Nuclear Medicine

Standard Operating Procedures
For Assistant Medical Officer in Nuclear Medicine

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Ministry Of Health, Malaysia

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FOREWORD

Standard Operating Procedures for Assistant Medical Officer (Medical Assistant) in the Medical Care Programme serves as a guide to meet the standards of care and professionalism set out by the Ministry of Health Malaysia (MOH). It also serves to enhance public awareness of standards expected from Assistant Medical Officer (Medical Assistant) who provide specialized care for patients. Public awareness of standards expected from Assistant Medical Officer (Medical Assistant) will hopefully encourage greater compliance amongst Assistant Medical Officer (Medical Assistant) themselves to these guidelines. It is in their best interest to adhere, at all times, to the Standard Operating Procedures laid in this book.

Of late, Assistant Medical Officer (Medical Assistant) have seen many positive changes initiated by the Medical Development and Practise Divisions of MOH. The MOH recognizes the valuable contributions by Assistant Medical Officer (Medical Assistant) and have created several senior posts of Amo's to enhance and improve the clinical supervision and management of patients. The Ministry of Health has always stressed on the importance of effective supervision of their peers by senior Assistant Medical Officer (Medical Assistant) under the guidance of medical officers. The preparation of the Standard Operating Procedures and other guidelines are aimed at providing useful information for quality patient care and I hope these guidelines will be used as reference material for Assistant Medical Officer (Medical Assistant) throughout the country in the execution of their duties and efforts to provide quality health care to the community.

I am confident the Standard Operating Procedures will be well accepted. We will of course ensure that updates with new topics, activities and procedures will be introduced in future editions.

May I congratulate the Medical Programme of MOH, all senior consultants and the Medical Assistant Technical Committee for their tireless efforts and commitment to publish the Standard Operating Procedures. We would also like to record our thanks to all doctors and Assistant Medical Officer involved in the successful preparation of this first edition of the Standard Operating Procedures. I am always impressed with efforts to strive for excellence in service delivery and such efforts by the Assistant Medical Officer (Medical Assistant) are most commendable indeed.

Tan Sri Datuk Dr. Hj. Mohd. Ismail Merican
Director General of Health Malaysia
Oktober 2007

FOREWORD

Successive generations of Assistant Medical Officer (Medical Assistant) who have worked in the Ministry of Health have all practiced the long-held tradition of hands-on training to ensure that everyone can acquire the latest knowledge and skills. While formal training has always been encouraged this is not always possible for some for various reasons. To their credit this form of knowledge and skill sharing has been done rather effectively. While practising the skill which they acquired through training never posed any problem, the lack of documents which specify standard methods of carrying various tasks has been a cause of anxiety and concern to many. Thus the arrival of this document on the standard operating procedures for nuclear medicine into the scene now should alleviate the anxiety of many.

The importance and relevance of this SOP Standard Operating Procedures for Nuclear Medicine, which is long overdue, can never be overstated. This SOP will ensure uniformity/ standardization, correctness/accuracy, effectiveness as well consistency in performance. Not all tasks require SOP as they are carried out routinely. SOPs can be considered as mandatory for tasks which are complicated. Tasks and procedures associated with the four above mentioned disciplines are certainly complicated.

SOP can easily be "linked" to quality assurance. Compliance to SOP would certainly ensure quality care for the patient. This is important as our patients now are increasingly well informed of their rights and they expect nothing less than the quality of care that they perceive they deserve. This SOP will not only be useful to those who are already familiar with the procedures but staff who are fairly new will find it very useful.

Writing this SOP, I am sure, has not been an easy task. It requires an certain depth of knowledge, team approach and the courage to decide on what should constitute standard methods. To the authors of this SOP we owe them deep gratitude for their effort, time and resilience. They must be congratulated for a job well done.

Thank you

Dato' Dr. Hjh. Noorimi binti Hj. Morad
Deputy Director General of Health (Medical)
Ministry of Health, Malaysia

MESSAGE

I would like to extend my heartfelt congratulations and extend my utmost appreciation to the Medical Assistant Board and the working committee of Nuclear Medicine Standard Operating Procedure for Assistant Medical Officer (Medical Assistant).

The Assistant Medical Officers group had in the past has always been required to improve, update and maintain working skills and performance in their respective field. In this aspect, it also involved new and emerging technologies in the Nuclear Medicine Services.

There is an ever increasing complexity in the Nuclear Medicine Services both in vivo and in vitro and also in the nuclear medicine diagnostic, therapeutic and interventional areas.

I hope this Standard Operating Procedure for Assistant Medical Officers (Medical Assistants) in Nuclear Medicine will be a valuable asset and act as a guide to new and ongoing trainee Assistant Medical Officer (Medical Assistant) to minimize errors and to increase their working skills.

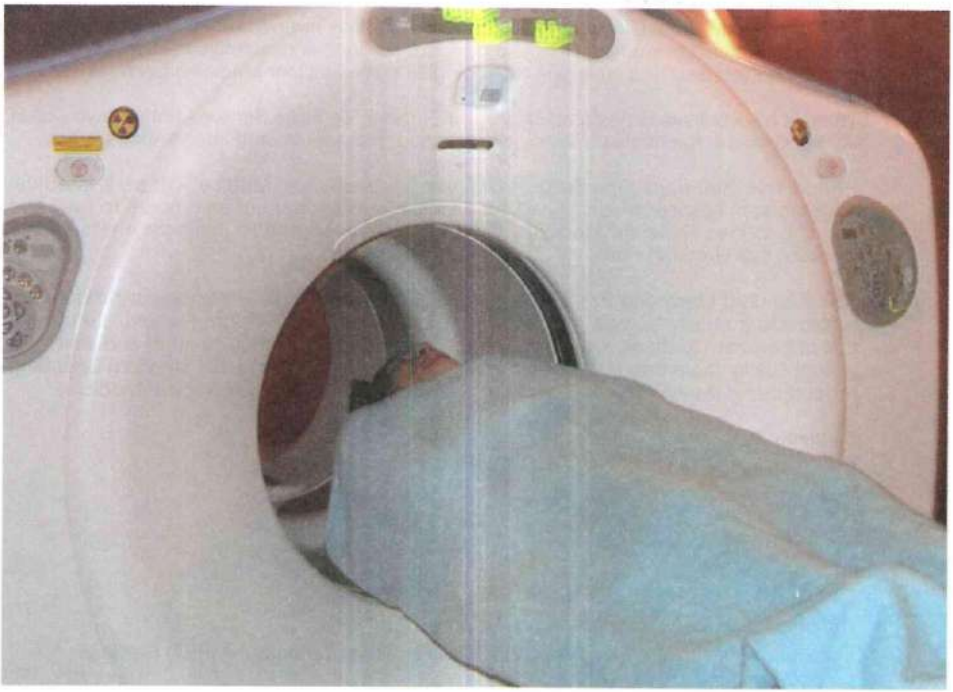
This Standard Operating Procedure guide will be a catalyst to enhance our productivity to provide a quality service thus fulfilling our nation's health vision. I would like to take this opportunity to thank everyone who has dedicated their timeless effort and also their willingness to share their knowledge and experiences in compiling this Standard Operating Procedure for the Assistant Medical Officers (Medical Assistant) in Nuclear Medicine.

Sincerely

DATO' DR. MOHAMED ALI BIN ABDUL KHADER
National Head for Nuclear Medicine Services,
Department of Nuclear Medicine & Positron Emission Tomography (PET) Services,
Penang Hospital

NUCLEAR MEDICINE

Standard Operating Procedures For Assistant Medical Officer in Nuclear Medicine



Ministry of Health, Malaysia

TECHNICAL COMMITTEE

ADVISOR	:	**Ybhg Dato' Dr Mohamed Ali bin Abdul Khader** DSPN,DJN,PKT,AM National Head for Nuclear Medicine Services, Department of Nuclear Medicine & Positron Emission Tomography (PET) Services, Penang Hospital
CHAIRMAN	:	**Mr Hj. Hassan bin Hj. Ahmad, AMN, PIS.** Chief Assistant Medical Officer Malaysia, Ministry of Health Malaysia.
SECRETARY	:	**Mr Hj Mustaffa bin Hamidon,** Senior Assistant Medical Officer, Department of Nuclear Medicine, Penang Hospital.
MEMBERS	:	**Mr Salim bin Talib** Senior Assistant Medical Officer , Department of Nuclear Medicine Hospital Kuala Lumpur.
	:	**Mr Sazali bin Ismail,** Assistant Medical Officer , Department of Nuclear Medicine Penang Hospital.
	:	**Mr Shakhar bin Mohd Yasin** Senior Assistant Medical Officer Nuclear Medicine Division, Hospital Sultanah Aminah, Johor Bahru.

