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VEER NARMAD SOUTH GUJARAT UNIVERSITY
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ક્રમાંક:એકે/પરિપત્ર/૯૨૭૦/૨૦૨૧

તા.૦૫/૦૭/૨૦૨૧

પ્રતિશ્રી,
ડીનશ્રી,
રેડીયોલોજી વિભાગ,
સ્મીમેર મેડીકલ કોલેજ, સુરત.

વિષય:- ફેલોશીપ તેમજ રેડીયો ઈમેજીંગ ટેકનીશીયનો સર્ટીફિકેટ કોર્સ ચાલુ કરવા બાબત.

સુજશ્રી,

સવિનય જણાવવાનું કે, શૈક્ષણિક વર્ષ ૨૦૨૧૦૨૨ થી સ્મીમેર મેડીકલ કોલેજના રેડીયોલોજી વિભાગ ખાતે ફેલોશીપ તેમજ રેડીયો ઈમેજીંગ ટેકનીશીયનો સર્ટીફિકેટ કોર્સ ચાલુ કરવાની સુરત મ્યુનિસિપલ કોર્પોરેશનની સામાન્ય સભામાં સૈદ્ધાંતિક મંજૂરી આપવામાં આવી હોઈ ફેલોશીપ તેમજ રેડીયો ઈમેજીંગ ટેકનીશીયનનો સર્ટીફિકેટ કોર્સના નીચે મુજબનાં અભ્યાસક્રમ જનરલ મેડીસીન વિષયની અભ્યાસસમિતિ ની તા.૧૦/૧૨/૨૦૨૦ ની સભાનાં ઠરાવ ક્રમાંક: ૨ થી મંજૂર કરી તબીબી વિદ્યાશાખાને ભલામણ કરેલ જે તબીબી વિદ્યાશાખાનાં કાર્યકારી અધ્યક્ષશ્રીએ વિદ્યાશાખાની મંજૂરીની અપેક્ષાએ વિદ્યાશાખા વતી મંજૂર કરી એકેડેમિક કાઉન્સિલને કરેલ ભલામણ એકેડેમિક કાઉન્સિલે તેની તા.૦૮/૦૩/૨૦૨૧ ની સભાનાં ઠરાવ ક્રમાંક: ૭ અન્વયે નીચે મુજબ સિન્ડિકેટને ભલામણ કરેલ જે સિન્ડિકેટે તેની તા.૧૨/૦૩/૨૦૨૧ ની સભાનાં ઠરાવ ક્રમાંક: ૮૬ થી મંજૂર કરેલ પરંતુ Fellowship in pediatric Radiology (General) ના નામાભીધાન અંગે વિચારણા કરતા એકેડેમિક કાઉન્સિલ તા.૧૨/૦૬/૨૦૨૧ ની સભાનાં ઠરાવ ક્રમાંક: ૦૨ થી અને સિન્ડિકેટ તા.૨૪/૦૬/૨૦૨૧ ની ઠરાવ ક્રમાંક:૦૨ થી નીચે મુજબ સ્વીકાર કરેલ છે. તેની જાણ સંબંધકર્તા શિક્ષકો અને વિદ્યાર્થીઓને કરવી, તદ્ઉપરાંત તેનો અમલ કરવો.

એકેડેમિક કાઉન્સિલની તા.૦૮/૦૩/૨૦૨૧ ની સભાનાં ઠરાવ ક્રમાંક: ૭

:: આથી ઠરાવવામાં આવે છે કે, સ્મીમેર મેડીકલ કોલેજના રેડીયોલોજી વિભાગ ખાતે ફેલોશીપ તેમજ રેડીયો ઈમેજીંગ ટેકનીશીયનો સર્ટીફિકેટ કોર્સ ચાલુ કરવાની સુરત મ્યુનિસિપલ કોર્પોરેશનની સામાન્ય સભામાં સૈદ્ધાંતિક મંજૂરી આપવામાં આવી હોઈ ફેલોશીપ તેમજ રેડીયો ઈમેજીંગ ટેકનીશીયનનો સર્ટીફિકેટ કોર્સના નીચે મુજબનાં અભ્યાસક્રમ જનરલ મેડીસીન વિષયની અભ્યાસસમિતિની તા.૧૦/૧૨/૨૦૨૦ની સભાનાં ઠરાવ ક્રમાંક: ૨ થી મંજૂર કરી તબીબી વિદ્યાશાખાને ભલામણ કરેલ જે તબીબી વિદ્યાશાખાનાં કાર્યકારી અધ્યક્ષશ્રીએ તબીબી વિદ્યાશાખાની મંજૂરીની અપેક્ષાએ સ્વીકારી એકેડેમિક કાઉન્સિલને કરેલ ભલામણ મંજૂર કરવામાં આવે છે અને તે અંગે સિન્ડિકેટને ભલામણ કરવામાં આવે છે.

Sr. no	Name of the Fellowship	Duration	Course fee	Stipend	Eligibility
1	Fellowship in Women's Imaging	1 years	1.5 lacs per annum	40000p.m	M.D/DNB/DMRD
2	Fellowship in pediatric	1 years	1.5 lacs per annum	40000p.m	M.D/DNB/DMRD

3	Fellowship in intervention Radiology	1 years	1.5 lacs per annum	40000p.m	M.D/DNB/DMRD
4	X-RAY,USG, CT-Scan,MRI Technician (Radio Imaging Technician)	2 year	1.3 lacs per 2 years	No.	B.sc physics / chemistry/ Biology/ Bio Technology

સિન્ડિકેટની તા.૧૨/૦૫/૨૦૨૧ની સભાનાં ઠરાવ ક્રમાંક:૮૬

:: આથી ઠરાવવામાં આવે છે. કે, સ્મીમેર મેડીકલ કોલેજના રેડિયોલોજી વિભાગ ખાતે ફેલોશીપ તેમજ રેડિયો ઈમેજીંગ ટેકનીશીયનો સર્ટીફિકેટ કોર્સ ચાલુ કરવાની સુરત મ્યુનિસિપલ કોર્પોરેશનની સામાન્ય સભામાં સૈધ્ધાંતિક મંજૂરી આપવામાં આવી હોઈ ફેલોશીપ તેમજ રેડિયો ઈમેજીંગ ટેકનીશીયનનો સર્ટીફિકેટ કોર્સના ઉપરોક્ત મુજબનાં અભ્યાસક્રમ જનરલ મેડીસીન વિષયની અભ્યાસસમિતિની તા.૧૦/૧૨/૨૦૨૦ની સભાનાં ઠરાવ ક્રમાંક: ૨ થી મંજૂર કરી તબીબી વિદ્યાશાખાને ભલામણ કરેલ જે તબીબી વિદ્યાશાખાનાં કાર્યકારી અધ્યક્ષશ્રીએ વિદ્યાશાખાની મંજૂરીની અપેક્ષાએ વિદ્યાશાખા વતી મંજૂર કરી એકેડેમિક કાઉન્સિલને કરેલ ભલામણ એકેડેમિક કાઉન્સિલે તેની તા.૦૮/૦૩/૨૦૨૧ ની સભાનાં ઠરાવ ક્રમાંક: ૭ અન્વયે ઉપરોક્ત મુજબ સિન્ડિકેટને ભલામણ કરેલ છે જે ભલામણ મંજૂર કરવી.

એકેડેમિક કાઉન્સિલની તા.૧૨/૦૬/૨૦૨૧ ની સભાનાં ઠરાવ ક્રમાંક: ૨


:: આથી ઠરાવવામાં આવે છે કે, સિન્ડિકેટની તેની તા.૧૨/૦૩/૨૦૨૧ ની સભાનાં ઠરાવ ક્રમાંક: ૮૬ અન્વયે મંજૂર કરેલ અભ્યાસક્રમમાં BOS ના ચેરમેનશ્રીએ તા.૨૦/૦૫/૨૦૨૧ ના રોજ ઈ-મેલ થી મોકલેલ નીચે મુજબનું નામ સ્વીકારી તે મુજબ મંજૂર કરવા સિન્ડિકેટને ભલામણ કરવામાં આવે છે.

Fellowship in pediatric Radiology (General)

સિન્ડિકેટની તા.૨૪/૦૬/૨૦૨૧ની સભાનાં ઠરાવ ક્રમાંક: ૨

:: આથી ઠરાવવામાં આવે છે કે, Fellowship in pediatric Radiology (General) ના નામાભીધાન અંગે વિચારણા કરવા એકેડેમિક કાઉન્સિલની સભા તા.૧૨/૦૬/૨૦૨૧ ના ઠરાવ ક્રમાંક: ૨થી કરેલ ભલામણનો યથાવત સ્વીકાર કરવો.

ભિડાણ: ઉપર મુજબ


ઈ.યા.કુલસચિવ

પ્રતિ,

- ૧) ડીનશ્રી, તબીબી વિદ્યાશાખા,
૨. પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી, સુરત.
૩. અનુસ્નાતક વિભાગ, વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી, સુરત.

Mona madam

સાંસ્કૃતિક શિક્ષણ ના 06/03/2029

બાબત: ૭ વિગત: ૩

સિદ્ધિ એ. ૧૨/૦૩/૨૦૨૯

બાબત: (વિગત)

Certificate: Pediatric General Radiology Fellowship

Location-Department of Radiodiagnosis, SMIMER
Awardee- Veer Narmad South Gujarat University

Program Highlights:-

DEFINITION OF GENERAL PEDIATRIC RADIOLOGY

General pediatric radiology is the organ/system-based subspecialty of Diagnostic Radiology dedicated to diagnosis of disorders and diseases in children utilizing different imaging techniques.

Goal -

On completion of training, the fellow is expected to be a competent specialist in Pediatric Radiology capable of assuming a consultant's role in the specialty. - The fellow must acquire a working knowledge of the theoretical basis of the specialty, including its foundations in the basic medical sciences and research. - Fellows must demonstrate the requisite knowledge, skills, and attitudes for effective patient-centered care and service to a diverse population. In all aspects of specialist practice, the graduate must be able to address issues of gender, sexual orientation, age, culture, ethnicity and ethics in a professional manner.

1. A 1 year comprehensive and well-balanced training program encompassing all of the basic and advanced clinical areas of pediatric imaging.
2. Training in Pediatric x-ray, procedures, colour Doppler, ultrasound, T.C.D., CT,MRI and nonvascular intervention.
3. Modular Fellowship course format
4. The fellow receives "hands-on" experience at the workstation as well as through active procedure services with image-guided aspirations and biopsies.
5. The fellow will be exposed to large number of pediatric patient work flow Fellows fully participate in all aspects of clinical services, with frequent contact with our referring physicians; will work side by side with nationally acclaimed academic radiologists, and will interact with renowned clinicians.

Eligibility

MD/DNB/DMRDRadiodiagnosis

Duration of Course

1 Year

Selection

Merit based - 2 step selection

ફેલોશિપ સર્ટિફિકેટ અંગે
નોંધ લેવાનું મનાવ્યું

P. Shandhan
18/1/2029

Step-1 VNSGU will conduct entrance test in similar manner as fetal medicine fellowship in GMC, surat. (100 MCQ test)

Step-2 VNSGU will call for interview & counseling test of these candidates and according to their knowledge, aptitude and interest in one of these three proposed courses admission will be given as per merit list .

