisions shall be overseen by Radiologists, while operational and administrative matters shall be managed by the Head of Department.

Radiation safety matters shall be overseen by the RSO, who shall monitor compliance and report deviations to the Head of Department and hospital management as required.

9.4 Display and Communication

The organizational structure shall be displayed within the department and made available to all staff. Any changes to the structure shall be communicated formally and updated in the departmental manual.

9.3 NABH STANDARD MAPPING

[Standard: AAC.9, OE: 1] – Diagnostic services are organized and directed

[Cross Ref: HRM.1, FMS.6, ROM.1]

10.0 STANDARD OPERATING PROCEDURES FOR IMAGING SERVICES

The Department of Radiology and Imaging Services shall implement standardized operating procedures for all imaging modalities to ensure safe, consistent, and high-quality service delivery. All procedures shall follow a defined workflow encompassing requisition verification, patient identification, pre-procedure assessment, execution of imaging, post-procedure care, reporting, and communication of results.

All SOPs shall be followed by trained and competent personnel under appropriate supervision, and all steps shall be documented as per defined protocols.

10.1 COMMON WORKFLOW APPLICABLE TO ALL IMAGING PROCEDURES

All imaging procedures shall follow a standardized workflow.

Upon receipt of an imaging requisition, the request shall be reviewed for completeness and clinical indication. Any ambiguity or inappropriate request shall be clarified with the treating clinician before proceeding.

Patient identification shall be verified using at least two identifiers. The patient shall be informed about the procedure, and relevant instructions shall be provided.

Pre-procedure assessment shall be conducted based on the modality, including screening for contraindications, allergy history, renal function (for contrast studies), pregnancy status, and MRI safety screening where applicable.

Where required, informed consent shall be obtained and documented prior to the procedure.

The imaging procedure shall be performed as per defined protocol using appropriate equipment settings and safety measures. Radiation protection measures shall be applied wherever applicable.

During and after the procedure, the patient shall be monitored for any adverse events. Any complication shall be managed promptly as per emergency protocols.

All images shall be reviewed by a Radiologist, and a structured report shall be generated. Critical findings shall be communicated immediately to the treating clinician and documented.

All steps of the procedure shall be recorded in appropriate registers or electronic systems.

10.2 X-RAY (FIXED AND MOBILE) SOP

X-ray examinations shall be performed based on a valid clinical requisition. The Radiology Technician shall verify patient identity and ensure correct positioning and exposure parameters.

Radiation protection measures, including use of lead aprons and shielding devices, shall be implemented. Special precautions shall be taken for pediatric patients and women of reproductive age, including pregnancy screening.

Mobile X-ray procedures shall be conducted with additional precautions to ensure safety of surrounding patients and staff, including use of portable shielding and maintaining safe distance.

Images shall be checked for quality before releasing the patient. The Radiologist shall interpret the images and generate a report.

10.3 CT SCAN SOP

All CT scan procedures shall be performed following clinical and safety protocols. Pre-procedure assessment shall include renal function evaluation and history of contrast allergy.

Informed consent shall be obtained for contrast-enhanced studies. Contrast shall be administered under supervision, and emergency drugs shall be readily available. Patients shall be monitored during and after the procedure for any adverse reactions. In case of contrast reaction, immediate management shall be initiated, including administration of antihistamines, steroids, or advanced life support as required. Images shall be reviewed by the Radiologist, and reports shall be generated within defined turnaround time. Critical findings shall be communicated immediately.

10.4 MRI SOP

MRI procedures shall require mandatory screening for contraindications including metallic implants, pacemakers, or foreign bodies.

A detailed MRI safety checklist shall be completed prior to entry into the MRI area.

Only authorized personnel and screened patients shall be allowed into the MRI zones.

Patients shall be explained the procedure, and consent shall be obtained where required. Sedation may be administered as per defined sedation policy.

Strict control of MRI safety zones shall be maintained, and only MRI-compatible equipment shall be used.

10.5 ULTRASOUND AND DOPPLER SOP

Ultrasound and Doppler studies shall be performed by qualified personnel based on clinical indication.