LIST OF CONTRIBUTORS

Hj Aziz bin Khalid
Assistant Medical Officer,
Department of Nuclear Medicine
Hospital Kuala Lumpur.

Mr Saiful Rizal Sukar,
Assistant Medical Officer,
Department of Nuclear Medicine
Hospital Kuala Lumpur.

Mr Shahrul Shahrim Said
Assistant Medical Officer,
Department of Nuclear Medicine
Hospital Kuala Lumpur.

Mr Abd Mutalib Omar Abd Wahab
Assistant Medical Officer,
Department of Nuclear Medicine
Hospital Kuala Lumpur.

Mr Mohd Lokman Ali
Assistant Medical Officer,
Department of Nuclear Medicine
Hospital Kuala Lumpur.

LIST OF REVIEWERS

1. **Ybhg Dato' Dr Mohamed Ali bin Abdul Khader**,DSPN,DJN,PKT,AM
   National Head for Nuclear Medicine Services,
   Department of Nuclear Medicine & Positron Emission Tomography (PET) Services,
   Penang Hospital

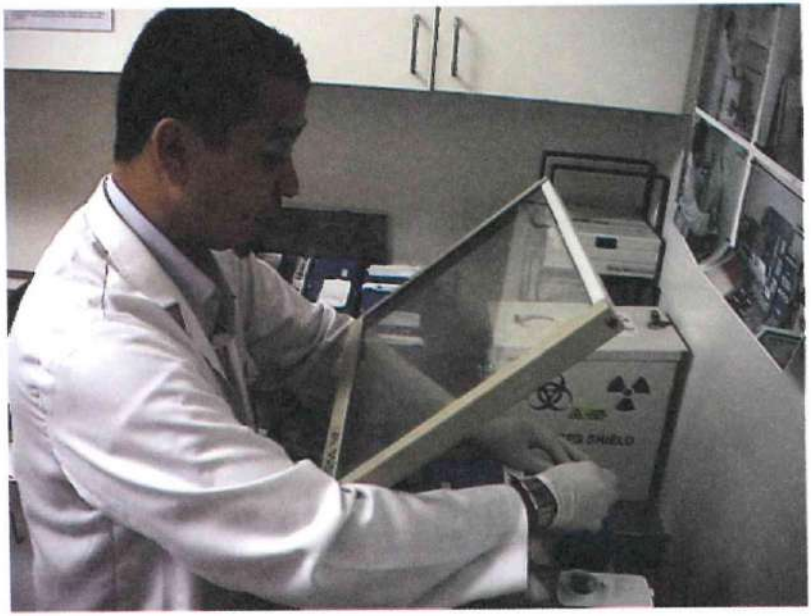
2. **Dr Lee Boon Nang**
   Senior Consultant & Head of Department
   Department of Nuclear Medicine
   Kuala Lumpur Hospital

3. **Dr Ng Chen Siew**
   Nuclear Medicine Specialist
   Nuclear Medicine Unit, Imaging & Diagnostic Department
   Sultanah Aminah Hospital Johor Bahru

CONTENTS

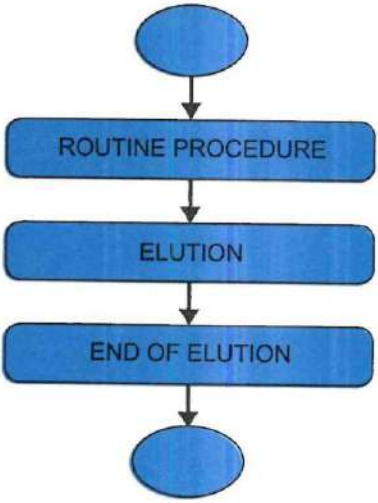
1. TECHNETIUM – 99m GENERATOR ELUTION/MILKING

Activity	Work Process	Standard	Requirement
1. Routine Procedure.	Pre Elution must be done behind the lead shield. - Refer to manual procedure in every hospital.	Workstation - hot lab. - strictly follow radiation safety method. - strictly follow aseptic technique	- Eluent vial 10ml/20ml - molybdenum generator. - normal saline. - lead brick. - Bactericidal swab. - needle 21/23G - sterile gloves. - L block shield.
2.Elution/ Milking The Generator.	Producing Technetium-99M – Refer to manual procedure in every hospital.		- evacuated collection vial. - needle protector.
3.End of Elution/ Milking.	Place 99mTc vial in collection vial to the reconstitution workstation and record the activity - refer to manual procedure		- forceps - tongs - Record book.



Technetium - 99m Generator Elution/Milking

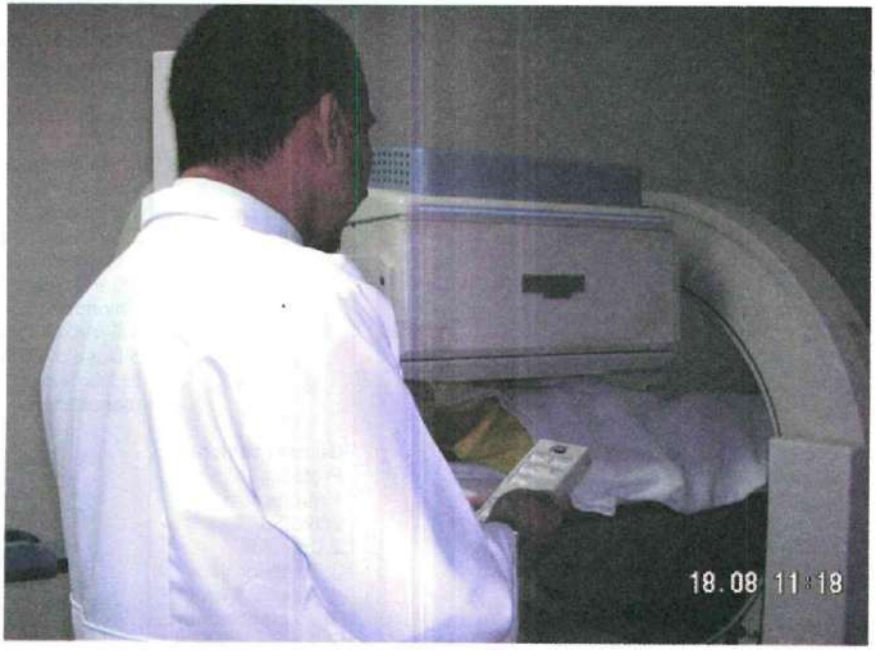
WORK FLOW TECHNETIUM – 99m GENERATOR ELUTION/MILKING



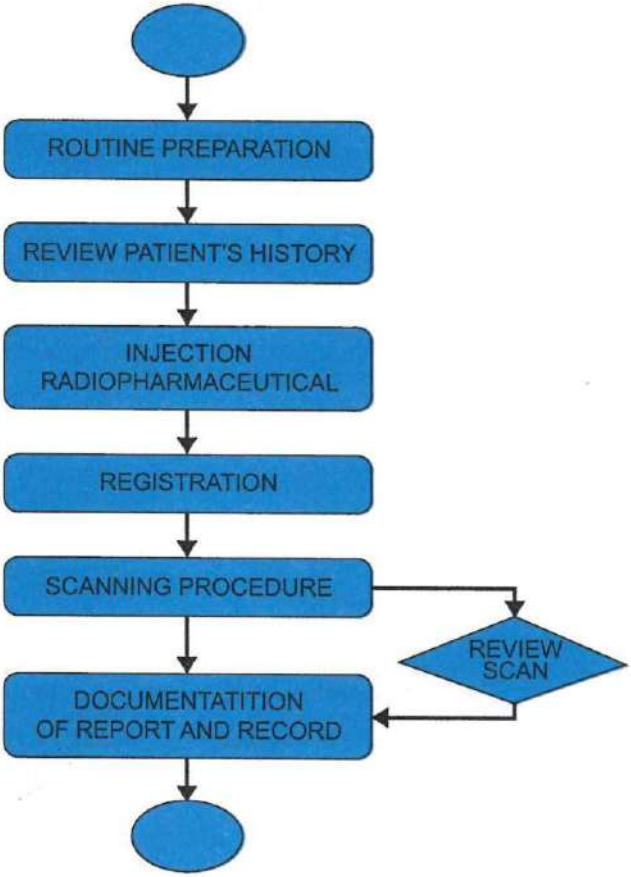
2.RENAL DTPA SCANNING
(DIETHYLENETRIAMINE PENTAACETIC ACID)

