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| **Justification criteria and projection guidelinesfor adult general radiography** |

**Document Control:**

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| **For Use In:** | James Paget University Hospitals NHS Foundation Trust,Norfolk and Norwich University Hospitals NHS Foundation Trust,Queen Elizabeth Hospital King’s Lynn NHS Foundation Trust |
| Imaging/Radiology  |
| **Search Keywords:** | Authorisation, justification, general, radiography, plain, film, adult, imaging, projection, criteria, radiology |
| **Document Author:** | Norfolk and Waveney (N&W) Plain Film Imaging Protocol Task & Finish Group |
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| **Ratified By:** | **JPUH:** Radiology Governance**NNUH:** Radiation Document Panel**QEH:** Radiology Clinical Governance |
| **Approval Date:**  | **NNUH:** 15/10/2024**JPUH:** 09/07/2024**QEH:** 25/06/2024 | **Date to be reviewed by:** This document remains current after this date but will be under review | 15/08/2025 |
| **Implementation Date:** | 6 January 2025 |
| **Reference Number:** | Trust Docs 23764,  |

**Version History:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Version** | **Date** | **Author** | **Reason/Change** |
| V1.0 | 10/06/2024 | N&W DAC Operations Workstream Lead | To originate document |

**Previous Titles for this Document:**

|  |  |
| --- | --- |
| **Previous Title/Amalgamated Titles** | **Date Revised** |
| Justification Criteria & Technique Guide for Plain Radiological Examinations (NNUH) Trust Docs ID: 9347 | 06/01/2025 |
| Justification Criteria & Technique Guide for Plain Radiological Examinations (QEH) | 06/01/2025 |
| Standard Views and Departmental Protocol (JPUH) | 06/01/2025 |

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Printed copies of this document should be considered out of date. The most up to date version is available from the Trust Intranet or document management system.

**Consultation**

This document was developed in conjunction with individuals from Queen Elizabeth Hospital King’s Lynn NHS Foundation Trust (QEH), James Paget University Hospitals NHS Foundation Trust (JPUH), Norfolk and Norwich University Hospitals NHS Foundation Trust (NNUH) in the form of a Task & Finish Group.

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No individual Trust is permitted to makes changes to this document without prior collaboration with the other two Trusts.

It is the responsibility of the most senior/relevant person listed in the ‘Consultation’ section above for the site that wants to make changes, to engage with their peers at the other two sites and commence discussions. These changes could be as a result of changes to practice or new legislation but joint agreement **MUST** be obtained prior to amending this document.

**Relationship of this document to other procedural documents**

This document is a clinical guideline applicable to the Acute Hospital Collaborative; please refer to local Trust’s procedural documents for further guidance, as noted in Section 5.

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# Introduction

## Rationale

Under the Ionising Radiation (Medical Exposures) Regulations (IR(ME)R) no medical exposure to radiation can take place without prior justification of the exposure by a practitioner. These regulations also prohibit any operator from carrying out an exposure or any practical aspect without having been adequately trained.

General radiographic exposures can be authorised by the IR(ME)R Operator if the referral complies with the enclosed justification guidelines and criteria which have been approved by the IR(ME)R Practitioner.

Referral criteria will be based on the current version of Royal College of Radiologists (RCR) ‘iRefer Guidelines: Making the best use of clinical radiology services.

## Objective

These guidelines have been developed to deliver a common set of justification criteria across the three acute Trusts to standardise practice and improve the clinical pathway.

The IR(ME)R Operator will use these guidelines to authorise certain exposures where it is not practicable for the practitioner to provide immediate justification. These guidelines for common examinations have been endorsed by the IR(ME)R Practitioner.

These guidelines are written to allow flexibility, e.g. an agreed range of radiographic projections which may be taken to provide the necessary clinical information. This will allow the IR(ME)R Operator the appropriate freedom to exercise professional judgement e.g. if additional/alternative projections are required based on clinical information and radiographic appearances.

## Scope

These guidelines apply to all IR(ME)R Operators (radiographers, radiographer assistant practitioners, trainee radiographer assistant practitioners, student radiographers and apprentice radiographers) undertaking general radiography of adult patients 16 years old and over, across the three acute Trusts.

In-patients (IP), out-patients (OP), General Practice (GP) patients and patients attending the accident and emergency department (ED) are covered under these guidelines.

## Glossary

The following terms and abbreviations have been used within this document:

