

COLLEGE OF
**HEALTH
SCIENCES**



MEDICAL DIAGNOSTIC IMAGING DEPARTMENT

Medical Diagnostic Imaging Laboratories

Lab Name	Location	Person in Charge	Programs Served	Courses Served
X-ray Lab	W12-040	<ul style="list-style-type: none"> - Mawadah Mubarak - Zarmeena Noorajan - Sura Majid 	Medical Diagnostic Imaging Dept.	<ul style="list-style-type: none"> - Introduction to MDI - Patient Care and Management (2) - Skeletal Radiography - Radiographic Technique - Medical Imaging Equipment - Digital Imaging
CT/MRI Simulators and PACS lab	W12-139	<ul style="list-style-type: none"> - Mawadah Mubarak - Asma Abdi 	Medical Diagnostic Imaging Dept.	<ul style="list-style-type: none"> - Computed Tomography - Magnetic Resonance Imaging
Ultrasound and Radiographic Skills lab	M12-033	<ul style="list-style-type: none"> - Mawadah Mubarak - Zarmeena Noorajan - Wijdan Attia 	Medical Diagnostic Imaging Dept.	<ul style="list-style-type: none"> - Introduction to MDI - Patient Care and Management (2) - Skeletal Radiography - Radiographic Technique - Medical Imaging Equipment - Digital Imaging - Ultrasonography

Medical Diagnostic Lab Staff

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5	Wijdan Attia Hamad	065057587	whamad@sharjah.ac.ae

INTRODUCTION TO MEDICAL DIAGNOSTIC IMAGING LABORATORY



Location	Lab Staff in Charge	Contacts
W12-040 & M12-033	Mawadah Mubarak	065053427
	Zarmeena Noorajan	065057563
	Sura Majid	065057566
	Wijdan Attia	065057587

INTRODUCTION

This course provides the foundation for all following MDI courses. It provides an insight into the field of Medical Imaging Technology, including plain radiography, ultrasound, computerized tomography, magnetic resonance imaging and radionuclide imaging. It provides the student with an understanding of the role of diagnostic imaging in health care, and an understanding of the place of modern medical diagnostic technology within the hospital health care team.

EQUIPMENT & INSTRUMENTS

- General X-Ray Machine
- Portable X-Ray Machine
- Radiographic Image receptors
- Whole Body Phantoms with Internal Anatomy
- Automatic Film Processor
- RTI Piranha Dosimeter
- DR System
- Dosimeter

EXPERIMENTS

- Orientation to MDI Labs
- X-Ray Machine and Operating Steps
- Digital Radiography System
- X-Ray Films and Cassettes
- Automatic Film Processor

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- Imaging Accessories
 - MDI Department Workflow and patient request forms
 - Imaging Modalities
 - Basic Radiation Protection (Distance)
 - Basic Radiation Protection (Shielding)
 - Basic Radiation Protection (Time)
 - X-ray Beam Penetration
 - Effect of kVp on X-ray Quantity
 - Effect of Technical Factors on X-ray Beam Intensity and Exposure Indicator Numbers
 - Effect of kVp on Radiographic Contrast
 - Field Size Effect on Density and Contrast

PATIENT CARE AND MANAGEMENT (2) LABORATORY



Location	Lab Staff in Charge	Contacts
W12-040 & M12-033	Mawadah Mubarak	065053427
	Zarmeena Noorajan	065057563
	Sura Majid	065057566
	Wijdan Attia	065057587

INTRODUCTION

This Laboratory deals with taking care of the patient in the Medical Diagnostic Imaging Department including infection control intravenous techniques, contrast agents and basic patient care procedures common at the Radiology Department. Departmental organization and issues of practice in an imaging department are examined together with medical-legal issues and local rules on regulation governing practices.

EQUIPMENT & INSTRUMENTS


- General X-Ray Machine (DR)
- Portable X-Ray Machine
- Whole Body Phantoms with Internal Anatomy
- Hand Washing Sink
- Stretcher
- Transfer Board
- Wheelchair
- Preparation trolley
- PPE items (gowns, gloves, masks, head covers, goggles... etc.)

EXPERIMENTS

- Infection Control- Hand Washing Technique
- Infection Control- Contact Precaution Technique
- Aseptic Techniques
- Pharmacology – Interpreting Medication Leaflet

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- Patient Transfer Techniques
 - Drug Administration
 - Vital Signs

TESTS & SERVICES

- Patient contact precaution awareness.
 - Training to prevent spreading Infectious disease in Medical Imaging Section.
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RADIOGRAPHIC TECHNIQUE & SKELETAL RADIOGRAPHY LABORATORY



Location	Lab Staff in Charge	Contacts
W12-040 & M12-033	Mawadah Mubarak	065053427
	Zarmeena Noorajan	065057563
	Sura Majid	065057566
	Wijdan Attia	065057587

INTRODUCTION

Skeletal Radiography Laboratory begins the practical experience in the fundamentals of practical radiography. It develops the skills necessary for the examination of patients and for producing actual radiographs. This course provides practical experience of the theory of Skeletal Radiography.