All ultrasound procedures shall comply with PCPNDT Act requirements. Proper documentation, including Form F where applicable, shall be maintained.

Patient preparation shall be ensured as per procedure requirement. Findings shall be documented and reported by the Radiologist.

10.6 ECHOCARDIOGRAPHY (TTE/TEE) SOP

Transthoracic echocardiography shall be performed as per standard protocols.

For transesophageal echocardiography, pre-procedure fasting shall be ensured, and informed consent shall be obtained. Sedation shall be administered as per policy, and continuous monitoring shall be ensured during the procedure.

Emergency preparedness shall be maintained for managing complications.

10.7 EMERGENCY MANAGEMENT DURING IMAGING

The department shall maintain readiness to manage emergencies such as contrast reactions, allergic reactions, vasovagal episodes, and cardiac events. Emergency drugs, crash cart, oxygen supply, and trained personnel shall be available at all times. All adverse events shall be documented and reported as per hospital incident reporting system.

10.8 DOCUMENTATION REQUIREMENTS

For each imaging procedure, the following shall be documented:

- Requisition details
- Patient identification verification
- Pre-procedure assessment findings
- Consent (where applicable)
- Procedure details
- Contrast administration details (if applicable)
- Adverse events (if any)
- Reporting and communication of findings

All records shall be maintained in PACS/RIS and patient medical records.
In case of ultrasound procedures covered under the PCPNDT Act, all mandatory documentation including Form F shall be completed accurately and in full, prior to or at the time of performing the procedure, as per statutory requirements. The responsibility for ensuring completeness and correctness of Form F shall lie with the designated Radiologist and supporting staff. All such records shall be maintained, stored, and made available for audit as per PCPNDT regulations and hospital policy.

10.3 NABH STANDARD MAPPING

[Standard: AAC.8, OE: 5] – Standardized and safe service delivery
[Standard: AAC.9, OE: 4, 5] – Diagnostic processes are defined and controlled
[Cross Ref: COP.3, MOM.1, FMS.8, IMS.2, PRE.2]

11.0 LEAD APRON VALIDATION AND RADIATION PROTECTIVE EQUIPMENT

The Department of Radiology and Imaging Services shall ensure that all radiation protective devices, including lead aprons, thyroid shields, gonadal shields, and protective barriers, are maintained in good condition and are effective in providing adequate radiation protection.

All protective equipment shall be uniquely identified and included in the department's inventory, with details such as identification number, type of equipment, location, date of procurement, and maintenance history.

11.1 Periodic Validation and Integrity Testing

All lead aprons and radiation protective devices shall undergo periodic validation to assess their integrity and effectiveness. Validation shall be carried out at least once annually, or more frequently if damage is suspected.

Validation shall be performed using appropriate methods such as fluoroscopic or radiographic examination to detect cracks, tears, or thinning of the protective material.

11.2 Acceptance and Rejection Criteria

Protective equipment shall be considered unfit for use if any defect such as cracks, holes, or significant wear compromising radiation protection is identified.

Any defective equipment shall be immediately withdrawn from use, labeled appropriately, and replaced or disposed of as per hospital policy.

11.3 Routine Inspection and Handling

In addition to periodic validation, all protective devices shall be visually inspected on a routine basis prior to use.

Proper handling and storage practices shall be followed to prevent damage, including hanging aprons on appropriate racks and avoiding folding or creasing.

11.4 Responsibility

The Radiation Safety Officer (RSO) shall be responsible for overseeing the validation and monitoring of radiation protective equipment.

Radiology Technicians shall be responsible for routine inspection prior to use and reporting any defects or concerns.

The Head of Department shall ensure availability of adequate and functional protective equipment.

11.5 Documentation and Records

The department shall maintain records of all validation and inspection activities, including:

- Inventory of protective equipment
- Validation schedule and reports
- Inspection records
- Records of defective equipment and corrective actions

All records shall be maintained in a structured and retrievable manner and shall be available for audit.

11.3 NABH STANDARD MAPPING

[Cross Ref: FMS.6, FMS.8, AAC.9 OE 5]

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12.0 QUALITY CONTROL PROGRAM IN RADIOLOGY

The Department of Radiology and Imaging Services shall establish and implement a comprehensive Quality Control (QC) program to ensure that all imaging services are performed with consistent diagnostic quality, optimal radiation dose, and reliable equipment performance.

