

Division of Cancer, Diagnostics & Support Services
Imaging Business Unit

Imaging Department Protocol:




Paediatric Imaging Guidelines

Paediatric Examination Protocols: Supplementary to the Imaging Business Unit Procedure for “Plain Film” Radiographic Examinations

Referral Guidelines, Authorisation and Justification Criteria

Reference Number: PPF099	Version Number 2.4	Status: Active	Document Owner: See QPulse 'document records' for electronic signature Job Title: Clinical Director – Imaging	
Version / Amendment History	Version	Date	Author & Role	Reason
	1.0	2021	Siphiwe Mabhikwa - Senior Paediatric Lead Radiographer RDH Dr J Crookdake – Consultant Radiologist (Paediatrics) Adam Bowes – Superintendent Radiographer QHB	First archived version
	2	July 2021	Trudi Whitehead – Superintendent: Non-Ionising Radiation	Amendments to PPF43 following alert regarding ingested/inhaled magnets
	2.1	January 2022	Emma Lawson – Superintendent: Ionising Radiation	Update to PPF 018 following amendment to gonad protection advice from MPE
	2.2	November 2022	Emma Lawson – Superintendent: Ionising Radiation	Addition of PPF 035 Femur
	2.3	December 2022	Emma Lawson – Superintendent: Ionising Radiation	Clarification of imaging in DDH added to PPF 018 Pelvis & Hip
	2.4	June 2023	Huw Thomas- Lead Radiographer Imaging Compliance	Update to use electronic signatures via QPulse.

<p>Intended Recipients – Essential to Role</p> <p>Operators & Practitioners</p> <p>ACD Plain Film</p> <p>CD – Imaging</p> <p>Chair Trust RPG</p>	<p>Intended Recipients – For Awareness / Reference</p> <p>Referrers</p>
<p>Communication:</p> <p>Emails via QPulse to Operators and Practitioners working under this protocol</p> <p>Referrers are notified of the protocol and it's local by letter</p> <p>Available on QPulse</p>	<p>Training:</p> <p>Operators and Practitioners receive training on this protocol and other IRMER procedures</p>
<p>To be Read in Conjunction with:</p> <p>Imaging Business Unit Procedure for “Plain Film” Radiographic Examinations</p> <p>Trust Policy Employer’s Procedures to meet the requirements of Schedule 2 of the Ionising Radiation (Medical Exposure) Regulations and those covering other matters relevant to the conduct of examinations involving ionising radiation</p>	
<p>Groups & Stakeholders Consulted</p> <p>Deputy General Manager</p> <p>Clinical Director</p> <p>Consultant Radiologist (Paediatrics)</p> <p>Key Referrers</p>	<p>Equality Impact Risk Assessment</p> <p>Stage 1: Completed</p> <p>Stage 2: N/A</p>
<p>Approving Group: Plain Film Medical Exposures Committee, Imaging PQRS, Radiology Advisory Group</p>	
<p>Authorising Committee: The Trusts radiation protection Group (RPG) ratify documents in accordance with the Trust radiation Safety Policy, and authorise their uploading onto the Trust intranet and internet sites</p>	

Imaging BU sign off	
 Dr Rajeev Singh Clinical Director – Imaging Date: 21/11/2022	 Mr David Tipper General Manager and Lead Radiographer Date: 2.7.21
 Dr Rathy Kirke Clinical Director – Imaging Date: 21/11/2022	

Divisional Sign-Off:		
Protocols approved by the Trust Radiation Protection Group		
Active from: 08.04.2021	Review Frequency: 3 Years	Review Due: See QPulse
Uncontrolled when printed. Staff should consult the electronic master copy for the definitive version		
This document remains in force until replaced or withdrawn.		

Index

Introduction	5
Index of protocols	Page
Head, Neck, Spine and Pelvis	
002 Skull	7
003 Facial Bones	9
006 Post Nasal Space	11
007 Mandible	13
013 Cervical Spine	14
014 Thoracic Spine	16
015 Lumbar Spine	18
016 Sacrum and Coccyx	20
018 Pelvis and Hip	21
Upper Limb	
022 Shoulder	24
024 Clavicle	25
028 Elbow	26
029 Forearm	28
031 Wrist	29
Lower Limb	
035 Femur	30
036 Knee	31
037 Tib & Fib	33
038 Ankle	34
039 Foot	36
040 Calcaneum	38
Thorax	
043 Chest	40
048 Soft Tissue Neck	42
Abdomen	
051 Abdomen	44
Other	
052 Skeletal survey (dysplasia)	46
054 Bone Age	47
058 Leg Length	48
059 VP Shunt Series	49
060 Whole Spine	50
062 NICU X-rays	51

Introduction

These Paediatric Plain Film Examination Protocols are supplementary to the Imaging Business Unit Procedure for Plain Film Radiographic Examinations (Ref PF 099) and provide additional information for x-raying paediatric patients. These paediatric examination protocols are linked by reference number to the equivalent adult examination protocol e.g.

- PF 031 - Plain Film adult wrist
- PPF 031- Paediatric Plain Film wrist

Evidence Base for these Protocols

The Royal College of Radiologists: iRefer

User Groups:

Referrers:

These guidelines are designed to assist the Referrer in selecting the most appropriate investigation for the patient's clinical condition.

These are protocols for each common clinical situation. There are no definite recommendations for each examination. Request for clinical indications not listed in these protocols but which are within the royal college of radiologists "iRefer Guidelines" will be considered but require direct justification by practitioner on a case by case basis.

The aim for all examinations is to obtain maximum information with minimum radiation, so as to meet the legal requirement to keep radiation dose as low as reasonably practicable (ALARP). The examination performed will be based on the referral information provided and may differ from that requested. It is important that referrers are aware of this potential variation, since the imaging undertaken may not be what the referring clinician expects. Where the referrer wishes specific radiographic projections, or for the examination to be performed in a particular way, they must provide the rationale for this as part of the referral so that it can be considered by the operator or practitioner as part of the authorisation or justification decision.

Operators:

These guidelines are designed to assist the operator in decision making when authorising referrals.

Examination requests meeting the criteria listed in this protocol may be authorised by the operator. All examinations authorised by the operator under this protocol will be conducted in accordance with the standard examination protocol indicated for the clinical information and referral source.

Examination requests not meeting the criteria listed must be passed to a practitioner for individual justification. If considered justified, the practitioner will indicate the examination protocol to be followed by the operator.

Practitioners:

These guidelines are designed to assist the practitioner in decision making when justifying referrals.

Examination requests meeting the criteria listed in this protocol may be authorised by the operator. The Clinical Director for Imaging acts as practitioner for all examinations

authorised under this protocol; which will be conducted in accordance with the standard examination protocol indicated for the clinical information and referral source.

Operators will pass any examination requests not meeting the criteria listed must be passed to a practitioner for individual justification. If considered justified, the practitioner will indicate the examination protocol to be followed by the operator. The individual practitioner making the justification decision is the practitioner for that examination.

All Examinations

All examination requests will be conducted in accordance with the employer's procedures to meet the requirements of Schedule 2 of the Ionising Radiation (Medical Exposures) Regulations and those covering matters relevant to the conduct of examinations involving the exposure of patients to ionising radiation.

Implementation, Training and Dissemination

All operators and practitioners undertaking plain film radiographic examinations will be trained on these protocols and must follow them in their day to day work.

These protocols will be available to operators and practitioners:

- On QPulse
- On the radiology Shared Drive
- As printed copies in relevant clinical areas (managed by the Superintendent Radiographers for the area)

All referrers will be notified of these guidelines which will be available to them on:

- On the Trust intranet site (Net-i)
- On the Trust internet site

Trust staff have access to the RCR iRefer website via Net-i

Monitoring Compliance

Audit of compliance with each employer's procedure forms part of the Imaging Quality Management Audit programme.

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 002

Site: All Sites



University Hospitals of
Derby and Burton
NHS Foundation Trust

Ref: PPF 002	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
---------------------	--	---

Examination	Paediatric Skull X-Ray		
Clinical Indications allowing Justification / Authorisation	<p>Trauma - Suspected foreign body or penetrating injury. Plain radiography is not indicated in head injury. CT is the modality of choice.</p> <p>Non Trauma - Lump - ?bony ?foreign body. Also in a child, suture synostosis. If as part of a shunt series, see separate guideline</p>		
Standard Examination	Projection	Centering Point	Comments
	AP	To occiput with emerging ray through glabella RBL at 90° to plate	
	Lateral	HCR midpoint between glabella and occipital protuberance	If for craniosynostosis, slightly rotated (5-10°)
	Tangential		Reduced exposure for soft tissue detail
Technique tips	Infants under 12 months of age may settle better if wrapped in a small sheet or towel, with arms at the sides.		
	Soothers such as dummies, soft blankets or a bottle are allowed.		
	Position holder in a way that allows eye contact with infant and encourage them to talk gently to the baby/infant.		
Paediatric Exposures Derby Hospitals	Age Group (years)	Derby Machine Settings	
		Philips	Agfa
	0-3	AP 70KVp, 4mAs, Lateral 70KVp, 3.2mAs, 110cm, direct exposure.	AP 70KVp, 8.0 mAs, Lateral 70KVp, 6.3mAs, 110cm, direct exposure.
	4-10	AP 70KVp, 12.5mAs, Lateral 70KVp, 10mAs, 110cm, with a GRID.	AP 70KVp, 12.5 mAs, Lateral 70KVp, 10.0mAs, 110cm, with a GRID.
	10+	AP 70KVp, 11.0mAs, Lateral 70KVp, 8mAs, 110cm, with a GRID.	AP 70KVp, 16.0mAs, Lateral 70KVp, 12.5mAs, 110cm, with a GRID.

PPF 002 Paediatric Skull X-Ray continued

Paediatric Exposures Burton Hospitals	Age Group (years)	Burton Machine Settings	
		Wolverson	AGFA
		Pre-programmed exposure, modified according to patient size	*Pre-programmed exposure, modified according to patient size*
	0-6	OF, Townes and Lat 70 KVp, 8.0 mAs 100 cm, Direct exposure	OF, Townes and Lat 70 KVp, 3.2 mAs 100 cm, Direct exposure
	6-12	OF, Townes and Lat 70 KVp, 10 mAs 100 cm. Direct exposure.	OF, Townes and Lat 70 KVp, 5.0 mAs 100 cm. Direct exposure.