Documents to be submitted by students

1. Birth Certificate/ proof of date of birth.
2. Four passport size photographs
3. Copy of the MCI Registration Certificate of MBBS/MD/ Others
4. Copy of Mark sheets and Degree Certificate of MBBS/MD/ Others
5. Experience Certificate /s
6. PAN Card
7. Adharcard

Course Syllabus

TRAINING SPECIFIC OBJECTIVES

A- X-RAY AND SPECIAL INVESTIGATIONS(Fluoroscopic studies of the neonatal and pediatric patient)

- 1) Review and interpret pediatric X-RAYS examinations on a daily basis
- 2) Demonstrate use of the different pediatric imaging techniques and methods
- 3) Identify patients that may require sedation and list indications and contraindications
- 4) Risk factors – contrast agents, radiation

B-Ultrasonography and Colour Doppler

- 1) Neonatal brain ,Ultrasonography of the neonatal and pediatric neck,
- 2) Ultrasonography of chest, abdomen, pelvis, musculoskeletal system, small parts and vascular system
- 3) Trans cranial Doppler study in child with sickle cell anemia- ICMR Project

C- CT and MRI of the Brain, neck, chest, abdomen, pelvis, and musculoskeletal systems, with sequences adapted to the pediatric patient

-Imaging protocols adapted to the neonate, young child and older child

- Recognize and differentiate normal from abnormal imaging findings in a variety of pediatric diseases of Brain, neck, chest, abdomen, musculoskeletal system, vascular system and neonatal brain.

Central Nervous System-

-List the main clinical findings and management

-The neonatal and infant brain-Normal development in premature and term neonates and infants - Hypoxic-ischemic encephalopathy

-Neonatal intracranial hemorrhage

Congenital anomalies of the brain and Genetic syndromes in children:

Intracranial infections

Intracranial S.O.L.-Neurofibromatosis ,Tuberous sclerosis complex, hemihypertrophy syndromes Osteochondrodysplasias, ,Tumors of the face, skull and brain

Trauma in children: Bony and visceral trauma in infants, including non-accidental trauma

Stroke -Thrombosis of the venous and arterial systems,Vascular anomalies

Pediatric Neck-

Tumors of the neck (Vascular and nonvascular)

Infection and Lymphadenopathy

Thyroid Gland

Salivary glands

Pediatric Chest-

Hyaline Membrane disease

Infections of the chest,

Pediatric cardiovascular disease/ Congenital and Acquired cardiovascular disease

Mediastinal and pleural pathology

Congenital lung malformations

Parenchymal and airways disease of the lungs

Bony and visceral trauma in children

Tumors: Tumors of the chest /chest wall/pleura/mediastinum/lung

- Recognize and differentiate normal from abnormal imaging findings in a variety of pediatric diseases of Brain, neck, chest, abdomen, musculoskeletal system, vascular system and neonatal brain.

Central Nervous System-

-List the main clinical findings and management

-The neonatal and infant brain-Normal development in premature and term neonates and infants - Hypoxic-ischemic encephalopathy

-Neonatal intracranial hemorrhage

Congenital anomalies of the brain and Genetic syndromes in children:

Intracranial infections

Intracranial S.O.L.-Neurofibromatosis ,Tuberous sclerosis complex, hemihypertrophy syndromes Osteochondrodysplasias, ,Tumors of the face, skull and brain

Trauma in children: Bony and visceral trauma in infants, including non-accidental trauma

Stroke -Thrombosis of the venous and arterial systems,Vascular anomalies

Pediatric Neck-

Tumors of the neck (Vascular and nonvascular)

Infection and Lymphadenopathy

Thyroid Gland

Salivary glands

Pediatric Chest-

Hyaline Membrane disease

Infections of the chest,

Pediatric cardiovascular disease/ Congenital and Acquired cardiovascular disease

Mediastinal and pleural pathology

Congenital lung malformations

Parenchymal and airways disease of the lungs

Bony and visceral trauma in children

Tumors: Tumors of the chest /chest wall/pleura/mediastinum/lung

Pediatric Abdomen-

Tumors of the abdomen and pelvis

Infections of abdomen, pelvis and musculoskeletal system

Hemolytic and Vascular disorders in children.

Pediatric genitourinary system

Congenital malformations of kidney, bladder, genital tract, and pelvis Vesicoureteral reflux
Hydronephrosis , Renal transplantation , Adnexal torsion , Acute scrotum ,Adrenal pathologies

Pediatric hepatobiliary system, pancreas and spleen: Parenchymal liver disease ,Congenital and
acquired biliary tract disorders ,Liver transplantation ,Pancreatic disorders ,splenic lesions

Pediatric gastrointestinal tract: Congenital malformations, including malrotation and atresias

Hirschsprung disease ,Meconium ileus: diagnosis and treatment, Pyloric stenosis ,Intussusception
diagnosis and treatment Appendicitis , NEC,Worms , Gastroesophageal reflux ,Bowel obstruction
Swallowing disorders ,Placement of enteric feeding catheters

Pediatric musculoskeletal system:

Congenital bony dysplasia and Developmental dysplasia of Hip

Metabolic bone disease

Osteochondroses

Alignment disorders

Bone marrow anomalies

Tumors of the musculoskeletal system

Bone age Determination

Interventional Radiology-

To assist interventional Radiologist and faculty members in doing various image guided vascular and nonvascular interventional procedures, Radiofrequency Ablation, Laser ablation etc. in pediatric patients.

Competence and General Strategy of Learning-

- Initially look at studies, provide a preliminary report and then review case material with the attending radiologist daily .

Generate and sign off an official report for those cases after staff review .

Arrange and interpret emergency cases .

Prescribe protocols and interpret CT, MRI examinations;

Perform and interpret ultrasound, radiographic and fluoroscopic studies .

Identify appropriateness of examination requests and make decisions as to the most appropriate imaging test for each situation.

Act as a consultant and provide stat verbal reports for the clinicians .

Provide night and weekend on-call coverage for imaging cases, including preliminary reports for emergent body studies (radiographs, CTs, MRIs, ultrasounds, fluoroscopic studies) after hours with supervision of attending staff in a system of delegated and graded responsibility

For intussusception reduction, to obtain informed consent prior to the procedure, perform the procedure under the supervision of the attending radiologist and ensure proper patient care post procedure

Communication: Explain the procedure to the patient/family, including the risks and possible complications, and answering questions

Generate clear and concise reports in a timely fashion and provide verbal reports whenever necessary

Review pediatric cases brought to attention by clinicians on a daily basis

Use appropriate history to guide decisions regarding the best imaging modality for a given clinical condition or issue

Communicate with imaging technologists and nurses to ensure optimal patient care

C.T.and M.R.I.- Screen and prescribe protocols for CT and MRI examinations in the pediatric context

Prioritize studies.

Discuss about availability of resources and the role of triage

Recognize the proper steps in the imaging investigation of various pediatric pathologies

Become increasingly responsible for individual body imaging subsections, including the proper delegation of authority to residents and technologist

Guide referring clinicians to the imaging study or studies most appropriate for their patients . Recognize and advise on the benefits/risks of imaging procedures, including radiation exposure, in consultation with referring physicians.

Take follow up of patient after treatment or Surgery from his doctor .

-Learn the importance of recognizing imaging findings of non-accidental injury

Academics-

1. Research-Complete at least one original research project on pediatric imaging as principal author with the purpose of preparation of a manuscript suitable for publication in a peer-reviewed journal

2. Present academic work on pediatric imaging at local, national or international scientific meetings

3. Learning-Preparation of a formal yearly lecture on a pediatric radiology topic to be presented to the department and undergo formal assessment . keep Logbook with entry of daily record& take signature of course faculty. -5. Active participation in Journal club

4. Teaching- of diagnostic radiology residents as well as residents from other clinical services , U.G.medical students and trainee x-ray technician

5. Maintenance of logbook: logbook to be maintained for daily work assisted and done by you, as well as for your academic work and teaching in the department. Signature of faculty/faculites to be taken daily.

Ethics and Professionalism-

1. Incorporate ethical practice, professional regulation and high personal standards of behavior

2. Become a member of an National and international pediatric radiology society

Exam System

Theory Examination : MCQ-25 Marks, 5 Shortnotes- 25 marks, L.A.Q- 5X10 = 50 Marks
(Total 100 marks)

Practical examination: 200 marks (80 marks for long case + 40x2 short cases each + 40 marks for viva)

Examiners: 3 guides/teachers from SMIMER

Course Guides-

(1 Dr. Mona D. Shastri

Professor and H.O.D

(2 Dr. Ekta Desai

Associate Professor

(3 Dr. Nehal Diwanji

Associate Professor

(4 Dr. Nirav Kadvani

Senior Resident & cross sectional imaging specialist.

Certificate: Fellowship in Women's Imaging

Location-Department of Radiodiagnosis, SMIMER

Awardee- Veer Narmad South Gujarat University

Goal & Program Highlights:-

On completion of training, the fellow is expected to be a competent specialist in Women's Imaging- capable of assuming a consultant's role in the specialty. - The fellow must acquire a working knowledge of the theoretical basis of the Superspecialty, including its foundations in the basic medical sciences and research. - Fellows must demonstrate the requisite knowledge, skills, and attitudes for effective patient-centered care and service to a diverse population. In all aspects of specialist practice, the Fellow must be able to address issues of gender, sexual orientation, age, culture, ethnicity and ethics in a professional manner.

1. A 1 year comprehensive and well-balanced training program encompassing all of the basic and advanced clinical areas of women's imaging.
2. Training in Breast, gynecologic and obstetrical imaging.
3. Modular Fellowship course format
4. Obstetrical imaging training includes performing and interpreting high risk OB ultrasound in our Fetal Medicine center and exposure to fetal MR.
5. The fellow will be involved with all aspects of breast imaging and procedures including mammography, ultrasound, Breast MRI, ductography, breast biopsy and wire localizations.
6. Gynecologic training includes MR interpretation, hands on endovaginal scanning and learning how to catheterize the uterus for fluoroscopic and sonographic evaluation of the endometrium and fallopian tubes.
7. Ultrasonography and Doppler, C.T.,MRI, Image guided intervention of thyroid.
8. The fellow receives "hands-on" experience at the workstation as well as through active procedure services with image-guided aspirations and biopsies.
9. Fellows fully participate in all aspects of clinical services, with frequent contact with our referring physicians; will work side by side with nationally acclaimed academic radiologists and fetal medicine specialist.

Eligibility

MD/DNB/DMRDRadiodiagnosis

Duration of Course

1 Year

Selection

Merit based – 2 step selection

Step-1) VNSGU will conduct entrance test in similar manner as fetal medicine fellowship in GMC, surat. (100 MCQ test)

Step-2 VNSGU will call for interview & counseling test of these candidates and according to their knowledge, aptitude and interest in one of these three proposed courses admission will be given as per merit list .

Required Certificates

1. Birth Certificate as proof of date and birth.
2. Four passport size photographs
3. Copy of the MCI Registration Certificate
4. Copy of Mark sheets and Degree Certificate of MBBS/MD/ Others
5. Experience Certificate /s
6. PAN Card
7. Adharcard

Course Syllabus- Curriculum

Obstetric Imaging

Module – 1

1. Introduction to the course
2. Pre-training assessment
3. Early pregnancy scan
4. First trimester screening for aneuploidy
5. Fetal structural anomalies in First trimester
6. Fetal biometry and assigning gestational age
7. Guidelines for second trimester scan and normal views
8. Fetal thorax
9. Fetal neck and face

Module – 2

1. Fetal GIT
2. Fetal GUT

3. Fetal skeletal system
4. Fetal heart and fetal echocardiography
5. Fetal CNS and fetal neurosonography

Module – 3

1. Fetal environment
2. Fetal growth abnormalities
3. Third trimester scan – what all to look for.
4. Obstetric colour Doppler
5. Multiple pregnancies
6. 3D-4D ultrasound in Obstetrics

Module – 4

1. Fetal infections
2. Genetics
3. Fetal Interventions
4. Recent advances
5. USG evaluation of other medical and surgical problems in pregnancy
6. Post-training assessment

Non-obstetric imaging

Module – 5

- Imaging in gynecological infertility
- Imaging in gynecological masses and tumors
- Imaging in ectopic pregnancies
- Hysterosalpingography for uterine malformations
- Hysterosalpingography for infertility and tubal patency

Module – 6

- Breast imaging by mammography
- Breast imaging by USG breast
- Breast imaging by MRI mammography

- Module-7

Thyroid Imaging by ultrasound and colour Doppler

Thyroid imaging with Cross sectional imaging
Thyroid Lesion –FNAC /Lab report correlations

Academics-

1 Research-Complete at least one original research project on women's imaging as principal author with the purpose of preparation of a manuscript suitable for publication in a peer-reviewed journal

2. Present academic work on women's imaging at State/National /international scientific meetings

3. Teaching of radiology residents/ residents from other clinical services / medical students

4.learning

Preparation of a formal yearly lecture on a Women's imaging topic to be presented to the department and undergo formal assessment

Follow-up of patient to be taken after procedure /treatment/ surgery from respective unit

Active participation in Journal club

Maintenance of logbook: logbook to be maintained for daily work assisted and done by you, as well as for your academic work and teaching in the department. Signature of faculty/faculites to be taken daily.