|  |  |
| --- | --- |
| **Term** | **Definition** |
| AAA | Abdominal aortic aneurysm |
| ACS | Acute coronary syndrome |
| AP | Anterior-posterior |
| ASIS | Anterior superior iliac spine |
| AXR | Abdomen x-ray |
| COPD | Chronic obstructive pulmonary disease |
| CT | Computed tomography |
| CTC | CT colonoscopy |
| CTU | CT urogram |
| CVC | Central venous catheter |
| CXR | Chest x-ray |
| DP | Dorsi-plantar |
| ED | Emergency department |
| ERCP | Endoscopic retrograde cholangiopancreatography |
| ESR | Erythrocyte sedimentation rate |
| ET | Endotracheal |
| EVAR | Endovascular aneurysm repair |
| FAI | Femora-acetabular impingement  |
| FB | Foreign body |
| FU | Follow up |
| GP | General Practice |
| GI | Gastrointestinal |
| HBL | Horizontal beam lateral |
| HCPC | The Health and Care Professions Council |
| HDU | High dependency unit |
| IBD | Inflammatory bowel disease |
| IP | In-patient |
| IR(ME)R | Ionising Radiation (Medical Exposure) Regulations 2017 and Ionising Radiation (Medical Exposure) (Amendment) Regulations 2024 |
| ITU | Intensive therapy unit |
| IUCD | Intrauterine contraceptive device |
| IVU | Intravenous urogram |
| JPUH | James Paget University Hospitals NHS Foundation Trust |
| KUB | Kidneys, ureters and bladder |
| MC | Metacarpal |
| MICRA | Type of pacemaker |
| MRI | Magnetic resonance imaging |
| MSK | Musculo-skeletal |
| NGT | Nasogastric tube |
| NJ | Nasojejunal |
| NM | Nuclear Medicine |
| NNUH | Norfolk and Norwich University Hospitals NHS Foundation Trust |
| OA | Osteoarthritis |
| OM | Occipito-mental |
| OP | Out-patient |
| OPG | Orthopantomogram |
| PA | Posterior-anterior |
| PICC | Peripherally inserted central catheter |
| PR | Per rectum |
| PTC | Percutaneous transhepatic cholangiography |
| PUO | Pyrexia of unknown origin |
| QEH | Queen Elizabeth Hospital King’s Lynn NHS Foundation Trust |
| RA | Rheumatoid arthritis |
| RCR | Royal College of Radiologists |
| RTC | Road Traffic Collision |
| SOBOE | Shortage of breath on exertion |
| STEMI MI | A STEMI (ST-Segment Elevation Myocardial Infarction) is the most severe type of heart attack. |
| TB | Tuberculosis |
| THR | Total hip replacement |
| TMJ | Temporo-mandibular joints |
| US | Ultrasound |
| UTI | Urinary tract infection |
| 3CG BARD | Type of peripherally inserted central catheter used on cardiac patients |

# Responsibilities

Health and Care Professions Council (HCPC) registered radiographers and qualified assistant practitioners will carry out the examination, within their scope of their practice, to the required standard and be responsible for attaining high quality images.

Trainees, students and apprentices will always be supervised and will carry out imaging under the auspices of an HCPC registered radiographer.

Radiographers, assistant practitioners and referrers must be familiar with the Royal College of Radiologist’s referral guidelines “iRefer: Making the best use of clinical radiology services’, as well as Trust specific referral criteria.

The referrer is responsible for the provision of sufficient and accurate clinical information to enable the justification of the medical exposure.

# Justification and imaging guidelines

These guidelines apply to adult patients aged 16 years and over; paediatric imaging is covered under separate guidelines.

The standard radiographic projections to be undertaken for each anatomical area are listed in the respective section, unless stated otherwise. The notes section may state where alternative projections/techniques may be required; these might be specific to one Trust.

## Foreign body referrals

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Examination Type** | **Indication** | **Contraindications** | **Radiographic Projections** | **Notes** |
| Foreign Body (FB)(Excluding Ingested/inserted FB) | * ?FB – referrer should indicate where and what the foreign body is as this will determine if a radiograph is the correct examination to locate a foreign body or evidence of foreign body.
 |  | * Two views are essential to locate a FB for most referrals. These views should be adapted to show the FB's location regarding the skin surface and/or bony structures At least one joint should be visible on the radiograph wherever possible
* A marker at the entry site should be used as a useful tool for locating FB’s
* Ensure the site marker is not confused with the foreign body
 | * Not all foreign bodies are opaque, but evidence of a foreign body may be seen. See Appendix 1 for examples of some common foreign bodies.
 |
| Ingested /inserted FB |  |  |  | * For FB radiographs of coins, a chest radiograph is sufficient to assess whether the location of the coin is below the diaphragm
* If coin or objects >2cm diameter then symptomatic AXR’s can be imaged (possible ileo-caecal valve obstruction)
* Abdominal radiographs should only be undertaken when assessing the location of batteries which can degrade within a few hours or objects that could potentially cause perforation. Subsequent radiographs can be undertaken to track passing of the FB.
* Multiple magnets and sharp items warrant AXR.

