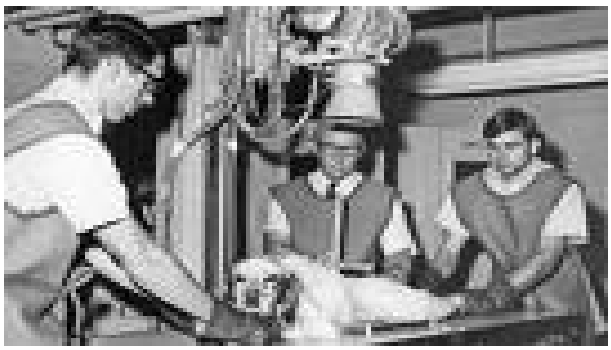
RADIODIAGNOSIS & IMGAING SERVICES STANDARD FACILITIES AND PFROESSIONAL SERVICES



DEPARTMNENT OF MEDICAL SERVICES
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Introduction

The Department of Radio Diagnosis & Imaging is well equipped to cater a variety of radiological services. Round the clock service feature serves the needs of inpatients, outpatients and outside referrals by providing the best possible and modern diagnostic facilities in main Radiology as well as in its off-campus facility. As service provider we provide vital underpinning of almost all the clinical specialties, but as experts in the field, we also have the responsibility of initiating and promoting change. Committed to quality service and following the current trend & need of time, the department is moving towards film less radiology and is now equipped with Picture Archiving and Communicating System (PACS), our general radiography procedures inclusive of different types of contrast radiography, Fluoroscopy are carried out and the Patient waiting time has minimized with the introduction of token system, Radiation dose, Report turnaround time and film rejection rate, no film loss, simultaneous viewing of images by multiple users, and increased throughput .Except for general radiology procedures, prior appointments are necessary for all the other specialized examination. General Radiography, contrast radiography and ultrasound facilities are also available for walk-in and appointed patients.

The spectrum of radiology services include:

Magnetic Resonance Imaging (M.R.I) The Department of Radio-Diagnosis & Imaging has a state-of-the-art scanner to take very high resolution pictures of body. These images give physicians important information in diagnosing the medical condition and planning a course of treatment. The new 1.5 Tesla MRI system has 16 slide with potential to do complete range of MRI applications and introducing new sequences, such as: Whole body MRI, Diffusion, Perfusion, Spectroscopy, Cardiac, Vascular and Abdominal, Pelvic and General MRI, Radio-diagnosis & Imaging offer the safest practice of sedation, where all sedations are administered by highly qualified Anesthetist with MRI compatible Anesthesia machine and monitoring equipment is a valuable imaging technique that uses a large magnet, a computer, and radio waves to look inside the body and to evaluate various body parts, such as the brain, neck, spine, abdomen, etc. It is can also be used to evaluate many blood vessel disorders by using special non-invasive imaging techniques known as MRA, Magnetic Resonance Angiography. This allows Radiologists to see inside some areas of the body which cannot be seen using conventional x-rays.

Ultrasound: Equipped with 6 full function high end units, other than routine procedures it provides services of Color Doppler for both arterial and venous vessels, transvaginal and prostate ultrasounds. Facilitates interventional procedures like FNA's, Diagnostic and Therapeutic Aspiration and Taps, Trucut biopsies are available. Ultrasonography is a medical imaging technique that uses high frequency sound waves and their echoes. It is a simple, safe, painless diagnostic procedure. Ultrasound has been used in a variety of clinical settings, including obstetrics and gynecology, cardiology and cancer detection. Ultrasound can capture moving images of pelvic & abdominal function, the male reproductive system, the kidney and (including gallstones), and fetal development breast abnormalities thyroid systems, among other applications. When enhanced with a special Doppler technique, ultrasound can also capture moving blood images of the heart, large and small blood vessels.

Fluoroscopy: Procedures are done on two machines. Fluoroscopy procedure includes Barium studies, Sialogram, Myelogram, Sinogram, MCUG, and Hysterosalpingogram, Venography etc.

Computerized Tomography (C.T Scan): CT scan section is equipped with General Electric's CT i/Pro. takes less than two minutes for a brain scan. It can examine body in arterial and venous phases. This machine is supported with a powerful windows advantage work station with unique software's, like one for making 3D images of facial bones, spine and other parts of skeleton, 3D reconstruction of face etc. It also performs Non invasive CT angiographies which are very easy to perform without use of long catheters, wires, big needles etc. A CT scan allows the radiologist to see the location, nature, and extent of many different diseases or abnormalities within the body. We can also provide images on CD (compact disks), which can be run on dicom compatible software. Images are also printed on a high quality Laser imager.