Ethics and Professionalism-1. Incorporate ethical practice, professional regulation and high personal standards of behavior 2. Become a member of an National and international society

Exam System

Theory Examination : MCQ-25 Marks, 5 Shortnotes- 25 marks, L.A.Q- 5X10 = 50 Marks
(Total 100 marks)

Practical examination: 200 marks (80 marks for long case + 40x2 short cases each + 40 marks for viva)

Examiners: 3 guides/teachers from SMIMER

Course Faculty

Dr. Nehal Diwanji- Associate Professor , cross sectional imaging specialist

Dr. Nipa Patidar – Assistant Professor with speciality in Breast Imaging and Women's Imaging

Dr. Dhara Shah- Assistant Professor with Speciality in Breast Imaging

Dr. Hitanshu Bhatt – Fetal Medicine expert

Dr. Gouri Nagarajan - Fetal Medicine expert

CERTIFICATE: FELLOWSHIP IN INTERVENTIONAL RADIOLOGY

Location: Department of Radiodiagnosis, SMIMER Hospital, Surat

Awarded by: Veer Narmad South Gujarat University

Goal and Program Highlights:-

- A one year comprehensive and well-balanced training program encompassing all the aspects in Interventional Radiology.

The fellow receives "**hands-on**" experience through active procedures in cath lab and well exposed to manage OPD and also to peri-procedural management of patients.

- The fellowship experience encompasses the entire range of IR involving both vascular - nonvascular and neuro interventions.
- Fellowship trainees perform a wide variety of cases including,
 - Basic interventions
 - Gastrointestinal – Hepatic interventions
 - Thoracic interventions
 - Musculoskeletal interventions
 - Neurointerventions
 - Peripheral vascular interventions
 - Gynecological – Obstetrical interventions
 - Urological interventions

Eligibility

MD/DNB in Radiodiagnosis /Diploma in radiodiagnosis – with 1 year training post diploma.

Duration of Course

1 year

Selection

Merit based- Two step selection

Course Faculty

Dr.Paresh Patel M.D. Radiodiagnosis and Fellowship in Interventional Radiology

(Asstt.Professor)

Dr. Jigar Aiyā D.M.R.D.D.N.B., Fellow in Neuro and vascular intervention

(Senior Resident)

Dr.Ankit Dumaswala M.D.Radiodiagnosis,Fellow In Neuro& Vascular Interventional Radiology

(Visiting Interventional Radiologist)

List Of Documents

1. Birth Certificate/ proof of date of birth.
2. Four passport size photographs
3. Copy of the MCI Registration Certificate of MBBS/MD/ Others
4. Copy of Mark sheets and Degree Certificate of MBBS/MD/ Others
5. Experience Certificates
6. PAN Card
7. Adharcard

Course Syllabus

Competence -

Upon completion of training, the Fellow candidate of Interventional Radiology should be:

- Familiar with the signs, symptoms, etiology, pathogenesis, natural history and management of vascular & non-vascular disorders amenable to diagnosis and/or treatment by percutaneous methods guided by imaging.
- Able to obtain clinical history, carry out relevant physical examination and communicate effectively with patients and relatives about the diseases and procedures as required.
- Have knowledge and training to comply with legal and ethical standards in carrying out clinical, procedural and post procedural patient care.
- Be knowledgeable about consent and other legal requirements of performing and recording details of clinical examination, evaluation and intra- as well as post-procedural care.
- Able to perform and interpret non-invasive and invasive imaging evaluation of diseases of the vascular systems, and of other regions amenable to IR therapy
- Knowledgeable about the management protocols of these disorders, including drug therapy and non-IR therapeutic alternatives.
- Aware of indications and contraindications for vascular and nonvascular interventional radiologic procedures.
- Experienced in pre-procedural clinical evaluation of patients and providing post procedural follow-up care
- Able to perform and interpret invasive vascular and non-vascular interventional procedures to the standards required and established by professional bodies and accepted by the practitioners.
- Knowledgeable about IR technology and hardware available for various procedures and anatomical areas
- Knowledgeable about new and evolving interventional techniques & technology
- Have in depth knowledge and training in the physical aspects of imaging, hazards of radiation and measures of protection.

Procedures:

PERIPHERAL VASCULAR – NON VASCULAR INTERVENTIONS:

- USG/CT guided FNAC/Biopsy
- USG/CT guided Aspiration/Drainage
- Embolization for GI, GU, Head and neck, peripheral Bleeders

- Radiofrequency tumor ablation, Microwave ablation
- Sclerotherapy
- Central line and catheter insertion
- Fluoroguided NGT, NJT insertion
- Percutaneous radiological gastrostomy/ jejunostomy insertion
- Percutaneous nephrostomy tube and stenting
- Bronchial artery embolization
- Uterine artery embolization
- Angioplasty and/or stenting (aortic, renal, mesenteric, celiac, limb arteries)
- Arterial thrombolysis
- Venous stenting and filter
- Varicose veins laser ablation
- Trans-arterial chemo-embolization
- Peripheral tumor or AVM or aneurysm/pseudoaneurysm embolization
- Pre-operative angioembolisation
- Percutaneous transhepatic biliary drainage and stenting
- Endobiliary Radiofrequency ablation
- Vertebroplasty, Kyphoplasty, Acetabuloplasty
- Tracheal stenting
- Esophageal dilatation

NEUROINTERVENTIONS:

- Diagnostic angiography
- Aneurysmal coiling- conventional, balloon assisted and stent assisted
- Carotid and vertebral angioplasty and/or stenting
- Embolization of brain AVM
- Dural arterio-venous shunts including cavernous dural arterio-venous shunts embolization
- Head & neck and brain vascular tumors embolization
- Head and neck vascular malformation embolization

Academics-

1- Research-Opportunity will be given to conduct at least one ***original research study*** during the course duration. Complete at least one original research project on Interventional Radiology as principal author with the purpose of preparation of a manuscript suitable for publication in a peer-reviewed journal

2-Oral/Poster presentation as part of course syllabus at a local/regional/ national/international meeting-

3. Learning-Preparation of a formal yearly lecture on a pediatric radiology topic to be presented to the department and undergo formal assessment

4. Teaching Teach diagnostic radiology residents as well as residents from other clinical services and medical students & Active participation in Journal club

DIAGNOSTIC AND INTERVENTIONAL FACILITIES IN THE DEPARTMENT

- ✓ Plain x-rays (Digital Radiography films) HKA axis x ray
- ✓ Special investigations like Barium study, MCU, IVU, Sinogram, fistulogram, H.S.G, loopogram, nephrostomogram etc.
- ✓ General Ultrasonography of Abdomen and pelvis,
- ✓ Musculoskeletal and small part ultrasound with 10- 14 MHz probe
- ✓ Antenatal Ultrasound with Anomaly scan, Foetal echo and 3D4D Ultrasound and antenatal Colour Doppler Study
- ✓ Fetal medicine and intervention centre
- ✓ Transvaginal and Trans rectal Ultrasonography.
- ✓ Transcranial Doppler study in sickle cell patients
- ✓ Colour Doppler study of Whole body
- ✓ 3D-4D Ultrasonography
- ✓ Ultrasound guided Diagnostic and therapeutic procedures
- ✓ C.T.Scan (Plain and contrast study)
- ✓ C.T.Angiography
- ✓ C.T.Guided Biopsy
- ✓ M.R.I
- ✓ M.R.Angiography
- ✓ D.S.A and Conventional angiography, peripheral angiography and vascular intervention
- ✓ Mammography, Sonomammography, M.R.I.of Breast
- ✓ Orthopantomography (OPG), and cephalogram.
- ✓ **Speciality Clinic-(1 Fetal medicine, Genetic counseling**
Fetal intervention ,Fetal M.R.I.
Since 2015 (2 D.S.A. & Interventional radiology
 (3 Pediatric radiology
 (4 Breast Imaging
- ✓ **Emergency Radiology- 24x7 emergency services available -**
Digital X-rays, ultrasound and color Doppler, C.T.,M.R.I.,D.S.A.
- ✓ Medicolegal age determination and other investigation reports
- ✓ Bone age determination for medico-legal cases & various government schemes
- ✓ Facilities of investigations - free of charge for beneficiaries of JSSK, MA Yojna (mukhyamantri amrutam), PLWH cases and poor patients.

First Year-

Principles Of Radiation Production, Detection And Measurement:

Gas-Filled Detectors (Ionization Chambers, Proportional Counters And Geiger Muller Counters) Scintillation Detectors, Thermoluminescent Dosimeters (Tld). Reasons For Choice Of Airlonization. Roentgen And Rad. Simple Principles Of Dosimeters.

Biological Effects Of Radiation : Chemical Effects Of Radiation - Radiolysis Of Water ; Production Of Free Radicals, Radicals Reactions, G-Valve. Effects Non-Stochastic Effects, Chromosome Aberrations And Mutations. Radiation Effects On Whole Body (Early Effects And Late Effects). Concept Of Doubling Dose. Risk Factors.

Radiation Protection: Principle Of Radiation Protection - Historical Development, Maximum Permissible Exposure Concept ; Annual Dose Equivalent Limits (Adel) A.L.A.R.A.(As Low As Reasonably Achievable) Concept ; International Recommendations And Current Code Of Practice For The Protection Of Persons Against Ionizing Radiation's From Medical And Dental Use.

Protective Materials: Lead, Lead - Impregnated Substances, Building Materials, Concept Of Barriers, Lead Equivalents And Variations With Quality. Design Of X-Ray Tubes Related To Protection. Structural Shielding Design (Work-Load, Use Factor, Occupancy Factor, Distance) Departmental Protection. Radiation Protection Of Staff Members, Patients And Public. Protection Instruments & Personnel And Area Monitoring.

Suggested Books For Reference: Farr RF & Allisy-Roberts PJ : Physics for Medical Imaging (Saunders-An imprint of Elsevier) 1st Edition 2006

SECTION B- Medical Physics

Switching And Timing: Exposure Timers, Spring Activated, Synchronous, Electronic, Auto Timers, Exposure Switching -Mechanical Contactors, Electronic Switching In Low Tension And High Tension Circuits. Interlocking Circuits - Use Of Relays, Tube Overload Protection. Circuit Diagrams - Simple Circuit Diagrams As Illustration Of Sequence From Mains Supply To Controlled X-Ray Exposures, Block Diagrams.

X-Ray Tubes: Rotating Anode X-Ray Tubes, Design, Rating, And Use Of Rating Charts, Care Of The X-Ray Tubes; Inherent Filtration And Additional Filtration; Practical Considerations In The Choice Of Focus; Speed Of Anode Rotation; Angle Of Anode Inclination. Grid-Controlled X-Ray Tube.

Control of Scattered Radiations: Cones, Tube Diaphragms,. Single And Multileaf Grids, Structure And Materials; Grid Ratio And Lines /Cm. Parallel And Focussed Grids, Stationary Grids, Crossed Hatched Grids. Gridded Cassettes, Grid Movements, Potter-Bucky Diaphragms ; Single Stroke, Reciprocating And Oscillating Mechanisms; Beam Centring Devices - Centre Finders, Optical Centring Devices, Light Beam Collimators.