**Drug packages****NNUH:**See site specific Forensics Protocol.**QEH and JPUH:*** Discussed with Radiologist and appropriate imaging agreed.
 |

## General Musculo-Skeletal (MSK) referrals

|  |  |  |
| --- | --- | --- |
| **Clinical Indication** | **?indicated as per iRefer** | **Notes** |
| Osteomyelitis | Indicated | * X-ray is the initial investigation but may be normal in early osteomyelitis.
* Radiographs have a low sensitivity for osteomyelitis immediately following a penetrating injury.
* Ensure the whole anatomical area is imaged when osteomyelitis suspected (e.g., undertake feet projections when ?osteomyelitis hallux).
 |
| ? fracture, ? dislocation, haemarthrosis | Indicated | * X-ray for acute/sub-acute injury/trauma.
 |
| Bone pain / unresolving bone pain | Indicated | * X-ray gives a dedicated view of the symptomatic area.
* Magnetic Resonance Imaging (MRI) performed if positive finding on X-ray.
 |
| Metabolic bone disease | Indicated | X-ray is helpful in the identification of osteoporotic collapse and differentiation from other unrelated causes. It also identifies characteristic signs of other metabolic bone disease, including osteomalacia and hyperparathyroidism. It is important in correlation with Nuclear Medicine (NM) abnormalities. |
| Suspected osteomalacia with pain | Indicated | Localised radiographs are used to establish the cause of local pain or an equivocal lesion following a nuclear medicine scan. |
| Arthropathy (initial presentation – most commonly osteo/rheumatoid arthritis) | Indicated | * X-ray of the affected joint may be helpful to establish cause, although erosions are a relatively late feature.
* **X-ray hands/feet:** In patients with suspected rheumatoid arthritis, X-ray of the feet may show erosions even when symptomatic hand(s) appear normal.
* **Other anatomical areas:** X-rays indicated for symptomatic joints only.
 |
| Painful prosthesis | Indicated | X-ray is useful to detect established loosening or ?periprosthetic fracture. Ensure the whole of the prosthesis and include sufficient normal bone beneath prosthesis and spacer/all cement on the necessary projections. |
| Arthropathy (follow-up) | Specialised investigation | X-ray may be required by specialists to assist management decisions, e.g., for instituting and modifying drug treatment and referral for joint replacement. |
| Soft tissue mass | Indicated only in specific circumstances | Ultrasound (US) is usually the first line investigation. X-ray is only useful if lesion is close to bone or for assessment of internal calcification. |

### Upper extremity

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Examination Type** | **Indication** | **Contraindications** | **Radiographic projections** | **Notes** |
| Hand | As per ‘General MSK referrals’  |  | * DP
* Oblique

**Arthropathy**: DP both hands & wrists | If punch injury, dorsal MC soft tissue swelling, or obvious metacarpal fracture perform lateral hand projection. |
| Finger | As per ‘General MSK referrals’  |  | * DP (of affected and adjacent finger)
* Oblique (trauma 1st presentation of suspected fracture in the region of the MCP)
* Lateral
 |  |
| Thumb | As per ‘General MSK referrals’  |  | * AP/DP
* Oblique (trauma 1st presentation)
* Lateral

**Arthropathy:** DP both hands & wrists | **NNUH:** **Orthopaedic thumbs ?OA/pain:** * AP thumb (Robert's view)
* Lateral thumb
* DP full hand
 |
| Wrist  | As per ‘General MSK referrals’  |  | * DP
* Oblique (trauma 1st presentation)
* Lateral
 |  |
| Scaphoid | As per ‘General MSK referrals’  |  | * DP with ulnar deviation
* DP with ulnar deviation & cephalad tube angulation
* DP oblique
* Lateral
 | **NNUH: Ligamentous instability** (See technique guide) |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Examination Type** | **Indication** | **Contraindications** | **Radiographic projections** | **Notes** |
| Radius & ulna | As per ‘General MSK referrals’  |  | * AP
* Lateral
 |  |
| Elbow | As per ‘General MSK referrals’  |  | * AP
* Lateral
 |  |
| Humerus | As per ‘General MSK referrals’  |  | * AP
* Lateral
 |  |
| Clavicle | As per ‘General MSK referrals’  |  | * AP to include entire shoulder girdle
* Coned 20° cephalad
 |  |
| Scapula | As per ‘General MSK referrals’  |  | * AP shoulder girdle
* Lateral (Y-view)
 |  |
| Acromio-clavicular joints | As per ‘General MSK referrals’  |  | See clavicle projection | Specific AP non-weight bearing/weightbearing views only to be performed when requested. |
| Sterno-clavicular joints | As per ‘General MSK referrals’  |  | **Trauma:** * ?medial clavicle fracture/dislocation – standard clavicle views only

**All other referral sources and clinical indications:** * + - * + Limited CT
 |  |
| Shoulder | As per ‘General MSK referrals’  |  | * 15° turned AP
* Axial

**Trauma/FU trauma**: * Straight AP
* Axial/modified axial/Y-view
 |  |

### Lower extremity

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Examination Type** | **Indication** | **Contraindications** | **Radiographic Projections** | **Notes** |
| Foot | As per ‘General MSK referrals’  | Morton’s neuromaPlantar fasciitisCalcaneal spur | * + DP
	+ Oblique

**JPUH:*** Plus lateral weight-bearing(non-trauma)

**Arthropathy:** * + DP both feet
 | If Lisfranc #/dislocation demonstrated, perform lateral foot as additional view.**Charcot foot/Podiatry:** * DP & lateral w/b if possible
* Oblique
 |
| Hallux and toes  | As per ‘General MSK referrals’  |  | * DP
* Oblique
 | 2nd – 5th toes - only x-ray if toe is visibly deformed or open fracture |
| Calcaneum | As per ‘General MSK referrals’  | SpurPlantar fasciitis (US/MRI indicated) | **NNUH:*** + Lateral
	+ Axial with 40° cranial angulation

