

Ministry of Health

Document Title	Procedure of Mobile Radiography in Radiology Department		
Document Type	SOP		
Directorate/Institution	Directorate General of Specialized Medical Care		
Targeted Group	All Radiographers providing mobile services in tertiary and		
	secondary hospital in the Sultanate of Oman.		
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Release Date	December 2022		
Review Frequency	3 years		

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Date	December 2022	Date	December 2022

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Acronyms:

МоН	Ministry of Health
PPE	Personal protective equipment
RPE	Respiratory protective equipment
MRSA	Methicillin-resistant Staphylococcus Aureus
IR	Image receptor
ECG	Electrocardiogram
ICU	Intensive care unit
SCBU	Special care baby unit
CCU	Coronary care unit
HDU	High dependency unit
A/E	Accident and emergency
IV	Intra-venous

Procedure of Mobile Radiography in Radiology Department

1. Introduction

This procedure provides information relating to Mobile Radiography. This Procedure will enable the Radiographers to preform mobile radiography in an effective and safely manner to reduce radiation risk to ward staff, patients and radiographers.

2. Scope

This Procedure applies to all Radiographers providing mobile services in tertiary and secondary hospital in the Sultanate of Oman.

3. Purpose

- 3.1 Provide the radiographers with knowledge about what is expected of them, e.g. performance standards;
- 3.2 Provide procedure for decision-making in routine situations;
- 3.3 Provide practice a safe manner in terms of infection control & radiation protection
- 3.4 Provide a means of communicating information to new radiographers; and ensure that they are working with high standards e.g. health and safety legislation.
- 3.5 To practice the technique competently and effectively

4. Definition

- 4.1 **Radiographer:** A qualified person trained to position patients and take diagnostic radiographs.
- 4.2 **Referrers:** A registered healthcare professional who is entitled, in accordance with the employer's procedures, to refer individuals for medical exposures.
- 4.3 Nurse: A person trained to care for the sick or infirm, especially in a hospital.
- 4.4 Personal Protective Equipment (PPE): PPE is equipment that will protect the user against health or safety risks at work. It can include items such as safety helmets, gloves, eye protection, high-visibility clothing, safety footwear and safety harnesses. It also includes respiratory protective equipment (RPE).

5. Procedure

Mobile Radiography also known as "ward radiography/portable x-ray" should be restricted to the patient whose medical condition is such that it is impossible for them to be moved to the X-ray department without seriously affecting their medical treatment and nursing care. Mobile radiography using transportable radiographic equipment allows imaging services to be brought to the patient. In contrast to the large stationary machines found in radiographic rooms, compact mobile radiography units can produce diagnostic images in virtually any location. Mobile radiography is commonly performed in patient rooms, emergency departments, intensive care units, surgery and recovery rooms, and nursery and neonatal units.

Such patients may be found in surgical and medical ward environments and in the following areas:

- Coronary care unit (CCU);
- Medical assessment unit;
- Surgical assessment unit;
- Cardiac surgery unit;
- Intensive care unit (ICU);
- High dependency unit (HDU);
- Special care baby unit (SCBU);
- Orthopaedic ward;
- Accident and emergency (A/E);
- Burns ward.

Examinations are normally complicated by a variety of situations:

- Patient's medical condition;
- Degree of consciousness and cooperation;
- Patient's treatment;
- Restrictions due to life support system, drips, and chest or abdominal drains; location of electrocardiogram (ECG) leads; traction apparatus; physical restrictions due to room size and layout of monitoring and life support equipment;
- Adequate power supply; and the shape, size and ability to move mobile or portable x-ray equipment in confined spaces.

The radiographer must be able to assume total control of the situation, and should enlist the help, cooperation and advice of nursing and medical staff before embarking on an examination.

5.1. Initial mobile procedure

The radiographer should plan for a mobile procedure. Ensuring that all of the necessary devices (e.g., IR, grid, tape, markers, immobilization devises) are transported with the mobile x-ray machine. This provides greater efficiency in performing examinations. If a battery-operated machine is used, the radiographer should check the machine to ensure that it is acceptably charged. An inadequately charged machine can interfere with performance and affect the quality of the radiograph.

Before entering the patient's room with the machine, the radiographer should follow several important steps.

