

Birth Abnormalities / Developmental Dysplasia of the Hip

01 IN BRIEF

Developmental Dysplasia of the Hip (DDH) was previously called Congenital Dislocation of the Hip. We now know that it describes a spectrum of abnormalities that affects the newborn and infant's hip joint during their first 12 months, making it prone to dislocation. The earlier it is detected the more simple and effective the treatment. There are many factors, both genetic and environmental, that predispose a baby to DDH including family history, breech delivery, muscle disorders and fetal crowding in the uterus.



02 WHAT DO I NEED TO KNOW?

INCIDENCE

- DDH is reported to have an incidence of true dislocation of around 1-1.5 per 1000 live births, whereas hip instability is as high as 1:100 live births. The rates of occurrence vary considerably between racial groups. Higher rates are seen among the Scandinavian population compared to lower rates in Asian groups. This may reflect genetic factors but also reflect the type of infant swaddling applied and the position of the legs during infancy.
- It is much more common in girls, with a rate of 5 to 8 girls affected for every boy.
- 65 per cent of cases affect the left hip and in 20 per cent of cases it is bilateral.

SPECTRUM

There are various terms used to describe the spectrum of hip abnormalities seen in DDH, and these can be confusing. As many of the abnormalities are not apparent at birth the term developmental has replaced congenital.

Terms used:

- **Subluxation:** Femoral head has partial contact with or cover by the acetabulum or roof of the hip joint.
- **Dislocation:** Femoral head has complete loss of contact or coverage with the acetabulum and is out of the joint, or dislocated.
- **Instability:** Femoral head is in the reduced or normal position and when tested it can be provoked by manipulation to either subluxate (partially move outside the joint) or dislocate outside the joint.
- **Clicky hip:** A lay term that describes high pitched clicks, which are felt or heard at the extremes of hip movement. They are quite different to the low pitched clunk that is felt when a dislocated hip is reduced (moves back into the normal position) during clinical examination.
- **Acetabular dysplasia:** Insufficient development of the hip socket, which is detected only on x-ray or ultrasound sound testing. The hip appears normal when examined.

RISK FACTORS

- