Title: Emergency Radiology Procedures	
Policy Owner: MOH committee on hospital clinical services and polices	**Policy Code**: A-ADM-004
Section location: Radiology, Emergency Room, ICU, CCU, Wards	**Effective Date**: 01-10-2022
Applies to: Radiology Department in general and specialized healthcare facilities	**Revision Date:** 31-12-2024
Approvals	**Signature Date:** 18 SEP 2022
Approved by: MOH committee on hospital clinical services and polices	
Approved by: Director of technical affairs	
Approved by: Assistant undersecretary of technical affairs	
Notes	

1.0 Purpose

1.1 The aim of this policy is to ultimately provide the most efficient, expedited and optimal care for patients in need of emergency care, and improve collaboration and cooperation between all hospital services thus ensuring the best outcomes for patients by using the different radiological modalities in the most efficient, sensitive and expedited means to assist all health care providers in reaching the appropriate diagnoses and initiating the appropriate management in a timely fashion that would best serve the patients without delays that can ensue in clinical repercussions.

2.0 Definition of the oncall qualified radiologist

2.1 A qualified radiologist should be available to interpret imaging studies in accordance with criteria determined by collaboration between the radiology department, the emergency department, and the medical staff of the hospital, depending on resources available.

2.2 The qualified radiologist may include a supervised radiology registrar or above rank with demonstrated competence, consistent with department and institution policy.

2.3 The supervising second oncall radiologist maybe off-site and provide interpretation remotely, with an appropriate teleradiology link if activated in the respective MOH hospital.

3.0 Definition of MRP: is the most responsible physician, or most responsible practitioner, generally refers to the physician, or other regulated healthcare professional, who has overall responsibility for directing and coordinating the care and management of a patient at a specific point in time. (Source: CMPA)

4.0 Definitions and time frame of emergency and urgency

4.1 Emergency: is when the pathology in question DOES pose an immediate threat to life if not diagnosed or managed accordingly to a timely manner. The radiological procedure should be done within one hour (based on the urgency judged by the referring

physician, the triage of pending radiological procedures requested and the logistics, and capabilities of the respective department).

4.2 Urgency: is when the pathology in question does NOT pose an IMMEDIATE threat to life but will have a significant effect (or threat) on life in the near future and a definite effect on the change of medical/surgical management. The exam should be completed as soon as possible after the referral is received within 4-6 hours (based on the urgency judged by the MRP, the triage of pending radiological procedures requested and the logistics, and capabilities of the respective department).

5.0 Radiological Investigations for Patients in the Intensive Care Settings (ICU/CCU)

5.1 All the emergently and urgently requested radiological exams should be done on the same day (earlier if deemed necessary by the diagnosis, ensuing plan and guidelines) following the time frame for each specified category (refer to article 4.0).

5.2 If the patient cannot be transferred to the radiology department, then the procedure should be done bedside in the ICU/CCU, otherwise can be done in the radiology department and the patient should be accompanied by the anesthetist.

5.3 Ultrasound guided interventional drainage procedures should be done on the same day (earlier if deemed necessary by the diagnosis, ensuing plan and guidelines) in ICU/ CCU if deemed fit and possible by the respective interventional radiologist (IR).

5.3.1 Symptomatic Large pleural effusions necessitating emergent intervention and tapping should be performed by the MRP ICU/CCU treating team accordingly.

5.3.1.1 If technical difficulties arise, ultrasound guided/assisted drainage (with the oncall radiologist real time sonographic guidance) should be sought for tapping after which pigtail drainage maybe deferred to the next day by the IR, if deemed necessary or possible (otherwise a surgical consultation should be sent in accordance with the medical and surgical emergency admission designation policy code ADM-003 for tube thoracostomy drainage).

5.3.1.2 If, due to complexity of the effusion (loculation, parapneumonic) or lack of unit personnel competency, interventional radiology expertise is required consultation of the oncall interventional radiologist by the most senior oncall MRP should be sought.