5.2. Primarily steps before mobile radiography is preformed

- X-ray requests should be checked first to ensure that the examination on the ward is necessary, and that the correct equipment and cassettes are obtained for transfer to the wards;
- Announce your presence to the nursing staff, and ask for assistance if needed.
- Determine that the correct patient is in the room;
- Introduce yourself to the patient and family as a radiographer and explain the examination;
- Ask family members and visitors to leave;
- Observe the medical equipment in the room and other apparatus and IV poles with fluids and other obstacles. Move the equipment if necessary with permission of attending nurse;
- Advice regarding the patient's medical condition should be sought first, before moving or disturbing the patient. Any disturbance of traction, ECG leads or drains should be undertaken only with the permission of the medical staff.
 Positioning of cassettes and movement or lifting of seriously ill patients should be undertaken with supervision from nursing staff.

5.2.1. Patient's consideration

Patients requiring mobile radiography often are in extended care facilities or are immobile and among the most sick. They may be awake and lying in bed in traction because of a broken limb, or they may be critically ill and unconscious. A brief but total assessment of the patient must be conducted before and during the examination. Some specific considerations to keep in mind are described in the following sections.

5.2.2. Assessment of patient's condition

A thorough assessment of the patient's condition and room allows the radiographer to make necessary adaptations to ensure the best possible patient care and imaging outcome. The radiographer assesses the patient's level of alertness and respiration and determines the extent to which the patient is able to cooperate and the limitations that may affect the procedure. Some patients may have varying degrees of drowsiness because of their medications or medical condition. Many mobile examinations are performed in patients' rooms immediately after surgery; these patients may be under the influence of various anaesthetics.

5.2.3. Patient's mobility

The radiographer must never move a patient or part of the patient's body without assessing the patient's ability to move or tolerate movement. Gentleness and caution must prevail at all times. If unsure, the radiographer should always check with the nursing staff or physician. Many patients who undergo total joint replacement may be unable to move the affected joint for many days or weeks, but this may not be evident to the radiographer. Some patients may be able to indicate verbally their ability to move or their tolerance for movement. The radiographer should never move a limb that has been operated on or is broken, unless the nurse, the physician, or sometimes the patient grants permission. Inappropriate movement of the patient by the radiographer during the examination may harm the patient.

5.2.4. Obstacles or Interfering devices

Patients who are in intensive care units or orthopaedic beds because of fractures may be attached to various devices, wires, and tubing. These objects may be in the direct path of the x-ray beam and consequently produce artefacts on the image. Experienced radiographers know which of these objects can be moved out of the x-ray beam. When devices such as fracture frames cannot be moved, it may be necessary to angle the central ray or adjust the IR to obtain the best radiograph possible. In many instances, the objects have to be radiographed along with the body part. The radiographer must exercise caution when handling any of these devices and should never remove traction devices without the assistance of a physician.

The radiographer sometimes may have difficulty accurately aligning the x-ray tube parallel to the IR while standing at the side of the bed. When positioning the tube above the patient, the radiographer may need to check the x-ray tube and IR alignment from the foot of the bed to ensure that the tube is not tilted.

For all projections, the primary x-ray beam must be collimated no larger than the size of the IR. When the central ray is correctly centred to the IR, the light field coincides with or fits within the borders of the IR.

A routine and consistent system for labelling and separating exposed and unexposed IRs should be developed and maintained. It is easy to "double expose" IRs during mobile radiography, particularly if many examinations are performed at one time. Most institutions require additional identification markers for mobile examinations. Typically the time of examination (especially for chest radiographs) and technical notes such as the position of the patient are indicated. The log should contain the exposure factors used for the projections and other notes regarding the performance of the examination.

5.3. Preforming mobile x-ray

5.3.1. Work flow:

Minimise radiographers stay in the patient's room to minimise contact with the patient as practically possible ensuring patient and staff safety.

5.3.2. On receiving the request:

- 5.3.2.1 Confirm patients' details and location.
- 5.3.2.2 Inform the staff nurse your arrival time to the ward.
- 5.3.2.3 Ensure you have all requirements to complete the examination.

5.3.3. Before arrival to the ward:

- 5.3.3.1 Strict adherence to infection
- 5.3.3.2 Economical use of PPE (Personal Protective Equipment)
 - Gown

- Mask
- Gloves
- 5.3.3.3 Ensure you have patient's details.
- 5.3.3.4 Plastic sleeve to pillow case to cover the x-ray cassette/IR or detector.
- 5.3.3.5 Ideally, a dedicated portable x-ray machine for at risk or confirmed patients.