Radiographic Technique completes the examination of the fundamentals of practical radiography. It continues development of the foundations of the skills necessary for the examination of patients, and for producing actual radiographs. This Laboratory provides practical experience for the theory of the axial skeleton and skull imaging technique.

Students build technical skills as well as confidence in practicing radiography within the laboratory setting before engaging with real patients at clinical sites.

EQUIPMENT & INSTRUMENTS

- PACS (Picture Archiving and Communication System) with Post Processing and Viewing System
- General X-Ray Machine
- General X-Ray Machine with Tomography
- Portable X-Ray Machine
- X-Ray Films and Cassettes
- Automatic Film Processor
- CR (Computed Radiography) System
- Dry Film Processor
- Whole Body Phantoms with Internal Anatomy
- Viewing Boxes

EXPERIMENTS

- Chest Radiography
- Bony Thorax Radiography
- Upper Extremities Radiography
- Lower Extremities Radiography
- Skull Radiography
- Abdomen Radiography
- Spine Radiography
- Special Procedures Radiography

TESTS & SERVICES

- Radiographic technique and Quality workshop

MEDICAL IMAGING EQUIPMENT LABORATORY



Location	Lab Staff in Charge	Contacts
W12-040 & M12-033	Mawadah Mubarak	065053427
	Zarmeena Noorajan	065057563
	Sura Majid	065057566
	Wijdan Attia	065057587

INTRODUCTION

Medical Imaging Equipment Laboratory provides laboratory experiments that demonstrate the features of X-ray radiographic systems and introduces students to the concept of quality control by performing QC procedures on the X-ray system.

EQUIPMENT & INSTRUMENTS

- General X-Ray Machine
- Portable X-Ray Machine
- CR (Computed Radiology) System
- Dry Film Processor
- Whole Body Phantoms with Internal Anatomy
- QC (Quality Control) Test Tools
- Digital Dosimeter (Piranha)
- Rad check plus
- Test stand
- Collimator test tool
- Beam alignment test tool
- Pinhole camera test stand
- 0.4 & 0.8 Aluminum filters
- Viewing Boxes

EXPERIMENTS

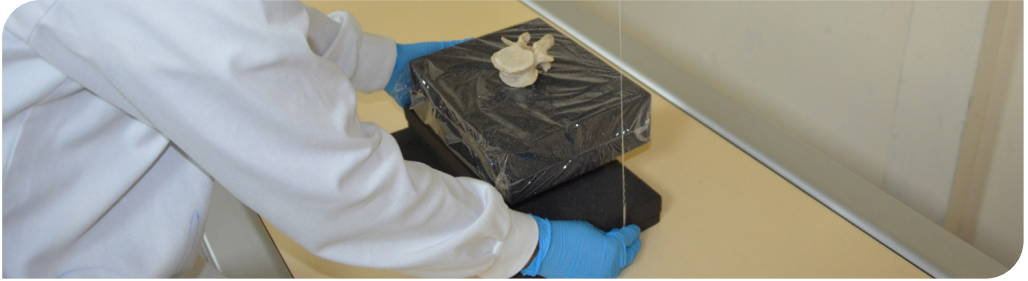
- Visual and Manual Quality Control

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- Heel Effect
 - Focal Spot Size Measurement
 - Half Value Layer Measurement
 - kVp Accuracy Test
 - Time Accuracy Test
 - Milliampere and Exposure Time Linearity and Reciprocity
 - Alignment of X-ray field and Image Receptor, and Beam Alignment Test

TESTS & SERVICES

- Quality Assurance and Quality Control Tests and Services for X-Ray Machines
- Laboratory Sessions in Quality Assurance and Quality Control Tests for Different Hospitals

DIGITAL IMAGING LABORATORY



Location	Lab Staff in Charge	Contacts
W12-040 & M12-033	Mawadah Mubarak	065053427
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	Sura Majid	065057566
	Wijdan Attia	065057587

INTRODUCTION

The Digital Imaging Laboratory introduces students to the photographic processes involved in the production of radiographs. Quality control issues are also examined. It involves practical work using the film processor and accessory equipment while applying the principles of film storage, safety and mixing in darkrooms.

The contents are designed to impart an understanding of the components, principles and operation of digital imaging systems found in diagnostic radiology. Computed Radiography, Digital Radiography and Digital Dynamic Imaging, are introduced. Guidelines for selecting exposure factors and evaluating images within a digital system assist students in bridging between film-based and digital imaging systems. Principles of quality management including quality assurance and quality control are studied and carried out in the lab.