5.3.2 Symptomatic Large ascites (non-pancreatic pathology related) necessitating emergent intervention and tapping should be performed by the MRP ICU/CCU treating team accordingly.

5.3.2.1 If technical difficulties arise, ultrasound guided/assisted drainage (with the oncall radiologist real time sonographic guidance) should be sought for tapping after which pigtail drainage maybe deferred to the next day by the IR.

5.3.2.2 Consultation of the oncall interventional radiologist by the most senior oncall MRP should be sought if any of the above fails or the respective department lacks competency.

6.0 Radiological Investigations for Patients in the Wards and Emergency Department

6.1 Choices of radiological investigations for the suspected pathology should be based on availability of the respective investigation, applicability of that modality to the pathology in question and expertise of the department; guided by the recent practice guidelines of the medical practice and radiological appropriateness criteria (e.g. ACR appropriateness criteria-link).

6.2 Deviation from the guidelines regarding the modality of investigations and the indications may be subject to mutual discussion between the treating physician and responsible radiologist depending on the patients' physical and clinical conditions.

7.0 Modalities of Radiological Investigations and Indications for performing them Emergently and Urgently

7.1 Introduction

7.1.1 As the emergency services provided by the radiology department during oncalls vary depending on modality, pending investigations and is subject to occasional limitations in manpower and/or utilities, it is highly appreciated and advised that the treating physicians requesting radiological investigations for their patients, to triage and prioritize their requests accordingly using their clinical judgement and degree of urgency of the ensuing management plan as well as the practice guidelines as a guide, so as to enable the correct investigations be done for the correct suspected pathology in a timely fashion with undue delay to all patients.

7.1.2 Accordingly, the oncall radiologist will practice prioritization and triaging of the requested radiological investigations as emergent and urgent to ensure that care and diagnosis are provided in a timely fashion.

7.1.3 It is also important to acknowledge that patients' condition is dynamic and subject to change while awaiting investigations and care; the clinical condition of a patient deemed in need of urgent radiological investigation may progress into an emergent need of the radiological investigations and it is for this reason that the MRP requesting the investigation must be aware of the clinical status of the patient and communicate and document these changes and concerns to the oncall radiologist to consider changing the triage of the case and expediting the investigation accordingly if deemed possible.

7.2 **Ultrasound** includes the following: (any other emergent/urgent condition must be accepted)

7.2.1 ICU patients

7.2.2 In ER as FAST

7.2.3 To rule out ectopic pregnancy

7.2.4 Acute cholecystitis (if diabetic, elderly, post procedure, lab changes, fever, persistent RUQ pain, multiple ED visits more than once)

7.2.5 To rule out cholangitis in septic patients

7.2.6 To rule out collections (superficial/deep tissue) and to guide procedures (e.g., ascitic/pleural drainage)

7.2.7 To rule out obstructive uropathy

7.2.8 Febrile UTI (to rule out obstruction or pyelonephritis as a cause)

7.2.9 To rule out abdominal aortic aneurysm

7.2.10 To rule out appendicitis in:

7.2.10.1 Non-obese, young female to rule out appendicitis vs ovarian pathology

7.2.10.2 Pediatrics

7.2.10.3 Pregnancy

7.2.10.4 Non-obese male

Note: In cases of positive unambiguously diagnostic US results of appendicitis, CT scan is not required.

7.2.11 Ultrasound Doppler:

7.2.11.1 To rule out ischemia of vascular flow to liver/kidney transplants

7.2.11.2 To rule out extremity, neck and splanchnic DVT

Note: The MRP may be guided by Well's score -for extremities DVT- prior to initiating the request. CTA (CT-Angio) is the radiological choice in suspected mesenteric ischemia and neck veins/arteries thrombosis, but US is an alternative in case of CTA cannot be done.

7.2.11.3 In case of acute scrotal/testicular pain

7.2.11.4 In case of genital trauma

7.2.11.5 Ovarian torsion

7.3 **CT- scans** include the following (any other emergent/urgent condition should be accepted):

7.3.1 **Whole body CT-scan** (with IV-contrast) or organ directed CT in trauma patients based on mechanism of trauma and guided by the recent guidelines and patient's clinical condition.

Note: CTA may be required in case of clinically suspected vascular injury. The MRP may be guided by the Western Trauma Association Imaging algorithm, ACR appropriateness criteria and RCR supporting references.

7.3.2 **Head and Neck**

7.3.2.1 CT brain for stroke cases based on the unified stroke protocol

7.3.2.2 Follow up CT scans of the brain in traumatic brain injury, infarcts, and intracerebral hemorrhage

7.3.2.3 CT brain for altered level of consciousness

7.3.2.4 CT brain for mild traumatic brain injury
(According to Canadian CT-head rules/New Orleans Guidelines)
(And in pediatric trauma for highly suspicious mechanism according to PECARN).

7.3.2.5 CT brain with contrast in patient with seizures (first attack and/or no previous MRI or CT brain with contrast), to rule out intracerebral pathology

7.3.2.6 CTA of the carotids, vertebral arteries, and the brain to rule out suspected blunt cerebrovascular injuries or dissection

7.3.2.7 CTV (CT-venography) to rule out suspected cerebral venous thrombosis

7.3.2.8 CTA in blunt/penetrating neck or brain injuries with clinically suspected vascular injury

7.3.2.9 CT with contrast of the neck to rule out retrobulbar, subglottic or retropharyngeal abscess and airway compromise

7.3.3 **Chest**

7.3.3.1 CTA to rule out pulmonary embolism

7.3.3.2 CTA for hemoptysis

7.3.3.3 Chest trauma (blunt and penetrating)

7.3.4 **Abdomen and Pelvis**

7.3.4.1 To rule out closed loop small or large bowel obstruction

7.3.4.2 Blunt/Penetrating abdominal trauma

7.3.4.3 CTA bowel in shock or sepsis of unknown source with rising lactic acid level (to rule out bowel ischemia or any other underlying etiology)

7.3.4.4 CTA abdomen to rule out:

7.3.4.4.1 Bowel ischemia

7.3.4.4.2 Abdominal Aortic Aneurysm leak

7.3.4.4.3 Active gastrointestinal (GI) bleed

7.3.4.5 Urgent CT abdomen and pelvis with IV-contrast is indicated in cases of abdominal pain in the following:

7.3.4.5.1 The immunocompromised patients

7.3.4.5.2 In acute severe pancreatitis with decreasing hemoglobin or blood drainage from intra-abdominal drains or upper GI bleed (to rule out ruptured splenic pseudoaneurysm – 10 %)

7.3.4.5.3 To rule out postoperative leaks

7.3.4.6 Urgent CT abdomen and pelvis with contrast is also indicated to rule out appendicitis in:

7.3.4.6.1 Obese patients

7.3.4.6.2 Those with large abdominal girth

7.3.4.6.3 In case of equivocal ultrasound results for appendicitis in:

7.3.4.6.3.1 Pediatrics

7.3.4.6.3.2 Female

7.3.4.6.3.3 Non-obese young male patients

7.3.4.7 Post bariatric surgery with clinically suspected complications as internal hernia, leaks and/or superior mesenteric artery/portal vein thrombosis.

7.3.4.8 Renal colic in case of suspected urinary tract obstruction with urine retention/anuria, impaired renal function, signs of urosepsis, single kidney, persistent pain, and nausea/vomiting.

7.3.4.9 Suspected pyelonephritis in case of urinary tract obstruction with urine retention/anuria, impaired renal function, signs of urosepsis, single kidney, persistent pain, and nausea/vomiting.