Department of Radio-Diagnosis & Imaging gives prime importance to the quality and patient care, and always uses safest intravenous

contrast media (Non Ionic contrast) which has less side effects as compared to the Ionic.

Mission of Radiological services in Bhutan

Our mission is to provide cutting edge radiology services to the people of Bhutan, serve as a destination site for medical diagnosis & imaging services, and educate the next generation of leaders in diagnosis & imaging science and its applications. We are a state-wide department providing all types of diagnostic & imaging services as well as a large number of rural sites ranging from the all parts of Bhutan. Radiological service is the most prevalent and yet unmet diagnostic health care services need of Bhutanese people at large and general in public. To respond to unmet needs, and improve diagnostic service in the country, radiology professional should be able to evaluate, priorities, delegate and co-ordinate working tasks in relation to the completion of a diagnostic program based on a professional evolution. As a member of the diagnostic professional the main policy for radiology services are mainly

- To improve quality of radiological services in country with specialized diagnostic & imaging services rendered
- To maintain all district hospitals with diagnosis & imaging services
- To follow the International Commission of Radiological Protection to patient to maintain optimization of radiation dose.
- Periodic up-gradation of professional skills through training, seminars, conferences CME, held within and outside country in line with BMHC rules and regulation for renewal of registration
- To understands the significance of radiological services within the health system and to develop an ability to think critically and constructively in relation to his/ her work and the tasks and field of responsibility involved
- Equip all the Radiology units conforming to latest technology
- Increase number of radiologists in the country
- Radiological act and Regulation to be formulated at its earliest
- To develop a critical view of ionizing radiation as a phenomenon and to make qualified decisions hereon based on professional and ethical consideration
- Radiological Association of Bhutan and Radiographer Association of Bhutan to be formed
- Re-affirm and widen the scope pf cost sharing for financial sustainability
- Crete separate Radio-Diagnosis & Imaging programme headed by Head of the Radiology Department

Radiology Professional Services Carrier enhancement

The Radiology profession is concerned with services to people and to their individual needs. In order to serve people effectively, the individual cannot be separated from cultural, customs and social pattern from which he is a product. It is important that the radiology professional to understand their role as members of the health care team as well as the role of the other health care professionals. The radiology profession should have broad knowledge of science, skills and high level of hand dexterity to develop attitudes appropriate for effective performance of the professional role. Nature of work of radiology profession is very stressful manually and mentally as all vital structures are in whole body , radiology profession are highly exposed to radiation hazards, chemicals of developer and fixer and other infectious diseases as they are in directly contact with blood while performing contrast media examination. The radiology profession work also involves entails standing, eye strain and continues stress and strain. The job involves physical and verbal abuse by the attendants pf the patients. (Extreme risk of radiation hazards can cause damage to the central nervous system syndrome, skin erythema, cancer and leukemia, eye cataracts and genetic effect)
The radiology profession are given I month radiation leave as per International Radiological Society.

Subject / syllabus covered in under Diploma course & Certificate course of Medical Radio-Diagnosis & Imaging taught during first 2-3 years of training, as under: (For certificate course up to 4^{th} Semester)

1st Semester

- Introduction to health services
- Anatomy & physiology
- Food & Nutrition
- Pharmacologic
- First Aid
- Microbiology

2nd Semester

Film processing

- Conventional Radiography part I
- General physics
- Clinical conventional radiography part I
- Radiography Anatomy

3rd Semester

- Conventional Radiography part II
- Radiation physics
- Radiation hazards & protection
- Clinical conventional radiography part II

4th Semester

- Contrast Radiography Part I
- Clinical contrast radiography part I
- Conventional Radiography part III
- Ultrasound
- Clinical ultrasound

5th Semester

CT.scan anatomy
CT.sacn physics
CT.Scan procedure
MRI physics
MRI anatomy

6th Semester

- CT.Scan Angiography
- MRI Angiography
- 3D MRI procedure

The course programme is planned in accordance with the key activities radiography that combines theoretical and clinical studies, knowledge of health science, humanities and social science.

The radiology profession will acquire and develop theoretical and clinical skills within central spheres of radiography, qualification them to practice radiography independently, ethically and flexibly in accordance with technological, scientific, organizational and social development both nationally and internationally.

The minimum duration of training for Diploma and certificate in Medical Radio-Diagnostic & Imaging is 2-3 years plus 6 months of internship,

For the Degree course the minimum duration is 4 years.

Radiographer

The Radiographer (X-Ray technician) play a very vital role in delivering diagnostic as well as preventive radiological services at the grass root level. They also responsible for carrying out the advance diagnostic treatment using latest technology like, ultrasound, CT.Scan, MRI and computed Radiography. The nature of work and the work environment carries risks ranging from deadly radiation hazard. The Radiographer also carry out the diagnostic procedure like contrast media examination independently. The radiographer also administrate human, material and economic resources and make qualified decision in relation to examination and courses of treatment based on professional and ethical consideration.