**QEH and JPUH:*** + Lateral
	+ Axial with 40° cranial angulation
	+ Oblique (trauma only)

**QEH and JPUH FU ORTHO:*** + Lateral
	+ Axial with 40° cranial angulation
 |  |
| Tibia & Fibula | As per ‘General MSK referrals’  |  | * AP
* Lateral
 | **NNUH: Spatial frame protocol**(See technique guide) |
| Ankle | As per ‘General MSK referrals’  |  | * AP
	+ Lateral
 | **NNUH**: **Ortho foot/ankle specialist non-trauma*** Weight-bearing
 |
| **Examination Type** | **Indication** | **Contraindications** | **Radiographic Projections** | **Notes** |
| Femur | As per ‘General MSK referrals’  |  | * AP
* Lateral

**Trauma**: * + AP pelvis
	+ AP femur
	+ Lateral femur
 | **NNUH:** **Leg Length Measurements** (See technique guide) |
| Knee | As per ‘General MSK referrals’ **GP:**Referrals will only be accepted for patients >50 years old | **GP**:Referrals <50 years old – MRI only  | * AP weight-bearing

(NNUH only if over 40yrs old)* Lateral

**NNUH and JPUH**: Plus 30° skyline**Trauma:*** AP
* Horizontal Beam Lateral
 | If clinical indications state locking perform intercondylar view.**NNUH:****Orthoview measurements** for orthopaedic-referred patients > 55 years old - will be specified on request if required.(See technique guide) |

### Pelvis and hip

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Examination Type** | **Indication** | **Contraindications** | **Radiographic Projections** | **Notes** |
| Pelvis & hip **(GP & rheumatology)** | As per ‘General MSK referrals’  |  | * AP pelvis (iliac crests down)

**NNUH:** * Plus turned lateral
 |  |
| Pelvis & hip **(Trauma)** | As per ‘General MSK referrals’  |  | **Trauma:** * AP pelvis
* Horizonal beam lateral

**Ensure whole of prosthesis is included on symptomatic side.** | Where a patient has suffered a hip/proximal femur fracture and has a history of cancer/mets, undertake femur views to determine if any focal bony lesions and aid surgical management. |
| Pelvis & hip **(Orthopaedic)** | As per ‘General MSK referrals’  |  | * + AP (ASIS down)
	+ Horizonal beam lateral (post-op)
	+ Turned lateral – FU prosthesis & all other requests
 | **NNUH:****Orthoview measurements** pre-op THR(See technique guide)**NNUH:** **FAI patients (Mr Marchant)*** Weight-bearing AP whole pelvis
* Turned lateral on the x-ray table
 |
| Pelvis**(Orthopaedic)** | Post-operative acetabular fractures  | Acute diagnosis of acetabular fractures – CT indicated | * + AP pelvis
	+ Judet projections
 | **NNUH:****Judet projections**(See technique guide) |
| Pelvis**(Orthopaedic)** | Confirmed pelvic ring fracture |  | * + AP pelvis
	+ Inlet/outlet projections
 | **NNUH:****Inlet/outlet projections** (See technique guide) |
| Sacro-iliac joints  | **NNUH:**Contraindication to MRI  | **NNUH & JPUH:**GP referrals  | * AP 15-20° angle cephalad or
* PA 15-20° angle caudad
 |  |

## General abdomen referrals

### Abdomen

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Examination Type** | **Indication** | **Contraindications** | **Radiographic Projections** | **Notes** |
| Abdomen | * Acute large or small bowel obstruction
* Inflammatory bowel disease of the colon: acute exacerbation (toxic megacolon)
* Renal calculi in absence of acute colic (usually following a CT KUB)
* Extent of faecal impaction (not constipation)
* EVAR / urology stent FU
* Post gastrografin for small bowel obstruction
* Patency capsule check – for patients with IBD prior to pillcam
* NJ tube check (landscape upper abdomen)
* Misplaced iatrogenic items e.g. IUCD, stents
* Ingested radio-opaque FB (see FB section)
* Concealed drug packages (see FB section)
 | * Non-specific abdominal pain
* Abdominal mass (US)
* Cholecystitis (US)
* Appendicitis (clinical diagnosis)
* Pyelonephritis (US)
* Haematemesis (endoscopy)
* PR bleed/melaena (endoscopy + CTC)
* Diverticulitis (endoscopy + barium enema)
* Abdominal trauma (US/CT)
* Ascites (US)
* AAA (US/CT/MRI)
* Diagnosis inflammatory bowel disease (fluoroscopy)
* Pancreatitis (US/CT)
* Palpable mass (US/CT/MRI)
* Jaundice (US/CT/MRI/ERCP/endoscopy/ PTC)
* Cirrhosis (US/MRI/CT)
* Renal colic - ?stones (CTU)
 | * Supine AP abdomen

**Acute abdomen**:* AP supine abdomen and erect CXR (if perforation suspected).
 | **Transit study/patency capsule**(See site specific protocols)**Lost IUCD:** Must have gynae ultrasound first. (Cover entire abdo on plain radiograph). |