Activity	Work Process	Standard	Requirement
1. Routine preparation.	Children give Syrup Chloral Hydrate.	Dose: 15 mg/kg.. Lasix- Adult 40 mg Children – 1mg/kg.	
2. Injection Radio pharmaceutical	Reconstitution of Radiopharmaceutical to follow manual procedure for every department/hospital	Dose: 480 MBq for adult via I/V. Dose for children refer to Gilder's chart.	
3. Registration	All patients should be registered in the standard registration book after receiving request form.	1.Name 2.Age 3.I/C No 4.Type of Scan 5.Referral Unit/ Dept	Equipment. 1.10 ml syringe 2.Alcohol swab 3.Glove. 4.Gamma camera 5.Extension tube 100 cm 6.Injection stand. 7.Film processing machine 8.Lead shield carrier. Radiopharmaceutical and Drug 1.Inj. Lasix 2.DTPA in lead shield syringe. 3.0.9% Sod Chloride. 4.Syrup Chloral. 5.Dose of DTPA to follow drug manufacture
4. Review Patient's History	1.Normal kidney/transplant kidney. 2.Catheterization /Nephrotomy tube	Dose: 15 mg/kg.. Lasix- Adult 40 mg Children – 1mg/kg. Dose: 480 MBq for adult via I/V.are injected in bolus. Dose for children refer to Gilder's chart.	
Scanning Procedure	1.Enter patient data in Computer. 2.Wish patient 3.Introduduce yourself to Patient. 4.Explain and inform Procedure 5.Position and make the Patient comfortable	Gamma camera Protocol. 1.Matrix size 256x256 2.Detector 2 3.Posterior View 4.Anterior view for Transplant kidney. 4.Supine Position.	

Activity	Work Process	Standard	Requirement
	6.Start the Acquisition **Refer Gamma Camera Procedure Manual in every Dept/Hospital**	5.Enter patient Dose/height/ weight/ 6.Inject injection Lasix 20 minutes post injection 7.Duration of scan is 40 minutes.	
5. Review Scan	1.Review by Medical Officer/Specialist		.
6. Documentation of Report and Record.	1.Prepare factual report. 2.Save in Computerized System. 3.Send report for Reporting.		1.Film processor 2.Film.



Renal DTPA Scan
FLOW CHART RENAL DTPA.

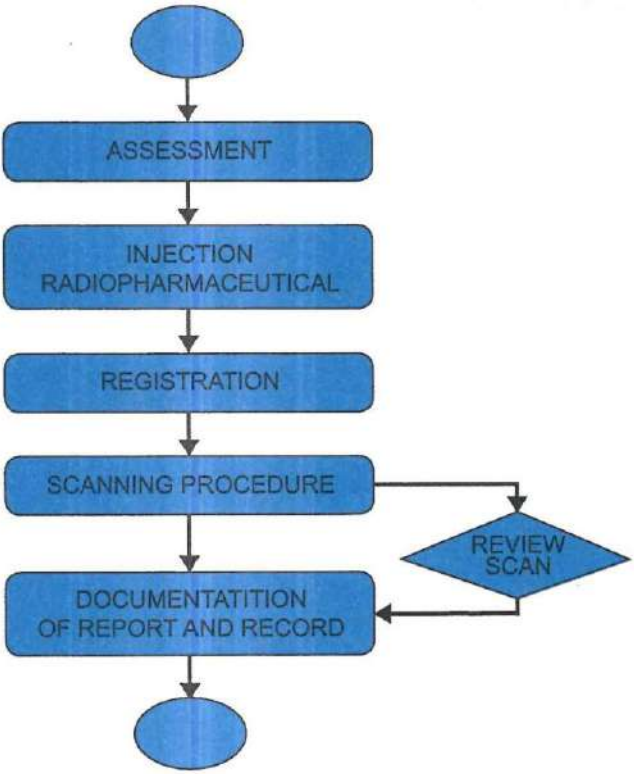


3. WHOLE BODY BONE SCAN

Activity	Work Process	Standard	Requirement
1. Assessment	Catheterization if necessary Children – give sedation before the scan	Syrup Chloral 15mg/kg	
2. Registration.	All patients should be registered in the standard registration book after receiving request form.	1. Name 2. Age. 3. I/C No 4.Type of scan 5. Referral Unit/ Dept.	Equipment. 1.Gamma camera. 2. Cobalt marker. 3. Isotope label. 4. Film Processor with film.
3. Injection Radio pharmaceutical	Reconstitution of Radiopharmaceutical to follow manual procedure for every department/hospital	Dose : MDP 750-1000 MBq for adult via I/V Children dose refer to Gilder's chart	Radiopharmaceutical. 1. MDP.
4. Scanning Patient	1.Enter patient data in Computer. 2.Wish patient 3.Introduduce yourself to Patient. 4.Explain and inform Procedure 5.Position and make the Patient comfortable **6.Start the acquisition and follow gamma camera procedure manual in every Hospital.**	1. Inject MDP 3 hours before the scan. 2. All metal accessories must be removed before the scan. 3. Supine position with marker on the right position. 4. During waiting period patient is advise to drink 1.5 liter water and encouraged patient to visit toilet frequently. 5. Ask patient to void the bladder prior to scan. Gamma camera protocol. 1. Use LEHR collimator. 2. Anterior and Posterior View.	
5 Review Scan	1.Review by Medical Officer/Specialist		

Activity	Work Process	Standard	Requirement
6. Documentation of Report and Record.	1.Prepare factual report. 2.Save in Computerized System. 3.Send report for Reporting.		

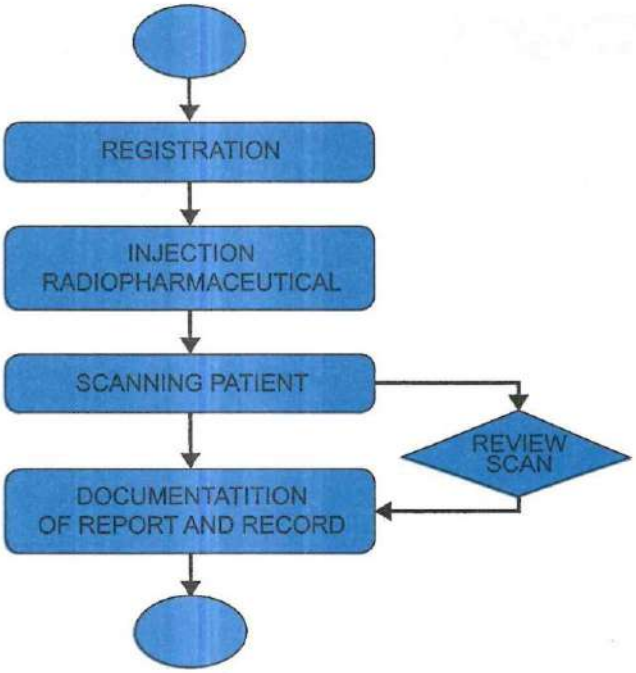
WORK FLOW WHOLEBODY BONE SCAN.



4. THYROID SCAN

Activity	Work Process	Standard	Requirement
1. Registration.	All patients should be registered in the standard registration book after receiving request form.	1. Name 2. Age. 3. I/C No 4. Type of scan 5. Referral Unit/ Dept.	Equipment. 1.Gamma camera. 2. Cobalt marker. 3. Isotope label. 4. Film Processor with film.
2. Injection Radio pharmaceutical		Patient must stop taking anti-thyroid drug 1 week before the scan Dose: 185-300 MBq for Adult via I/V Dose: Children refer to Gilder's chart.	
3. Scanning Patient	1.Enter patient data in Computer. 2.Wish patient 3.Introduduce yourself to Patient. 4.Explain and inform Procedure 5.Position and make the Patient comfortable 6..**Start the acquisition and follow gamma camera procedure manual in every Hospital.** .	1. Scan the patient 15-20 minute after injection – drink 1 cup of water before the scan. 2. LEHR collimator. 3. Pin Hole Collimator. 3. Supine position with marker on supra sternum north. 4. Matrix size 256 x 256. 5. Detector 1 and Anterior View. LAO View. RAO View.	
4.Review Scan	1.Review by Medical Officer/Specialist	.	
5. Documentation of Report and Record.	1.Prepare factual report. 2.Save in Computerized System. 3.Send report for Reporting.		

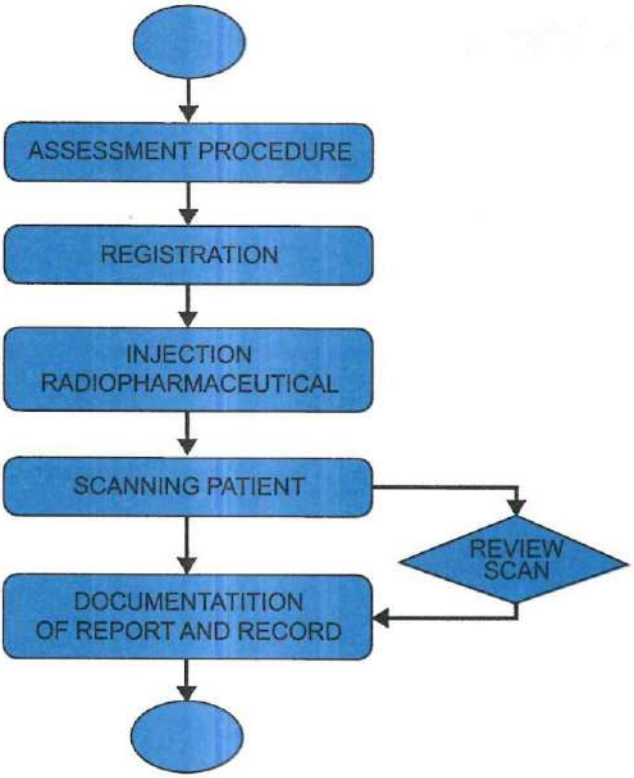
WORK FLOW THYROID SCAN



5.RENAL DMSA SCAN (DEMERCAPTO SUCCINIC ACID)

Activity	Work Process	Standard	Requirement
1.. Assessment Procedure.	Children give Syrup Chloral Hydrate 1 hour before scan..	Dose: 15 mg/kg..	Equipment. 1. Gamma camera 2. Film processing Machine. 3. Cobalt Marker. Radiopharmaceutical and Drug. 1. Syrup Chloral Hydrate 2. DMSA...
2. Registration	All patients should be registered in the standard registration book after receiving request form.	1. Name 2. Age 3. I/C No 4. Type of Scan 5. Referral Unit/ Dept	
3. Injection Radio pharmaceutical	Reconstitution of Radiopharmaceutical to follow manual procedure for every department/hospital	DMSA Dose. 1. Adult- 100MBq 2. Children – 15MBq/kg. 3. I/V Inj.	
4. Scanning Procedure	1. Enter patient data in Computer. 2.Wish patient 3.Introduce yourself to Patient. 4. Explain the Procedure 5. Position and make the patient comfortable. 6.Start the Acquisition and **.Follow Gamma Camera Procedure Manual in every Dept/Hospital**	Gamma camera Protocol. 1. Scan patient 3 Hour after giving Inj. DMSA. 2. Matrix size 256x256 3 Detector 1 and 2 4 Posterior And Anterior View 5 Supine Position. 6. LAO View. 7. RAO View. 8. Marker right side.	
5.Riview Scan	1.Review by Medical Officer/Specialist		
6. Documentation of Report and Record.	1.Prepare factual report. 2.Save in Computerized System. 3.Send report for Reporting.		

WORK FLOW RENAL DMSA

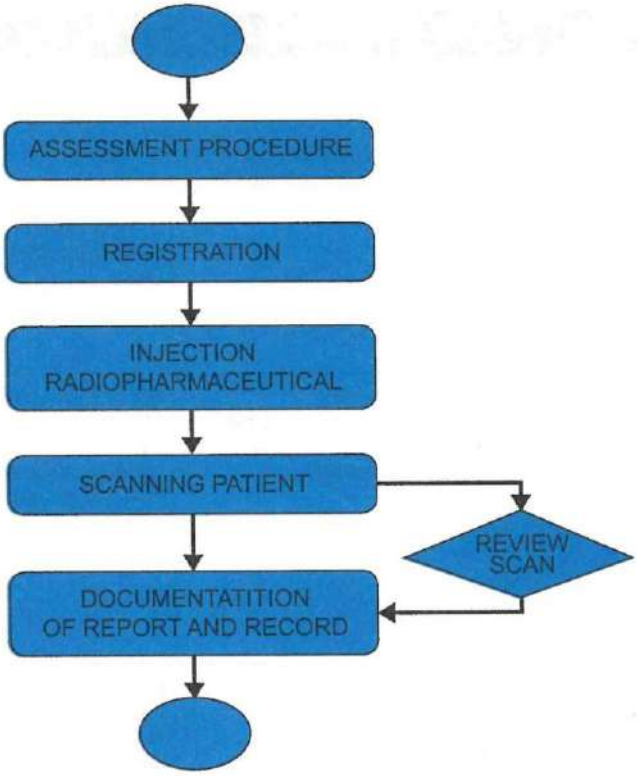


6. MECKEL'S DEVITICULUM SCAN.

Activity	Work Process	Standard	Requirement
1. Assessment Procedure	Children give Syrup Chloral Hydrate	Children give Syrup Chloral Hydrate Dose: 15 mg/kg.. Fasting 4 hours prior to scanning.	Equipment. 1. 10 ml syringe 2. Alcohol swab 3. Glove. 4. Gamma camera 5. Extension tube 100 cm 6. Injection stand. 7. Lead shield carrier. 8. 2 - Co 57 marker. Radiopharmaceutical and Drug 1 Technitium in lead shield syringe. 2.0.9% Sod Chloride for flushing TC04 3. Syrup Chloral. 4. Dose of TC04 refer manual procedure in every dept/hospital.
2. Registration	All patients should be registered in the standard registration book after receiving request form.	1. Name 2. Age 3. I/C No 4. Type of Scan 5. Referral Unit/ Dept	
3. Injection Radio pharmaceutical	1.Prepare factual report. 2.Save in Computerized System. 3.Send report for Reporting.	Dose 400 MBq for Adult via I/V. Children refer to Gilder's chart via I/V.	
4. Scanning Procedure	1. Enter patient data in Computer. 2.Wish patient 3.Introduce yourself to Patient. 4. Explain the Procedure 5. Position and make the patient comfortable. 6.Start the Acquisition and **Refer Gamma Camera Manual Procedure in every Dept/Hospital**	Gamma camera Protocol. 1. Matrix size 256x256 2. LEHR Collimator. 3. Detector 1 4 Anterior view 5. Supine Position. 6. Duration of scan is 60 minutes. 7. Place marker on Umbilicus and Xiphoid Sternum. 8. Right Lateral view	
5. Review Scan	1.Review by Medical Officer/Specialist		

Activity	Work Process	Standard	Requirement
6. Documentation of Report and Record.	1.Prepare factual report. 2.Save in Computerized System. 3.Send report for Reporting.		