The QC program shall encompass image quality assurance, standardization of exposure parameters, equipment quality control testing, radiation dose monitoring, and continuous performance evaluation.

The program shall be supervised by the Head of Department in coordination with the Radiation Safety Officer (RSO) and Biomedical Engineering Department.

12.1 Image Quality Assurance

The department shall ensure that all imaging studies meet defined standards of diagnostic quality. Image quality shall be evaluated based on clarity, contrast, resolution, absence of artifacts, and adequacy for clinical interpretation.

Radiologists shall review image quality as part of routine reporting and provide feedback to technical staff where improvement is required.

Periodic audits of image quality shall be conducted to ensure consistency and identify areas for improvement.

12.2 Standardization of Exposure Parameters (Ideal Exposure Values)

The department shall establish standardized imaging protocols defining optimal exposure parameters for each modality and type of examination.

For X-ray procedures, parameters such as kVp and mAs shall be defined for different anatomical regions and patient categories, including pediatric patients.

For CT procedures, standardized protocols shall include parameters such as slice thickness, pitch, and reference dose indicators including CTDI and DLP.

All exposure protocols shall be developed, reviewed, and approved by the Radiologist in consultation with the RSO and shall be periodically updated based on technological advancements and clinical requirements.

Detailed exposure parameter tables shall be maintained as controlled documents (annexures), with version control and approval records.

12.3 Radiation Dose Optimization and Monitoring

The department shall implement measures to ensure radiation exposure is kept As Low As Reasonably Achievable (ALARA) while maintaining diagnostic image quality.

Radiation dose indicators shall be monitored for applicable modalities, particularly CT, and compared against established reference levels.

Any deviation from standard dose ranges shall be reviewed, and corrective actions shall be implemented where necessary.

Dose monitoring records shall be maintained and periodically reviewed.

12.4 Equipment Quality Control (Equipment QC)

All imaging equipment shall undergo periodic quality control testing to ensure proper functioning and consistent performance.

Equipment QC shall include modality-specific tests such as:

- X-ray: output consistency, exposure reproducibility, alignment, and image uniformity
- CT: image uniformity, noise levels, slice thickness accuracy, and dose consistency
- MRI: signal uniformity, geometric accuracy, and artifact evaluation
- Ultrasound: image resolution, penetration, and probe integrity

QC testing shall be conducted at defined intervals by trained personnel or authorized service providers, and results shall be documented.

Any deviation from acceptable limits shall be addressed promptly, and equipment shall not be used for patient care until issues are resolved.

12.5 Repeat and Reject Analysis

The department shall monitor repeat imaging and rejected images to identify trends and causes such as technical errors, patient movement, or equipment issues.

Repeat rates shall be analyzed periodically, and corrective actions such as staff training or protocol modification shall be implemented.

12.6 Quality Indicators and Performance Monitoring

The QC program shall be linked with departmental quality indicators, including:

- Image repeat rate
- Equipment downtime
- Report turnaround time
- Radiation dose compliance

Performance shall be reviewed periodically, and continuous quality improvement initiatives shall be undertaken.

12.7 Roles and Responsibilities

The Head of Department shall oversee the QC program and ensure its implementation.

Radiologists shall be responsible for image quality evaluation and protocol approval. The Radiation Safety Officer shall be responsible for radiation dose monitoring and safety compliance.

The Biomedical Engineering Department shall support equipment QC and maintenance.

Radiology Technicians shall be responsible for adhering to protocols and reporting deviations.

12.8 Documentation and Records

The department shall maintain the following QC records:

- Image quality audit records
- Exposure protocol documents (controlled annexures)
- Equipment QC test reports
- Radiation dose monitoring records
- Repeat/reject analysis reports

All records shall be maintained in a structured and retrievable manner and shall be available for audit.

12.9 Peer Review of Imaging Reports (Quality Assurance Program)

The Department of Radiology and Imaging Services shall implement a structured peer review system as part of its quality assurance program to evaluate the accuracy and consistency of imaging interpretations.

