

# Diagnostic Imaging Pathways - Paediatric, Hip Developmental Dysplasia

## Population Covered By The Guidance

This pathway provides guidance on the screening imaging of paediatric patients to exclude developmental dysplasia of the hips.

**Date reviewed: March 2017**

**Date of next review: March 2020**

**Published: July 2017**

## Quick User Guide

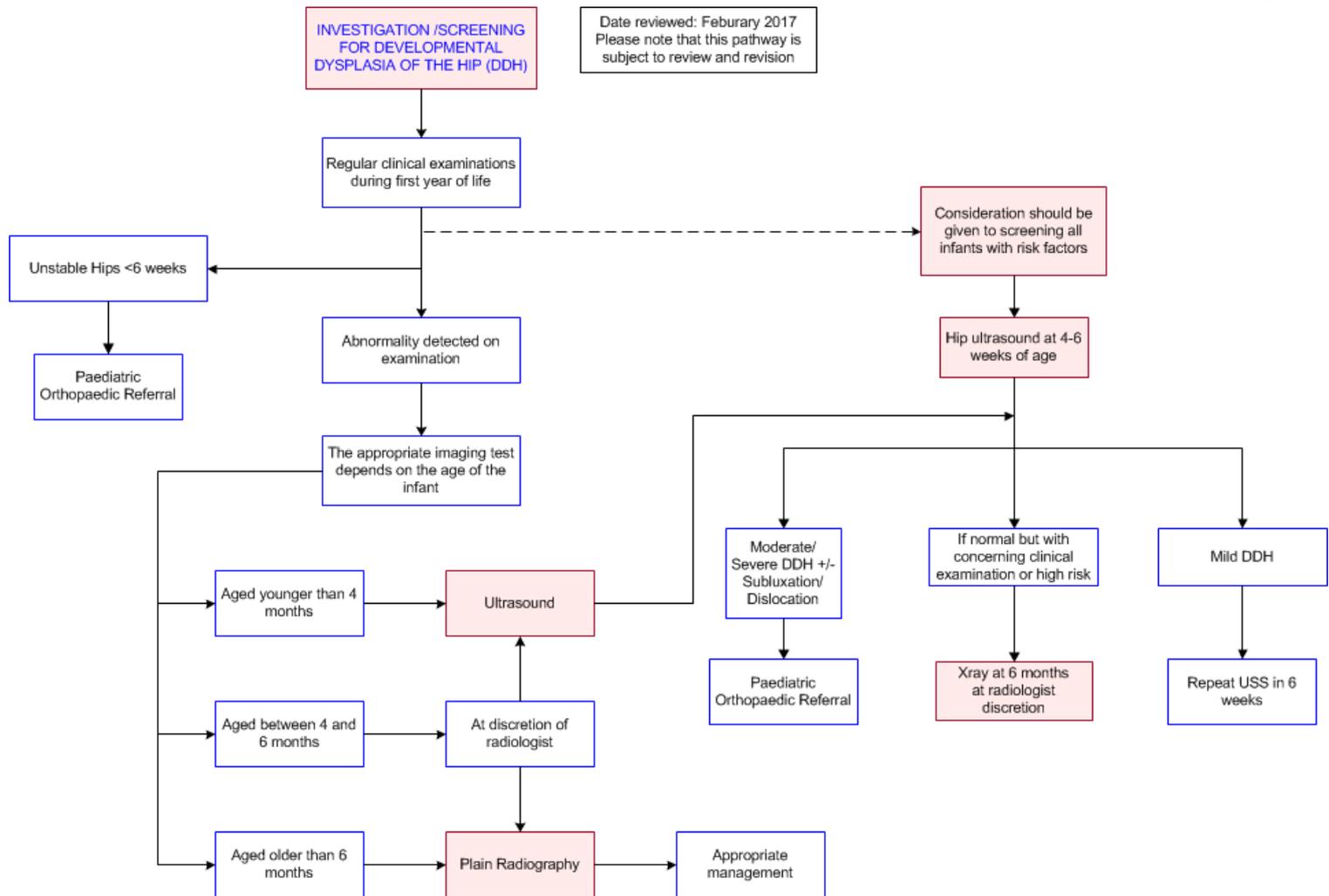
Move the mouse cursor over the **PINK** text boxes inside the flow chart to bring up a pop up box with salient points.

Clicking on the **PINK** text box will bring up the full text.

The relative radiation level (RRL) of each imaging investigation is displayed in the pop up box.