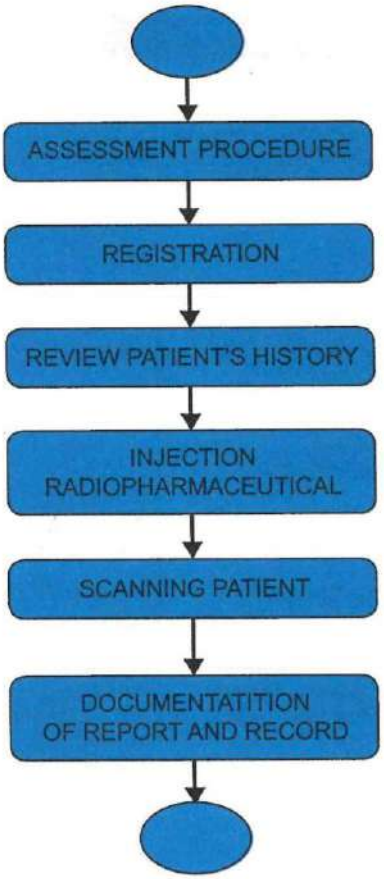
WORK FLOW MECKEL'S DEVITICULUM SCAN



7 . 3 PHASE WHOLEBODY BONE SCAN.

Activity	Work Process	Standard	Requirement
1. Assessment Procedure.	Children give Syrup Chloral	Dose: 15 mg/kg..	Equipment. 1. 10 ml syringe 2. Alcohol swab 3. Glove. 4. Gamma camera 5. Extension tube 100 cm 6. Injection stand. 7. Lead shield carrier. 8. Co 57 marker. Radiopharmaceutical and Drug 1. MDP in lead shield syringe. 2. 0.9% Sod Chloride for flushing MDP. 3. Syrup Chloral Hydrate. 4. Dose of MDP to follow drug manufacture.
2. Registration	All patients should be registered in the standard registration book after receiving request form.	1. Name 2. Age 3. I/C No 4. Type of Scan 5. Referral Unit/ Dept	
3. Review patient's history	To access the area to be scan.		
4. Injection Radio pharmaceutical	Reconstitution of Radiopharmaceutical to follow manual procedure for every department/hospital	Dose: 750 – 1000 MBq for Adult via I/V. Children dose refer to Gilder's chart via I/V.	
5. Scanning Procedure	1. Enter patient data in Computer. 2.Wish patient 3.Introduce yourself to Patient. 4. Explain the Procedure 5. Position and make the patient comfortable. 6.Start the Acquisition and **Refer Gamma Camera Procedure Manual in every Dept/Hospital**	Gamma camera Protocol. 1. Matrix size 256x256 2. Detector 1 or 2 3. Posterior or Anterior view 4. LEHR Collimator.. 5. Supine Position. 6. Place marker at Right side of patient.	
6. Documentation of Report and Record.	1.Prepare factual report. 2.Save in Computerized System. 3.Send report for Reporting.		

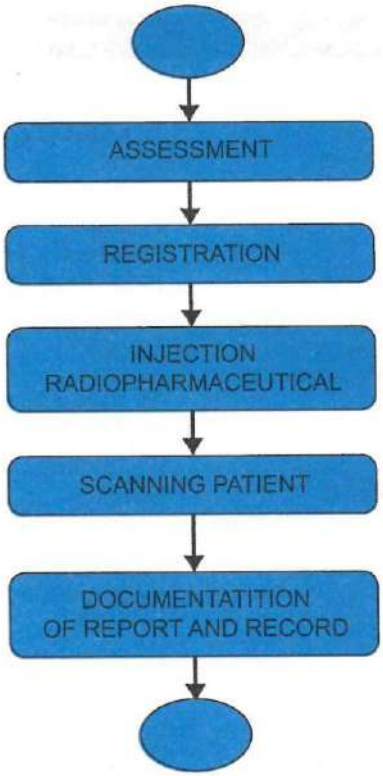
WORK FLOW 3 PHASE BONE SCAN



8. PARATHYROID SCAN.

Activity	Work Process	Standard	Requirement
1. Assessment			Equipment. 1.Gamma camera.. 2. Isotope label. 4. Film Processor with film. Radiopharmaceutical. 1. Tetrofosmin.
2. Registration.	All patients should be registered in the standard registration book after receiving request form.	1. Name 2. Age. 3. I/C No 4. Type of scan 5. Referral Unit/ Dept.	
3. Injection Radio pharmaceutical	Reconstitution of Radiopharmaceutical to follow manual procedure for every department/hospital	Dose : Tetrofosmin 750 MBq for adult via I/V Children dose refer to Gilder's chart.	
4. Scanning Patient	1. Enter patient data in Computer. 2.Wish patient 3.Introduce yourself to Patient. 4. Explain the Procedure 5. Position and make the patient comfortable. **6. Start the acquisition and follow gamma camera procedure manual in every Hospital.**	1. Inject Tetrofosmin 15 minutes before the scan. 2.Thyroid Phase 15 minutes after injection then follow by Parathyroid Phase 2.00 hours after thyroid phase. 3. Supine position with neck extend. Gamma camera protocol. 1. LEHR collimator. 2. Anterior View 3. Matrix size 236 x 256	
5. Documentation of Report and Record.	1.Prepare factual report. 2.Save in Computerized System. 3.Send report for Reporting.		

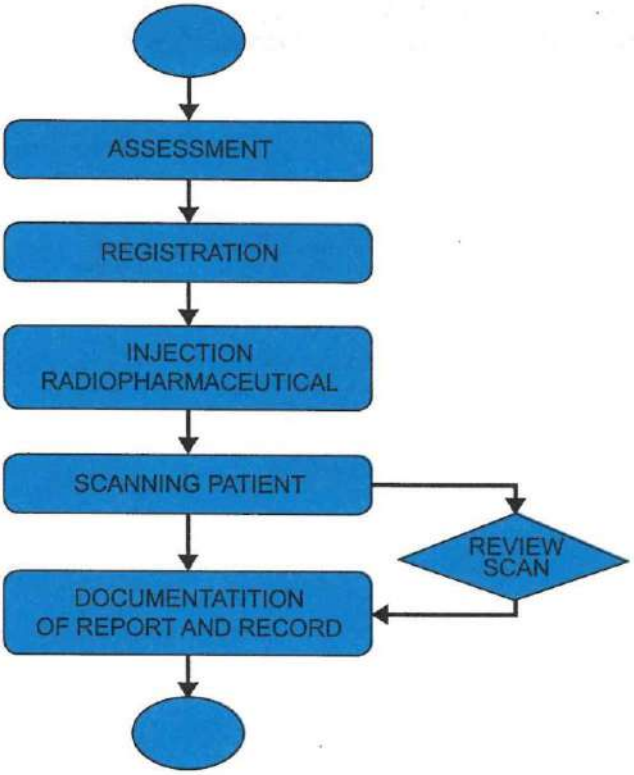
WORK FLOW PARATHYROID SCAN



9. HEPATOBILIARY SCAN

Activity	Work Process	Standard	Requirement
1. Assessment Procedure.	Children give Syrup Chloral Hydrate.	To give Syrup Luminal daily for 5 days before scan. Dose of Sy Chloral Hydrate: 15 mg/kg.. Fasting 4 hours prior to scanning.	Equipment. 1. 10 ml syringe 2. Alcohol swab 3. Glove. 4. Gamma camera 5. Extension tube 100 cm 6. Injection stand. 7. Lead shield carrier. Radiopharmaceutical and Drug 1. Bridatex in lead shield syringe. 2.0.9% Sod Chloride for flushing Bridatex 3. Syrup Chloral Hydrate.. 4. Dose of Bridatex refer manual procedure in every dept/hospital.
2. Registration	All patients should be registered in the standard registration book after receiving request form.	1. Name 2. Age 3. I/C No 4. Type of Scan 5. Referral Unit/ Dept	
3. Injection Radio pharmaceutical	Reconstitution of Radiopharmaceutical to follow manual procedure for every department/hospital	Bridatex: -Dose 15MBq/Kg or refer to Gilder's chart via I/V. -Adult dose is 120MBq	
4. Scanning Procedure	1. Enter patient data in Computer. 2.Wish patient 3.Introduce yourself to Patient. 4. Explain the Procedure 5. Position and make the patient comfortable 6.**Start Acquisition and Refer Gamma Camera Manual Procedure in every Dept/Hospital**	Gamma camera Protocol. 1. Matrix size 256x256 2. LEHR Collimator. 3. Detector 1 4 Anterior view 5. Supine Position. 6. Duration of scan is within 24 hours (If result is abnormal)	
5. Review Scan	1.Review by Medical Officer/Specialist		
6.Documentation of Report and Record.	1.Prepare factual report. 2.Save in Computerized System. 3.Send report for Reporting.		