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 003

Site: All Sites



University Hospitals of
Derby and Burton
NHS Foundation Trust

Ref: PPF 003	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
---------------------	--	---

Examination	Paediatric X-Ray Facial bones		
Clinical Indications allowing Justification / Authorisation	Orbital blunt trauma (orbital views for penetrating injury), mid-facial trauma.		
Standard Examination	Projection	Centering Point	Comments
24 x 30 round cone	OM (occipital mental)	Central ray to pass through the midline between the lower orbital margins	
	OM 30° (occipital mental)	30°caudal angle. Central ray to pass through midline between lower orbital margins	
Additional Views			
Technique tips	X-rays are often unhelpful in children. Below five years, requests are only accepted in cases of major trauma, after examination by a Maxillofacial / ENT specialist.		
	Advisable to delay x-ray if patient uncooperative.		
Paediatric exposures	Age Group (years)	Derby Machine Settings	
Derby Hospitals		Philips	Agfa
	0-3	None – Applicable.	None – Applicable.
	4-10	OM and OM30 70KVp, 12.5mAs direct exposure, 110cm.	OM and OM30 70KVp, 14mAs with a Grid, 110cm.
	10+	OM and OM30 70KVp, 11mAs with a Grid, 110cm.	OM and OM30 70KVp, 20mAs with a Grid, 110cm.

PPF 003 Paediatric X-Ray Facial bones continued

Paediatric Exposures Burton Hospitals	Age Group (years)	Burton Machine Settings	
		Wolverson	Agfa Rooms
		Pre-programmed exposure, modified according to patient size	*Pre-programmed exposure, modified according to patient size*
	0-6	OM and OM30 60KVp, 8.0 mAs, 110 cm, Direct exposure.	OM and OM30 70KVp, 2.0 mAs, 110 cm, Direct exposure.
	6-12	OM and OM30 60KVp, 10 mAs, 110 cm, Direct exposure.	OM and OM30 70kvp, 3.0mAs, 110 cm, Direct exposure.

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 006

Site: All Sites



University Hospitals of
Derby and Burton
NHS Foundation Trust

Ref: PPF 006	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
---------------------	--	---

Examination	Paediatric Postnasal space X-Ray		
Clinical Indications	? Large adenoids or tonsils. To discuss with paediatric radiologist if referral not from ENT.		
Standard Examination	Projection	Centring Point	Comments
	Lateral PNS	1cm below the EAM Position as for lateral C-Spine	Cone to include the lower orbits and posterior pharynx. All films take with mouth closed and if PNS obliterated, may require a repeat whilst child is sniffing. Soft tissue of adenoidal pad should be clearly reproduced
Technique tips	The area of interest extends from the lower orbit to the pharynx, and sideways, from the nose to back of the ear. Try to avoid irradiation of the thyroid and the lens of the eye.		
	FFD at 180 cm, collimate the LBD to within the 24 x 30 cm.		
	Position patient as for lateral c-spine and plate level with top of forehead. Patients under seven years of age are better sitting down.		
	Move the tube so that the light from the LBD creates a profile shadow on the plate which extends from the lower orbital margin to the pharynx.		
	Adjust collimation as required.		
	A small child (under five years), may be x-rayed sitting on guardian/parent's knees. Child should be sitting so that the face is in profile and as close to the plate as possible.		
	Place a 45° foam pad between the child and holder so that primary beam is a bit further away from the holder.		
	The holder wraps one arms round the child holding the child's hands, and if required, the other arm could be used to hold the top of the head gently. The best way to keep the child's head still is to place a distraction toy directly in front of the child. This holds their attention.		
	Mouth should be closed whenever possible.		
If very small child (<2 years), perform supine with head turned in the lateral position as per lateral C-Spine positioning.			
Paediatric Exposures Derby Hospitals	Age Group (years)	Derby Machine Settings	
		Philips	Agfa
	0-3	None-applicable.	None-applicable.
	4-10	Lateral 70KVp, 10mAs 110cm with direct exposure.	Lateral 68KVp, 10mAs 110cm with direct exposure.
	10+	Lateral 70KVp, 8mAs, 110cm with GRID.	Lateral 70KVp, 14mAs, 110cm with direct exposure.

PPF 006 Paediatric Postnasal space X-Ray continued

Paediatric Exposures Burton Hospitals	Age Group (years)	Burton Machine Settings	
		Wolverson	Agfa Rooms
		Pre-programmed exposure, modified according to patient size	*Pre-programmed exposure, modified according to patient size*
	0-6	Lateral 60KVp, 8.0 mAs, 110 cm, Direct exposure.	Lateral 70KVp, 2.5 mAs, 110 cm, Direct exposure.
	6-12	Lateral 60KVp, 10 mAs, 110 cm, Direct exposure.	Lateral 70kvp, 3.0 mAs, 110 cm, Direct exposure.

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 007

University Hospitals of
Derby and Burton
NHS Foundation Trust

Ref: PPF 007	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
---------------------	--	---

Examination	Paediatric Mandible X-Ray		
Clinical Indications allowing Justification / Authorisation	Mandibular trauma. Specialist Dental Surgeon or Maxillofacial request. Below five years old, requests only accepted after discussion with Radiologist by Maxillofacial / ENT Registrar or above.		
Standard Examination	Projection	Centering Point	
	PA Mandible	7.5cm to the EOP with RBL parallel to floor	
	OPG	Set	
			In trauma, do PA and OPG only
Additional Views	Lateral Oblique	Between the angles of the mandible	
			Both sides indicated
Technique tips	The examination should be delayed if the patient is not a suitable candidate for OPG.		
	Perform lateral oblique views if the child will not sit still for long enough to perform OPG.		
Paediatric Exposures Derby Hospitals	Age Group (years)	Derby Machine Settings	
		Philips	Agfa
	0-3	PA 70KVp, 2mAs, 110cm, direct exposure	PA 70KVp, 8mAs, 110cm, direct exposure
	4-10	PA 70KVp, 14mAs, 110 cm with GRID.	PA 70KVp, 14mAs, 110 cm with GRID.
	10+	PA 70KVp, 11mAs, 110 cm with GRID.	PA 70KVp, 20mAs, 110 cm with GRID.
Paediatric Exposures Burton Hospitals	Age Group (years)	Burton Machine Settings	
		Wolverson	Agfa Rooms
		Pre-programmed exposure, modified according to patient size	*Pre-programmed exposure, modified according to patient size*
	0-6	PA 60KVp, 8.0 mAs, 110 cm, Direct exposure.	PA 70KVp, 3.2 mAs, 110 cm, Direct exposure.
	6-12	PA 60KVp, 10 mAs, 110 cm, Direct exposure.	PA 60kvp, 4.0cmAs, 110 cm, Direct exposure.

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 013

Site: All Sites



University Hospitals of
Derby and Burton
NHS Foundation Trust

Ref: PPF 013	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
---------------------	--	---

Examination	Paediatric Cervical spine X-Ray		
Clinical Indications allowing Justification / Authorisation	Head injury or neck injury if meets NICE head injury imaging criteria		
	Congenital disorders, osteomyelitis, primary bone tumour cervical rib.		
	Normal plain x-ray may be falsely reassuring and MRI should be considered as first line in many clinical situations. To be discussed with paediatric or MSK radiologist.		
	Spondylolisthesis or ankylosing spondylitis.		
Standard Examination	Projection	Centering Point	Comments
	AP (C3 - C7)	Cricoid cartilage with 10-15° cephalad angulation	
	Lateral	2.5 cm behind the angle of the mandible	180 cm FFD
	Peg (C1 - C3)	RBL at 20° centre through open mouth along hard palate	History of trauma C1 - 3 indicated
Additional Views	AP/PA 10° oblique	Level of C3 (angle: up 10° for AP, down 10° for PA)	
	Trauma oblique	Level of C3/4 (angle: 60° transversely, displace film)	Patient supine
	Flexion/extension views	As for lateral	Only for instability. See below
Comments - Trauma	Important to demonstrate C7/T1 junction. If clinically appropriate, initially perform lateral cervical spine with traction. Consider MRI if there is persistent clinical concern as per NICE C-Spine guidelines in children Horizontal beam lateral in trauma, AP and peg views can wait until patient is stabilised.		
	The odontoid peg should be demonstrated, but the AP open mouth is not always necessary at the time of initial presentation.		
	Three views should be undertaken for trauma regardless of referral route, ie. for GP patients.		
	Clinical supervision of paediatric trauma patients attending without neck blocks is mandatory. Ref: S Hewitt.		
Comments Cervical rib	AP C3 to T1. Do not cone too tight laterally, must include the ribs.		
Comments – flexion/extension	Flexion / extension views are for identifying ligamentous injury with normal cervical spine findings including atlanto-axial instability - of no use in the acute situation. Orthopaedic referral only.		

PPF 013 Paediatric Cervical spine X-Ray continued

Comments - AAI	? AAI - Atlanto axial Instability. Historically, this was done routinely on children with Down's syndrome, but now only performed in specific indications. To discuss with paediatric radiologist if request not from a spinal surgeon. Lateral film of C-Spine as per request from spinal surgeon		
Paediatric Exposures Derby Hospitals	Age Group (years)	Derby Machine Settings	
		Philips *Pre-programmed exposure, modified according to patient size*	Agfa
	0-3	AP and Lateral 60kvp, 1.8mAs, 110cm, Direct exposure	AP and Lateral 60kvp, 1.8mAs, 110cm, Direct exposure.
	4-10	AP 63kvp, 2.0mAs Lateral 70Kvp,4.0mAs Odontoid 68KVp 3.2mAs with GRID 110cm, Direct exposure	AP 63kvp, 2.0mAs Lateral 70Kvp,4.0 mAs Odontoid 68KVp 3.2mAs +Grid 110cm, Direct exposure.
10+	AP 70KVp, 3.2mAs with GRID Lateral 70Kvp,6.0mAs Odontoid 70KVp 4.0mAs 110cm, Direct exposure	AP 70KVp, 3.2mAs +Grid Lateral 70Kvp, 6.0mAs Odontoid 70KVp 4.0mAs 110cm, Direct exposure.	
Paediatric Exposures Burton Hospitals	Age Group (years)	Burton Machine Settings	
		Main Department *Pre-programmed exposure, modified according to patient size*	AGFA Mobile *Pre-programmed exposure, modified according to patient size*
	0-6	AP 60 KVp,1.0 mAs 180 cm, Direct exposure	AP 60 KVp,1.0 mAs 180 cm, Direct exposure
6-12	AP 70 KVp, 3.2 mAs 180 cm. Direct exposure.	AP 70 KVp, 3.2 mAs 180 cm. Direct exposure.	