SYMBOL	RRL	EFFECTIVE DOSE RANGE
	None	0
	Minimal	< 1 millisieverts
	Low	1-5 mSv
	Medium	5-10 mSv
	High	>10 mSv

## Pathway Diagram



## Image Gallery

*Note: Images coming soon*

## Teaching Points

- Developmental dysplasia of the hip (DDH) is the most common hip pathology noted in infants and delayed diagnosis may lead to early development of osteoarthritis in addition to abnormal or painful gait
- Early diagnosis and treatment is critical to provide the best possible functional outcome
- Risk factors that predispose to DDH include
  - Family history
  - Associated congenital orthopaedic conditions
  - Female sex
  - Breech presentation
  - High birth weight
- Ultrasonography is the initial investigation of choice if risk factors are present and screening is

indicated

- Ultrasonography is recommended as an adjunct to the clinical evaluation by a properly trained health care provider
- Ultrasonography is best delayed until at least 3-4 weeks post term to avoid false positives
- Plain films of the hip are indicated after 6 months of age

## Risk Factors for Developmental Dysplasia of the Hip

- Although most patients with developmental dysplasia of the hip have no risk factors, screening based on risk factors has been proposed to limit over diagnosis [1, 2](#)
- Risk factors that predispose to DDH include; [2](#)
  - Female
  - Breech presentation
  - Family history
  - Associated congenital orthopaedic conditions
  - Oligohydramnios
  - High birth weight
  - First born
- A meta-analysis found that the most significant risk factors associated with DDH included: those presenting in the breech position during delivery (common odds ratio of 5.7 and 95% confidence interval of 4.4-7.4), being female (OR 3.8, 95% CI 3.0-4.6), clicking hips at clinical examination (OR 8.6, 95% CI 4.5-16.6) and having a family history of DDH (OR 4.8, 95% CI 2.8-8.2) [2, 3](#)

## Ultrasound

- **Uses and features**
  - Effective non-invasive way to image the cartilaginous hip joint that involves no exposure to radiation [1, 4](#)
  - The cartilage and the hip can be visualized while assessing the stability of the hip and the morphologic features of the acetabulum [4-7](#)
  - Indications for its use vary but in general it is used in children under 4-6 months of age who have signs of hip instability on examination
  - Graf's standardised morphology criteria are commonly used [5,7](#)
  - Studies indicate that ultrasonography is more sensitive than physical examination in detecting developmental dysplasia of the hip [5, 8](#)
- **Limitations**
  - Hip ultrasound is best delayed until at least 3-4 weeks post term because of physiological immaturity evident on early US which may lead to false positive results. [1, 9](#) Whilst it is ideal to delay ultrasound until at least 3-4 weeks post term, if the hip is clinically dislocated or is frankly unstable then earlier orthopaedic referral should be sought
  - Accurate results in hip sonography requires training and experience [5](#)
  - Ultrasonography used as a screening tool in some centres has reduced the number of infants who require surgical treatment at the expense of more infants being treated with abduction splinting [10-12](#)
  - Universal ultrasonography screening of newborn infants is not recommended [9](#)
  - Recent studies have suggested that targeted ultrasound to infants at high risk of hip dysplasia did not significantly increase the rate of treatment but also did not significantly reduce the rate of late detected dysplasia or surgery [10](#)

- The screening of children for developmental dysplasia of the hip is a controversial topic. Clinical methods of screening when performed by experienced clinicians have a reasonably high sensitivity and specificity for detecting DDH [1, 10, 13-16](#)

## Plain Radiography

- Plain radiography is less reliable in the first few months of life when the femoral head is composed mainly of cartilage [9](#)
- It becomes a more reliable method of investigating for DDH in children aged between 4 and 6 months as the ossification center of the femoral head appears [5, 9](#)
- The relationships of the femoral head and proximal femoral metaphysis to the acetabulum are an important part of evaluating for DDH
- A single AP pelvic view is usually sufficient but a frog view should be done to assess reducibility if subluxation or dislocation is noted [9](#)
- The use of the acetabular index and other objective means are used to evaluate for DDH, although the sensitivity and specificity of some of these are uncertain. However, these measurements are only one part of the radiographic assessment used to gauge hip dysplasia [17, 18](#)

## References

Date of literature search: February 2017

References are graded from Level I to V according to the Oxford Centre for Evidence-Based Medicine, Levels of Evidence. [Download the document](#)

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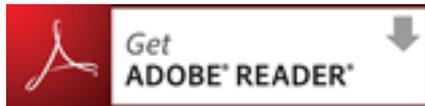
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