WORK FLOW HEPATOBILIARY SCAN

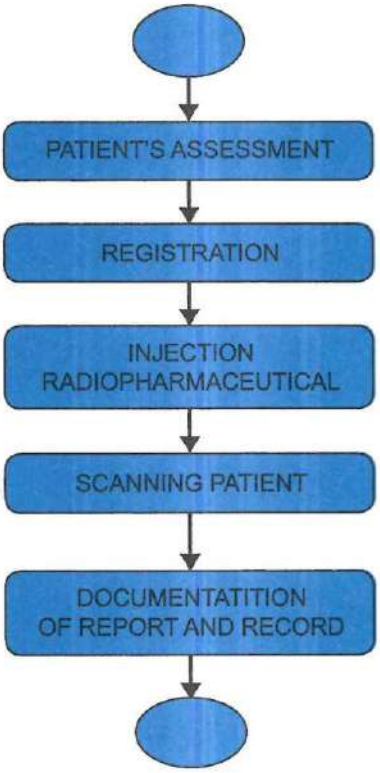


10. MYOCARDIAL PERFUSION SCAN

Activity	Work Process	Standard	Requirement
1. Patient's Assessment.		1. Fast overnight and have and light breakfast on the morning of the procedure.	Equipment. 1. Gamma camera. 2. Film Processor with film. 3. ECG Monitor Machine.
2. Registration.	All patients should be registered in the standard registration book after receiving request form.	1. Name 2. Age. 3. I/C No 4. Type of scan 5. Referral Unit/ Dept.	
3. Injection Radio pharmaceutical	Reconstitution of Radiopharmaceutical to follow manual procedure for every department/hospital	1. One day protocol - 185 – 250 MBq injected during exercise stress test. -Dose 500- 750 MBq to be given 4 hours after 1st injection. 2. 2 days protocol. - 185- 250 MBq injected during exercise stress test and the same dose to be given the next day.	
4. Scanning Patient	1. Enter patient data in Computer. 2.Wish patient 3.Introduce yourself to Patient. 4. Explain the Procedure 5. Position and make the patient comfortable 6. **Start the acquisition and refer gamma camera procedure manual in every Hospital.** 7. Repeat the scan after 4 hours for 1 day protocol procedure.	1. Supine position with arms over patient,s head. 2. Chest lead on left,right chest and left abdomen.(gated only) Gamma camera protocol. 1. Use LEHR collimator. 2. 90 degree collimator position. 3.Matrix size 256 x 256..	

Activity	Work Process	Standard	Requirement
5.Documentation of Report and Record.	1.Prepare factual report. 2.Save in Computerized System. 3.Send report for Reporting.		

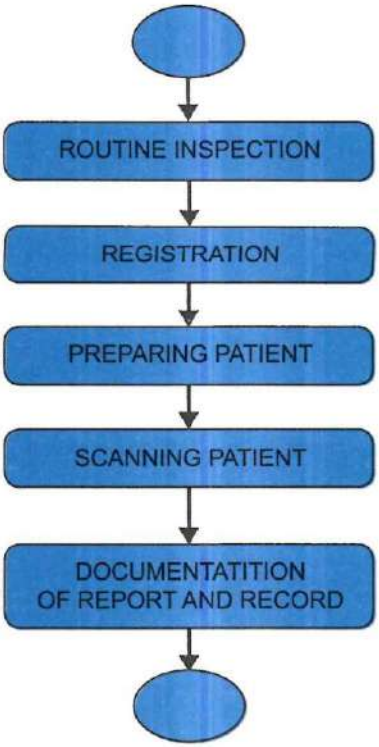
WORK FLOW
MYOCARDIAL PERFUSION SCAN



11. BONE DOSIMETRY.

Activity	Work Process	Standard	Requirement
1. Routine Inspection.	Daily Quality Assurance	Result – Less then 0.6 %	Equipment. - Analyzer Delphi - QC Spine Phantom. - Whole body Phantom. - A4 Paper.
2. Registration.	All patients should be registered in the standard registration book after receiving request form.	1. Name 2. Age. 3. I/C No 4. Type of scan 5. Referral Unit/ Dept.	Registration Book
3.Preparing the Patient.	Interview patient and Explain procedure. - Refer to manual Procedure and User's Quide.	- Weight Limit – 187 kg - Measure weight and height - Remove all metal - Any surgery done. - Any procedure using : Iodine, barium and nuclear medicine isotope study.	Weighing machine.
4. Scanning Patient	1. Enter patient data in Computer. 2.Wish patient 3.Introduce yourself to Patient. 4. Explain the Procedure 5. Position and make the patient comfortable 6.Start Acquisition and **- Refer to Manual Procedure and User's Guide in every department**	Scan Area : - Spine and hip.	- Knee and Foot Positioner - Velcro strap. - Lead shield.
5.Documentation of Report and Record.	1.Prepare factual report. 2.Save in Computerized System. 3.Send report for Reporting.		

WORK FLOW BONE DOSIMETRY

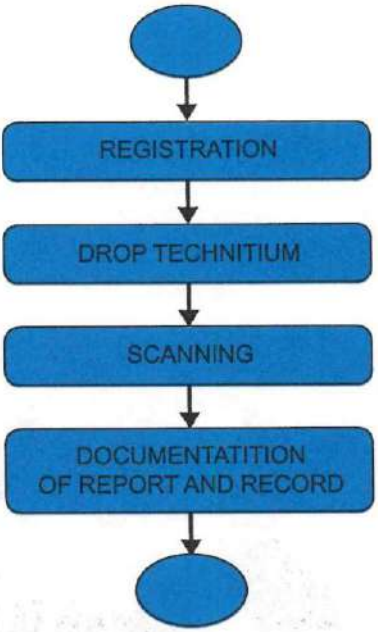


Gamma Camera

12. DACRAYOCINTIGRAPHY

Activity	Work Process	Standard	Requirement
1. Registration.	All patients should be registered in the standard registration book after receiving request form.	1. Name 2. Age. 3. I/C No 4. Type of scan 5. Referral Unit/ Dept.	Equipment. 1.Gamma camera. 2. Cobalt marker. 3. Isotope label. 4. Film Processor with film.
2. Radio Pharmaceutical Drop		Dose: 7 MBq in one drop	Radiopharmaceutical. 1. Technetium
3. Scanning Patient	1. Enter patient data in Computer. 2.Wish patient 3.Introduce yourself to Patient. 4. Explain the Procedure 5. Position and make the patient comfortable **6.Start Acquisition and Refer to Manual Procedure and User's Guide in every departme**	1. Scan the patient immediately after drops isotope into patient both eye 2. LEHR collimator. 3. Marker on right side of patient eye 4. Matrix size 256 x 256.	
5.Documentation of Report and Record.	1.Prepare factual report. 2.Save in Computerized System. 3.Send report for Reporting.		