## Chest referrals

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Examination Type** | **Indication** | **Contraindications** | **Radiographic Projections** | **Notes** |
| Chest | Please note this is not an exhaustive list:* Acute chest pain? STEMI MI/ heart failure/ ACS /unstable angina
* Congenital heart disease
* Chronic stable angina
* Pericarditis / pericardial effusion
* Valvular heart disease
* Pulmonary embolism (also indicated during pregnancy)
* Pleural effusion
* Pleuritic chest pain
* Non-specific PERSISTENT chest pain
* Consolidation
* Chest infection / pneumonia
* Pyrexia of unknown origin (PUO)/ septic screen
* Inhaled/swallowed FB - if respiratory symptoms develop (to show oesophageal and tracheo-bronchial opaque
 | **Pre-operative** **not indicated unless:*** Pre-op thoracic/cardiac surgery
* Pre-op breast surgery
* Pre-op vascular surgery
* Where the patient has known or suspected malignancy, aged under 60 with cardiac or respiratory disease
* Patient >60 years with significant cardiorespiratory disease
 | * PA erect where possible
* AP erect if PA not possible
* Supine for spinal/pelvic trauma & ED trauma patients
* Erect only – pleural effusion
 | Where possible bone subtraction should be applied to all chest radiographs. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Examination Type** | **Indication** | **Contraindications** | **Radiographic Projections** | **Notes** |
| Chest (contd) | * Foreign bodies as well as the complications e.g. collapse
* Chest trauma / blunt/penetrating trauma
* Haemoptysis
* Malignancy (primary)
* Metastases, including of unknown primary origin
* ?TB
* Lung nodule follow-up
* Dyspnoea
* Weight loss
* Hoarseness
* Clubbing
* Supraclavicular or cervical lymphadenopathy
* Thrombocytosis/Raised ESR
* Pneumothorax/suspected pneumomediastinum
* Respiratory difficulty (at rest / on exertion) SOBOE
* ITU/HDU patient – where change in symptoms or insertion/removal of a device
 | **Others:*** Asthma (unless acute exacerbation that is life-threatening or does not respond to treatment, e.g., GP referral with other symptoms
* Repeat prior to hospital discharge (in patients with satisfactory clinical recovery) FU 4-6-12 weeks should be arranged
* Upper respiratory tract infection
* Expiratory CXR for pneumothorax
* ?Aortic dissection –US/CT indicated
* ?Covid (additional clinical information is required to justify the request)
* Rib fracture
 | **NNUH:**Haemoptysis for over 40’s * PA/AP & lateral
* Post Pacemaker insertion
	+ PA & lateral
* MICRA pacemaker
	+ PA only
 |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Examination Type** | **Indication** | **Contraindications** | **Radiographic Projections** | **Notes** |
| Chest (contd) | * ? NGT placement unable to aspirate
* CVC line / PICC/ Hickman etc.
* Position of catheters/tubes/ET tube
* Bowel / oesophageal perforation
* Pacemaker localisation
* Occult lung disease
* Exacerbation of COPD
* Covid pneumonia
* Oesophageal stent migration

**Medico-legal:*** Where the patient is an immigrant (UK category 2) having arrived in the country within the previous year and has not had a chest x-ray
* Occupational purposes (e.g., diver)
 | **NNUH:** Post 3CG BARD PowerPICC line insertion, unless:* Atrial fibrillation/Flutter
* Pacemaker in-situ
* No consistent P wave
* New Practitioner (first 50 insertions require CXR)
 | **NNUH:** PICC lines – ensure patient’s arms are placed by their sides so that line position is not distorted/changed. |  |
| Sternum | * Major blunt trauma
 |  | * PA/AP CXR
* Lateral sternum
 |  |
| Soft tissue neck | * Ingested FB (e.g., some fish bones)
 |  | * Lateral with Val Salva
 | See Appendix 1 |

## Vertebral column referrals

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Examination Type** | **Indication** | **Contraindications** | **Radiographic Projections** | **Notes** |
| Cervical Spine | **OP & IP:*** Pre-op RA
* OA
* RA
* Neurological signs
* Atlanto-axial subluxation

**GP:*** ? osteoporotic wedge fracture
* Cervical rib
* Acute trauma
 | **GP:*** OA
* Atlanto-axial subluxation
 | **OP & IP:*** AP
* Lateral

**Atlanto-axial subluxation:** * Lateral in flexion
* **NNUH**: Lateral in extension

**? osteoporotic wedge fracture:** * Lateral projection only

**Cervical rib/thoracic inlet**:* AP only – to include all of 1st rib

**Trauma:** * AP
* Odontoid peg
* HBL
* Swimmers (if C7/T1 not seen on lateral)

**JPUH:**Discuss with referrer as to whether swimmers view is necessary rather than straight to CT. |  |
| **Examination Type** | **Indication** | **Contraindications** | **Radiographic Projections** | **Notes** |
| Thoracic Spine and Lumbar Spine | **OP & IP:*** Neurological signs
* Metastatic disease
* Metabolic/congenital disorders
* OA
* RA
* Prosthesis / post-op
* **NNUH:** Pre-op