7.3.4.10 Any suspected genitourinary trauma with hematuria (Kidney/bladder)

7.3.5 **Others**

7.3.5.1 CTA limbs for acute ischemia or in case of blunt/penetrating trauma with suspected vascular injury

7.3.5.2 CT with IV-contrast to rule out necrotizing fasciitis and/or subfascial, intramuscular, submuscular abscesses

7.3.5.3 CT for pregnant patient with trauma or sepsis
(Based on ACOG and EAST guidelines)

8.0 **MRI** include the following:

8.1 Emergency MRI to be done in case of cord compression, cauda equina syndrome, spinal injury

8.2 Pregnant patients with pathologies best diagnosed by MRI and/or upon the final consensus of the MRP and respective radiologist

9.0 **Urgent/emergent imaging in Pediatrics** include the following:

9.1 For scrotal pain/trauma/suspecting pathology: US Doppler of the scrotum/testes

9.2 For abdominal pain:

9.2.1 To rule out intussusceptions: ultrasound

9.2.2 Suspected complicated hernias (strangulated/obstructed) or to differentiate inguinal hernia from undescended testicular torsion: ultrasound

9.2.3 To rule out appendicitis: ultrasound of the abdomen/pelvis is the first modality of choice. CT scan of the abdomen and pelvis:

9.2.3.1 If ultrasound is inconclusive/equivocal

9.2.3.2 In obese, immunosuppressed patients, and cerebral palsy patients

9.2.4 For blunt/penetrating trauma, the above-mentioned policies, and guidelines (7.3.1 will apply to the pediatric population pending update and modification of the pediatric trauma policy/guideline in the ministry of health).

10.0 **Radiology Requests, Reports and Communication**

10.1 All cases approved during the oncall should be done during the oncall hours (consideration to changes in the expected turnaround time should be given to cases in need of medical preparations for contrast related allergies).

10.2 All emergency radiology requests must be written with sufficient information pertaining to the patient's details, indication of the chosen radiological modality and the suspected/provisional clinical diagnosis.

10.3 The request must be relayed to and/or discussed with the radiologist by phone (or in person keeping in mind undue delays in patient care) by the MRP.

10.4 The request should include all the following:

10.4.1 Name(s) and contact number(s) of the requesting doctor(s) and the sub-specialty if any (e.g., gynecologist, neurologist, etc.)

10.4.2 Contact number(s) of the patient

10.4.3 Department and unit

10.5 Conflicts of opinion arising between the oncall radiologist and MRP/requesting physician, regarding the urgency and or modality of a radiological investigation, must be escalated to the senior registrars and above rank of both services and final decisions made must **not** be unilateral.

10.5.1 Changing the Modality: Rendering a request as inappropriate, must **not** be a unilateral decision and the changes in the request for radiological examination should be documented by the treating team and radiologist.

10.5.2 Deferring/Rejection: It is professionally mandatory that the responsible oncall radiologist who DOES take the decision that a request for a radiological investigation is non-urgent or not indicated without agreement of the treating team (after discussion), to document (in the radiological request and/or MR8 MOH form or respective form) the reason for such a decision providing his/her signature and stamp for official documentation. The rejection (if any) should be done in consultation with second on call radiologist of the rank of senior registrar or above.

10.6 **Definition of the preliminary report and validated report**

10.6.1 **Definition of the preliminary report**: Interpretive reports that may be issued when creation of a final report would unnecessarily delay care of an emergency patient. It is issued by the supervised radiology registrar first oncall or above rank.

10.6.1.1 The preliminary report should include the answers pertaining to the question(s) (documented on the request) and any possible pathology related to the clinical scenario or documented suspected diagnosis.

10.6.1.2 The preliminary report may at times of emergency contain limited or incomplete information to other findings in the imaging modality which will be documented in the validated report.

10.6.1.3 Establishing a management plan based on the preliminary report or the awaited validated report is left to the discretion, clinical judgement, and correlation of the MRP requesting the radiological exam.

10.6.1.4 Major discrepancy between preliminary and validated reports that alter treatment plans should be audited and reviewed regularly by the respective involved departments and forwarded to the MOH committee on policies.