WORK FLOW DACRYOCINTIGRAPHY

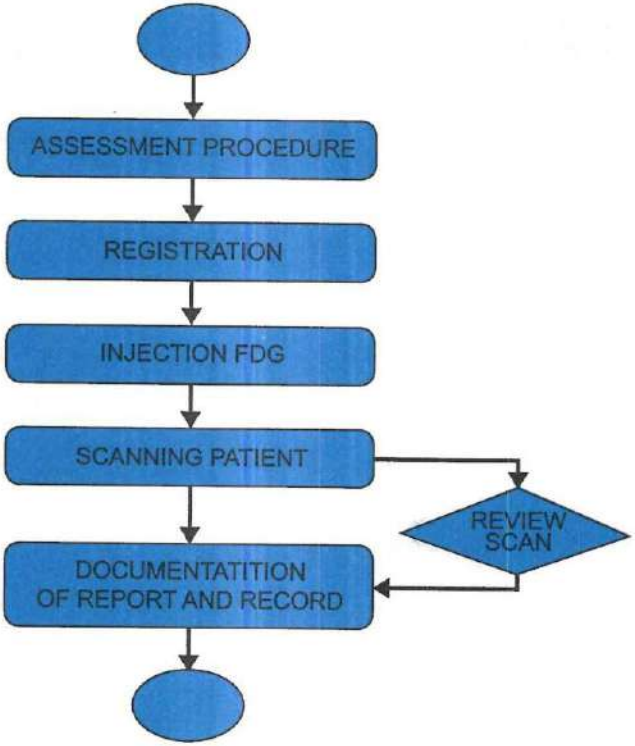


PET-CT Scanner

13. PET – CT SCAN

Activity	Work Process	Standard	Requirement
1. Assessment Procedure	Children give Sedation	- Patient keep in the dark and quiet room.1 hour before the scan. - No strenuous muscular exercise at least 2 days before the scan. and after given FDG. - Do not pregnant. - RBS below 8 ml/l - Fast 4-6 hours the day of scan. - Catheterization if necessary - I/V Catheter.	-- Separate room for each patient. - CCTV - I/V catheter. - 3 way stopper - N/S in 10 ml syringe - Tungsten Mug. - Extension tubing 30 cm. - 3 ml syringe with 21 G needle.
2.Injection Radio pharmaceutical	Preparation of F 18 – Follow manual procedure in every hospital	Radiopharmaceutical - F 18 Dose 5 MCi-15 MCi - Children – 0.24 MCi/kg	
3. Registration	All patients should be registered in the standard registration book after receiving request form.	1. Name 2. Age 3. I/C No 4. Type of Scan 5. Referral Unit/ Dept	Equipment. - PET – CT Scanner.
4. Scanning Procedure 5. Review Scan	1. Enter patient data in Computer. 2.Wish patient 3.Introduce yourself to Patient. 4. Explain the Procedure 5. Position and make the patient comfortable **6.Start Acquisition and Refer PET-CT Manual Procedure in every Dept/ Hospital** **Review by Specialist/ Medical Officer**	PET-CT Protocol.	
6.Documentation of Report and	.Save in Computerized System.		Film Processor

WORK FLOW PET – CT SCAN.

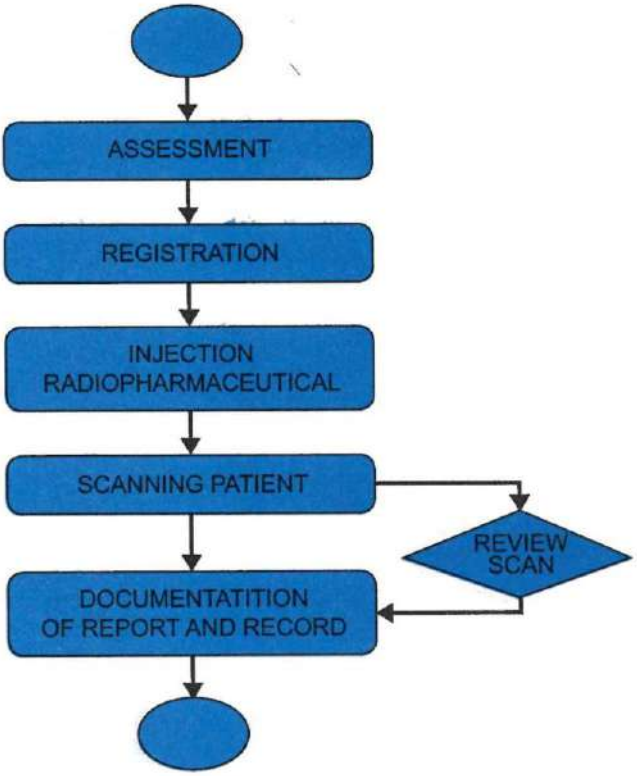


14. GALLIUM SCAN

Activity	Work Process	Standard	Requirement
1. Assessment	Children – give sedation before the scan	-Syrup Chloral 15mg/kg - To take high fiber food 1 day before scan.	
2. Registration.	All patients should be registered in the standard registration book after receiving request form.	1. Name 2. Age. 3. I/C No 4. Type of scan 5. Referral Unit/ Dept.	Equipment. 1.Gamma camera. 2.. Isotope label. 3. Film Processor with film. Radiopharmaceutical. 1. Gallium
3. Radio pharmaceutical	Preparation of Galium - to follow manual Manual procedure in Each Hospital	- Dose : Gallium 111-185MBq - Children dose refer to Gilder's chart.	
4. Scanning Patient	1. Enter patient data in Computer. 2.Wish patient 3.Introduce yourself to Patient. 4. Explain the Procedure 5. Position and make the patient comfortable **4. Start the acquisition and follow gamma camera procedure manual in every Hospital.**	1. To be scan 48 hours after given injection Gallium. 2. All metal accessories must be removed before the scan. 3. Ask patient to void the bladder prior to scan. Gamma camera protocol. 1. Use MEHR collimator. 2. Anterior, Posterior and thorax with lateral skull position. 3.Anterior and Posterior Abdomen. 4. Anterior and Posterior Pelvis.	Film processor
5. Review Scan	Review by Medical Officer/Specialist		

Activity	Work Process	Standard	Requirement
6.Documentation of Report and Record.	1.Prepare factual report. 2.Save in Computerized System. 3.Send report for Reporting.		

WORK FLOW GALIUM SCAN

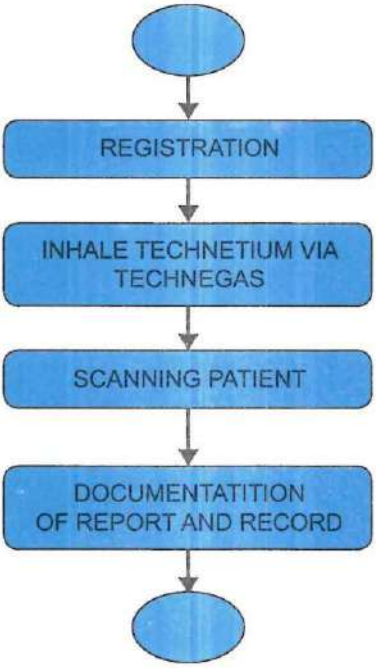


15. LUNG VENTILATION AND PERFUSION SCAN

Activity	Work Process	Standard	Requirement
1. Registration.	All patients should be registered in the standard registration book after receiving request form.	1.Name 2.Age. 3.I/C No 4.Type of scan 5.Referral Unit/ Dept.	Equipment. 1.Gamma camera. 2.. Isotope label. 3. Film Processor with film. 4. Technegas. 5. Technitium
2. Scanning Patient - Ventilation -Perfusion	1. Enter patient data in Computer. 2.Wish patient 3.Introduce yourself to Patient. 4. Explain the Procedure 5. Position and make the patient comfortable 6.**Start the acquisition and follow gamma camera procedure manual in every Hospital.**	Patient positioned upright with camera Posterior. Valves readjusted Technegas Breathing 2 – 4 minutes – 350 k Gamma camera protocol. 1. Use LEHR collimator.large field of view camera. 2. Anterior, Posterior , LAO and RPO MAA – Dose 6 – 8 MCi - Before injection, syringe should be shaken to resuspend particles. - injected in supine position. - imaging performed immediately after injection. - Use LEHR collimator.large field of view camera. Ant,Post, Lateral ,LAO and LPO View. - 500,000 counts for each view.	

Activity	Work Process	Standard	Requirement
3.Documentation of Report and Record.	1.Prepare factual report. 2.Save in Computerized System. 3.Send report for Reporting.		