EQUIPMENT & INSTRUMENTS

- PACS (Picture Archiving and Communication System) with Post Processing and Viewing System
- General X-Ray Machine
- X-Ray Films and Cassettes
- Automatic Film Processor
- CR (Computed Radiology) System
- DR (Digital Radiology) System
- Dry Film Processor
- Whole Body Phantoms with Internal Anatomy
- Viewing Boxes

EXPERIMENTS

- Automatic Film Processor: Component and Function
- Characteristic Curve
- Darkroom Safelight Test
- Image Artifact
- The Air Gap Technique
- The Effect of Heel Effect on Image Quality
- Field Size: Effects on Density & Contrast
- The Effect of kVp on Contrast
- Introduction to Computed Radiography
- Introduction to Digital Radiography
- The Effect of Alignment on Shape Distortion
- The Effect of Distance on Shape Distortion
- Post Processing Images

TESTS & SERVICES

- Quality Assurance and Quality Control Tests and Services for X-Ray and Tomography Machines
- Laboratory Sessions in Quality Assurance and Quality Control Tests for Different Hospitals

ULTRASONOGRAPHY LABORATORY



Location	Lab Staff in Charge	Contacts
W12-040 & M12-033	Mawadah Mubarak	065053427
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INTRODUCTION

This Laboratory provides students with basic concepts and terminology as well as scanning protocols, instrumentation and techniques for the ultrasound examination of different body parts, together with sufficient practice to enable them to play a useful role in the health system. The Laboratory prepares students so that with further study they will be ready to acquire international recognition as registered ultrasound technologists. Students practice on life-size models as well as on each other to gain the skills needed to practice Ultrasonography.

EQUIPMENT & INSTRUMENTS

- Diagnostic Ultrasound Machine
- Ultrasound Phantoms
- Ultrasound Simulator

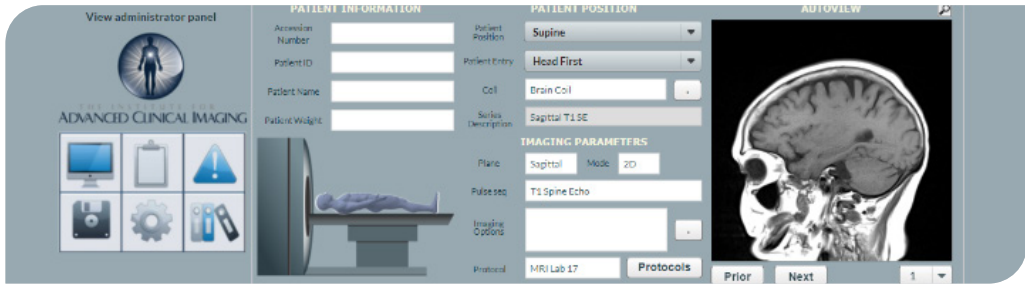
EXPERIMENTS

- Ultrasound knobology
- Transducer and image display modes
- Doppler Ultrasound
- Spleen and Pancreas Ultrasound
- Biliary System Ultrasound
- Gynecology Ultrasound
- Patient care and preparation in Ultrasound
- Image Artifact
- Liver Ultrasound
- Thyroid Ultrasound
- Renal Ultrasound
- Obstetric Ultrasound

TESTS & SERVICES

- General Ultrasound Scanning

MAGNETIC RESONANCE IMAGING LABORATORY



Location	Lab Staff in Charge	Contacts
W12-139	Mawadah Mubarak	065053427
	Asma Abdi	065057561

INTRODUCTION

The content of this course is designed to provide students with basic MRI knowledge. This course provides the physical principles of MRI, instrumentation, image formation with emphasis on pulse sequences, and image artifacts. The course also provides and demonstrates the knowledge base necessary to perform standard magnetic resonance imaging procedures. Normal anatomy and pathological conditions, contrast administration, angiography (MRA), and MRI safety will be discussed throughout the course. Among the advanced imaging procedures, functional imaging technique (fMRI), diffusion weighted imaging (DWI), and technical developments in MRI will be introduced.

EQUIPMENT & INSTRUMENTS

- MRI Simulator

EXPERIMENTS

- Brain MRI
- Cervical Spine MRI
- Lumbar Spine MRI
- Spine MRI
- Knee MRI

COMPUTED TOMOGRAPHY LABORATORY



Location	Lab Staff in Charge	Contacts
W12-139	Mawadah Mubarak	065053427
	Asma Abdi	065057561

INTRODUCTION

With the help of CT simulator software, the students will have clinical hands- on training for basic Computed Tomography clinical examinations within the classroom. This lab helps the students to understand the basic concepts related to the acquisition and scanning protocols. It will also enable the students to be introduced into a clinical scenario. Further, it helps them to understand how to screen a patient before undergoing a CT examination. With further practice and knowledge in the health care settings equip them to practice as a CT technologist.

EQUIPMENT & INSTRUMENTS

- The Simulator Software

SIMULATED TRAINING ON:

- CT Head
- CT Chest
- CT Neck
- CT Abdomen & Pelvis
- CT Lumbar Spine
- CT Wrist