Note: Some Sr. Radiographers has been trained in specialized technology field in CT Scan, MRI, Ultrasound and computed radiography so, they play vital role in delivering advance diagnostic services same like Diploma, degree radiographer.

Darkroom Assistant

Entry qualification class 12 through RCSC.6 months basic training in the department. The Darkroom Assistant also play a very vital role in processing exposed film in the Department of Radio-Diagnosis & imaging using Automatic film processor, The Darkroom assistant also maintain the Film processing room, maintain the stock ledger of x-ray films, prepare film processing chemicals under desirable condition. The Darkroom assistant will also cross check the quality of films, chemicals.

After 4 years of working experience Darkroom assistant is enrolled to radiographer course.

Radiographer Career Ladder (Certificate)

Entry qualification : 12+in science and 2 years training in RIHS

Duration of promotion

Stage 1	Junior Radiographer (S2)
Stage 2	Radiographer (S1)
Stage 3	Sr. Radiographer (P5)

Junior Radiographer: (S2)

Major Occupational Group: **Medical Services Group**

Sub-Group: **Medical Diagnostic group**

PURPOSE, DUTIES AND RESPONSIBILITIES

Propose: Conduct conventional Radiography procedure and investigation for diagnosis and effective management of disease condition

Duties and Responsibilities

- Maintenance of x-ray processing room, cleaning of x-ray cassettes and change of solution
- Maintaining of level, temperature of solution, film loading, unloading and processing all sorts of exposed films
- Assist senior radiographer in carrying out the specialized diagnosis procedures
- Carrying out the basic radiography procedures, preparation of emergency trolley.
- Provide first Aids and emergency care to the patients
- Promotes health and hygiene of the patients
- Does emergency duty beyond office hours, when ever necessary
- Annual indenting, submits monthly reports and annual reports to the
- concerned Dzongkhag

Radiographer: (S1)

Major Occupational Group: **Medical Services Group**

Sub-Group: **Medical Diagnostic group**

PURPOSE, DUTIES AND RESPONSIBILITIES

Purpose: Conduct basic Radiological procedures, basic ultrasound investigation for diagnosis and effective management of disease condition

Duties and Responsibilities

- Maintenance of x-ray processing room, cleaning of x-ray cassettes and change of solution
- Maintaining of level, temperature of solution, film loading, unloading and processing all sorts of exposed films
- Assist senior radiographer in carrying out the specialized diagnosis procedures
- Carrying out the basic radiography procedures, preparation of emergency trolley.
- Carrying of routine barium meal studies.
- Give appointment date to specialized contrast examination
- Carrying of basic ultrasound diagnosis and give finding.
- Provide first Aids and emergency care to the patients
- Promotes health and hygiene of the patients
- Does emergency duty beyond office hours, when ever necessary
- Annual indenting, submits monthly reports and annual reports to the concerned Dzongkhag

Senior Radiographer: (P5A)

Major Occupational Group: **Medical Services Group**

Sub-Group: **Medical Diagnostic group**

PURPOSE, DUTIES AND RESPONSIBILITIES

Purpose: Carrying out computed radiography & advance Radiological & Imaging, specialized contrast examination like IVU, HSG. Conduct basic CT.Scan, basic MRI and ultrasound procedures and investigation for diagnosis and effective management of diseases condition. Manages the technical unit in Regional Referral hospital. Involves in administration and technical matter in the unit and teaching to radiographer students.

Duties and Responsibilities

- Carrying out the basic radiography procedures, preparation of emergency
- trolley.
- Carrying of routine barium meal studies.
- Give appointment date to specialized contrast examination
- Carrying of HBS and reproductive ultrasound and give finding of the disease
- Carrying out of intravenous Urography examination and reproductive examination.
- Carrying of basic CT.Scan, basic MRI procedures
- Carrying of computed radiography examination
- Organizes and conduct training programme of Radiographer students under
- Supervision of HOD
- Teaches GNM students on patient's preparation for contrast and ultrasound examinations.
- Gets involved in technical activities as well as radiology unit in absence of HOD
- Provide first Aids and emergency care to the patients

- Promotes health and hygiene of the patients
- Does emergency duty beyond office hours, when ever necessary
- Annual indenting, submits monthly reports and annual reports to the
- concerned Dzongkhag and Ministry.

Diploma (1 year)

Stage: Junior technical Officer (Radiographer) (P4)

Entry qualification : Diploma in Medical Radio-Diagnosis & Imaging Technology (12+ in science and 3 years from institute recognized by BMHC.