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 014

Site: All Sites



University Hospitals of
Derby and Burton
NHS Foundation Trust

Ref: PPF 014	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
---------------------	--	---

Examination	Paediatric Thoracic spine X-Ray		
Clinical Indications allowing Justification / Authorisation	Trauma with localised pain.		
	Normal plain x-ray may be falsely reassuring and MRI should be considered as first line in many clinical situations, such as osteomyelitis, suspected tumour or back pain. To be discussed with paediatric or MSK radiologist.		
Standard Examination	Projection	Centering Point	Comments
	AP (T1 – L2)	PA - centre on T6 AP - Midpoint cricoid cartilage and zyphoid process 2.5cm below sternal notch	High kVp should be used
	Lateral	Through the axilla at the level of T6	Do breathing lateral (long exposure time) only if equipment permits
Clinical comments	NOT indicated if no pain or neurological deficit associated with trauma.		
	There should be a low threshold for radiography when pain/tenderness is associated with significant trauma.		
	Scheuermann disease follow up - specialist referral only. A lateral film only should be performed unless the Orthopaedic Surgeon requests otherwise.		
	Breathing laterals are possible on children. The exposure can be altered to give a longer time, for example for a fifteen year old (average size) = 70 kVp 100mA 280ms.		
	For scoliosis, see whole spine section.		
Paediatric Exposures RDH	Age Group (years)	Derby Machine Settings	
		Philips *Pre-programmed exposure, modified according to patient size*	Agfa
	0-3	AP 65kvp, 5mAs. Lateral 73Kvp, 7.1mAs 110 cm, Direct exposure.	AP 63kvp, 1.0mAs. Lateral 63Kvp, 1.6mAs 110cm, Direct exposure.
	4-10	AP 70kvp, 6.3mAs. Lateral 73Kvp, 7.1mAs 110 cm, Direct exposure.	AP 66kvp, 10mAs. Lateral 77Kvp, 16mAs 110cm, with GRID.
	10+	AP 73kvp, 8mAs. Lateral 73Kvp, 7.1mAs 110 cm, Direct exposure.	AP 70kvp, 12mAs. Lateral 77Kvp, 25mAs 110cm, with GRID.

PPF 014 Paediatric Thoracic spine X-Ray continued

Paediatric Exposures QHB	Age Group (years)	Burton Machine Settings	
		Main Department	AGFA Mobile
		Pre-programmed exposure, modified according to patient size	*Pre-programmed exposure, modified according to patient size*
	0-6	AP 60 KVp, 1.6 mAs 100 cm, Direct exposure	AP 60 KVp, 1.6 mAs 100 cm, Direct exposure
	6-12	AP 70 KVp, 4.0 mAs 100 cm. Direct exposure.	AP 70 KVp, 4.0 mAs 100 cm. Direct exposure.

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 015

Site: All Sites



University Hospitals of
Derby and Burton
NHS Foundation Trust

Ref: PPF 015	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
---------------------	--	---

Examination	Paediatric Lumbar spine X-Ray		
Clinical Indications allowing Justification / Authorisation	Trauma with pain		
	Congenital disorders		
	Normal plain x-ray may be falsely reassuring and MRI should be considered as first line in many clinical situations, such as osteomyelitis, suspected tumour or back pain. To be discussed with paediatric or MSK radiologist.		
	Scheuermann Disease follow up patients - specialist referral. See below.		
Standard Examination	Projection	Centering Point	Comments
	AP if possible	Midline at level of costal margin	Include SIJs. If pelvis is examined in conjunction with lumbar spine, use a 24 x 30 cm plate for AP lumbar spine view.
	Lateral	7.5cm anterior to spinous process of L3	
Additional Views	Coned L5/S1	7.5cm anterior to spinous process of L5	Small cone. Only perform if L5/S1 joint space is poorly visualised on the lateral view
	Oblique 45°	Mid-clavicular line at level of lower costal margin, distant from film	Specialist referral only
Comments	Scheuermann Disease follow up patients - specialist referral. A lateral film only unless the Orthopaedic Surgeon requests otherwise. See below.		
	For scoliosis, see whole spine section.		
Paediatric Exposures Derby Hospitals	Age Group (years)	Derby Machine Settings	
		Philips *Pre-programmed exposure, modified according to patient size*	Agfa
	0-3	AP 70kvp, 5.0mAs. Lateral 73Kvp, 7.1mAs 110 cm, Direct exposure.	AP 68kvp, 5.0 mAs. Lateral 73Kvp,7.1mAs 110 cm, Direct exposure.
	4-10	AP 70kvp, 6.3mAs. No grid Lateral 77Kvp, 20mAs with Grid. 110 cm.	AP 73kvp, 4.5 mAs. No grid Lateral 77Kvp,20mAs with Grid. 110 cm.
	10+	AP 77kvp, 14mAs. Lateral 79Kvp,29.0mAs 110 cm with Grid.	AP 70kvp, 16.0mAs. Lateral 79Kvp,29.0mAs 110 cm with Grid.

PPF 015 Paediatric Lumbar spine X-Ray continued

Paediatric Exposures Burton Hospitals	Age Group (years)	Burton Machine Settings	
		Main Department *Pre-programmed exposure, modified according to patient size*	AGFA Mobile *Pre-programmed exposure, modified according to patient size*
	0-6	AP 60 KVp, 2.0mAs 100 cm, Direct exposure	AP 60 KVp, 2.0 mAs 100 cm, Direct exposure
	6-12	AP 70 KVp, 4.0 mAs 100 cm. Direct exposure.	AP 70 KVp, 4.0 mAs 100 cm. Direct exposure.

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 016

Site: All Sites

Ref: PPF 016	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
---------------------	--	---

Examination	Paediatric Sacrum and coccyx X-Ray		
Clinical Indications allowing Justification / Authorisation	Persistent pain following trauma. This is usually performed sometime after the initial trauma, not acutely. Discuss with radiologist if history is acute		
Standard Examination	Projection	Centering Point	Comments
	AP sacrum	Midline, midway between ASIS and upper border of symphysis pubis	10-25° cranial beam
	AP coccyx	Midline, 2.5cm superior to symphysis pubis	15° caudal beam
	Lateral	Sacrum to include coccyx	
Additional Views			
Technique tips			
Paediatric Exposures Derby Hospitals	Age Group (years)	Derby Machine Settings	
		Philips	Agfa
	0-3	AP 65kVp, 4mAs and Lateral 65KVp, 6.0mAs, 110cm direct exposure.	AP and Lateral 63KVp, 4.0mAs, 110cm direct exposure.
	4-10	AP 70kVp, 6.3mAs and Lateral 70KVp, 9.5mAs, 110cm, with GRID.	AP and Lateral 66KVp, 8.0mAs, 110cm direct exposure.
10+	AP 77kVp, 12.5mAs and Lateral 81KVp, 20mAs, 110cm, with GRID.	AP and Lateral 70KVp, 14.0mAs, 110cm with GRID.	
Paediatric Exposures Burton Hospitals	Age Group (years)	Burton Machine Settings	
		Wolverson	Agfa Rooms
		Pre-programmed exposure, modified according to patient size	*Pre-programmed exposure, modified according to patient size*
	0-6	AP and Lateral 60KVp, 1.3 mAs, 110 cm, Direct exposure.	AP and Lateral 65KVp, 2.5 mAs, 110 cm, Direct exposure.
6-12	AP and Lateral 60KVp, 4.0 mAs, or 70KVP on the AEC, 110 cm, Direct exposure.	AP and Lateral 70kvp, 4.0mAs, 110 cm, Direct exposure.	

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 018



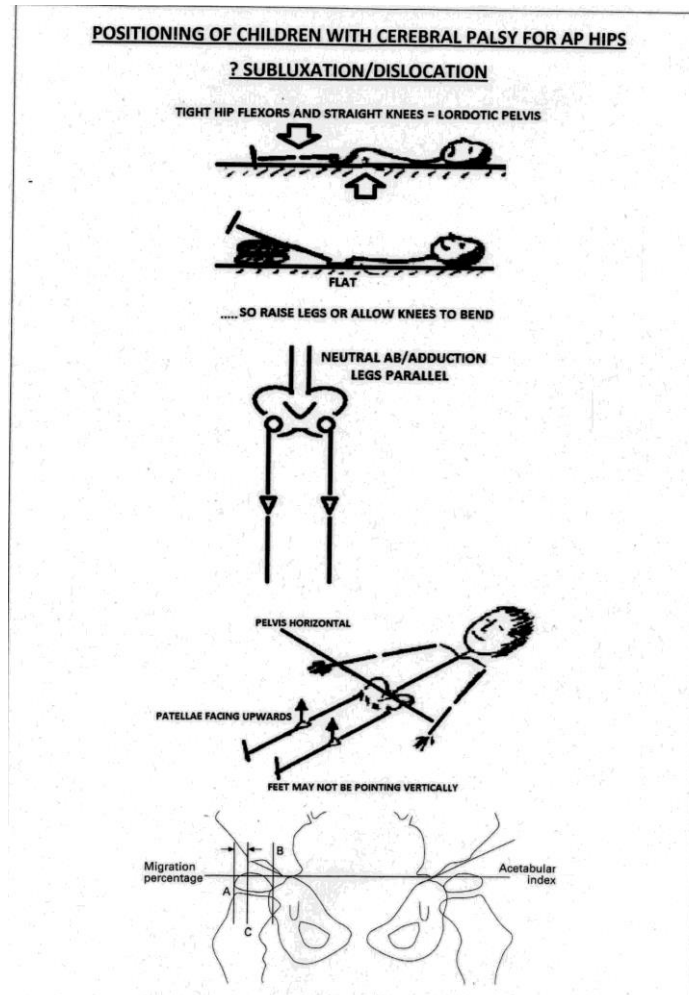
University Hospitals of
Derby and Burton
NHS Foundation Trust