Peer review shall be conducted periodically for selected imaging studies, particularly for modalities such as CT and MRI, using a defined sampling methodology. The sample size and frequency of review shall be defined by the department, with a minimum threshold established to ensure meaningful evaluation.

The peer review process shall be carried out in a structured manner by qualified Radiologists, including the Head of Department or designated peers, without compromising the integrity of the original reporting process.

Discrepancies identified during peer review shall be graded based on their clinical significance and potential impact on patient management, using a standardized scoring system such as RADPEER or an equivalent methodology.

All discrepancies shall be documented, analyzed, and discussed in departmental review meetings. Corrective and preventive actions shall be implemented based on findings, with emphasis on continuous quality improvement rather than individual fault-finding.

Records of peer review activities, discrepancy analysis, and actions taken shall be maintained and shall be available for audit.

12.3 NABH STANDARD MAPPING

[Standard: AAC.9, OE: 5, 6] – Diagnostic services are controlled and quality is monitored

[Cross Ref: PSQ.1, FMS.6,HRM.5, IMS.2]

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13.0 RADIATION AND MRI SAFETY PROGRAM

The Department of Radiology and Imaging Services shall establish and implement a comprehensive Radiation and MRI Safety Program to ensure protection of patients, staff, and the public from hazards associated with ionizing radiation and magnetic fields.

The program shall be implemented under the supervision of the Radiation Safety Officer (RSO) and shall comply with AERB guidelines, statutory regulations, and hospital safety policies.

13.1 Radiation Safety Program

The department shall ensure that all radiation-emitting equipment is operated in accordance with the principles of radiation protection, with particular emphasis on justification, optimization, and dose limitation.

Radiation exposure to patients shall be minimized by adhering to the ALARA (As Low As Reasonably Achievable) principle, while ensuring adequate image quality for diagnosis.

Radiation exposure to staff shall be monitored through the use of Thermoluminescent Dosimeter (TLD) badges, which shall be issued to all radiation workers and reviewed periodically. Any abnormal exposure shall be investigated, and corrective actions shall be implemented.

13.2 Radiation Safety Signages and Controlled Areas

All radiation areas shall be clearly demarcated and controlled as per AERB guidelines.

Appropriate radiation safety signage shall be displayed prominently at entry points and within controlled areas, including:

- Radiation warning signs
- “Controlled Area” and “Supervised Area” markings
- Pregnancy warning notices
- Entry restriction signage for unauthorized personnel

Access to radiation areas shall be restricted to authorized personnel only.

13.3 Use of Protective Devices

All personnel working in radiation areas shall use appropriate protective devices such as lead aprons, thyroid shields, and barriers.

Protective devices shall be used consistently during procedures and shall be maintained and validated as per Section 11.0.

13.4 MRI Safety Program

The department shall implement strict safety controls for MRI services due to the risks associated with strong magnetic fields.

MRI areas shall be divided into designated safety zones (Zone I to Zone IV), and access shall be controlled based on authorization and screening status.

13.5 MRI Screening and Access Control

All patients, staff, and attendants entering the MRI area shall undergo mandatory screening using a standardized checklist to identify any contraindications such as metallic implants, pacemakers, or foreign bodies.

No individual shall be allowed entry into restricted MRI zones without proper screening and clearance.

Access to MRI rooms shall be strictly controlled, and only authorized and trained personnel shall be permitted entry.

13.6 MRI Equipment and Environmental Safety

Only MRI-compatible equipment shall be used within designated MRI zones. Ferromagnetic objects shall be strictly prohibited within restricted areas.

Clear demarcation of MRI zones shall be maintained, and safety instructions shall be displayed prominently.

Emergency procedures specific to MRI, including quench situations and patient evacuation, shall be defined and communicated to staff.

13.7 Training and Awareness

All staff working in radiation and MRI areas shall undergo training on radiation protection and MRI safety protocols.

Training shall include identification of hazards, safe working practices, emergency response, and regulatory requirements.