5.3.4. **On the ward/ isolation room:**

- 5.3.4.1 Minimize time in the patient room/ward
- 5.3.4.2 Minimize contact with the patient and surroundings
- 5.3.4.3 Cover the detector/cassette with plastic sleeve.
- 5.3.4.4 Check the room that there is enough space room for the portable machine and manoeuvre it.
- 5.3.4.5 Once entered close all the doors.
- 5.3.4.6 Explain to the patient what is expected of them and ask them to move into position with minimum contact.
- 5.3.4.7 Ask for a nurses help if required
- 5.3.4.8 Preform the portable examination.
- 5.3.4.9 Once removed the detector/cassette form behind the patient, remove the plastic sleeve.
- 5.3.4.10 Throw the plastic sleeve in the clinical waste bag.
- 5.3.4.11 Move machine away from the patient.
- 5.3.4.12 Disinfect the machine and detector/cassette properly using disinfected solutions.
- 5.3.4.13 Remove the PPE by removing the gown first, gloves and then mask
- 5.3.4.14 Wash your hand thoroughly.
- 5.3.4.15 Park machine in dedicated place.

5.4. Radiation protection

5.4.1 This is of paramount importance in the ward situation. The radiographer is responsible for ensuring that nobody enters the controlled area during exposure of the patient.

- 5.4.2 The radiographer must liaise clearly with the ward staff on their arrival on the ward and issue verbal instructions in a clear and distinct manner to staff and patients to avoid accidental exposure to radiation.
- 5.4.3 The radiographer, and anyone assisting in an examination, must be protected adequately from scatter radiation by the use of a lead-rubber apron.
- 5.4.4 Use of the inverse square law, with staff standing as far away as possible from the unit and outside the radiation field, should be made when making an exposure. The patient should also receive appropriate radiation protection.
- 5.4.5 Lead protective shields may be used as backstops when using a horizontal beam to limit the radiation field, e.g. when the absorption nature of roomdividing walls is unknown.
- 5.4.6 Exposure factors used for the examination should be recorded, enabling optimum results to be repeated. Patients tend to be x-rayed frequently when under intensive care.

5.5. Infection control

- 5.5.1 The control of infection plays an important role in the management of all patients, especially following surgery and in the nursing of premature babies.
- 5.5.2 To prevent the spread of infection, local established protocols should be adhered to by staff coming into contact with patients, e.g. hand-washing between patients and the cleanliness of equipment used for radiographic examination. Patients with a known highly contagious infection, and those with a compromised immune system and at high risk of infection, will be barriernursed. In such circumstances, it is important that local protocols associated with the prevention of spread of infection are followed.
- 5.5.3 The x-ray mobile equipment used in ICU, cardiac surgery units and SCBU should, ideally, be dedicated units and kept on site. Failing this, they should be cleaned with antiseptic solution before being moved into infection-controlled units.
- 5.5.4 Radiographers should wear the PPE (Personal Protective Equipment) gowns or disposable plastic aprons, gloves, facemasks and over-shoes before entering these areas. Cassettes should be cleaned and covered with plastic sheets or clean pillowcases/towels before use. After use, cassettes and all equipment should be

cleaned with antiseptic solution. Disposable gloves are worn when touching the patient.

5.6. MRSA:

- 5.6.1 Methicillin-resistant Staphylococcus Aureus (MRSA) is a bacterial infection that is resistant to methicillin and many other antibiotics. MRSA is a particular threat to vulnerable patients and can cause many symptoms, including fever, wound and skin infections, inflammation and pneumonia. The bacteria can be spread readily from an infected patient to others. MRSA is spread mainly from person to person by hand. When healthcare workers deal with MRSA-infected patients, the bacteria may transfer to their hands and can then be passed on to a vulnerable patient.
- 5.6.2 MRSA patients are usually barrier-nursed. Controls such as effective handwashing, wearing of gloves and aprons, and the cleaning of the environment and equipment are necessary to prevent spread of the bacteria.
- 5.6.3 When undertaking a mobile x-ray on more than one barrier nursed patient on a ward or ICU, it is important that disposable aprons are changed between patients as well as ensuring that the hands of the operators are washed between patients to prevent the spread of infection. A number of speciality wards use differently coloured aprons per patient bay as a prompt to confine the use of aprons to a specific patient.

6. Responsibility

- 6.1 A designated lead or senior staff must be available, and the team should support him/her.
- 6.2 All Radiographers to adhere to the policy and guidelines and to take full precautions working in a mobile setting.

7. Document History and Version Control

Version	Description	Review Date
01	Initial Release	December 2025

8. Related Documents

There is no related document for this procedure.

9. References

Title of book/ journal/ articles/ Website	Author	Year of publication	Page
Clark's positioning in Radiography	Whitley. S, Sloane. C, Hoadley. G, Moore A. D. and Alsop C. W	2005	_p 353
Health & Safety	IR(ME)R	2017	p6,7,8,5,16 &17
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