Ref: PPF 018	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
---------------------	--	---

Examination	Paediatric X-Ray Pelvis		
Clinical Indications allowing Justification / Authorisation	Trauma with inability to weight bear, pelvic trauma associated with pain and/or neurological deficit.		
	Bone pain, painful prosthesis.		
	Hip pain, limp, slipped epiphysis, Perthes disease, irritable hip, avascular necrosis and referred pain (knee).		
	DDH – only if over 6 months old (USS if younger).		
Standard Examination	Projection	Centering Point	Comments
	Pelvis AP	Midline above symphysis level with peritoneal crease	Legs in neutral position, heels in line with hips, toes pointing up
	Frog Lateral	To hip joints in the midline, soles of feet together, knees externally rotated	
Additional Views - DDH	Pelvis AP		Further views as per consultant only
Additional Views – For Migration index in CPIP	Pelvis AP	As per standard AP pelvis	For positioning, see attached document below
Addition views – ABIR view as per Mr J Brousil	Pelvis AP	As per standard AP pelvis	ABIR = Abduction and internal rotation. Legs abducted away from the body with feet internally rotated.
Comments – gonad protection	Gonad protection should be applied to male patients only for follow-up of known hip pathology (e.g. DDH). To be applied by a Radiographer trained and competent in the use of gonad shielding. For more information see Imaging Policy: Gonad Shielding for Paediatric Patients at UHDB (see QPulse)		
Comments – hip pain	Perform AP pelvis. View film, if epiphysis is fused exam is then complete; if epiphysis not fused, perform frog lateral in addition. Gonad protection should be evident on the frog lateral only.		
Comments – follow up films	Follow up films for internal fixation of hip for SUFE should include both hips AP and frog views. Gonad protection should be evident on both AP and frog lateral views.		
Comments - Trauma	AP pelvis. ED to review AP and frog to be performed if safe to position child. To discuss with paediatric radiology if ED deem frog lateral not safe.		
Technique tips	Two comforters may be needed to hold an uncooperative child.		
	In children (they generally have good muscle tone) the area of interest extends from the umbilicus to the top of the inside leg for an AP. Centering point should be half way in the midline.		
	The pelvis should be flat (no back arching), legs in neutral with no adduction or abduction and no internal or external rotation.		
	For the AP, one holder should hold the child from the head end, keeping the shoulders firmly down on the table top and the other should be at the		

	leg end holding over the knees to stop any flexion and rotation.		
	For the frog, the legs should be flexed, rotated out and held against 45° pads on either side. Sandbags may have to be used over the feet. Centre lower over the upper border of the symphysis pubis and collimate down to hips.		
Paediatric Exposures Derby Hospitals	Age Group (years)	Derby Machine Settings	
		<table border="1"> <tr> <td>Philips *Pre-programmed exposure, modified according to patient size*</td> <td>Agfa</td> </tr> </table>	Philips *Pre-programmed exposure, modified according to patient size*
	Philips *Pre-programmed exposure, modified according to patient size*	Agfa	
	0-3	AP 62KVp, 4mAs, Lateral 63KVp, 5.0mAs 110cm, direct exposure.	AP 63KVp, 4.0mAs, Lateral 63KVp, 5.0mAs 110cm, direct exposure.
4-10	AP 65kVp, 6mAs, Lateral 66KVp, 10.0mAs 110cm with a grid.	AP 66kVp, 8.0mAs, Lateral 66KVp, 10.0mAs 110cm with a grid.	
10+	AP 68kVp, 6mAs, Lateral 75KVp, 20.0mAs 110cm with a grid.	AP 70kVp, 14.0mAs, Lateral 75KVp, 20.0mAs 110cm with a grid.	
Paediatric Exposures Burton Hospitals	Age Group (years)	Burton Machine Settings	
		<table border="1"> <tr> <td>Pelvis *Pre-programmed exposure, modified according to patient size*</td> <td>Femur *Pre-programmed exposure, modified according to patient size*</td> </tr> </table>	Pelvis *Pre-programmed exposure, modified according to patient size*
	Pelvis *Pre-programmed exposure, modified according to patient size*	Femur *Pre-programmed exposure, modified according to patient size*	
0-6	AP 60 KVp, 2.0 mAs 100 cm, Direct exposure	AP 60 KVp, 1.0 mAs 100 cm, Direct exposure	
6-12	AP 70 KVp, 4.0 mAs 100 cm. Direct exposure.	AP 60 KVp, 2.0 mAs 100 cm. Direct exposure.	

CPIP Positioning



Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 022

Site: All Sites

Ref: PPF 022	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
---------------------	--	---

Examination	Paediatric X-Ray Shoulder		
Clinical Indications allowing Justification / Authorisation	Trauma, arthropathy, bone tumours, osteomyelitis, bone pain, metabolic bone disease, ? dislocation, specialist referral.		
Standard Examination	Projection	Centering Point	Comments
	AP shoulder	Coracoid process	
	Axial	Head of Humerus	
Additional Views	Y view	Medial border of scapula	If Axial not possible
Technique tips	If request is for clavicle fracture, please perform clavicle views as per separate protocol		
Paediatric Exposures Derby Hospitals	Age Group (years)	Derby Machine Settings	
		Philips	Agfa
	0-3	AP 60KVp, 0.8mAs and Axial 55KVp, 2mAs, 110cm, direct exposure.	AP 60KVp, 2.8 mAs and Axial 65KVp, 3mAs, 110cm, direct exposure.
	4-10	AP 60KVp, 1.8mAs and Axial 60KVp, 4mAs, 110cm, direct exposure.	AP 62KVp, 3.2 mAs and Axial 65KVp, 4mAs, 110cm, direct exposure.
	10+	AP 60KVp, 1.8mAs and Axial 66KVp, 6mAs, 110cm, direct exposure.	AP 62KVp, 3.8 mAs and Axial 65KVp, 5mAs, 110cm, direct exposure.
Paediatric Exposures Burton Hospitals	Age Group (years)	Burton Machine Settings	
		Main Department	AGFA Mobile
		Pre-programmed exposure, modified according to patient size	*Pre-programmed exposure, modified according to patient size*
	0-6	AP and Y-view 60 KVp, 1.0 mAs 100 cm, Direct exposure	AP 60 KVp, 1.0 mAs 100 cm, Direct exposure
6-12	AP and Y-view 63 KVp, 2.5 mAs 100 cm. Direct exposure.	AP and Y-view 63 KVp, 2.5 mAs 100 cm. Direct exposure.	

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 024

Site: All Sites



University Hospitals of
Derby and Burton
NHS Foundation Trust

Ref: PPF 024	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
---------------------	--	---

Examination	Paediatric Clavicle X-Ray			
Clinical Indications allowing Justification / Authorisation	Trauma, arthropathy, bone tumours, osteomyelitis, bone pain, ? dislocation, specialist referral.			
Standard Examination	Projection	Centering Point	Comments	
	AP clavicle	Mid clavicle	If fracture seen, no further views needed	
Additional Views	Axial	Mid clavicle	20-30° cranial angulation	
Technique tips	Axial view if AP view is normal or unsure.			
Paediatric Exposures Derby Hospitals	Age Group (years)	Derby Machine Settings		
		Philips	Agfa	
		Pre-programmed exposure, modified according to patient size		
	0-3	AP and Axial 60KVp, 2mAs 110cm ,Direct Exposure	AP and Axial 60KVp, 1.6mAs 110cm ,Direct Exposure	
	4-10	AP and Axial 60KVp, 3mAs 110cm ,Direct Exposure	AP and Axial 60KVp, 2.0 mAs 110cm ,Direct Exposure	
10+	AP and Axial 64KVp, 6mAs 110cm ,Direct Exposure	AP and Axial 60KVp, 1.6mAs 110cm ,Direct Exposure		
Paediatric Exposures Burton Hospitals	Age Group (years)	Burton Machine Settings		
		Main Department	AGFA Mobile	
		Pre-programmed exposure, modified according to patient size	*Pre-programmed exposure, modified according to patient size*	
	0-6	AP and Y-view 60 KVp, 1.0 mAs 100 cm, Direct exposure	AP 60 KVp, 1.0 mAs 100 cm, Direct exposure	
6-12	AP and Y-view 63 KVp, 2.5 mAs 100 cm. Direct exposure.	AP and Y-view 63 KVp, 2.5 mAs 100 cm. Direct exposure.		

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 028

Site: All Sites



University Hospitals of
Derby and Burton
NHS Foundation Trust

Ref: PPF 028	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
---------------------	--	---

Examination	Paediatric Elbow X-Ray		
Clinical Indications / Justification	Trauma, arthropathy, bone tumours, osteomyelitis, bone pain, metabolic bone disease, ?dislocation, specialist referral.		
Standard Examination	Projection	Centering Point	Comments
	AP	2.5cm below midpoint between epicondyles	Fit film by age
	Lateral	Lateral epicondyle at 90°	Fit film by age
Additional Views	AP radial head (Oblique)	To radial head	Tightly collimated. Hand in full pronation & supination. Orthopaedic request only.
Comments	True lateral views are important for evaluation of potential effusion, evaluation is often impossible if the lateral view is angled.		
	"Equal angles" AP view (with elbow flexed 90°) makes diagnosis impossible (Rang).		
	When injury site is specified as distal humerus, AP view with the humerus parallel to the film should be done. When no injury is seen, a view where the forearm is parallel to the film will complete the examination.		
	When the proximal radius and ulna is specified as the injury site the forearm should be parallel to the film. When no injury is seen, a view where the humerus is parallel to the film will complete the examination.		
	Mishandling, such as forced extension for x-ray positioning should be avoided as it can cause damage to the brachial artery and median or ulnar nerves.		
Technique tips	Small children need to be sitting very close to the edge of the x-ray table (because of small humerus and they tend to pull away from the injured side).		
	Sit parent/comforter as close as possible to the edge of the x-ray table and the child should then sit on their lap as physically close to the table as possible. Start with the lateral; parent's arm closest to the table should be placed firmly on the child's shoulder and the other arm goes around the child and holds the wrist. Move table up so that a true lateral is achieved.		
	For an AP view (movement should be from the shoulder joint), support the elbow (one hand under the elbow and other at wrist) and get the child to move it towards their midline whilst dropping it to waist level. Gently encourage them to lift and swing to it the side again over the film. Never force them to extend more than they can manage and humerus should be parallel to the film.		
	Another way to achieve a good AP view is to lay the child on the x-ray table with arm to the side. Gently move the arm away from the body and get the forearm supported by the parent/comforter.		