**GP:*** ? osteoporotic wedge fracture
* Trauma
 | * Infection/discitis: MRI should be requested
* Scoliosis – specialist consultant referral only

**GP:*** Any other indication other than osteoporotic wedge fracture
 | **OP & IP:** * AP and lateral (**NNUH Ortho referrals standing**)

**GP:** **? osteoporotic wedge fracture*** Lateral

**Trauma:** * AP
* HBL
 | **NNUH:****Scoliosis** (See technique guide)All acute trauma images should be performed supine. Standing images can only be performed at the request of a Consultant (ED or Orthopaedic) after supine films have been undertaken and ***should never be first-line investigation in A&E.*** **It is the referrer’s responsibility to ensure that the patient is clinically stable to be able to stand.** |
| Sacrum | * Not indicated
 | * Contraindicated
 |  | NNUH and JPUH likely to have CT as first line of investigation.JPUH for ? insufficiency fracture to have MRI |
| Coccyx | * Not indicated
 | * Contraindicated
 |  |  |

## Skull / Facial Bones / Mandible referrals

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Examination Type** | **Indication** | **Contraindications** | **Radiographic Projections** | **Notes** |
| Skull | Aneurysm clips pre-MRI |  | **Aneurysm clips pre-MRI:*** Lateral skull only
 |  |
| Facial Bones | As per ‘General MSK referrals’  |  | * OM & OM 30°
 | **NNUH and QEH:**Supine if patient cannot tolerate PA views |
| Temporo-mandibular joints (TMJ) | As per ‘General MSK referrals’  | TMJ requests from GPs – OPG or MRI more appropriate | See mandible including notes**ED and Oral Health referrals**:* TMJ: open & closed mouth
 |  |
| Mandible | As per ‘General MSK referrals’  |  | **Trauma:** * OPG & PA mandible

**Non-trauma:** * OPG only
 | If OPG not possible, undertake AP/PA & lateral oblique mandible views. |
| Orbits | As per ‘General MSK referrals’  |  | **FB (pre-MRI):** * Coned view of both eyes with eyes in neutral position

**FB (trauma):** * Affected eye only
 | If positive for metallic elements, refer images to qualified imaging staff, who will decide whether further imaging is necessary. |
| Teeth | As per ‘General MSK referrals’  |  | * OPG
 | **NNUH:** Peri-apicals (dental referrals).(See separate dental protocol).**JPUH:** Peri-apicals/CBCT specific dental request from consultant only. |

## Trauma referrals

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Examination Type** | **Indication** | **Contraindications** | **Radiographic Projections** | **Notes** |
| Trauma Series | * RTC
* Fall from height
* Various mechanisms of trauma resulting in multiple injuries
 |  | * Lateral cervical spine
* AP Pelvis (**MUST** include iliac crests)
* Supine CXR
 | Performed in ED Resus or in Department.NB: not all projections will always be required – it is rare for a cervical spine to be performed in Resus due to NICE guidelines on CT head/neck. |

## Shunt Series referrals

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Examination Type** | **Indication** | **Contraindications** | **Radiographic Projections** | **Notes** |
| Shunt series (adult) | Assess location and integrity of ventriculoperitoneal shunt |  | * Lateral skull
* Lateral cervical spine
* PA/AP chest
* AXR
 | Ensure overlap of projections so that entire shunt is visualised on radiographic series |

# Training & Competencies

IR(ME)R Operators will be trained in those aspects of radiation protection that will ensure proper performance of the examination, optimising the technique to allow maximal diagnostic information while ensuring that the radiation dose is kept within the department diagnostic reference levels (IR(ME)R Reg.17).

Radiographer and assistant practitioner competence will be assessed at induction and then annually to ensure they are performing at the required standard (see section 5). Any further training will be supported as part of the competency assessment process.

An up-to-date record of all IR(ME)R Operators, showing the date on which training was completed and the nature of the training, will be maintained by radiology.

# Related Documents

General Radiographer Induction and Competency Process

Assessment of General Radiographer Induction and Competence

Trust IR(ME)R Employer’s Procedures

Paediatric Plain Radiography Imaging Guideline

# References

Royal College of Radiologists. iRefer Guidelines: Making the best use of clinical radiology. RCR, May 2017.

[iRefer | The Royal College of Radiologists (rcr.ac.uk)](https://www.rcr.ac.uk/our-services/irefer/)

Ionising Radiation (Medical Exposures) Regulations 2017. Statutory Instruments No 1322 <http://www.legislation.gov.uk/uksi/2017/1322/pdfs/uksi_20171322_en.pdf>

Ionising Radiation (Medical Exposures) (Amendment) Regulations 2024. Statutory Instruments No 896

<https://www.legislation.gov.uk/uksi/2024/896/made>

# Monitoring Compliance

Compliance with the process will be monitored through the following:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Key elements** | **Process for Monitoring** | **By Whom****(Individual / Group / Committee)** | **Responsible Governance Committee / Department** | **Frequency of monitoring** |
| Audit of compliance with justification criteria guidelines | Retrospective audit of sample of plain film referrals to ensure appropriate imaging/projections undertaken by the operator. | Plain Film Modality Lead / Head of Department | Radiology Clinical Governance | Annual |

The audit results are to be discussed at the Radiology Clinical Governance meeting to review the results and recommendations for further action. Then sent to the Radiation Protection/Safety Committee meetings who will ensure that the actions and recommendations are suitable and sufficient.