Equipments: I Fluoroscopy and Image Intensifiers: Direct Fluoroscopy, Fluoroscopy Image, Fluoroscopic Screen, Explorators (Serial Changers, Spot Film Devices) And Accessories. Radiation Protection Including Integrating Timer. Tilting Tables. Principles And Construction Of Image Intensifiers, Television Camera Tubes And Cathode Ray Tubes. Recording The Intensified Image, Methods Of Viewing The Intensified Image, Equipment For Fluorography And Cine-Fluorography. Radiographic and Fluoroscopic Tables, Telecommand Tables.

li Equipment for Special Procedures: Special Trolleys And Chairs, Portable And Mobile X-Ray Units, Cordless Mobile X-Ray Equipment, Capacitor Discharge Mobile Equipment, Equipments For O.T. Bi-Plane Radiography, Cranial And Dental Equipment, Skull Tables, Mammography, Mass-Miniature Radiography, Tomography (Conventional X-ray Tomography is obsolete after availability of computed Tomography (CT) scan. Only historical importance), Multi Section Cassettes, Rapid Cassette Changer, Rapid Film Changer, Magnification Radiography, Subtraction Radiography.

lii Care and Maintenance of X-Ray Equipment: General Principles Of routine care. General Care In Use And Special Care Of Mobile Equipments. Simple Test. Uses Of Spinning Top And Step Wedge, Checks On Generator Output; Check For Integrity Of Tomographic Equipment; Procedure For Obtaining Radiograph Of The small area of body. Use Of Ma (milli Ampre) And Timer Wisconsin Test Tool, Test Of Kilo Voltage, Wisconsin Test Cassette, Use Of Focal Spot Test Tool, Testing Light Beam Diaphragm, Failures Of X-Ray Tubes And Ht Cables.

Radiography Techniques -I

- Responsibility Of Radiographer During Radiological Procedures.
- Preparation Of Patient For Different Procedures.
- Contrast Media - Positive And Negative, Ionic & Non - Ionic
- Adverse Reactions To Contrast Media And Patient Management
- Emergency Drugs In The Radiology Department
- Emergency Equipments In The Radiology Department
- Asepsis during Procedure
- Radiation Protection Rules- ALARA, Ten Day Rule.
- The Following Should Be Dealt With Indication, Contraindications, Patient Preparation, Contrast Media Used, Method Of Administration Of Contrast Media, Accessories Required, Technique To Be Adopted, Variation In Normal Technique In Specific Circumstances, Films Taken, Complications, Precautions And After-Care Of The Patient.

Preparation Of The Room, Apparatus And Instruments Positions Of The Patient: Erect, Sitting, Supine, Prone, Lateral, Oblique, Decubitus Etc., Relative Position Of X-Ray Tube And Patient, Relevant Exposure Factors. Use Of Accessories Such As Radiographic Cones, Grid And

Positioning Aids. Anatomic And Physiological Basis Of The Procedure, Association of Theory With Practical Work. Radiographic Appearances, Both Normal And Common Abnormal Conditions Where Elementary Knowledge Of The Pathology Involved Will Ensure The Application Of The Appropriate Radiographic Technique. Modifications In Technique For Various Disabilities And Types Of Subject. Radiation Protection, Use Of Gonad & Thyroid Shield, Practical Methods Reducing Radiation Dose To The Patient.

Upper limb: Routine Projections For The Whole Hand, Fingers, Wrist Joint, Forearm, Elbow Joint And Humerus. Supplementary Projections For Scaphoid, Carpal Tunnel Ball Catchers Projections, Head Of The Radius, Supracondylar Fracture And Olecranon Process.

Lower limb: Routine Projections For The Whole Foot, Toes, Calcaneum, Ankle Joint, Leg, Knee-Joint, Patella And Femurs. Supplementary Projections For Talo-Calcaneal Joint, Forced Projections For Torn Ligaments, Flat Feet, Club Feet, Intercondylar Projections For Loose Bodies In The Knee, Axial Projection For Patella.

Shoulder Girdle And Thorax: Routine Projections For The Shoulder Joint, Scapula, Acromio-Clavicular Joint, Clavicle, Sternoclavicular Joint, Sternum And Ribs.

Supplementary Projections For The Axial Projection Of Clavicle, Bicipital Groove Carotid Process, Classification Of Tendons, Subluxation, Upper Ribs, Lower Ribs And Axillary Ribs.

Pelvic Girdle And Hip Region : Routine Projections For The Whole Pelvis, Sacro-Iliac Joints, Hip Joint And Neck Of Femur.

Supplementary Projections For The Greater And Lesser Trochanters Of Femur. Frog Leg Projection, Ischium Symphysis Pubis, Ilium, Acetabulum And Congenital Dislocation Of Hip Arthrodesis.

Vertebral Column: Routine Projections For Atlanto-Occipital Joint, Cervical Spine, Cervico Thoracic Junction, Thoracic Spine, Lumbar Spine, Lumbo-Sacral Region, Sacrum And Coccyx.

Supplementary Projections For The Intervertebral Foramina, Posterior Arch Of Atlas, Flexion And Extension Of Cervical Spine, Scoliosis And Kyphosis, Sacro Iliac Joint.

Skeletal Survey: Skeletal Survey For Metabolic Bone Diseases, Metastases, Hormonal Disorders, Renal Disorders.

Skull: Routine Projections For Cranium And Facial Bones. Supplementary Projections For Trauma, Towne's & Method, Sella, Turcica, Optic Foramina, Jugular Foramina, Temporal Bones, Mastoids Petrous Bone, Zygomatic Arches, Orbits, Maxillae, Nasal Bones, Mandible, Temporomandibular Joints.

Nasal Sinuses: Techniques For Frontal, Maxillary, Ethmoidal And Sphenoid Sinuses, Erect And Horizontal Projections For Fluid Levels.

Teeth: Routine Projections Of All Teeth – Intra-Oral And Extra-Oral Projections. Supplementary Projections For Localisation Of Roots, Children, Edentulous Subjects And Use Of Occlusals And Bitewings, Orthopantomography.

Chest: Routine Projections For Lungs, Cardia And Diaphragm.

Supplementary Projections For Opaque Swallow, Thoracic Inlet, Soft Tissue Neck, Decubitus, 'Apicograms, Paediatric Cases.

Abdomen: Kub, Erect Abdomen And Decubitus Projection, Supplementary Projections For Acute Abdomen.

Radiographic Photography And Image Processing

Dark Room Planning: For A Small Hospital, For A Large Hospital, Location Of Dark Room Construction Of Dark Room, Ventilation, Wall Protection, Entrance To Dark Room - Single Door, Double Door, Labyrinth

Dark Room: Instruction To Staff, Dry Bench, Hopper, Drawer, Cupboard, Loading And Unloading Cassettes Hangers, Types Of Hangers And Storage Of Hangers, Printing, Wet Bench, Cleanliness, Control Of Dust, Dark Room Sink, Hatches, Drier, Safe Lights, Direct And Indirect, Uses, Factors Affecting Safelight Performance, Safelight Tests, Viewing Room, Film Dispensing

X-Ray Films: Glass, Cellulose And Polyester Bases Structure Of X-Ray Films - Emulsion, Gelatin, Base And Supercoating Types Of X-Ray Films, Single Coated, Duplitised, Spectral Sensitivity, Colour Sensitivity Graininess Of Films, Speed Of Films, Screen & Non-Screen Films, Various Formats Of Films

Films For Special Procedures Storage Of Film Materials And Radiographs, Record Of Film Stock And Radiographs Deterioration Of Films On Storage, Characteristic Curves - Uses Of Step Wedge Information On Basic Fog, Film Gamma, Contrast, Speed, Film Latitude, Effects On Development

Intensifying Screens: Fluorescence - Phosphors Phosphors Employed :- Calcium Tungstate, Barium Fluochloride etc. Rare Earths Construction Of Intensifying Screens The Influence Of Kilovoltagage In Different Phosphors Intensification Factor Resolving Power Of Intensifying Screens Speed Of Screens Screen Film Contact Tests Types Of Intensifying Screens Advantages And Limitations Of Intensifying Screens.

X-Ray Cassette: Construction Of X-Ray Cassettes, Types Of Cassettes, Mounting Intensifying Screens On Cassettes, Identification Of Cassettes, Care Of Cassettes

Photochemistry: Chemistry Of Image Formation, Formation Of Latent Image, Conversion Of Latent Image To Visible Image, Meaning Of Ph, Importance Of Ph In Processing Films

Processing Methods: Preparation Of Solution , Manual Processing Apparatus, Control Of Temperature, Replenishment, Rapid Processing Automatic Processor - Principle And Features, Water Supply, Use Of Thermostat, Regeneration Of Solutions, Maintenance, Advantage And Limitations. Processing Of Cut Films And Roll Films.

Computer Radiography and Direct Digital Radiography

Digital Radiography - Principles, Processing, Equipments, Advantages. Radiological Information Systems.

The Radiographic Image: The Emergent Beam Related To Densities On Film Contrast - Objective And Subjective, Long Scale And Short Scale, Radiation Contrast, Film Contrast And Radiographic Contrast, Density Sharpness, Sources Of Unsharpness, Avoiding Different Unsharpness Resolution Factors Affecting Resolution Choice Of Kilovoltage And Milliamperage Choice Of Short Focus And Broad Focus Selection Of Focus To Film Distance And Object To Film Distance Selection Of Cassettes Avoiding Scatter Radiation, Magnification, Distortion, Penumbra Presentation of a Radiograph - Identification Markers - Name Printer Viewing Equipment Magnifiers for Cut Films and Roll Films

Developer: Constituents, Characteristic, Manual and Automatic Processors, Effects on Developing Time, Temperature, Agitation, Replenisher, Exhaustion

Rinsing: Acid Stop-Bath, Methods, Objects

Fixer: Constituents, Characteristics, Manual and Automatic Processors, Fixing Time and Clearing Time Factors Affecting Fixing Time, Replenisher, Exhaustion

Washing and Drying: Objects, Methods, Factors Affecting Washing and Drying, Wetting Agents, Comparison of Different Methods

Day Light Film Handling: Day Light System Using Cassettes Day Light System without Cassettes

Film Faults: Fog - Various Fogging In Films, Causes And Prevention. Stains - Types, Causes And Prevention Spots And Splashes - Types, Causes And Prevention Marks And Prints - Types, Causes And Prevention Drying Marks - Types, Causes And Prevention Faults In Automatic Processor - Types, Causes.

Reproduction Of Radiographs: Copying Radiographs Magnification and Minification. Contact Prints Types Of Paper Equipment

Practicals

A). Cassette And Intensifying Screens B). Chemical Used In Film Processing C). Films Used In Photography And Printers D). Diagnostic Image Processing

Imaging Technology: Practical Course:

Radiographic Technique I

Radiography - Plain Views of Upper Limb: Hands Fingers, Thumb, Wrists, Forearm, Elbow, Humerus

Radiography - Plain Views of Shoulder: Shoulder Joint, Acromio - Clavicular Joint, Scapula Various Views And Projections, Clavicle, Sterno - Clavicular Joint

Radiography - Plain Views of Lower Limb: Foot, Toes, Tarsus & Calcis, Ankle, Tibia, Fibula & Patella, Knee Joint, Femur, Hip Joint Pelvis & Sacro-Ilic Joint

Radiography Of Vertebrae: Cervical Spine Upper, Cervical Spine Lower, Cervico-Thoracic, Cervico-Middle, ThoracoLumbar, Lumbo-Sacral, Sacrum & Coccyx, Ribs-Upper & Lower, Sternum

Radiography of Skull Plain Views: Ap, Lateral & Towns, Sinuses, Mandible, Equipment, Teeth Mastoids

Radiography Of Chest: Lungs & Trachea; Heart-Diaphragm Radiography of G.I. Tract Plain X-Rays Abdomen-Erect; Liver, Spleen.