PPF 028 Paediatric Elbow X-ray continued

Paediatric Exposures Derby Hospitals	Age Group (years)	Derby Machine Settings	
		Philips *Pre-programmed exposure, modified according to patient size*	Agfa
	0-3	AP and Lateral 55KVp, 2mAs, 110 cm, Direct exposure.	AP and Lateral 60KVp, 1.7mAs, 110 cm, Direct exposure.
	4-10	AP and Lateral 60KVp, 2.5mAs, 110 cm, Direct exposure.	AP and Lateral 60KVp, 2.0 mAs, 110 cm, Direct exposure.
	10+	AP and Lateral 60KVp, 2.8mAs, 110 cm, Direct exposure.	AP and Lateral 60KVp, 2.5 mAs, 110 cm, Direct exposure.
Paediatric Exposures Burton Hospitals	Age Group (years)	Burton Machine Settings	
		Main Department *Pre-programmed exposure, modified according to patient size*	AGFA Mobile *Pre-programmed exposure, modified according to patient size*
	0-6	AP 60 KVp,0.8 mAs 100 cm, Direct exposure	AP 60 KVp,0.8 mAs 100 cm, Direct exposure
	6-12	AP 60 KVp, 1.6 mAs 100 cm. Direct exposure.	AP 60 KVp, 1.6 mAs 100 cm. Direct exposure.

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 029

Site: All Sites



University Hospitals of
Derby and Burton
NHS Foundation Trust

Ref: PF 29	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
-------------------	--	---

Examination	Paediatric Forearm X-Ray		
Clinical Indications allowing Justification / Authorisation	Trauma, bone pain or tenderness, arthropathy, specialist referral. Foreign body, lump		
Standard Examination	Projection	Centring Point	Comments
	AP	Midshaft of the radius & ulna	To include the wrist and elbow joint
	Lateral	Midshaft of the radius & ulna	To include the wrist and elbow joint
Technique tips	Use markers for ?FB		
Paediatric Exposures	Age Group (years)	UHDB Machine Settings	
		Philips.	Agfa.
		Pre-programmed exposure, modified according to patient size	
	0-3	AP and Lateral 60KVp, 1.6 mAs, 110 cm, Direct exposure.	AP and Lateral 60KVp, 2.0 mAs, 110 cm, Direct exposure.
	4-10	AP and Lateral 60KVp, 2 mAs, 110 cm, Direct exposure.	AP and Lateral 60kvp, 2.2mAs, 110 cm, Direct exposure.
10+	AP and Lateral 60KVp, 2.5 mAs, 110 cm, Direct exposure	AP and Lateral 60kvp, 2.5 mAs, 110 cm, Direct exposure.	

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 031

Site: All Sites



University Hospitals of
Derby and Burton
NHS Foundation Trust

Ref: PPF 031	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
---------------------	--	---

Examination	Paediatric Wrist X-Ray		
Clinical Indications allowing Justification / Authorisation	Trauma, arthropathy, bone tumours, osteomyelitis, bone pain, metabolic bone disease, ?dislocation, specialist referral.		
Standard Examination	Projection	Centering Point	Comments
	DP	Midpoint between radial and ulnar styloid	
	Lateral	Radial styloid process	Metacarpals and radius & ulna positioned in straight line
Comments	For ?Rickets - perform DP projection only. For bone age, see separate section.		
Paediatric Exposures Derby Hospitals	Age Group (years)	Derby Machine Settings	
		Philips	Agfa
		Pre-programmed exposure, modified according to patient size	
	0-3	AP and Lateral 40KVp, 7.1mAs, 110 cm, Direct exposure.	AP and Lateral 60KVp, 1mAs, 110cm, Direct exposure.
	4-10	AP and Lateral 40KVp, 8mAs, 110 cm, Direct exposure.	AP and Lateral 60KVp, 1.8mAs, 110cm, Direct exposure.
10+	AP and Lateral 52KVp, 2mAs, 110 cm, Direct exposure.	AP and Lateral 60KVp, 1.8mAs, 110cm, Direct exposure.	
Paediatric Exposures Burton Hospitals	Age Group (years)	Burton Machine Settings	
		Main Department	AGFA Mobile
		Pre-programmed exposure, modified according to patient size	*Pre-programmed exposure, modified according to patient size*
	0-6	AP 60 KVp, 0.8 mAs 100 cm, Direct exposure	AP 60 KVp, 0.8 mAs 100 cm, Direct exposure
6-12	AP 60 KVp, 1.6 mAs 100 cm. Direct exposure.	AP 60 KVp, 1.6 mAs 100 cm. Direct exposure.	

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 035

Site: All Sites



University Hospitals of
Derby and Burton
NHS Foundation Trust

Ref: PPF 035	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
---------------------	--	---

Examination	Paediatric Femur X-Ray		
Clinical Indications allowing Justification / Authorisation	Trauma with inability to weight bear. Bone pain tenderness, arthropathy, specialist referral. Foreign body, osteomyelitis, lump		
Standard Examination	Projection	Centring Point	Comments
	AP	Midshaft of the femur	To include the hip & knee joint
	Lateral	Midshaft of the femur	To include the hip & knee joint
Technique tips	Use markers for ?FB		
Paediatric Exposures	Age Group (years)	Derby Machine Settings	
		Philips.	Agfa.
		Pre-programmed exposure, modified according to patient size	
	0-3	AP and Lateral 60KVp, 2.8 mAs, 110 cm, Direct exposure.	AP and Lateral 60KVp, 1.6 mAs, 110 cm, Direct exposure.
	4-10	AP and Lateral 66KVp, 3.6 mAs, 110 cm, Direct exposure.	AP and Lateral 65kvp, 3.2mAs, 110 cm, Direct exposure.
	10+	AP and Lateral 70KVp, 5 mAs, 110 cm, Direct exposure	AP and Lateral 68kvp, 6 mAs, 110 cm, Direct exposure.
	Age Group (years)	Burton Machine Settings (all machines)	
	0-1.5	AP and Lateral 110cm FFD, 60kVp, 1mAs, direct exposure	
	1.5-6	AP and Lateral 110cm FFD, 60kVp, 1.6mAs, direct exposure	
	6-12	AP and Lateral 110cm FFD, 60kVp, 2mAs, direct exposure	
13+	AP and Lateral 110cm FFD, 70kVp, 2.5mAs, direct exposure		

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 036

Site: All Sites



University Hospitals of
Derby and Burton
NHS Foundation Trust

Ref: PPF 036	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
---------------------	--	---

Examination	Paediatric Knee X-Ray		
Clinical Indications allowing Justification / Authorisation	Trauma with inability to weight bear or pronounced bone tenderness. Arthropathy, bone tumours, osteomyelitis, bone pain, metabolic bone disease, ?dislocation, specialist referral.		
Standard Examination	Projection	Centering Point	Comments
	AP	2.5cm below patella apex	
	Lateral	2.5cm below and behind apex of patella	Horizontal beam for trauma
Additional Views – Orthopaedic request only	Intercondylar view	See Technique Tips	Useful for suspected loose body
	Skyline patella PA	Patient examined prone with knee hyperflexed. Tube angled until the central ray passes through joint space.	For patellofemoral joint
Comments	In recent trauma, perform horizontal beam lateral (from any source, including GP).		
	For Osgood Schlatter's, perform AP and lateral of affected knee only.		
	See Orthopaedic procedures manual for more specialised views.		
Technique Tips – Intercondylar view	Do PA with patient kneeling on plate, placed on the couch with knee under examination in the centre of the plate. Patient leans forward until femur is 45° to the couch, pelvis straight, patella central to femur. Lower leg straight with both malleoli at ankle joint, equidistant from couch. Centre through knee joint with VCR.		
Paediatric Exposures Derby Hospitals	Age Group (years)	Derby Machine Settings	
		Philips *Pre-programmed exposure, modified according to patient size*	Agfa
	0-3	AP and Lateral 60KVp, 2.0mAs, 110 cm, Direct exposure.	AP and Lateral 60KVp, 2.5mAs, 110 cm, Direct exposure.
	4-10	AP and Lateral 60KVp, 2.6mAs, 110 cm, Direct exposure.	AP and Lateral 60KVp, 3.2mAs, 110 cm, Direct exposure.
	10+	AP and Lateral 60KVp, 3.2mAs, 110 cm, Direct exposure.	AP and Lateral 66KVp, 3.2mAs, 110 cm, Direct exposure.

PPF 036 Paediatric Knee X-Ray continued

Paediatric Exposures Burton Hospitals	Age Group (years)	Burton Machine Settings	
		Main Department *Pre-programmed exposure, modified according to patient size*	AGFA Mobile *Pre-programmed exposure, modified according to patient size*
	0-6	AP 60 KVp, 1.0 mAs 100 cm, Direct exposure	AP 60 KVp, 1.0 mAs 100 cm, Direct exposure
	6-12	AP 60 KVp, 1.6 mAs 100 cm. Direct exposure.	AP 60 KVp, 1.6 mAs 100 cm. Direct exposure.