# Appendices

## Appendix 1 – List of common radio-opaque bones and other common foreign bodies

|  |  |  |
| --- | --- | --- |
| **Highly Radio-opaque** | **Moderately Radio-opaque** | **Not radio-opaque** |
| Fish bones:* Salmon
* Cod Mullet
* Sole
* Megrime
* Tilapio
* Haddock
* Bass Red Fish
* Durad
* Gurnard
* Lemon Sole
* Cole fish

Iron tabletsAny metal FB e.g., paper clips, earringsBatteries | Fish bones:* Trout
* Pomfret
* Plaice
* Scad
* Sword Fish
* Grey Mullet
* Monk Fish
* Red Snapper
 | Fish bones:* Herring
* Sardine
* Mackerel
* Sprat
* Hake
* Kipper
* Bream
* Pike
* Bullhead
* Flounder

WoodSplintersThornsPlasticsLegoCD’s / DVD’sFibreglass |

# Equality Impact Assessment (EIA)

**NNUH:**

|  |  |
| --- | --- |
| **Type of function or policy** | New |

|  |  |  |  |
| --- | --- | --- | --- |
| **Division** | Clinical Support Services | **Department** | Radiology |
| **Name of person completing form** | Louise Reilly | **Date**  | 05/03/2024 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Equality Area** | **Potential Impact** | **Which groups****are affected** | **Full Impact Assessment Required****YES/NO** |
| **Negative Impact** | **Positive Impact** |
| Race | None | None | N/A | No |
| Pregnancy & Maternity | None | None | N/A | No |
| Disability | None | None | N/A | No |
| Religion and beliefs | None | None | N/A | No |
| Sex | None | None | N/A | No |
| Gender reassignment  | None | None | N/A | No |
| Sexual Orientation | None | None | N/A | No |
| Age | None | None | N/A | No |
| Marriage & Civil Partnership | None | None | N/A | No |
| **EDS2 – How does this change impact the Equality and Diversity Strategic plan (contact HR or see EDS2 plan)?**  |  |

|  |
| --- |
| **A full assessment will only be required if*** **The impact is potentially discriminatory under the general equality duty**
* **Any groups of patients/staff/visitors or communities could be potentially disadvantaged by the policy or function/service.**
* **The policy or function/service is assessed to be of high significance**
 |
| **IF IN DOUBT A FULL IMPACT ASSESSMENT FORM IS REQUIRED** |
| **The review of the existing policy re-affirms the rights of all groups and clarifies the individual, managerial and organisational responsibilities in line with statutory and best practice guidance.** |

**JPUH:**

**Policy or function being assessed:** Justification criteria and projection guidelines for adult general radiography – v 1.0 (revised from v1.5)