13.8 Incident Reporting and Safety Monitoring

Any incident related to radiation exposure, MRI hazards, or safety breaches shall be reported immediately as per hospital incident reporting policy.

All incidents shall be investigated, and corrective and preventive actions shall be implemented.

13.9 Documentation and Records

The department shall maintain records related to radiation and MRI safety, including:

- TLD monitoring reports
- Radiation safety audits
- MRI screening records
- Incident reports
- Training records
-

All records shall be maintained in a structured and retrievable manner and shall be available for audit.

13.3 NABH STANDARD MAPPING

[Cross Ref: FMS.6, FMS.8, AAC.8 OE 5, AAC.9 OE 5, HRM.5]

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14.0 CONFIDENTIALITY AND PRIVACY OF RADIOLOGY INFORMATION

The Department of Radiology and Imaging Services shall ensure strict confidentiality, privacy, and security of all patient-related information, including imaging data, reports, and associated records, in accordance with hospital policies, applicable laws, and ethical standards.

All patient information shall be accessed, used, stored, and shared only for legitimate clinical, administrative, or legal purposes and shall be protected against unauthorized access, disclosure, alteration, or loss.

14.1 Role-Based Access Control (RBAC)

Access to radiology information systems, including RIS, PACS, and VNA, shall be governed by role-based access control mechanisms.

Each user shall be assigned a unique user ID and password, and access privileges shall be granted based on the user's role and responsibilities, following the principle of minimum necessary access.

Radiologists shall have access to imaging data and reporting systems required for clinical interpretation. Radiology Technicians shall have access limited to functions necessary for performing imaging procedures. Administrative staff shall have restricted access as per their functional requirements.

Unauthorized access or sharing of login credentials shall be strictly prohibited.

14.2 Data Storage and Integrity

All imaging data shall be stored in secure systems such as PACS and VNA, which shall serve as the primary repository of radiological records.

Appropriate safeguards shall be implemented to ensure data integrity, protection against unauthorized access, and prevention of data loss. Regular data backups shall be performed, and system security measures shall be maintained in coordination with the Information Technology Department.

14.3 Audit Trails and System Monitoring

All access to radiology information systems shall be logged automatically. Audit trails shall capture details of user access, modifications, and retrieval of patient data.

Audit logs shall be periodically reviewed to identify unauthorized access or suspicious activity. Any discrepancies shall be investigated, and appropriate corrective actions shall be taken.

14.4 Confidential Handling of Reports and Films

Radiology reports and films shall be handled in a manner that ensures confidentiality at all stages.

Printing of reports and films shall be carried out in controlled environments. Reports shall be handed over only to authorized individuals, including the patient, treating clinician, or authorized representatives, upon proper verification.

Care shall be taken to avoid exposure of patient information in public or unauthorized areas.

14.5 Release of Information and Medico-Legal Compliance

Radiology records shall be released only upon proper authorization and in accordance with hospital policy and legal requirements.

In medico-legal cases, records shall be preserved and released only through authorized channels, with appropriate documentation and approvals.
All releases of information shall be documented, including details of the recipient, purpose, date, and authorization.

14.6 Confidentiality Obligations of Staff

All staff shall maintain strict confidentiality of patient information as part of their professional responsibility.

Staff shall be sensitized and trained on confidentiality requirements and shall sign confidentiality agreements as per hospital policy.

Any breach of confidentiality shall be treated as a serious violation and shall be subject to disciplinary action.

14.7 Linkage with MRD Policy

All aspects of record retention, archival, retrieval, and disposal shall be governed by the hospital's Medical Records Department (MRD) policy.

The Radiology Department shall ensure compliance with MRD guidelines while maintaining modality-specific operational processes.

14.8 Information Security Incidents and Breach Management

Any breach of confidentiality, unauthorized access, or data loss shall be reported immediately through the hospital's incident reporting system.

All such incidents shall be investigated, and corrective and preventive actions shall be implemented to prevent recurrence.

14.3 NABH STANDARD MAPPING

[Standard: AAC.9, OE: 5] – Controlled diagnostic services

[Cross Ref: IMS.2, IMS.4, PRE.1, MOM.1]

15.0 DUTY SCHEDULING AND STAFF DEPLOYMENT

The Department of Radiology and Imaging Services shall ensure that adequate and qualified staff are available at all times to provide imaging services in accordance with patient care requirements.