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 037

Site: All Sites



University Hospitals of
Derby and Burton
NHS Foundation Trust

Ref: PF 037	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
--------------------	--	---

Examination	Paediatric Tibia & Fibula X-Ray		
Clinical Indications allowing Justification / Authorisation	Trauma with inability to weight bear. Bone pain tenderness, arthropathy, specialist referral. Foreign body, osteomyelitis, lump		
Standard Examination	Projection	Centring Point	Comments
	AP	Midshaft of the Tibia & Fibula	To include the ankle & knee joint
	Lateral	Midshaft of the Tibia & Fibula	To include the ankle & knee joint
Technique tips	Use markers for ?FB		
	Weight-bearing views – orthopaedic request only		
Paediatric Exposures	Age Group (years)	UHDB Machine Settings	
		Philips.	Agfa.
		Pre-programmed exposure, modified according to patient size	
	0-3	AP and Lateral 62KVp, 1.25 mAs, 110 cm, Direct exposure.	AP and Lateral 60KVp, 2.0 mAs, 110 cm, Direct exposure.
	4-10	AP and Lateral 65KVp, 2.5 mAs, 110 cm, Direct exposure.	AP and Lateral 60kvp, 2.2mAs, 110 cm, Direct exposure.
10+	AP and Lateral 65KVp, 2.5 mAs, 110 cm, Direct exposure	AP and Lateral 60kvp, 2.5 mAs, 110 cm, Direct exposure.	

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 038

Site: All Sites



University Hospitals of
Derby and Burton
NHS Foundation Trust

Ref: PPF 38	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
--------------------	--	---

Examination	Paediatric Ankle X-Ray		
Clinical Indications allowing Justification / Authorisation	Trauma with inability to weight bear or pronounced bone tenderness, arthropathy, specialist referral. Foreign body, osteomyelitis.		
Standard Examination	Projection	Centring Point	Comments
	AP	Midway between medial and lateral malleoli	
	Lateral	Over medial malleolus	
Additional Views	PA calcaneum (Cobey view)	Lateral malleoli	Weight bearing. 30° caudal
Technique tips	Use markers for ?FB		
	Weight-bearing views – orthopaedic request only		
Paediatric Exposures Derby Hospitals	Age Group (years)	Derby Machine Settings	
		Philips.	Agfa.
		Pre-programmed exposure, modified according to patient size	
	0-3	AP and Lateral 40KVp, 10 mAs, 110 cm, Direct exposure.	AP and Lateral 60KVp, 2.0 mAs, 110 cm, Direct exposure.
	4-10	AP and Lateral 40KVp, 18 mAs, 110 cm, Direct exposure.	AP and Lateral 60kvp, 2.2mAs, 110 cm, Direct exposure.
10+	AP and Lateral 60KVp, 2 mAs, 110 cm, Direct exposure	AP and Lateral 60kvp, 2.5 mAs, 110 cm, Direct exposure.	

PPF 018 Paediatric Ankle X-Ray continued

Paediatric Exposures Burton Hospitals	Age Group (years)	Burton Machine Settings	
		Wolverson	Agfa Rooms
		Pre-programmed exposure, modified according to patient size	
	0-6	AP and Lateral 60KVp, 1.2 mAs, 110 cm, Direct exposure.	AP and Lateral 60KVp, 1.0 mAs, 110 cm, Direct exposure.
	6-12	AP and Lateral 60KVp, 1.6 mAs, 110 cm, Direct exposure.	AP and Lateral 60kvp, 1.3mAs, 110 cm, Direct exposure.

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 039

Site: All Sites



University Hospitals of
Derby and Burton
NHS Foundation Trust

Ref: PPF 039	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
---------------------	--	---

Examination	Paediatric Foot X-Ray		
Clinical Indications allowing Justification / Authorisation	Trauma with inability to weight bear or pronounced bone tenderness, arthropathy, specialist referral. Foreign body, osteomyelitis,		
Standard Examination	Projection	Centering Point	Comments
	DP	Cuboid / navicular	
	DP oblique	Cuboid / navicular	
Additional Views – Orthopaedic request only	DP standing	Between feet, cuboid/navicular region	For hallux valgus, both DP feet on one film
	Lateral	Cuboid / navicular	In children, for tarsal coalition only
Comments	For foreign body, DP and lateral with radio-opaque marker to demonstrate entry site.		
Technique tips			
Paediatric Exposures Derby Hospitals	Age Group (years)	Derby Machine Settings	
		Philips	Agfa
		Pre-programmed exposure, modified according to patient size	
	0-3	AP and Lateral 40KVp, 10mAs, 110 cm, Direct exposure.	AP and Lateral 60KVp, 1.5 mAs, 110 cm, Direct exposure.
	4-10	AP and Lateral 40KVp, 12mAs, 110 cm, Direct exposure.	AP and Lateral 60KVp, 1.8 mAs, 110 cm, Direct exposure.
10+	AP and Lateral 53KVp, 2.3mAs, 110 cm, Direct exposure.	AP and Lateral 60KVp, 2.0 mAs, 110 cm, Direct exposure.	

PPF 039 Paediatric Foot X-Ray continued

Paediatric Exposures Burton Hospitals	Age Group (years)	Burton Machine Settings	
		Wolverson	Agfa Rooms
		Pre-programmed exposure, modified according to patient size	*Pre-programmed exposure, modified according to patient size*
	0-6	DP and Oblique 60KVp, 1.6 mAs, 110 cm, Direct exposure.	DP and Oblique 60KVp, 1.3 mAs, 110 cm, Direct exposure.
	6-12	DP and Oblique 60KVp, 2.0 mAs, 110 cm, Direct exposure.	DP and Oblique 60kvp, 1.3 mAs, 110 cm, Direct exposure.

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 040

Site: All Sites



University Hospitals of
Derby and Burton
NHS Foundation Trust

Ref: PPF 040	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
---------------------	--	---

Examination	Paediatric Calcaneum X-Ray		
Clinical Indications allowing Justification / Authorisation	Trauma with inability to weight bear or pronounced bone tenderness, arthropathy, specialist referral, osteomyelitis		
Standard Examination	Projection	Centering Point	Comments
	Axial	30°↑ vertical 5cm above posterior part of heel	
	Lateral	Talocalcaneal articulation	Coned lateral (of affected side only) for calcaneal spur
Comments	Plantar spurs are a common incidental finding and seldom relate to clinical symptoms. Cause of pain is seldom detected on a radiograph. Lateral only. ?Sever's disease - lateral views of both calcanei only is necessary.		
Paediatric Exposures Derby Hospitals	Age Group (years)	Derby Machine Settings	
		Philips	Agfa
		Pre-programmed exposure, modified according to patient size	
	0-3	Axial and lateral 40kvp, 11mAs, Direct exposure	Axial and Lateral 65kvp, 3.0 mAs, 110 cm, Direct exposure.
	4-10	Axial and Lateral 64kvp, 3,6 mAs, 110 cm, Direct exposure	Axial and Lateral 65kvp, 4.0 mAs, 110 cm, Direct exposure.
10+	Axial and Lateral 64kvp, 4 mAs, 110 cm, Direct exposure	Axial and Lateral 66kvp, 5.0 mAs, 110 cm, Direct exposure.	

PPF 040 Paediatric Calcaneum X-Ray continued

Paediatric Exposures Burton Hospitals	Age Group (years)	Burton Machine Settings	
		Wolverson	Agfa Rooms
		Pre-programmed exposure, modified according to patient size	*Pre-programmed exposure, modified according to patient size*
	0-6	Axial and Lateral 60KVp, 2.0 mAs, 110 cm, Direct exposure.	Axial and Lateral 60KVp, 1.0 mAs, 110 cm, Direct exposure.
	6-12	Axial and Lateral 60KVp, 2.5 mAs, 110 cm, Direct exposure.	Axial and Lateral 60kvp, 2.0mAs, 110 cm, Direct exposure.

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 043

Site: All Sites



University Hospitals of
Derby and Burton
NHS Foundation Trust

Ref: PPF 043	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
---------------------	--	---

Examination	Paediatric Chest X-Ray		
Clinical Indications allowing Justification / Authorisation	Penetrating chest trauma or moderate blunt chest trauma, chest pain, SOB, asthma, cardiac disease, hypertension, haemoptysis, pleural effusions, ITU/HDU patient, follow-up pneumonia, assessment of central lines, suspected malignancy, suspected pneumothorax, , sepsis, immuno-suppression, stridor, wheeze, ? abdominal perforation, inhaled FB (see separate section), pre-operation, transplant work up, ? hiatus hernia, ? epigastric pain, unexplained weight loss, collapse ? cause, confusion, hypertension, ? aspiration, smoke inhalation, fatigue/malaise, ? PE, increased temperature ? focus, NG tube position, ketotic, pulmonary oedema, pre cardiac catheter. pH probe		
Standard Examination	Projection	Centering Point	Comments
	PA	Tube angled 5° caudal from horizontal centre to mid-plate	Fit screen by age, Minimum 83 kVp 180cm FFD AP view may be unavoidable depending on patient condition or age
Additional/alternative Views	AP erect or supine	Tube angled 5-10° caudal centred to imaginary nipple line	See below
	Expiratory view as for PA/AP chest	As above for AP or PA	See below
	Lateral	To axilla at the level of T5	180cm FFD
Inhaled Foreign body	PA/AP chest		PA/AP chest in inspiration with the neck included, head turned lateral
	PA/AP - Expiratory		
	Lateral		Lateral if FB is opaque
Comments	Annotation of the PA/AP chest image is required if additional views have been obtained to alert the reporting radiologist.		
	An AP supine view will be necessary in children who are unable to sit unsupported due to greater ability to immobilise, eg. babies, young infants, uncooperative children.		
	For mobile AP chest radiographs, a constant FFD must be used, exposure information written on film. Patients examined either supine or erect. Semi-supine or semi-erect is not required.		
	See separate protocol for NNU films PF062		
Comments – NG tube	Perform a standard chest x-ray, not a coned oblique as in adults.		
Comments – pH probes	For initial x-ray, perform standard chest X-ray. These often require repositioning and for follow up films cone to include only the lower central chest to include the probe tip.		
Technique Tips –	Lie baby down with pelvis AP and immobilise legs with two sandbags over the knees and upper femora.		