10.6.2 **Definition of final/validated report:**

10.6.2.1 A report issued by the senior registrar and above rank.

10.6.2.2 It is the final interpretive report which may, at times, need more data (e.g., prior imaging, reports, patient's medical record etc. when possible) and thus more time than the preliminary report to be issued.

10.6.3 **Time to issue preliminary radiology reports.**

Preliminary Radiology reports will be issued after a defined range of time from the procedure depending on the urgency of the case as follows**:**

10.6.3.1 **Emergency cases**: should be issued **DURING** the oncall and in a timely fashion (within 1 hour of the procedure), verbally initially if necessary.

10.6.3.2 **Urgent cases:** should be issued **DURING** the oncall (within 2-4 hours of the procedure, earlier if indicated), verbally initially if necessary.

10.6.3.3 If for any reason an electronically issued report cannot be provided, a written brief report in the MR8 of the patients file is sufficient.

10.6.4 **Time to issue validated radiology reports.**

Validated Radiology reports will be issued after a defined range of time from the procedure depending on the urgency of the case as follows:

10.6.4.1 **Emergency cases**: should be issued **DURING** the oncall and in a timely fashion (within 2 hours of the procedure).

10.6.4.2 **Urgent cases:** should be issued **DURING** the oncall (within 6 to 8 hours of the procedure, earlier if indicated.

10.6.4.3 If for any reason an electronically issued report cannot be provided, a written brief report in the MR8 of the patients file is sufficient, pending a validated report.

10.7 For emergency cases in general it is the responsibility of both, the radiologist and the MRP to ensure the findings and report are provided and acquired respectively through a clear line of communication and follow up.

10.8 It is the professional responsibility of the radiologist oncall to contact and inform the treating team in person (and document) if there are any significant changes made to the preliminary radiology report issued after validation immediately.

10.9 Auditing the reports and quality assurance will be a combined responsibility between the clinical departments and radiology department to ensure efficient service provision.

11.0 Intravenous Contrast Imaging, Risks and Consents

11.1 All consents must follow Kuwait Ministry of Health rules and regulations on informed consent.

11.2 Patients with impaired renal function in need of intravenous (IV) contrast imaging must be informed and consented for the risk of contrast induced nephropathy and dialysis by the treating physician. A high-risk consent form in such situation must be signed by the treating physician and the patient.

11.3 Patients with risk factors and/or history of contrast related allergies who are in need of imaging with intravenous contrast, but, due to clinical urgency, were not adequately medically prepared, to reduce the risk of allergic reaction, should be consented for high risk of contrast induced allergic reactions by the MRP.

11.4 With patients who are intubated, have an altered level of consciousness/mentally incompetent with impaired renal function, and/or history of allergy, and in need of intravenous contrast imaging, the following must be applied:

11.4.1 If a legal representative is present, it is the responsibility of the MRP to obtain the consent from that legal representative (and co-signed as per MOH informed consent rules and regulations).

11.4.2 If a legal representative is **NOT** available/present or exist, the consent should be signed by two most senior responsible physicians (as per ministry decree) if deemed necessary by them to obtain the necessary radiological imaging or procedures.

11.5 If the patient or family refuse IV-contrast and CT is requested to assess intraperitoneal fluid or visceral leak, CT with oral contrast should be done instead (at the treating team's discretion). Alternative investigation if available and suitable should be done to reach almost same results.

11.6 If the patient or family refuse contrast (for any reason), the treating physician must discuss with the oncall radiologist about the yield, benefit, and alternatives if any (e.g.,

VQ scan for PE if CTA chest cannot be done) for the non-contrast study to achieve the necessary diagnosis and plan management (with the final decision left for the MRP).

11.7 Interventional radiological procedures

11.7.1 To avoid the unnecessary wasting of resources, delay in management and possible medical complications en route, interventional radiological procedures will be aimed to be provided to the patients (stable and unstable) in their index hospitals by the interventional radiology team.