- Barium Swallow ,Barium Meal - Single Contrast And Double Contrast Barium Meal Follow Through, Small Bowel Enema, Barium Enema
- Intravenous urography
- Micturating Cysto Urethrography
- Ascending Urethrography
- Additional Investigation : Ultrasound Scanning

Reference Book: 1. Philip W. Ballinger: Merrill's Atlas Of Radiographic Positioning And Radiological Procedures (Mosby) 2. Ra Swallow, E Naylor: Clarks Positioning In Radiography E J Roebuck, A S Whitley 3. Sante Lr: Roentgenologic Technique (Edwards Inc) 4. Goldman: A Radiographic Index 5. Ross And Gailway: A Handbook Of Radiography (Lewis) 6. Glenda J. Bryan: Diagnostic Radiography (Mosby) 7. Piles: Medical Radiographic Technique (Thoms). 8. L.C.Gupta & U.C.Sahn : Radiography for Technicians (Jayee Brothers)

Radio-Imaging Technician

Curriculum Second Year-

Theory-

Physics-

C.T.Scan Physics

M.R.I.-Physics

DSA& interventional radiology -Physics

Introduction :

- Computed Tomography
- M.R.I.

- Angiography:
- Percutaneous Catheterization
- Catheterization Sites, Asepsis
- Guide Wire, Catheter, Pressure Injector And Accessories
- Use Of Digital Subtraction, Single Plane And Biplane
- Head And Neck Arteriography
- Pulmonary Arteriography
- Coronary Arteriography
- Ascending Aortography
- Trans Lumbar Aortography
- Celiac Axis, Superior Mesenteric And Inferior Mesenteric Arteriography
- Renal Arteriography
- Trans Femoral Arteriography
- Interventional Vascular Radiography
- Peripheral Venography - Lower Limb, Upper Limb
- Central Venography, Superior Venacavography, Inferior Venacavography, Pelvic Venography
- Ascending Lumbar Venography, Intra Osseous Venography, Percutaneous, pleuroportography
- Transhepatic Portography, Selective Retrograde Venography - Renal Venography
- Interventional Vascular Radiography

Miscellaneous:

- Arthrography
- Sialography
- Lymphography
- Sinography

- Fistulography
- Dach reocystography

Computed Tomography:

- History
- Principles Of Computed Tomography
- Generations - Spiral C.T.
- Instrumentation.
- Data Acquisition
- Data Presentation
- Image Reconstruction
- 2 D And 3 D Images
- Image Display
- Pixel And Voxel
- C.T. Number
- Window Level And Window Width
- Scan Artefacts
- Patient Positioning In Computed Tomography
- Contrast Materials And Administration.
- Basic Diagnostic Aspects
- Interventional C.T. Guided Procedures
- Documentation.
- Safety Consideration - Radiation Dose
- Quality Assurance.

Magnetic Resonance And Imaging:

- History
- The Spinning Proton - Magnetisation, Precession, Larmor Frequency
- Radio Frequency Pulse And Proton - Resonance, Free Induction Decay, Relaxation, T-1 & T-2
- Instrumentation - Magnet, Shim Coils, Gradient Coils, Radio Frequency Transmitter And Receiver Coils, Computer.
- Pulse Sequences - Saturation Recovery, Spin Echo, Inversion Recovery.
- Image Production - 2d And 3d Pictures.
- Image Quality - Signal To Noise Ratio, Contrast To Noise Ratio.
- Image Artefacts.
- Flow Techniques - Magnetic Resonance Angiography Spectroscopy. Mr Contrast Agents - Paramagnetic And Ferromagnetic Documentation. Safety Consideration Quality Assurance.

Ultrasound Imaging:

- History
- Ultrasound Characteristics - Nature, Propagation, Frequency, Wavelength, Velocity, Amplitude, Intensity, Acoustic Impedance, Reflection, Refraction Etc. Interference With Media, Interface, Attenuation.
- Transducer - Piezoelectric Effect, Construction, Types Of Arrays - Mechanical & Electronic .
- Acoustic Coupling Media.
- Ultrasound Instrumentation.
- Display Modes - A Mode, B Mode, M Mode, Real Time.
- Grey Scale Imaging
- Doppler Methods - Continuous Wave Doppler, Pulsed Doppler, Duplex, Real Time Colour Flow Imaging.
- Ultrasound Artefacts.

- Patient Preparation And Handling
- Basic Diagnostic Aspects
- Interventional Techniques - Transducer Sterilisation, Needles, Diagnostic Procedures, Therapeutic Procedures.
- Documentation
- Safety Consideration - Effects Of Healing, Cavitation.
- Quality Assurance - Phantoms, Performance, Accuracy, Sensitivity, Spatial Resolution Tests.

Digital Substraction Angiography and Interventional Radiology-

- Angiography:
 - Percutaneous Catheterization
 - Catheterization Sites, Asepsis
 - Guide Wire, Catheter, Pressure Injector And Accessories
 - Use Of Digital Subtraction, Single Plane And Biplane
 - Head And Neck Arteriography
 - Pulmonary Arteriography
 - Coronary Arteriography
 - Ascending Aortography
 - Trans Lumbar Aortography
 - coeliac Axis, Superior Mesenteric And Inferior Mesenteric Arteriography
 - Renal Arteriography
 - Trans Femoral Arteriography
 - Peripheral Venography - Lower Limb, Upper Limb
 - Central Venography, Superior Venacavography, Inferior Venacavography, Pelvic Venography
 - Ascending Lumbar Venography, Intra Osseous Venography, Percutaneous, plenoportography
 - Transhepatic Portography, Selective Retrograde Venography - Renal Venography

- Adrenal Venography, Hepatic Venography, Internal Jugular Venography, Orbital Venography
- Radiation safety for patient and technician in Interventional Vascular Radiography
- Quality Assurance - Phantoms, Performance, Accuracy, Sensitivity, Spatial Resolution Tests.

Mammography :

Basic principles of Mammography.

Equipment description.

Imaging technology.

Uses and advantages.

Interventional Radiology:

Basic principles of Interventional radiology.

Interventional Procedures.

Imaging materials, imaging technology.

Uses and advantages.

LIST OF PRACTICALS:

Skull radiography.

1. Facial bones radiography.
2. OPG and Dental radiography.
3. Portable radiography.
4. Radiography in ICU.
5. Radiography in Casualty / Trauma center.

6. Radiography in operation theatre.

LIST OF PRACTICALS:

Hands on training of Imaging of the following under supervision:

1. Imaging techniques of CT scan.
2. Imaging techniques of MRI
3. Imaging techniques in Interventional radiology.
4. Imaging techniques in Mammography.
5. Imaging techniques in CR.
6. Imaging techniques in DR.

Assessments of Knowledge of following Protocols:

1. Protocols for CT scan of Brain.
2. Protocols for CT scan of PNS, Neck & larynx.
3. Protocols for CT scan of Thorax, Abdomen and Pelvis.
4. Protocols for CT Angiography.
5. Protocols for multiphase contrast CT Study.
6. Protocols for multiphase contrast CT Study.
7. Protocols for Dynamic CT Study.
8. Protocols for MRI of Brain.
9. Protocols for MRI of PNS, Neck & larynx.
10. Protocols for MRI of Abdomen and Pelvis.
11. Protocols for MRI of Extremities.
12. Protocols for MR Angiography.
13. Protocols for MRCP.
14. Protocols for Dynamic MRI Study

Hands on training of Quality Assurance under supervision:

1. Tests to check light leakage in the cassette.
2. White light leakage test.
3. Safelight efficiency test.
4. Film/screen contact test.
5. Sensitometry test using an aluminium step wedge.
6. Collimator accuracy of scale test.
7. Light beam/x-ray beam alignment test.
8. Film/screen compatibility – colour of light emission test.
9. Grid line damage and grid movement test.
10. Test to detect cracking of lead aprons and gloves.
11. Accuracy of timer and kVp test.
12. Test alignment of x-ray beam to upright bucky.
13. Cassette centered to the middle of the bucky test.
14. Central ray centered to the middle of the bucky test

BOOKS-

Reference Books:

- 1 Piles : Medical Radiographic Technique (Thomas)
- 2 Santel.R. : Roentgenologic Technique (Edwards Inc)
- 3 Philip Wballiger : Merils Atlas Of Radiographic Positions And Radiological
Procedures
(Mosby)
- 4 Goldman : A Radiographic Index
- 5 Patesson : Printed Notes For Radiographers In India (Cmai)
- 6 Achwaz : Unit Step Radiography (Thomas)
- 7 Ross & Galloway : A Hand Book Of Radiography (Lewis)
- 8 Glenda J. Bryan : Diagnostic Radiography (Churchill Livingstone)
- 9 Jacobi & Paris : Textbook Of Radiological Technology (Mosby)
- 10 Scarrow : Contrast Radiography (Schering Chemicals)
- 11 Vanderplasts : Medical X-Ray Technique (Mac Millan)
- 12 Stephen Chapman & Richare : A Guide To Radiological Procedures (Jaypee Brothers)
Nakielny
- 13 R.F. Fatr & P.J. Ahisy : Physics For Medical Imaging (Saunders)
- 14 D.N. Chesney & M.O.
Chesney : X-Ray Equipment For Student Radiographers (Cbs)
- 15 Christensen, Curry & Dowdey : An Introduction Of Physics To Diagnostic Radiography (Lea &
Febiger)
- 16 Cullinan : Illustrated Guide Techniques (Blackwell)

- 17 Jamdrell, Thompson & Ashworth : X-Ray Physics And Equipment (Blackwell)
- 18 Adrian K.Dixon : Body C.T. - A Handbook (Churchill Livingstone)
- 19 John M. Stevens, Alan R. Valentine & Brian E. Kendall : Computed Cranial & Spinal Imaging (Williams & Wilkins)
- 20 John R. Haaga, Charles F. Lanzion, David J. Sartoris & Elias A.Aerhouni : Computerised Tomography And Magnetic Resonance Imaging Of The Whole Body (Vol.1 & li) (Saunders).
- 21 Philip T. English & Christine Moore : Mri For Radiographers (Springer)
- 22 Rehani: : Diagnostic Imaging - Quality Assurance.
- 23 Pablo R.Ros & W. Dean Bidgood : Abdominal Magnetic Resonance Imaging (Mosby)
- 24 Roger C. Sounders : Clinical Sonography : A Practical Guide (Little Brown & Company)
- 25 Pes Palmer : Manual Of Diagnostic Ultrasound (Who)
- 26 Sandra L Hagen Ansert: : Text Book Of Diagnostic Ultrasonography (Bi Publications).
- 27 Meril's Atlas of Radiographic Positioning

Name of Course- Radio imaging Technician

Eligibility- B. Sc Physics/chemistry/Biology/Biotechnology

Language of course-English

Total Seat-8

Duration of Course

2 Year

Selection

Merit based by V.N.S.G.U.

Documents required

1. Birth Certificate as proof of date and birth.
2. proof of Nationality and Address
3. Four passport size photographs
4. Copy of Mark sheets and Degree Certificate
5. 10th and 12 th Marksheet/certificate
6. Computer training certificate

EXAM- At the end of second year

Theory -100

Practical-100

Examiner- Two Internal Examiner from SMIMER

Exam Pattern-

Theory – MCQ-25 Marks, 5 Shortnotes- 25 marks, L.A.Q- 5X10 = 50 Marks

Practical- (1- X-ray Taking – 2 different regions of the body as asked by examiners -40 marks

(2 Viva Table-1- X-RAY Physics ,CR DR ,Procedure and Radiation Safety- 30 marks

(3 Viva Table-2 C.T., M.R.I., Angiography , Contrast- 30 Marks

- Correctly Identify the Anatomy to Imaged.
- To properly position the patient for Imaging
- Correctly select appropriate projection/projections to demonstrate the area of interest.
- Use appropriate radiographic parameters to produce a radiograph with satisfactory results.
- Differentiate a properly positioned and exposed radiograph from a wrongly positioned and over or underexposed radiograph.