Supine Chest	A small (15° foam pad), is placed under the upper chest and shoulders extending to midway up back of head to lift the chin away from the chest.
	The face parallel to the ceiling with chin away from the chest.
	Patient supine with the median sagittal plane at right angle and the coronal plane parallel to the table (no rotation, or lordosis, pelvis and head straight).
	Arms should be flexed and held on either side of the face. Make sure that head does move.
	Angle the tube down, between 5 - 10° caudally.
	Centre over sternum at the level of the imaginary nipple line.
	Collimate to include about 2.5 cm below the xyphisternum.
	Prep and observe the abdomen rise and fall. Inspiration is when the abdomen rises.
Inhaled foreign body	Inspiratory and expiratory views should be performed as routine for all? inhaled foreign bodies
	Inspiration and expiration views should also be performed in cases of foreign body ingestion if the patient has respiratory symptoms – e.g. swallowed foreign body with SoB
Ingested foreign body	If the history suggests impaction of the oesophagus (eg. choking, drooling, a feeling of something stuck), a lateral soft tissue neck and frontal chest x-ray should be obtained. A lateral view of the chest should be performed if the object is opaque.
	If the patient has chest symptoms (eg. SOB, wheeze, cough), chest x-rays in inspiration and expiration should be performed.
	If the site of the foreign body is uncertain and the patient is asymptomatic, a chest x-ray will usually be requested. Perform a frontal view to include as much of the neck as possible (head straight) and the entire hemidiaphragms. Perform an expiratory film as per the inhaled foreign body guidelines, it is often difficult in children to determine if the FB is inhaled or ingested. Further imaging is at the discretion of the clinician. Sharp objects are associated with complication and an abdominal x-ray may be needed.
Battery ingestion	Ingestion of batteries can be life threatening and prompt recognition and removal is required if the battery is in the oesophagus. There is often not a history of ingested battery. If a radio-opaque foreign body is seen a lateral view should be obtained and urgent review by a paediatric ED consultant is mandatory. All foreign bodies should be assumed to be within the patient until proven otherwise.
Magnet ingestion	A lateral will be required if a magnet is seen to determine the single vs multiple (or single magnet and other metallic FB) – impossible to determine number on single view (packet of sweets)
	CXR – Just do AP/PA first and If seen above the diaphragm, likely to need lateral chest +/- neck soft tissue – ED team to review images and request further images
	AXR – Just AP first. If a metallic object is seen by the ED team, a lateral will be requested to determine the number. Needs lateral AXR – NOT A DECUBITUS
Diagnostic criteria for CXRs	Performed at peak of inspiration (at least five anterior ribs).
	Reproduction of the thorax without rotation or tilting.
	Reproduction of the chest must extend from the cervical trachea to L1.
	Reproduction of the vascular pattern in central ² / ₃ of lungs.
	Reproduction of trachea and proximal bronchi.
	Visually sharp reproduction of the diaphragm and costophrenic angles.
	Reproduction of the retrocardiac lung and the mediastinum.

Paediatric Exposures Derby Hospitals	Age Group (years)	Derby Machine Settings	
		Philips	Agfa
		Pre-programmed exposure, modified according to patient size	
	0-3	AP 66 KVp, 1.6 mAs 150 cm, Lateral 68Kvp, 2.0mAs 150cm.Direct exposure	AP 66 KVp, 1.8 mAs 150 cm, Lateral 68Kvp, 2.0mAs 150cm.Direct exposure.
	4-10	AP 70 KVp, 1.6mAs 180 cm, Lateral 70Kvp, 4.0mAs 180cm.Direct exposure.	AP 66 KVp, 2.0mAs 180 cm, Lateral 70Kvp, 4.0mAs 180cm.Direct exposure.
	10+	AP 80 KVp, 1.6mAs 180 cm, Lateral 90Kvp, 4.0mAs 180cm.Direct exposure.	AP 80 KVp, 2.0mAs 180 cm, Lateral 90Kvp, 4.0 mAs 180cm.Direct exposure.
Paediatric Exposures Burton Hospitals	Age Group (years)	Burton Machine Settings	
		Main Department	AGFA Mobile
		Pre-programmed exposure, modified according to patient size	
	0-6	AP 60 KVp, 1.0 mAs 180 cm, Direct exposure	AP 60 KVp, 1.0 mAs 180 cm, Direct exposure
	6-12	AP 66 KVp, 2.5 mAs 180 cm. Direct exposure.	AP 66 KVp, 2.5 mAs 180 cm. Direct exposure.
Signature & Date	<p>This document is managed and signed electronically in the Imaging QPulse system. Please see the QPulse 'document details' record.</p> <p>Hardcopy Versions of this document must be accompanied by the document details report from QPulse.</p>		

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 048

Site: All Sites

Ref: PPF 048	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
---------------------	--	---

Examination	Paediatric soft tissue neck X-Ray		
Clinical Indications allowing Justification / Authorisation	Foreign body or specialist referral.		
Standard Examination	Projection	Centering Point	
	Lateral (upper)	C4 in the midline	
			Comments Valsalva manoeuvre
Technique tips	See ingested/inhaled foreign body guidelines within paediatric chest x-ray document.		
Paediatric Exposures Derby Hospitals	Age Group (years)	Derby Machine Settings	
		Philips	Agfa
	0-3	Lateral 60kVp, 2mAs, 110cm, direct exposure	Lateral 60kVp, 2mAs, 110cm, direct exposure
	4-10	Lateral 70kVp, 4mAs, 110cm, direct exposure	Lateral 70kVp, 4mAs, 110cm, direct exposure
	10+	Lateral 70kVp, 4mAs, 110cm, direct exposure	Lateral 70kVp, 4mAs, 110cm, direct exposure
Paediatric Exposures Burton Hospitals	Age Group (years)	Burton Machine Settings	
		Wolverson	AGFA Room
		Pre-programmed exposure, modified according to patient size	*Pre-programmed exposure, modified according to patient size*
	0-6	AP 70 KVp 5.0 mAs 100 cm, Direct exposure	AP 70 KVp, 2.0 mAs 100 cm, Direct exposure
6-12	AP 70 KVp, 6.2 mAs 100 cm. Direct exposure.	AP 70 KVp, 3.0 mAs 100 cm. Direct exposure.	

Imaging Department Clinical Protocol

Modality: Plain Film Supplementary to PF 051

Site: All Sites



University Hospitals of
Derby and Burton
NHS Foundation Trust

Ref: PPF 051	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
---------------------	--	---

Examination	Paediatric Abdominal X-Ray		
Clinical Indications allowing Justification / Authorisation	Acute abdominal pain. Recurrent vomiting. Ingested foreign body. Intussusception. Obstruction. Constipation (To discuss with radiologist if not a referral from a paediatrician). Distended abdomen. ?NEC.		
Standard Examination	Projection	Centering Point	Comments
	AP	Midline, level of iliac crests	
Additional Views	Lateral decubitus	As for AP	Consultant/SpR request only for demonstration of free gas if erect CXR not possible
	Lateral shoot through		See separate NNU document PPF 062
Technique tips	For Foreign body inhalation and ingestion, please see specific section within the Chest X-ray protocol PPF 043		
Ingested foreign bodies	Indicated for batteries, magnets and sharp objects. Please see "Ingested Metal Foreign Body – Paediatric Clinical Guideline" on NETI		
	A CXR will be required, please see CXR guidelines - PPF 043		
Paediatric Exposures Derby Hospitals	Age Group (years)	Derby Machine Settings	
		Philips	Agfa
	0-3	AP and Lateral 60KVp, 1.0 mAs, 110 cm, Direct exposure.	AP and Lateral 60KVp, 2.0 mAs, 110 cm, Direct exposure.
	4-10	AP and Lateral 70kvp, 4.8mAs, 110 cm, with GRID	AP and Lateral 60kvp, 2.2mAs, 110 cm, Direct exposure.
	10+	AP 70kvp, 8mAs, 110 cm, with GRID	AP 70kvp, 14mAs, 110 cm, with GRID

PPF 051 Paediatric Abdominal X-Ray continued

Paediatric Exposures Burton Hospitals	Age Group (years)	Burton Machine Settings	
		Main Department *Pre-programmed exposure, modified according to patient size*	AGFA Mobile *Pre-programmed exposure, modified according to patient size*
	0-6	AP 60 KVp, 1.0 mAs 100 cm, Direct exposure	AP 60 KVp, 1.0 mAs 100 cm, Direct exposure
	6-12	AP 70 KVp, 6.3 mAs 100 cm. Direct exposure.	AP 70 KVp, 6.3 mAs 100 cm. Direct exposure.
Signature & Date	<p>This document is managed and signed electronically in the Imaging QPulse system. Please see the QPulse 'document details' record.</p> <p>Hardcopy Versions of this document must be accompanied by the document details report from QPulse.</p>		

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 052

Site: All Sites



University Hospitals of
Derby and Burton
NHS Foundation Trust

Ref: PPF 052	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
---------------------	--	---

Examination	Paediatric Skeletal survey (dysplasia)		
Clinical Indications allowing Justification / Authorisation	Suspected genetic abnormality Please see separate guidelines for the investigation of suspected physical abuse/non accidental injury in children		
Standard Examination Derby and Burton Hospitals	Projection	Centering Point	Comments
	Lateral Skull	Midway between glabella and occipital protuberance	Also OF at Burton
	AP spine	Midway between C7 and S1	(T1 - S1 on one film)
	Lateral spine	Midway between C7 and S1, over vertebral body	(T1 - S1 on one film)
	Chest	As per specific protocol PPF 043	Include shoulders
	AP pelvis	As per specific protocol PPF 018	
	AP knee	As per specific protocol PPF 036	X-ray one knee only
	AP humerus and forearm	Elbow joint	As one film. X-ray one side only
	DP Hand and Wrist	Middle of third metacarpal	X-ray one side only
Comments	The above protocol is the standard dysplasia survey. Geneticist will often ask for specific x-rays which either do not include above films or has extra views. Please perform x-rays as requested.		
	No 'babygrams' to be performed even if requested by geneticist – discuss with radiologist if requested		
	Further views may be necessary - discuss with Radiologist.		
Technique Tip	You may need to raise the wrist and elbow slightly to get arm level with shoulder to-avoid shortening that limb.		
	Allow 45 minutes to complete this examination.		