Duty scheduling shall be planned and implemented in a structured manner to ensure continuity of services, including emergency coverage.

A duty roster shall be prepared in advance and shall clearly define staff deployment across all shifts.

15.1 Duty Roster Planning

Duty rosters shall be prepared on a monthly basis by the Head of Department or designated authority, ensuring appropriate allocation of Radiologists and Radiology Technicians based on workload, modality requirements, and service hours.

The roster shall include details of staff assigned to each shift, including morning, evening, and night shifts where applicable.

The duty roster shall be reviewed periodically and updated as required.

15.2 Radiologist Availability and On-Call System

Radiologist availability shall be ensured at all times, either through on-site presence or an established on-call system.

The on-call Radiologist shall be reachable at all times and shall be available to provide guidance, interpretation, and reporting for urgent and emergency cases.

Contact details of on-call Radiologists shall be clearly displayed and communicated to relevant departments.

15.3 Technician Coverage

Radiology Technicians shall be deployed across shifts to ensure continuous operation of imaging services.

At least one trained technician shall be available during all operational hours. Additional staffing shall be provided based on workload and modality requirements.

15.4 Shift Handover

A structured handover process shall be followed between shifts to ensure continuity of care and communication of pending tasks, critical cases, and equipment status.

Handover details shall be documented where applicable.

15.5 Backup and Contingency Planning

The department shall maintain a backup system to address staff shortages, emergencies, or unexpected workload increases.

Alternative arrangements, including calling additional staff or redistributing workload, shall be implemented to ensure uninterrupted service delivery.

15.6 Leave and Absence Management

Planned leave shall be managed in a manner that ensures adequate staffing levels at all times. Unplanned absences shall be addressed through contingency arrangements.

15.7 Documentation and Records

The department shall maintain records of:

- Duty rosters
- On-call schedules
- Attendance records
- Handover records (where applicable)

All records shall be maintained in a structured and retrievable manner and shall be available for audit.

15.3 NABH STANDARD MAPPING

[Standard: AAC.8, OE: 2] – Services are available as per patient needs

[Cross Ref: HRM.1, HRM.3]

16.0 REPORTING AND TURNAROUND TIME (TAT)

The Department of Radiology and Imaging Services shall ensure timely, accurate, and standardized reporting of all imaging studies to support clinical decision-making and continuity of care.

All imaging studies shall be interpreted by qualified Radiologists, and reports shall be generated in a structured format within defined turnaround times based on the type and urgency of the investigation.

16.1 Classification of Imaging Requests

All imaging requests shall be categorized based on clinical urgency as:

- Routine
- Urgent
- Emergency

The categorization shall guide prioritization of imaging and reporting to ensure timely availability of results.

16.2 Defined Turnaround Time (TAT)

The department shall establish defined turnaround times for reporting based on modality and urgency.

Emergency imaging studies shall be reported on priority, with immediate or near-immediate communication of findings.

Urgent cases shall be reported within a shorter defined timeframe, while routine cases shall be reported within standard departmental timelines.

The defined TAT benchmarks shall be documented, approved by the Head of Department, and periodically reviewed.

16.3 Reporting Process

All imaging studies shall be reviewed and interpreted by a Radiologist. Reports shall be prepared in a structured and standardized format, ensuring clarity, completeness, and clinical relevance.

Reports shall include patient identifiers, clinical indication, findings, impression, and recommendations where applicable.

Reports shall be made available through RIS/PACS and integrated into the patient medical record.

16.4 Critical Result Communication

Any critical, urgent, or life-threatening findings shall be communicated immediately to the treating clinician.

Communication shall be made through direct verbal communication, telephone, or other appropriate means, ensuring timely action.

All critical result communications shall be documented, including:

- Patient details
- Nature of critical finding
- Date and time of communication
- Name of clinician informed
- Name and designation of person communicating

16.5 Documentation and Traceability

All reports shall be stored in RIS/PACS and shall be retrievable at any time. Records of report generation time and communication of critical results shall be maintained to ensure traceability and audit readiness.