- Correctly identify anatomical features displayed in radiograph obtained.
- Use Special techniques in Wards, ICU, and Operation Theatres.

Students will identify and observe the objects and draw the following diagrams:

1. Cross sectional diagram of X-ray Film.
2. Cross sectional diagram of Intensifying Screen.
3. Characteristic Curve.
4. X-ray Tube.
5. CT scan Tube.

RADIOLOGY DEPARTMENT, SMIMER HOSPITAL

YEAR -2018

INVESTIGATIONS	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCT	NOV	DEC	TOTAL
CONVENTIONAL RADIOLOGY (KRAY)	15160	12135	12616	11845	11857	13313	12893	12970	12679	11720	11460	5150	143798
CONTRAST RADIOLOGY (BARIUM, IVP)	390	273	271	243	287	283	296	265	267	262	238	146	3221
ULTRASOUND (GRAY SCALE)	3917	3357	3291	2788	3123	3271	3581	3571	3615	3705	3271	2067	39557
USG (COLOUR DOPPLER)	370	487	341	277	323	340	358	318	318	318	316	154	3920
ULTRASOUND GUIDED PROCEDURES	337	285	291	265	287	309	305	310	293	292	267	149	3390
(FNAC, BIOPSY, ASPIRATION)													
CT SCANS	526	603	505	513	511	544	552	641	605	541	479	270	6290
CT GUIDED BIOPSY/ FNAC	51	52	51	31	42	54	47	42	51	50	47	28	546
MRI	592	538	565	501	518	487	600	648	617	495	550	313	6424
DSA WORK LOAD	72	64	72	43	57	67	65	58	58	61	56	32	705
MAMMOGRAPHY	135	122	129	108	117	123	110	122	105	120	97	66	1354
FETAL MEDICINE CASES	152	433	304	295	250	299	220	217	140	198	118	233	2859
OPG	158	134	221	201	194	200	224	181	178	146	149	261	2247
EMERGENCY RADIOLOGY													
CONVENTIONAL RADIOLOGY (X-RAY)	3682	3634	3593	3417	3107	3314	3155	4662	3286	4017	3793	2505	42165
ULTRASOUND (GRAY SCALE)	964	930	1002	934	954	865	928	898	904	932	1054	1125	11490
ULTRASOUND GUIDED PROCEDURE	75	69	76	67	56	58	60	62	64	84	66	68	805
USG (COLOUR DOPPLER)	84	76	83	71	60	61	57	63	71	70	66	64	826
CT SCAN	67	62	78	102	78	69	101	60	101	103	81	125	1027
MRI	95	94	96	94	56	77	71	129	124	79	151	124	1190
INTERVENTIONAL RADIOLOGY													
INREVENTIONAL PROCEDURES	402	399	387	391	372	390	398	368	404	418	434	414	4777
INREVENTIONAL OPD CONSULTATION	98	79	58	85	78	79	120	113	109	99	116	107	1141
INREVENTIONAL Ward Data	7	6	10	11	12	6	10	7	9	11	13	11	113
PAEDIATRIC RADIOLOGY													
CONVENTIONAL RADIOLOGY (XRAY)	1902	1596	1730	1431	1496	1692	1855	1879	1612	1578	1319	711	18801
ULTRASOUND GRAYSCALE /DOPPLER	399	395	262	131	143	209	218	423	360	169	163	99	2971
CT SCAN	74	79	60	55	53	66	47	109	116	48	34	13	754
MRI	57	71	39	36	44	41	35	76	74	29	23	11	536
WOMENS IMAGING													
MAMMOGRAPHY & SONOMAMMOGRAPHY	216	197	201	202	216	179	188	187	196	202	201	210	2395
FEMALE PELVIS ULTRASOUND /DOPPLER	562	489	579	497	549	493	578	584	573	513	591	597	6605
FEMALE THYROID ULTRASOUND /DOPPLER	87	91	81	78	90	87	86	99	91	79	90	88	1047
FETAL MEDICINE CASES	152	433	304	295	250	299	220	217	140	198	118	233	2859
CT, MRI, Biopsy and IR (vascular/non vascular)	101	99	103	97	98	102	119	106	105	89	95	98	1212

RADIOLOGY DEPARTMENT, SMIMER HOSPITAL

YEAR - 2019

INVESTIGATIONS	YEAR - 2019												TOTAL
	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCT	NOV	DEC	
CONVENTIONAL RADIOLOGY (XRAY)	11940	12193	14132	13023	12901	13632	15714	14632	15041	14101	14577	16264	168150
CONTRAST RADIOLOGY (BARIUM, IVP)	315	283	292	287	285	281	353	296	275	277	287	287	3518
ULTRASOUND (GRAY SCALE)	4141	3805	4500	3682	3612	4135	4447	4211	3977	3856	3995	4011	48372
USG (COLOUR DOPPLER)	342	309	353	338	296	398	387	351	328	332	378	347	4159
ULTRASOUND GUIDED PROCEDURES	311	292	316	322	295	296	365	324	295	286	310	326	3738
(FNAC, BIOPSY, ASPIRATION)	512	524	555	436	448	426	515	472	510	372	449	530	5749
C.T.S.CANS	53	55	61	62	66	59	64	59	50	56	57	64	706
C.T GUIDED BIOPSY/ FNAC	550	563	577	489	513	577	581	605	575	543	544	623	6740
MRI	66	62	70	61	63	63	80	65	119	152	171	174	1146
DSA WORK LOAD	117	112	122	124	130	119	127	111	112	117	126	135	1452
MAMMOGRAPHY	200	425	633	586	520	511	826	485	661	606	816	760	7029
FETAL MEDICINE CASES	138	122	209	196	195	209	258	185	190	146	148	265	2261
OPG													
EMERGENCY RADIOLOGY													
CONVENTIONAL RADIOLOGY (X-RAY)	2514	2250	2887	2905	3052	3047	3068	2780	3060	2929	2485	3123	34100
ULTRASOUND (GRAY SCALE)	1142	851	1005	692	1251	895	950	1122	1091	1009	1320	1017	12345
ULTRASOUND GUIDED PROCEDURE	57	58	68	76	80	64	64	67	83	70	59	65	811
USG (COLOUR DOPPLER)	62	51	67	64	72	66	62	58	68	63	57	61	751
CT SCAN	55	84	107	84	92	73	59	77	80	86	73	104	974
MRI	75	101	103	101	90	99	82	111	100	111	80	121	1174
INTERVENTIONAL RADIOLOGY													
INREPERVENTIONAL PROCEDURES	426	423	474	446	424	390	509	448	503	488	544	564	5639
INREPERVENTIONAL OPD CONSULTATION	106	86	59	89	98	79	141	160	172	125	166	157	1438
INREPERVENTIONAL Word Data	11	8	13	15	12	9	19	17	14	17	23	11	169
PEDIATRIC RADIOLOGY													
CONVENTIONAL RADIOLOGY (XRAY + Proc)	1329	1493	1561	1486	1500	1414	1358	1315	1597	1468	1403	1464	17388
ULTRASOUND GRAY SCALE /DOPPLER	203	222	316	251	490	320	392	422	313	295	278	341	3843
CT SCAN	47	61	50	23	58	49	34	47	18	12	19	30	448
MRI	46	22	44	21	68	41	44	42	16	11	18	22	395
WOMENS IMAGING													
MAMMOGRAPHY & SONOMAMMOGRAPHY	201	207	211	213	217	200	215	197	202	205	209	211	2488
FEMALE PELVIS ULTRASOUND /DOPPLER	595	563	609	577	575	601	607	597	583	532	607	602	7048
FEMALE THYROID ULTRASOUND /DOPPLER	97	99	86	89	91	93	88	101	97	89	91	88	1109
FETAL MEDICINE CASES	200	425	633	586	520	511	826	485	661	606	816	760	7029
CT, MRI, Biopsy and IR (vascular /non vascul	108	103	120	114	101	108	123	112	110	99	105	108	1311

RADIOLOGY DEPARTMENT, SMIMER HOSPITAL work load up to September-2020

INVESTIGATIONS	YEAR -2020												TOTAL
	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCT	NOV	DEC	
CONVENTIONAL RADIOLOGY (XRAY)	14271	14271	11893	8662	14477	15544	13151	8862	12250	13877	13368	140626	
CONTRAST RADIOLOGY (BARIUM, IVP)	298	298	263	44	82	92	74	44	141	139	102	1577	
ULTRASOUND (GRAY SCALE)	3988	3988	3593	2127	3110	3314	2311	2009	2726	3119	3187	33472	
USG (COLOUR DOPPLER)	368	368	314	58	107	112	100	48	150	162	104	1891	
ULTRASOUND GUIDED PROCEDURES	345	345	294	53	116	99	92	39	138	156	114	1791	
(FNAC, BIOPSY, ASPIRATION)	517	517	359	158	223	450	595	481	558	550	517	4925	
CT SCANS	71	71	49	33	81	37	26	2	33	37	46	486	
CT GUIDED BIOPSY/ FNAC	609	609	374	212	317	463	780	425	349	464	412	18478	
MRI	211	211	119	61	87	107	48	2	89	100	64	1099	
DSA WORK LOAD	128	128	107	22	52	53	42	11	53	69	44	709	
MAMMOGRAPHY	325	329	158	7	13	0	0	0	0	0	0	836	
FETAL MEDICIN. CASES													
OPC													
EMERGENCY RADIOLOGY													
CONVENTIONAL RADIOLOGY (X-RAY)	2557	2619	2321	2696	3486	3669	2511	2012	2619	3167	2594	30251	
ULTRASOUND (GRAY SCALE)	1062	993	1014	522	739	938	659	597	590	809	847	8770	
ULTRASOUND GUIDED PROCEDURE	60	55	55	4	12	5	1	3	12	34	22	263	
USG (COLOUR DOPPLER)	78	51	56	3	8	3	2	2	18	34	25	280	
CT SCAN	107	74	58	5	9	18	23	12	43	100	88	537	
MRI	101	89	77	4	15	13	5	11	44	84	57	500	
INTERVENTIONAL RADIOLOGY													
INREVENTIONAL PROCEDURES	199	187	117	21	64	73	15	35	92	77	51	931	
INREVENTIONAL OPD CONSULTATION	627	481	1108	148	302	126	28	41	21	205	159	1030	
INREVENTIONAL. Word Data	5	9	20	10	31	5	4	0	0	16	0	100	
PEDIATRIC RADIOLOGY													
CONVENTIONAL RADIOLOGY (XRAY + Proc)	1282	1282	1171	874	1086	951	590	483	711	836	866	10132	
ULTRASOUND GRAY SCALE /DOPPLER	278	278	231	188	232	182	113	99	112	117	140	1970	
CT SCAN	16	16	20	14	7	15	12	5	17	20	12	154	
MRI	25	25	8	18	5	17	10	0	11	4	16	139	
WOMENS IMAGING													
MAMMOGRAPHY & SONOMAMMOGRAPHY	272	180	45	43	82	98	86	32	69	1082	866	2855	
FEMALE PELVIS ULTRASOUND /DOPPLER	418	466	92	59	116	322	138	43	54	112	140	1960	
FEMALE THYROID ULTRASOUND /DOPPLER	56	43	62	20	89	78	16	19	25	190	12	610	
FETAL MEDICINE CASES	759	768	707	413	650	654	669	553	518	547	16	6254	
CT,MRI,Biopsy and IR (vascular/non vascular)	98	103	78	32	102	128	35	49	59	69	48	801	