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 054

Site: All Sites



University Hospitals of
Derby and Burton
NHS Foundation Trust

Ref: PPF 054	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
---------------------	--	---

Examination	Paediatric hand and wrist X-ray for bone age		
Clinical Indications allowing Justification / Authorisation	Bone age		
Standard Examination	Projection	Centering Point	Comments
	DP LEFT hand and wrist	Middle of 3 rd metacarpal	Left hand/wrist only
Comments	In neonates, it may be appropriate to x-ray the knee for bone age, however discuss with the Radiologist first.		
Paediatric Exposures Derby Hospitals	Age Group (years)	Derby Machine Settings	
		Philips	Agfa
	0-3	PA 40KVp, 5mAs, 110cm, Direct exposure.	PA 60KVp, 1.3mAs, 110cm, Direct exposure.
	4-10	PA 60KVp, 1.1mAs, 110cm, Direct exposure.	PA 60KVp, 1.5mAs, 110cm, Direct exposure.
	10+	PA 60KVp, 1.2mAs, 110cm, Direct exposure.	PA 60KVp, 1.5mAs, 110cm, Direct exposure.
Paediatric Exposures Burton Hospitals	Age Group (years)	Burton Machine Settings	
		Main Department	AGFA Mobile
		Pre-programmed exposure, modified according to patient size	*Pre-programmed exposure, modified according to patient size*
	0-6	AP 60 KVp, 0.8 mAs 100 cm, Direct exposure	AP 60 KVp, 0.8 mAs 100 cm, Direct exposure
6-12	AP 60 KVp, 1.6 mAs 100 cm. Direct exposure.	AP 60 KVp, 1.6 mAs 100 cm. Direct exposure.	

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 058

Site: All Sites



University Hospitals of
Derby and Burton
NHS Foundation Trust

Ref: PPF 058	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
---------------------	--	---

Examination	Paediatric leg x-rays for leg length		
Clinical Indications allowing Justification / Authorisation	As specialist referral only from orthopaedics.		
Standard Examination	Projection	Centering Point	Comments
	AP both legs	Midway between iliac crests and ankles	Place ruler between legs
Additional Views			
Technique tips	Aim to use 2 images only, only use 3 if necessary		
	Use sponge to stand on in order to include both ankles		
	Orthopaedic clinic may specify the patient to stand on a block on a particular leg. Please do as requested.		
Paediatric Exposures Derby Hospitals	Age Group (years)	Derby Machine Settings	
		Philips	Agfa
	0-3	N/A	N/A
	4-10	70kVp with AEC's with GRID	N/A
	10+	80kVp with AEC's with GRID	N/A
Paediatric Exposures Burton Hospitals	Age Group (years)	Burton Machine Settings	
		Wolverson	Agfa Rooms
		Pre-programmed exposure, modified according to patient size	*Pre-programmed exposure, modified according to patient size*
	0-6	N/A	AP and Lateral 70KVp, 5.0 mAs, 110 cm, Direct exposure.
	6-12	N/A	AP and Lateral 70kvp, 6.3 mAs, 110 cm, Direct exposure.

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 059

Site: All Sites



University Hospitals of
Derby and Burton
NHS Foundation Trust

Ref: PF 059	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
--------------------	--	---

Examination	Paediatric VP shunt series		
Clinical Indications allowing Justification / Authorisation	Suspected non-functioning VP (ventriculoperitoneal) shunt		
	Derby Hospitals		
Standard Examination	Projection	Centering Point	Comments
Derby Hospitals	AP skull to clavicles	To occiput with emerging ray through glabella RBL at 90° to plate	To include both clavicles
	Lateral skull to include clavicles	HCR midpoint between glabella and occipital protuberance	
	AP erect or supine CXR	Tube angled 5-10° caudal centred to imaginary nipple line	Fit screen by age. Include both shoulders
	AP abdomen	Midline, level of iliac crests	
		Burton Hospitals	
Standard Examination	Projection	Centering Point	Comments
Burton Hospitals	AP skull to clavicles	To occiput with emerging ray through glabella RBL at 90° to plate	To include both clavicles
	Lateral skull to include clavicles	HCR midpoint between glabella and occipital protuberance	
	AP erect or supine CXR	Tube angled 5-10° caudal centred to imaginary nipple line	Fit screen by age. Include both shoulders
	AP abdomen	Midline, level of iliac crests	

Imaging Department Examination Protocol

Modality: Plain Film – Supplementary to PF 060

Site: All Sites



University Hospitals of
Derby and Burton
NHS Foundation Trust

Ref: PPF 060	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
---------------------	--	---

Examination	Paediatric X-Ray Whole spine		
Clinical Indications allowing Justification / Authorisation	Scoliosis assessment – Orthopaedic referral		
Standard Examination	Projection	Centering Point	Comments
	AP whole spine	Midway between C1 and symphysis in midline	Do PA in females if possible
Additional Views	Lateral	Midway between C1 and symphysis pubis, over vertebral bodies	Orthopaedic referral only
Comments	For GP referrals, If referral is for painful scoliosis, perform lateral spine centred on site of pain and do AP of whole spine		
Technique tips	Patient to stand with bare feet, PA and with a straight pelvis.		
	The area of interest is to include the whole sacrum up to the base of skull.		
	Ask the patient to stand tall (heels on the ground) and to look straight ahead.		
	When a second film is required to image the top end of the spine, there should be a small overlap and no movement in between the two views.		
Paediatric Exposures Derby Hospitals	Age Group (years)	Derby Machine Settings	
		Philips	Agfa
	0-3	N/A	N/A
	4-10	AP 70kVp and Lateral 70kVp, using the AEC's	N/A
	10+	AP 80kVp and Lateral 85kVp, using the AEC's	N/A
Paediatric Exposures Burton Hospitals	Age Group (years)	Burton Machine Settings	
		AGFA room	Wolverson
	All age groups	70 kVp and 3.2MAS, Using AEC's, Central chamber only	N/A

Imaging Department Examination Protocol

Modality: Plain Film – Paediatric Protocol Only PPF 062

Site: All Sites

Ref: PPF 062	Review Due: Please see QPulse Active until replaced	Document Owner: Please see QPulse
---------------------	--	---

Examination	Paediatric NNU X-Rays		
Clinical Indications allowing Justification / Authorisation	Chest: Umbilical catheter/ETT, NG tube position. Increased work of breathing. ?pneumonia ?sepsis ?RDS ?aspiration ?cardiac disease. Effusion, pneumothorax, prematurity. Abdomen: Recurrent vomiting/ NG aspirates. Obstruction. Distended abdomen. ?NEC		
Standard Examination	Projection	Centering Point	Comments
	AP chest	Midway between nipples	5-10° angle on tray
	AP abdomen	Midway between xiphisternum and symphysis pubis	Tray must be flat
	Chest/abdomen	Midway between chest and abdomen	For lines only – see notes below
	Lateral Decubitus or shoot through		See notes below
General comments	Infection is a great threat to a pre-term babies and we must do all we can to minimise the risk. Hand washing is recognised as the most effective way of combating infection and it is essential to wash and dry hands well before and in between each patient. Also, clean the plate before and after inserting inside the incubator.		
	Over handling can cause serious deterioration in the patient's condition. We minimise the handling time by having the equipment in position and the exposure set before placing the plate under the baby.		
	Heat loss is another threat to the pre-term baby. The baby should never be placed directly onto the plate. They settle much better if the plate is placed under the fleecy blanket or even a towel.		
	Radiation protection is crucial in view of the known hazards. In radiation protection terms, a pre-term baby is regarded as a foetus because of the low birth weight. Their yield of malignancy is five times higher than for adults.		
	Lead shielding of the bone marrow forming long bones and organs is very important and there should be evidence of it on every film. It is therefore essential to settle the baby as much as possible to stop any wriggling and movement.		
	X-ray on the unit is a combined effort with the nurse responsible for the baby's care. We must heed their advice but direction should be given to ensure good position.		
	Incubator trays should be used for the detector		

PPF 062 Paediatric NNU X-Rays continued

<p>CXR and AXR or Combined Chest/abdo</p>	<p>For specific concerns regarding the chest (e.g. infection/pneumothorax/increased work of breathing) and separately of the abdomen (e.g. NEC), separate films should be obtained. The two films with appropriate centring will give better evaluation of both areas.</p> <p>A single NNU Chest/abdomen film should be performed for evaluation of umbilical line position as the line needs to be followed from umbilicus to tip on a single image. This is normally only performed in the immediate post-natal period.</p> <p>For follow up films of existing lines after repositioning, please discuss with referrer as to whether chest/abdomen needs to be repeated or just abdomen.</p>
<p>Chest Technique</p>	<ul style="list-style-type: none"> • View any previous images done on PACS web and pair detector to mobile x-ray machine before you go. • Position the mobile unit close to the incubator. • Set the exposure. • Wipe / clean the plate. • Wash hands. • Ask nurse to place all ECG leads to the edge of baby's body and make sure that wires are not across or underneath the baby. • Ask nurse to tilt the tray that the baby lies on, by approximately 10° so the head is up. • Place the plate under the fleecy blanket or baby nest. • Baby must be moved up or down to avoid the hole which is on top of some incubators. • Position the baby with head straight, chin slightly up to clear the apices and body straight. Arms should be kept to the side of the baby and allow the baby to settle. • Centre midline and level with the imaginary nipple line. This is also true when requested to do chest and abdomen together. The head must be heavily masked with lead rubber to protect from the direct beam. • Mask the rest of the body with the lead rubber. Use the piece with "L" cut out to mark the film. • Expose when appropriate.
<p>Abdomen Technique</p>	<p>As for chest, except the tray that the baby lies on should be flat.</p> <ul style="list-style-type: none"> • Centre halfway between the xyphisternum and the symphysis pubis (babies have high diaphragms). • Include soft tissue edge on both sides and shield the rest of the body. • Lateral decubitus or shoot through for investigation of free intraperitoneal gas. Please discuss with NNU team. Decubitus is preferable, but patient clinical state may mean lateral position not possible. In this case do shoot through • Lateral decubitus - baby to be turned to lie on a folded towel onto the left side (right side up) for 5-10 minutes before exposure. • Lateral shoot through – Baby supine. Horizontal beam.
<p>Chest or abdomen for position of long line</p>	<ul style="list-style-type: none"> • Position as described for ordinary x-ray of this area. • Include the insertion point. • If the line is inserted in the arm, the whole of the shoulder and humerus should be included. The arm should be by the side. The position of the arm significantly affects the tip position. • If the line is inserted in the leg, x-ray with the leg straight • Ensure that no leads and wires are lying across or underneath the patient.