11.7.2 It is the responsibility of the MRP to ensure and document (in MR8 of the patients' file) **informing** the patient and or the legal guardian (if present or exists) about the intended interventional radiological procedure and possible complications and ensure/document approval of the patient for the procedure.

11.7.3 It is professionally mandatory that **consent** for interventional radiological procedures, explained to the patient(s) or their legal representative(s), be taken and completed by the interventional radiologist performing the procedure (or a member of their team assisting in the procedure) denoting risks, benefits, and possible complications in the specified Ministry of Health procedure consent form.

11.7.4 Emergency interventional radiological procedures

11.7.4.1 Stable patients

11.7.4.1.1 At times of logistic, personnel or departmental limitations that hinder provision of interventional radiological procedures to stable patients in their index hospitals, the interventional radiology team will request the transfer of the stable patient to their respective hospitals where the logistic, personnel or departmental set up and support are available for performance of the interventional radiological procedure. Note: The above is expected to be an exception of the standard not the norm.

11.7.4.1.2 If a stable patient is requested and planned for an interventional radiological procedure in another health care facility, it is the responsibility of the treating team to provide the following:

11.7.4.1.2.1 Ensure arrangements, booking and timing of the procedure with the respective interventional radiologist.

11.7.4.1.2.2 Ensure to establish the transport and medical support en route (physician, nurse, ICU etc.) (Please refer to the interhospital transfer policy)

11.7.4.1.2.3 Ensure and document (in MR8 of the patient's file) informing the patient and or his legal guardian (if present or exists) about the intended interventional radiological procedure and possible complications and ensure/document approval of the patient for the procedure.

11.7.4.1.2.4 The official consent should be signed and submitted by the respective interventional

radiologist upon receipt of the patient as per rules and regulations.

11.7.4.2 Unstable patients:

11.7.4.2.1 When the patient cannot be transferred to the hospital where the interventional radiologist is available, the interventional radiologist oncall should perform the intended procedure in the index hospital, if logistically and technically possible.

11.7.4.2.2 In the above clinical situation (11.7.4.2.1), it is the responsibility of the treating clinician to refer to the on-call schedule of the interventional radiologists and provide all the necessary arrangement needed for the performance of the procedure in the index hospital (e.g., Anesthesia, ICU/nursing staff, etc.) and to follow articles number (11.7.4.1.2.3 and 11.7.4.1.2.4)

12.0 Fees collection for expatriates: Pending final review and amendments of the radiology services fee collection by the financial departments of the Ministry of Health and in accordance with the ministerial decree of 2018, emergency care and investigations must **NOT** be delayed or withheld from expatriate patients and fee collection should be acquired after the necessary management by the respective administrative and financial departments not the clinicians and or technical staff.

13.0 Violations of the above, with or without resulting medical complications arising from such breach of code of conduct, may be reviewed in investigative committees and are subject to disciplinary actions.

14.0 Monitoring procedure

14.1 MOH committee on hospital clinical services and polices will monitor the above policy.

14.2 A Senior doctor of the related team can email the above-mentioned committee, in case of any incidence.

14.3 The email address will be: policy.moh.kw@gmail.com

References:

- Wait time benchmarks for radiology wait time alliance.ca
- Canadian Association of Radiologists report on national maximum wait time access targets for medical imaging 2013
- ACR PRACTICE PARAMETER FOR RADIOLOGIST COVERAGE OF IMAGING PERFORMED IN HOSPITAL EMERGENCY DEPARTMENTS, 2018
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- Wells PS et al. JAMA. 2006 Jan 11;295(2):199-207
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- ACR appropriateness criteria (revised 2019) https://www.acr.org/Clinical-Resources/ACR-Appropriateness-Criteria
- RCR standards of practice and guidance for trauma radiology in severely injured patients, second edition, https://www.rcr.ac.uk/system/files/publication/field_publication_files/bfcr155_traumaradiol.pdf
- WTA Adult Blunt Injury Initial Imaging Algorithm https://www.westerntrauma.org