RADIOLOGY DEPARTMENT, SMIMER HOSPITAL			
january - 2020 Monthly data			
INVESTIGATIONS	INDOOR	OUTDOOR	TOTAL
CONVENTIONAL RADIOLOGY (XRAY)	1772	12499	14271
CONTRAST RADIOLOGY (BARIUM, IVP)	130	168	298
ULTRASOUND (GRAY SCALE)	814	3174	3988
USG (COLOUR DOPPLER)	159	209	368
ULTRASOUND GUIDED PROCEDURES (FNAC, BIOPSY, ASPIRATION)	141	204	345
C.T.SCANS	242	275	517
CT GUIDED BIOPSY/ FNAC	22	49	71
MRI	254	355	609
DSA WORK LOAD	43	168	211
MAMMOGRAPHY	8	122	128
OPG	9	320	329
EMERGENCY RADIOLOGY			
CONVENTIONAL RADIOLOGY (X-RAY)	...	...	2557
ULTRASOUND (GRAY SCALE)	...	...	1062
ULTRASOUND GUIDED PROCEDURE	...	...	60
USG (COLOUR DOPPLER)	...	...	78
CT SCAN	...	...	107
MRI	...	...	101
INTERVENTIONAL RADIOLOGY			
INRERVENTIONAL OPD CONSULTATION		199	199
INRERVENTIONAL PROCEDURES	206	421	627
I.R.WARD ADMISSION	5	0	5
PAEDIATRIC RADIOLOGY			
CONVENTIONAL RADIOLOGY (XRAY + Proc.)	470	812	1282
ULTRASOUND GRAY SCALE /DOPPLER	129	150	278
CT SCAN	13	3	16
MRI	17	8	25
WOMENS IMAGING			
MAMMOGRAPHY & SONOMAMMOGRAPHY	30	242	272
FEMALE PELVIS ULTRASOUND /DOPPLER	217	201	418
FEMALE THYROID ULTRASOUND /DOPPLER	18	38	56
FETAL MEDICINE CASES	112	647	759
CT,MRI,Biopsy and IR (vascular/non vascular)	41	57	98

RADIOLOGY DEPARTMENT, SMIMER HOSPITAL			
February - 2020 Monthly data			
INVESTIGATIONS	INDOOR	OUTDOOR	TOTAL
CONVENTIONAL RADIOLOGY (XRAY)	1568	11378	12946
CONTRAST RADIOLOGY (BARIUM, IVP)	177	144	321
ULTRASOUND (GRAY SCALE)	763	3031	3794
USG (COLOUR DOPPLER)	129	163	292
ULTRASOUND GUIDED PROCEDURES (FNAC, BIOPSY, ASPIRATION)	130	155	285
C.T.SCANS	210	231	441
CT GUIDED BIOPSY/ FNAC	22	27	49
MRI	230	352	582
DSA WORK LOAD	34	113	147
MAMMOGRAPHY	17	111	128
OPG	3	83	86
EMERGENCY RADIOLOGY			
CONVENTIONAL RADIOLOGY (X-RAY)	...	....	2619
ULTRASOUND (GRAY SCALE)	...	....	993
ULTRASOUND GUIDED PROCEDURE	...	....	55
USG (COLOUR DOPPLER)	...	....	51
CT SCAN	...	....	74
MRI	...	....	89
INTERVENTIONAL RADIOLOGY			
INRERVENTIONAL OPD CONSULTATION	...	187	187
INRERVENTIONAL PROCEDURES	186	295	481
I.R.WARD ADMISSION	9	0	9
PAEDIATRIC RADIOLOGY			
CONVENTIONAL RADIOLOGY (XRAY)	381	768	1149
ULTRASOUND GRAY SCALE /DOPPLER	103	154	257
CT SCAN	11	4	15
MRI	14	2	16
WOMENS IMAGING			
MAMMOGRAPHY & SONOMAMMOGRAPHY	32	148	180
FEMALE PELVIS ULTRASOUND /DOPPLER	253	213	466
FEMALE THYROID ULTFASOUND /DOPPLER	19	24	43
FETAL MEDICINE CASES	22	746	768
CT,MRI,Biopsy and IR (vascular/non vascular)	20	83	103

RADIOLOGY DEPARTMENT, SMIMER HOSPITAL			
March - 2020 Monthaly data (Covid Lockdown- 22/03 onwards)			
INVESTIGATIONS	INDOOR	OUTDOOR	TOTAL
CONVENTIONAL RADIOLOGY (XRAY)	1674	10152	11893
CONTRAST RADIOLOGY (BARIUM, IVP)	118	145	263
ULTRASOUND (GRAY SCALE)	780	2859	3593
USG (COLOUR DOPPLER)	142	171	314
ULTRASOUND GUIDED PROCEDURES (FNAC, BIOPSY, ASPIRATION)	129	165	294
C.T.SCANS	156	204	359
CT GUIDED BIOPSY/ FNAC	9	40	49
MRI	155	225	374
DSA WORK LOAD	14	105	119
MAMMOGRAPHY	11	96	107
OPG	6	152	158
EMERGENCY RADIOLOGY			
CONVENTIONAL RADIOLOGY (X-RAY)	..	..	2321
ULTRASOUND (GRAY SCALE)	..	..	1014
ULTRASOUND GUIDED PROCEDURE	..	..	55
USG (COLOUR DOPPLER)	..	..	56
CT SCAN	..	..	58
MRI	..	..	77
INTERVENTIONAL RADIOLOGY			
INRERVENTIONAL OPD CONSULTATION	0	117	117
INRERVENTIONAL PROCEDURES	152	310	462
I.R.WARD ADMISSION	20	0	20
PAEDIATRIC RADIOLOGY			
CONVENTIONAL RADIOLOGY (XRAY)	438	690	1171
ULTRASOUND GRAY SCALE /DOPPLER	84	149	231
CT SCAN	13	7	20
MRI	14	4	8
WOMENS IMAGING			
MAMMOGRAPHY & SONOMAMMOGRAPHY	21	24	45
FEMALE PELVIS ULTRASOUND /DOPPLER	51	41	92
FEMALE THYROID ULTRASOUND /DOPPLER	3	59	62
FETAL MEDICINE CASES	11	696	707
CT,MRI,Biopsy and IR (vascular/non vascular)	33	45	78

RADIOLOGY DEPARTMENT, SMIMER HOSPITAL			
April - 2020 Monthly data (COVID Lockdown period)			
INVESTIGATIONS	INDOOR	OUTDOOR	TOTAL
CONVENTIONAL RADIOLOGY (XRAY)	1274	7408	8662
CONTRAST RADIOLOGY (BARIUM, IVP)	21	23	44
ULTRASOUND (GRAY SCALE)	357	1770	2127
USG (COLOUR DOPPLER)	22	35	58
ULTRASOUND GUIDED PROCEDURES (FNAC, BIOPSY, ASPIRATION)	17	37	53
C.T.SCANS	90	65	158
CT GUIDED BIOPSY/ FNAC	15	18	33
MRI	117	90	212
DSA WORK LOAD	26	35	61
MAMMOGRAPHY	4	18	22
OPG	0	7	7
EMERGENCY RADIOLOGY			
CONVENTIONAL RADIOLOGY (X-RAY)	..	..	2696
ULTRASOUND (GRAY SCALE)	..	..	522
ULTRASOUND GUIDED PROCEDURE	..	..	4
USG (COLOUR DOPPLER)	..	..	3
CT SCAN	..	..	5
MRI	..	..	4
INTERVENTIONAL RADIOLOGY			
INRERVENTIONAL OPD CONSULTATION		21	21
INRERVENTIONAL PROCEDURES	58	90	148
I.R.WARD ADMISSION	10		10
PAEDIATRIC RADIOLOGY			
CONVENTIONAL RADIOLOGY (XRAY)	380	494	874
ULTRASOUND GRAY SCALE /DOPPLER	113	75	188
CT SCAN	13	1	14
MRI	15	3	18
WOMENS IMAGING			
MAMMOGRAPHY & SONOMAMMOGRAPHY	14	29	43
FEMALE PELVIS ULTRASOUND /DOPPLER	26	33	59
FEMALE THYROID ULTRASOUND /DOPPLER	11	9	20
FETAL MEDICINE CASES	112	301	413
CT,MRI,Biopsy and IR (vascular/non vascular)	11	21	32

COVID IMAGING	813
X-RAY	125
ULTRASOUND	25
CT SCAN	

RADIOLOGY DEPARTMENT, SMIMER HOSPITAL			
May - 2020 Monthly data			
INVESTIGATIONS	INDOOR	OUTDOOR	TOTAL
CONVENTIONAL RADIOLOGY (XRAY)	2280	12197	14477
CONTRAST RADIOLOGY (BARIUM, IVP)	32	50	82
ULTRASOUND (GRAY SCALE)	686	2424	3110
USG (COLOUR DOPPLER)	37	71	107
ULTRASOUND GUIDED PROCEDURES (FNAC, BIOPSY, ASPIRATION)	36	80	116
C.T.SCANS	112	110	223
CT GUIDED BIOPSY/ FNAC	42	57	81
MRI	144	173	317
DSA WORK LOAD	47	40	87
MAMMOGRAPHY	5	47	52
OPG	2	11	13
EMERGENCY RADIOLOGY			
CONVENTIONAL RADIOLOGY (X-RAY)	..	..	3486
ULTRASOUND (GRAY SCALE)	..	..	739
ULTRASOUND GUIDED PROCEDURE	..	..	12
USG (COLOUR DOPPLER)	..	..	8
CT SCAN	..	..	9
MRI	..	..	15
INTERVENTIONAL RADIOLOGY			
INRERVENTIONAL OPD CONSULTATION		64	64
INRERVENTIONAL PROCEDURES	125	177	302
I.R.WARD ADMISSION	31		31
PAEDIATRIC RADIOLOGY			
CONVENTIONAL RADIOLOGY (XRAY)	437	652	1086
ULTRASOUND GRAY SCALE /DOPPLER	134	98	232
CT SCAN	6	1	7
MRI	3	2	5
WOMENS IMAGING			
MAMMOGRAPHY & SONOMAMMOGRAPHY	19	63	82
FEMALE PELVIS ULTRASOUND /DOPPLER	23	93	116
FEMALE THYROID ULTRASOUND /DOPPLER	30	59	89
FETAL MEDICINE CASES	172	478	650
CT,MRI,Biopsy and IR (vascular/non vascular)	34	68	102

COVID IMAGING

X-RAY	1096
Ultrasound	235
C.T.	35

RADIOLOGY DEPARTMENT, SMIMER HOSPITAL			
june - 2020 Monthaly data (COVID Era)			
INVESTIGATIONS	INDOOR	OUTDOOR	TOTAL
CONVENTIONAL RADIOLOGY (XRAY)	1796	13748	15544
CONTRAST RADIOLOGY (BARIUM, IVP)	36	56	92
ULTRASOUND (GRAY SCALE)	607	2707	3314
USG (COLOUR DOPPLER)	48	64	112
ULTRASOUND GUIDED PROCEDURES (FNAC, BIOPSY, ASPIRATION)	28	71	99
C.T.SCANS	203	247	450
CT GUIDED BIOPSY/ FNAC	3	34	37
MRI	206	257	463
DSA WORK LOAD	30	77	107
MAMMOGRAPHY	6	37	53
OPG	0	0	0
EMERGENCY RADIOLOGY (Ref.from casualty and E.W.)			
CONVENTIONAL RADIOLOGY (X-RAY)	..	..	3669
ULTRASOUND (GRAY SCALE)	..	..	938
ULTRASOUND GUIDED PROCEDURE	..	..	5
USG (COLOUR DOPPLER)	..	..	3
CT SCAN	..	..	18
MRI	..	..	13
INTERVENTIONAL RADIOLOGY			
INRERVENTIONAL OPD CONSULTATION		73	73
INRERVENTIONAL PROCEDURES	53	73	126
I.R.WARD ADMISSION	5		5
PAEDIATRIC RADIOLOGY			
CONVENTIONAL RADIOLOGY (XRAY)	357	594	951
ULTRASOUND GRAY SCALE /DOPPLER	75	112	182
CT SCAN	5	10	15
MRI	4	13	17
WOMENS IMAGING			
MAMMOGRAPHY & SONOMAMMOGRAPHY	15	83	98
FEMALE PELVIS ULTRASOUND /DOPPLER	44	278	322
FEMALE THYROID ULTRASOUND /DOPPLER	9	69	78
FETAL MEDICINE CASES	124	530	654
CT,MRI,Biopsy and IR (vascular/non vascular)	32	96	128
COVID IMAGING			
X-RAY			2438
Ultrasonography			298
C.T.SCANS			158
COVID Portable x-ray			