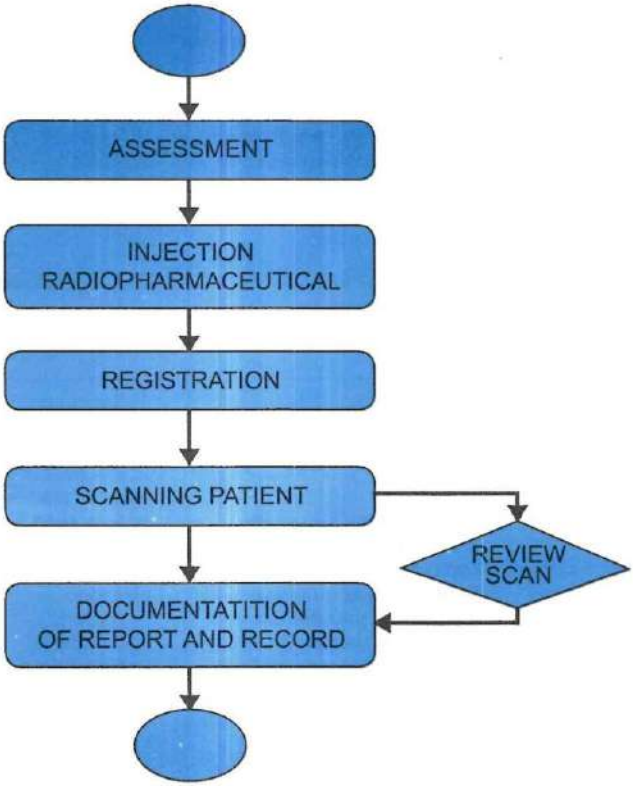
WORK FLOW
LUNG VENTILATION AND PERFUSION



16. RADIOIODINE 131 WHOLE BODY SCAN

Activity	Work Process	Standard	Requirement
1. Assessment	Advise patientto pass motion in the morning prior to scan		
2. Registration	All patients should be registered in the standard registration book after receiving request form.	1.Name 2.Age. 3.I/C No 4.Type of scan 5.Referral Unit/ Dept.	Equipment. 1. Gamma camera. 2. Radioiodine marker 3. Isotope label. 4. Film Processor with film.
3. Feeding of Radioiodine 131	Preparation of Radioiodine 131 to follow manual procedure for every department/hospital	Dose : Radioiodine 131=5 mCi given orally 3 days before the scan	Radioiodine 131 solution
4. Scanning Patient	1. Enter patient data in Computer. 2. Wish patient 3. Introduce yourself to patient 4. Explain and inform Procedure 5. Position and make the Patient confortable 6. **Start the acquisition and follow gamma camera procedure manual in every Hospital.**	1. Supine position with marker on the right position. 2. Ask patient to void the bladder prior to scan. Gamma camera protocol. 1. Use HE collimator. 2. Ant without marker - 480 sec. 3. Ant with marker - 120 sec. 4. Anterior and Posterior View. 5. Place marker at SSN and thyroid cartilage. 6. Energy-364 keV 7. Speed - 10 cm/min.	
5. Review Scan	1. Review by Medical Officer/ Specialist		
6. Documentation of Report and Record	1. Prepare factual report. 2. Save in Computerized System. 3. Send report for Reporting.		

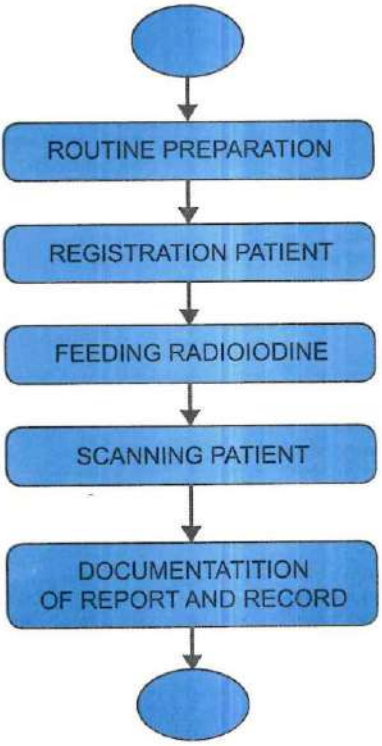
WORK FLOW RADIOIODINE 131 WHOLEBODY SCAN



17. RADIOIODINE 131 WHOLEBODY SCAN (FOR ABLATION)

Activity	Work Process	Standard	Requirement
1. Routine preparation	Feeding Radioiodine 72 hours before the scan – refer to manual procedure in every hospital.	Dose: 3700 – 11100 MBq **Preparation procedure – refer to manual procedure in every hospital.**	- Radioiodine Solution. - Dose calibrator. - Fume hood.
2. Registration.	All patients should be registered in the standard registration book after receiving request form.	1. Name 2. Age 3. I/C No 4. Type of Scan 5. Referral Unit/ Dept	
3. Feeding Radioiodine	Preparation of Radioiodine – please refer to procedure manual in every hospital	Dose: 3700 – 11100 MBq	
4.Scanning the patient.	1. Enter patient data in Computer. 2.Wish patient 3.Introduce yourself to patient. 4. Explain the Procedure 5. Position and make the patient comfortable 6. **Start the acquisition and follow gamma camera procedure manual in every Hospital.**	1. To be scan 72hours after given Radioiodine. 2. All metal accessories must be removed before the scan. 3. Ask patient to void the bladder prior to scan. Gamma camera protocol. 1. Use High Energy collimator. 2. Anterior Neck with and without marker. - Duration 8 minutes 3. Whole body scan – 15 cm per minute.	- Gamma camera - Radioiodine marker.
5..Documentation of Report and Record.	1.Prepare factual report. 2.Save in Computerized System. 3.Send report for Reporting.		

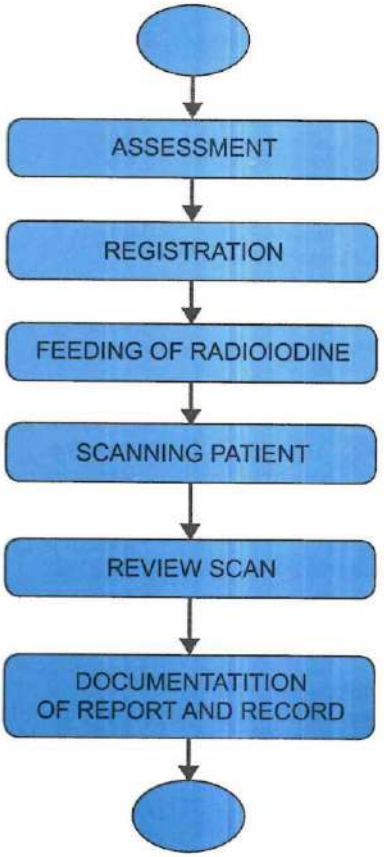
WORK FLOW
RADIOIODINE WHOLEBODY SCAN



18. RADIOIODINE 131 WHOLE BODY SCINTIGRAPHY

Activity	Work Process	Standard	Requirement
1. Assessment	Children – give sedation before the scan	Syrup Chloral 15mg/kg	
2. Registration. 3. Feeding of Radioiodine	All patients should be registered in the standard registration book after receiving request form. Preparation of Radioiodine to follow manual procedure for every department/hospital	1. Name 2. Age. 3. I/C No 4.Type of scan 5. Referral Unit/ Dept. Dose : Radioiodine 131 = 3 – 5 mCI Children dose refer to Gilder's chart To do scan 3 days after patient taking radioiodine	Equipment. 1.Gamma camera. 2. Cobalt marker. 3. Isotope label. 4. Film Processor with film. Radioiodine 131
4. Scanning Patient	1.Enter patient data in Computer. 2.Wish patient 3.Introduduce yourself to Patient. 4.Explain and inform Procedure 5.Position and make the Patient comfortable **6.Start the acquisition and follow gamma camera procedure manual in every Hospital.**	1.3 days after patient taking radioiodine 131 2. All metal accessories must be removed before the scan. 3. Supine position 5. Ask patient to void the bladder prior to scan. Gamma camera protocol. 1. Use HE collimator. 2. Anterior and Posterior View.	
5 Review Scan	1.Review by Medical Officer/Specialist		
6. Documentation of Report and Record.	1.Prepare factual report. 2.Save in Computerized System. 3.Send report for Reporting.		

WORK FLOW
RADIOIODINE 131 WHOLEBODY SCINTIGRAPHY



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