16.6 Monitoring of Turnaround Time

Turnaround time performance shall be monitored as part of departmental quality indicators.

Data on reporting timelines shall be collected and analyzed periodically. Delays shall be reviewed, and corrective actions shall be implemented.

16.7 Handling of Delays and Escalation

Any delay in reporting beyond defined timelines shall be identified and escalated to the Head of Department.

Appropriate corrective measures, including resource allocation or workflow modification, shall be implemented to prevent recurrence.

16.8 Report Recall and Amendment Mechanism

The Department of Radiology and Imaging Services shall establish a defined mechanism for recall, correction, and amendment of imaging reports whenever errors are identified at any stage, including pre-analytical, analytical, or post-analytical phases.

In the event of identification of an erroneous report, the department shall ensure immediate withdrawal of the incorrect report from all points of use, including clinical areas, Medical Records Department, RIS/PACS systems, and any other repositories where the report is available.

If the report has already been issued to the patient or clinician, a corrected report shall be generated and clearly communicated, with appropriate instructions to disregard the earlier report. The corrected report shall clearly indicate that it is an amended version.

All instances of report recall and amendment shall be documented, including the nature of the error, source of detection, corrective action taken, and communication details.

A root cause analysis shall be conducted for each such incident, and corrective and preventive actions shall be implemented to prevent recurrence.

Records of report amendments shall be maintained and periodically reviewed as part of the quality assurance program.

16.3 NABH STANDARD MAPPING

[Standard:AAC.8, AAC.9, OE: 4, 6] – Diagnostic services are timely and monitored

[Cross Ref: IMS.2, PSQ.1]

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17.0 QUALITY INDICATORS AND PERFORMANCE MONITORING

The Department of Radiology and Imaging Services shall establish, monitor, and review defined quality indicators to evaluate the performance, safety, and effectiveness of imaging services.

Quality indicators shall be measurable, relevant, and aligned with departmental objectives and patient care requirements. Data shall be collected, analyzed, and reviewed periodically, and appropriate corrective and preventive actions shall be implemented.

17.1 Key Quality Indicators

The department shall monitor the following key quality indicators:

17.1.1 Report Turnaround Time (TAT) Compliance

This indicator measures the percentage of imaging reports generated within the defined turnaround time.

Calculation:

Number of reports completed within defined TAT ÷ Total number of reports × 100

The department shall define target compliance levels and review performance periodically.

17.1.2 Repeat Imaging Rate

This indicator measures the proportion of imaging studies repeated due to technical errors or inadequate image quality.

Calculation:

Number of repeated imaging studies ÷ Total number of imaging studies × 100

The causes of repeat imaging shall be analyzed and corrective actions shall be implemented.

17.1.3 Contrast Reaction Rate

This indicator measures the incidence of adverse reactions related to contrast administration.

Calculation:

Number of contrast reactions ÷ Total number of contrast studies × 100

All contrast reactions shall be documented and reviewed.

17.1.4 Equipment Downtime

This indicator measures the duration of equipment non-availability due to breakdown or maintenance.

Calculation:

Total downtime hours ÷ Total operational hours × 100

Frequent breakdowns shall be analyzed, and corrective measures shall be implemented.

17.1.5 Critical Result Communication Compliance

This indicator measures the percentage of critical findings communicated within defined timelines.

Calculation:

Number of critical results communicated within defined time ÷ Total number of critical results × 100

All communications shall be documented.

17.1.6 Radiation Dose Compliance (where applicable)

This indicator measures adherence to defined radiation dose reference levels.

Calculation:

Number of studies within defined dose limits ÷ Total number of monitored studies × 100

Deviations shall be reviewed and corrective actions implemented.

17.2 Monitoring and Review

Quality indicator data shall be collected and reviewed on a monthly basis by the Head of Department and relevant team members.

Trends shall be analyzed to identify areas for improvement, and findings shall be discussed in departmental meetings.

17.3 Corrective and Preventive Actions

Based on analysis of quality indicators, corrective and preventive actions shall be implemented to address identified gaps.