Duration of promotion every 4 yrs

Stage 1 Junior Technical Officer(Radiographer) (P4)

Stage 2 Senior Technical Officer (Radiographer) (P3)

Stage 3 Chief Technical Officer (Radiographer) (P2)

Junior Technical Officer (Radiographer**)** (P4)

Major Occupational Group: **Medical Services Group**

Sub-Group: **Medical Diagnostic group**

PURPOSE, DUTIES AND RESPONSIBILITIES

Purpose: Conduct FNAC guided ultrasound investigation and colour Doppler investigation. Conduct all types of specialized contrast media examinations using computed radiography and CT.Scan, MRI for diagnosis and effective management of disease conditions and manages the technical unit of a 100 bedded district hospital.

Duties and Responsibilities

- Conducts all sorts of Radiography examination using conventional and digital radiography
- Performs CT.Scan & MRI procedures using contrast media for diagnosis and effective treatment.
- Teaches radiographer students and guide the junior radiographer in their day to day work.
- Performs advance specialized contrast media examinations like, sinogram, Fistulogram, Reproductive system, salivary gland, Venography system under the supervision of Radiologist.
- Performs specialized ultrasound examination of Color Doppler, Echo/ Neonatal
- FNAC guided ultrasound and gives report.
- Monitor the records and report of all activities carried out in relation of their profession are maintained and submitted to Dzongkhag / Ministry.
- Get involves in installation of X-Ray machine in the country
- Get involved in selection of equipment and other accessories

- Provide first Aids and emergency care to the patients
- Promotes health and hygiene of the patients
- Does emergency duty beyond office hours, when ever necessary

Senior Technical Officer (Radiographer) (P3)

Major Occupational Group: **Medical Services Group**

Sub-Group: **Medical Diagnostic group**

PURPOSE, DUTIES AND RESPONSIBILITIES

Purpose: Conduct FNAC guided ultrasound investigation and colour Doppler investigation. Conduct all types of specialized contrast media examinations using computed radiography and CT.Scan, MRI for diagnosis and effective management of disease conditions and manages the technical unit of a 350 bedded national referral Hospital / regional referral hospital.

Duties and responsibilities

- Conducts all sorts of Radiography examination using conventional and digital radiography
- Performs CT.Scan & MRI procedures using contrast media for diagnosis and effective treatment.
- Teaches radiographer students and guide the junior radiographer in their day to day work.
- Performs advance specialized contrast media examinations like, sinogram, Fistulogram, Reproductive system, salivary gland, Venography system under the supervision of Radiologist.
- Performs specialized ultrasound examination of Color Doppler, Echo/ Neonatal
- FNAC guided ultrasound and gives report.
- Monitor the records and report of all activities carried out in relation of their profession are maintained and submitted to Dzongkhag / Ministry.
- Gets involved in technical activities as well as radiology unit in absence of HOD
- Get involves in installation of X-Ray machine in the country
- Get involved in selection of equipment and other accessories
- Provide first Aids and emergency care to the patients
- Promotes health and hygiene of the patients

- Does emergency duty beyond office hours, when ever necessary

- **Chief technical Officer** (Radiographer) (P2)

Major Occupational Group: **Medical Services Group**

Sub-Group: **Medical Diagnostic group**

PURPOSE, DUTIES AND RESPONSIBILITIES

Purpose: Conduct FNAC guided ultrasound investigation and colour Doppler investigation. Conduct all types of specialized contrast media examinations using computed radiography and CT.Scan, MRI for diagnosis and effective management of disease conditions and manages the technical unit of a 500-2500 bedded hospital. Involves in administration and technical matter in the unit and teaching to radiographer students.

Duties and responsibilities

- Conducts all sorts of Radiography examination using conventional and digital radiography
- Performs CT.Scan & MRI procedures using contrast media for diagnosis and effective treatment.
- Teaches radiographer students and guide the junior radiographer in their day to day work.
- Performs advance specialized contrast media examinations like, sinogram, Fistulogram, Reproductive system, salivary gland, Venography system under the supervision of Radiologist.
- Performs specialized ultrasound examination of Color Doppler, Echo/ Neonatal
- FNAC guided ultrasound and gives report.
- Monitor the records and report of all activities carried out in relation of their profession are maintained and submitted to Dzongkhag / Ministry.
- Gets involved in technical activities as well as radiology unit in absence of HOD
- Get involves in installation of X-Ray machine in the country
- Get involved in selection of equipment and other accessories
- Provide first Aids and emergency care to the patients
- Promotes health and hygiene of the patients
- Does emergency duty beyond office hours, when ever necessary

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