RADIOLOGY DEPARTMENT, SMIMER HOSPITAL			
july - 2020 Monthaly data (COVID Era)			
INVESTIGATIONS	INDOOR	OUTDOOR	TOTAL
CONVENTIONAL RADIOLOGY (XRAY)	1461	11650	13151
CONTRAST RADIOLOGY (BARIUM, IVP)	27	47	74
ULTRASOUND (GRAY SCALE)	485	1826	2311
USG (COLOUR DOPPLER)	41	59	100
ULTRASOUND GUIDED PROCEDURES (FNAC, BIOPSY, ASPIRATION)	33	59	92
C.T.SCANS	197	398	595
CT GUIDED BIOPSY/ FNAC	3	23	26
MRI	97	109	206
DSA WORK LOAD	16	32	48
MAMMOGRAPHY	10	32	42
OPG	0	0	0
EMERGENCY RADIOLOGY (Ref.from casualty and E.W.)			
CONVENTIONAL RADIOLOGY (X-RAY)	..	..	2511
ULTRASOUND (GRAY SCALE)	..	..	659
ULTRASOUND GUIDED PROCEDURE	..	..	1
USG (COLOUR DOPPLER)	..	..	2
CT SCAN	..	..	23
MRI	..	..	5
INTERVENTIONAL RADIOLOGY			
INRERVENTIONAL OPD CONSULTATION		29	29
INRERVENTIONAL PROCEDURES	2	26	28
I.R.WARD ADMISSION	17	0	17
PAEDIATRIC RADIOLOGY			
CONVENTIONAL RADIOLOGY (XRAY)	213	377	590
ULTRASOUND GRAY SCALE /DOPPLER	35	84	113
CT SCAN	10	2	12
MRI	8	2	10
WOMENS IMAGING			
MAMMOGRAPHY & SONOMAMMOGRAPHY	2	84	86
FEMALE PELVIS ULTRASOUND /DOPPLER			138
FEMALE THYROID ULTRASOUND /DOPPLER			16
FETAL MEDICINE CASES			669
CT,MRI,Biopsy and IR (vascular/non vascular)			35
COVID IMAGING			
X-RAY -COVID OPD			4432
Ultrasonography			285
C.T.SCANS			395
COVID Portable X-ray			1250

RADIOLOGY DEPARTMENT, SMIMER HOSPITAL			
Aug - 2020 Monthly data (COVID Era)			
INVESTIGATIONS	INDOOR	OUTDOOR	TOTAL
CONVENTIONAL RADIOLOGY (XRAY)	1022	7860	8862
CONTRAST RADIOLOGY (BARIUM, IVP)	12	32	44
ULTRASOUND (GRAY SCALE)	311	1698	2009
USG (COLOUR DOPPLER)	18	30	48
ULTRASOUND GUIDED PROCEDURES (FNAC, BIOPSY, ASPIRATION)	13	26	39
C.T.SCANS	202	279	481
CT GUIDED BIOPSY/ FNAC	0	2	2
MRI	115	120	425
DSA WORK LOAD	0	2	2
MAMMOGRAPHY	2	9	11
OPG	0	0	0
EMERGENCY RADIOLOGY (Ref.from casualty and E.W.)			
CONVENTIONAL RADIOLOGY (X-RAY)	..	..	2012
ULTRASOUND (GRAY SCALE)	..	..	597
ULTRASOUND GUIDED PROCEDURE	..	..	3
USG (COLOUR DOPPLER)	..	..	2
CT SCAN	..	..	12
MRI	..	..	11
INTERVENTIONAL RADIOLOGY			
INRERVENTIONAL OPD CONSULTATION	0	35	35
INRERVENTIONAL PROCEDURES	0	41	41
I.R.WARD ADMISSION	All COVID	0	0
PAEDIATRIC RADIOLOGY			
CONVENTIONAL RADIOLOGY (XRAY)	254	213	483
ULTRASOUND GRAY SCALE /DOPPLER	39	68	99
CT SCAN	5	0	5
MRI	0	0	0
WOMENS IMAGING			
MAMMOGRAPHY & SONOMAMMOGRAPHY	..	32	32
FEMALE PELVIS ULTRASOUND /DOPPLER	...	43	43
FEMALE THYROID ULTRASOUND /DOPPLER	...	19	19
FETAL MEDICINE CASES	62	491	553
CT,MRI,Biopsy and IR (vascular/non vascular)	...	49	49
COVID IMAGING			
X-RAY -COVID OPD	..	..	1273
Ultrasonography	..	..	153
C.T.SCANS	..	..	238
COVID Portable X-ray	..	..	831

RADIOLOGY DEPARTMENT, SMIMER HOSPITAL			
Sep - 2020 Monthaly data (COVID Era)			
INVESTIGATIONS	INDOOR	OUTDOOR	TOTAL
CONVENTIONAL RADIOLOGY (XRAY)	1162	11088	12250
CONTRAST RADIOLOGY (BARIUM, IVP)	49	92	141
ULTRASOUND (GRAY SCALE)	492	2234	2726
USG (COLOUR DOPPLER)	50	100	150
ULTRASOUND GUIDED PROCEDURES (FNAC, BIOPSY, ASPIRATION)	39	99	138
C.T.SCANS	289	269	558
CT GUIDED BIOPSY/ FNAC	10	23	33
MRI	168	181	349
DSA WORK LOAD	25	74	89
MAMMOGRAPHY	10	43	53
OPG	0	0	0
EMERGENCY RADIOLOGY (Ref.from casualty and E.W.)			
CONVENTIONAL RADIOLOGY (X-RAY)	..	..	2619
ULTRASOUND (GRAY SCALE)	..	..	590
ULTRASOUND GUIDED PROCEDURE	..	..	12
USG (COLOUR DOPPLER)	..	..	18
CT SCAN	..	..	43
MRI	..	..	44
INTERVENTIONAL RADIOLOGY			
INRERVENTIONAL OPD CONSULTATION	0		92
INRERVENTIONAL PROCEDURES	0		21
I.R.WARD ADMISSION	All COVID	0	0
PAEDIATRIC RADIOLOGY			
CONVENTIONAL RADIOLOGY (XRAY)	242	477	711
ULTRASOUND GRAY SCALE /DOPPLER	40	72	112
CT SCAN	14	3	17
MRI	9	2	11
WOMENS IMAGING			
MAMMOGRAPHY & SONOMAMMOGRAPHY	13	56	69
FEMALE PELVIS ULTRASOUND /DOPPLER	5	49	54
FEMALE THYROID ULTRASOUND /DOPPLER	2	23	25
FETAL MEDICINE CASES	23	495	518
CT,MRI,Biopsy and IR (vascular/non vascular)	6	53	59
COVID IMAGING			
X-RAY -COVID OPD	..	..	1960
Ultrasonography	..	..	142
C.T.SCANS	..	..	240
COVID Portable X-ray	..	..	634

RADIOLOGY DEPARTMENT, SMIMER HOSPITAL			
OCT - 2020 Monthly data (COVID Era)			
INVESTIGATIONS	INDOOR	OUTDOOR	TOTAL
CONVENTIONAL RADIOLOGY (XRAY)	1210	12667	13877
CONTRAST RADIOLOGY (BARIUM, IVP)	56	83	139
ULTRASOUND (GRAY SCALE)	529	2590	3119
USG (COLOUR DOPPLER)	63	99	162
ULTRASOUND GUIDED PROCEDURES (FNAC, BIOPSY, ASPIRATION)	59	97	156
C.T.SCANS	332	218	550
CT GUIDED BIOPSY/ FNAC	10	27	37
MRI	252	212	464
DSA WORK LOAD	29	71	100
MAMMOGRAPHY	17	52	69
OPG	0	0	0
EMERGENCY RADIOLOGY (Ref.from casualty and E.W.)			
CONVENTIONAL RADIOLOGY (X-RAY)	..	..	3167
ULTRASOUND (GRAY SCALE)	..	..	809
ULTRASOUND GUIDED PROCEDURE	..	..	34
USG (COLOUR DOPPLER)	..	..	34
CT SCAN	..	..	100
MRI	..	..	84
INTERVENTIONAL RADIOLOGY			
INRERVENTIONAL OPD CONSULTATION	0	77	77
INRERVENTIONAL PROCEDURES	81	124	205
I.R.WARD ADMISSION	16	0	16
PAEDIATRIC RADIOLOGY			
CONVENTIONAL RADIOLOGY (XRAY)	339	497	836
ULTRASOUND GRAY SCALE /DOPPLER	59	68	117
CT SCAN	13	7	20
MRI	3	1	4
WOMENS IMAGING			
MAMMOGRAPHY & SONOMAMMOGRAPHY	21	88	109
FEMALE PELVIS ULTRASOUND /DOPPLER	17	112	129
FEMALE THYROID ULTRASOUND /DOPPLER	5	89	94
FETAL MEDICINE CASES	33	684	717
CT,MRI,Biopsy and IR (vascular/non vascular)	13	56	69
COVID IMAGING			
X-RAY -COVID OPD	..	..	1082
Ultrasonography	..	..	112
C.T.SCANS	..	..	190
COVID Portable X-ray	..	..	547

RADIOLOGY DEPARTMENT, SMIMER HOSPITAL			
NOV - 2020 Monthly data (COVID Era)			
INVESTIGATIONS	INDOOR	OUTDOOR	TOTAL
CONVENTIONAL RADIOLOGY (XRAY)	1074	12292	13368
CONTRAST RADIOLOGY (BARIUM, IVP)	48	54	102
ULTRASOUND (GRAY SCALE)	523	2664	3187
USG (COLOUR DOPPLER)	56	48	104
ULTRASOUND GUIDED PROCEDURES (FNAC, BIOPSY, ASPIRATION)	60	54	114
C.T.SCANS	290	227	517
CT GUIDED BIOPSY/ FNAC	23	23	46
MRI	221	197	412
DSA WORK LOAD	42	22	64
MAMMOGRAPHY	5	39	44
OPG	0	0	0
EMERGENCY RADIOLOGY (Ref.from casualty and E.W.)			
CONVENTIONAL RADIOLOGY (X-RAY)	..	..	2594
ULTRASOUND (GRAY SCALE)	..	..	847
ULTRASOUND GUIDED PROCEDURE	..	..	22
USG (COLOUR DOPPLER)	..	..	25
CT SCAN	..	..	88
MRI	..	..	57
INTERVENTIONAL RADIOLOGY			
INRERVENTIONAL OPD CONSULTATION	0	51	51
INRERVENTIONAL PROCEDURES	82	77	159
I.R.WARD ADMISSION	0		0
PAEDIATRIC RADIOLOGY			
CONVENTIONAL RADIOLOGY (XRAY)	262	604	866
ULTRASOUND GRAY SCALE /DOPPLER	60	80	140
CT SCAN	9	3	12
MRI	13	3	16
WOMENS IMAGING			
MAMMOGRAPHY & SONOMAMMOGRAPHY	14	77	866
FEMALE PELVIS ULTRASOUND /DOPPLER	21	114	140
FEMALE THYROID ULTRASOUND /DOPPLER	3	78	12
FETAL MEDICINE CASES	36	481	16
CT,MRI,Biopsy and IR (vascular/non vascular)	10	38	48
COVID IMAGING			
X-RAY -COVID OPD	..	..	729
Ultrasonography	..	..	125
C.T.SCANS	..	..	169
COVID Portable X-ray	..	..	481