Actions may include staff training, protocol revision, equipment maintenance, or process modification.

17.4 Documentation and Reporting

Records of quality indicators, analysis, and actions taken shall be maintained and shall be available for audit.

Reports may be shared with the Quality Department as per hospital policy.

17.3 NABH STANDARD MAPPING

[Standard: AAC.9, OE: 6] – Quality of diagnostic services is monitored

[Cross Ref: PSQ.1, IMS.2]

AMENDMENT HISTORY

Sl. No	Current Revision			Nature of Change
	Edition No	Revision No.	Date	
1	01	00	1 Oct 2019	First issue as per NABH Hospital Accreditation Standards – 4th Edition
2	01	01	1 Nov 2020	Minor Revisions, updating Doc No. and updating for compliance as per NABH Hospital Standards 5th Edition
3	01	01	1 Jan 2022	No changes.
4	01	02	1 Jan 2025	Amended as per the 6th Edition.

18.0 DOCUMENTATION AND RECORD MANAGEMENT IN RADIOLOGY SERVICES

The Department of Radiology and Imaging Services shall maintain comprehensive, accurate, and retrievable documentation for all activities related to imaging services. Documentation shall serve as evidence of service delivery, patient safety, regulatory compliance, and quality assurance.

All records shall be created, maintained, stored, retrieved, and disposed of in accordance with hospital policies and the Medical Records Department (MRD) guidelines.

18.1 Scope of Documentation

The department shall maintain documentation related to all stages of imaging services, including requisition, procedure, reporting, communication, quality control, safety monitoring, and equipment management.

Documentation shall be maintained in both electronic and physical formats, as applicable.

18.2 Imaging Records and Reports

All imaging studies shall be recorded and stored in RIS/PACS/VNA systems, which shall serve as the primary repository of radiological records.

Each record shall include:

- Patient identification details
- Clinical indication
- Imaging procedure performed
- Images generated
- Radiology report
- Date and time of procedure and reporting

All records shall be retrievable and protected against unauthorized access.

18.3 Registers and Logs

The department shall maintain the following registers and logs to ensure traceability and audit readiness:

- Imaging requisition records
- Report turnaround time (TAT) monitoring register
- Critical result communication register
- Contrast administration log (with batch tracking)
- Radiation dose monitoring records
- TLD monitoring records
- Equipment maintenance and QC records
- Lead apron validation records
- Incident and adverse event reports
- Training and competency records
- Peer review and discrepancy records

All registers may be maintained in electronic or physical format but shall be complete, updated, and retrievable.

18.4 Consent and Patient Safety Records

All consent forms related to imaging procedures, including CT contrast studies, MRI, and TEE, shall be documented and retained as part of the patient record.

Pre-procedure screening records, including MRI safety checklists and pregnancy screening, shall also be maintained.

18.5 Record Ownership and Responsibility

Responsibility for documentation shall be clearly defined:

- Radiologists → Reporting and interpretation records
- Technicians → Procedure and operational records
- RSO → Radiation safety records
- Biomedical Department → Equipment maintenance records
- Head of Department → Oversight and compliance

18.6 Integration with MRD

All radiology records shall be integrated with the hospital's Medical Records Department (MRD) system.

Retention, archival, retrieval, and disposal of records shall be governed by MRD policy, and the Radiology Department shall comply with all such requirements.

18.7 Record Retention and Retrieval

All records shall be retained for defined periods as per hospital policy and legal requirements.

Records shall be retrievable within a reasonable timeframe and shall be made available for clinical use, audit, or legal purposes when required.

18.8 Data Security and Confidentiality

All records shall be protected against unauthorized access, loss, or damage.

Access to records shall be controlled as per role-based access control mechanisms, and audit trails shall be maintained for electronic systems.

18.9 Audit and Review of Records

Documentation practices shall be periodically audited to ensure completeness, accuracy, and compliance with policies.

Deficiencies identified during audits shall be addressed through corrective and preventive actions.

18.3 NABH STANDARD MAPPING

[Standard: AAC.9, OE: 5] – Diagnostic services documentation maintained

[Cross Ref: IMS.2, IMS.4, PSQ.1]