**Department/Service:** Radiology

**Assessment completed by**: Quality Standard for Imaging Lead **Date of assessment:** 03/07/2024

|  |  |  |
| --- | --- | --- |
| **1.** | Describe the aim, objective and purpose of this policy or function. | To deliver a common set of justification criteria and projection guidelines for adult general radiography across the three acute Trusts of the Norfolk and Waveney Integrated Care System.  |
| **2i.** | Who is intended to benefit from the policy or function? | **Staff Patients Organisation**  |
| **2ii** | How are they likely to benefit? | An approved set of justification criteria and projection guidelines, produced by subject matter experts and based on the current version of the Royal Collage of Radiologists ‘iRefer’ guidelines, ensures the technique used to image patients is standardised across the Norfolk and Waveney Integrated Care System. Approval of these guidelines by an IR(ME)R practitioner enables IR(ME)R operators to authorise certain exposures where it is not practicable for the practitioner to provide immediate justification, thereby demonstrating compliance with the Ionising Radiation (Medical Exposure) regulations. Staff benefit through having a clear set of justification criteria and projection guidelines to follow, and patients benefit from a standardised approach to imaging. A consistent approach enables workload to be planned efficiently.  |
| **2iii** | What outcomes are wanted from this policy or function? |  An efficient X-ray service, which is compliant with IR(ME)R regulations and provides consistently high quality imaging for patients across the Norfolk and Waveney Integrated Care System. |
| **For Questions 3-11 below, please specify whether the policy/function does or could have an impact in relation to each of the nine protected characteristics:** |
| **3.** | Are there concerns that the policy/function does or could have a detrimental impact on people due to their **race/ethnicity?** | **No** |  |
| **4.** | Are there concerns that the policy/function doesor could have a detrimental impact on people due to their **gender?** | **No** |  |
| **5.** | Are there concerns that the policy/function does or could have a detrimental impact on people due to their **disability?** Consider Physical, Mental and Social disabilities (e.g. LearningDisability or Autism). | **No** |  |
| **6.** | Are there concerns that the policy/function does or could have a detrimental impact on people due to their **sexual orientation?** | **No** |  |
| **7.** | Are there concerns that the policy/function does or could have a detrimental impact on people due to their **pregnancy or maternity?** | **No** |  |
| **8.** | Are there concerns that the policy/function doesor could have a detrimental impact on people due to their **religion/belief?** | **No** |  |
| **9.** | Are there concerns that the policy/function doesor could have a detrimental impact on people due to their **transgender?** | **No** |  |
| **10.** | Are there concerns that the policy/function does or could have a detrimental impact on people due to their **age?** | **No** |  |
| **11.** | Are there concerns that the policy/function doesor could have a detrimental impact on people due to their **marriage or civil partnership?** | **No** |  |
| **12.** | Could the impact identified in Q.3-11 above, amount to there being the potential for a disadvantage and/or detrimental impact in thispolicy/function? | **N/A** |  |
| **13.** | Can this detrimental impact on one or more of the above groups be justified on the grounds of promoting equality of opportunity for another group? Or for any other reason? E.g. providing specific training to a particular group. | **N/A** |  |
| **14.** | **Specific Issues Identified** |
|  | Please list the specific issues that have been identified as being discriminatory/promoting detrimental treatment | Page/paragraph/section ofpolicy/function that the issue relates to |
| **15.** | **Proposals** |
|  | How could the identified detrimental impact be minimised or eradicated? |  **N/A** |
|  | If such changes were made, would this haveRepercussions or negative impact on other groups as detailed in Q. 3-11? | **N/A** |
| **16.** | Given this Equality Impact Assessment, does the policy/function need to be reconsidered/redrafted? | **No** |
| **17.** | **Policy/Function Implementation** |
|  | Upon consideration of the information gathered within the equality impact assessment, the Director/Head of Service agrees that the policy/function should be adopted by the Trust.Please print:**Name of Director/Head of Service:** Anita Haylett **Title:** Diagnostic Imaging Service Manager**Date:** 16/7/24**Name of Policy/function Author:** N&W Plain Film Imaging Protocol Task & Finish Group **Title:** N/A**Date:** 16/7/24 |
| **18.** | **Proposed Date for Policy/Function Review**The document is to be reviewed one year from implementation date, and then 3 yearly thereafter.  |
|  | Please detail the date for policy/function review (3 yearly): See document control page for implementation date |
| **19.** | **Explain how you plan to publish the result of the assessment?** |
|  | Standard Trust process |
| **20.** |  **The Trust Values** |
|  | In addition to the Equality and Diversity considerations detailed above, I can confirm that the four core Trust Values are embedded in all policies and procedures.They are that all staff intend to do their best by:Caring for our patients, and they will:* Deliver the best and safest care for our patients;
* Continuously improve patient experience;
* Reduce health inequalities, ensuring equitable access for all; and
* Empower patient choice and personal responsibility for health.

Supporting our people, and they will:* Promote an inclusive, fair and safe workplace;
* Develop compassionate and effective leadership;
* Attract, engage, develop and deploy our staff to deliver the best care for our patients; and
* Promote well-being opportunities to keep our staff healthy and well.

Collaborating with our partners, and they will: * Collaborate to achieve seemless patient pathways at place and system level;
* Embrace our role as an anchor institution, working together for the best outcomes; and
* Be an effective partner to achieve both our ambitions and our partner’s ambitions.

Enhancing our performance, and they will: * Make the best use of our physical and financial resources;
* Lead the way towards achieving Net Zero Carbon;
* Future-proof our service for the people we serve; and
* Improve services through digital transformation, research and new models of care.

I confirm that this policy/function does not conflict with these values [signed]: **Anita Haylett** |

**QEH:**

|  |  |
| --- | --- |
| **Type of function or policy** | New |

|  |  |  |  |
| --- | --- | --- | --- |
| **Division** | Radiology | **Department** | General X-ray |
| **Name of person completing form** | Nicola Doyle | **Date**  | 18/07/2024 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Equality Area** | **Potential****Negative Impact** | **Impact****Positive Impact** | **Which groups are affected** | **Full Impact Assessment Required****YES/NO** |
| Race | No | No | N/A | No |
| Pregnancy & Maternity | No | No | N/A | No |
| Disability | No | No | N/A | No |
| Religion and beliefs | No | No | N/A | No |
| Sex | No | No | N/A | No |
| Gender reassignment  | No | No | N/A | No |
| SexualOrientation | No | No | N/A | No |
| Age | No | No | N/A | No |
| Marriage & Civil Partnership | No | No | N/A | No |
| **EDS2 – How does this change impact the Equality and Diversity Strategic plan (contact HR or see EDS2 plan)?**  |  |

|  |
| --- |
| * **A full assessment will only be required if: The impact is potentially discriminatory under the general equality duty**
* **Any groups of patients/staff/visitors or communities could be potentially disadvantaged by the policy or function/service**
* **The policy or function/service is assessed to be of high significance**
 |
| **IF IN DOUBT A FULL IMPACT ASSESSMENT FORM IS REQUIRED** |
| **The review of the existing policy re-affirms the rights of all groups and clarifies the individual, managerial and organisational responsibilities in line with statutory and best practice guidance.** |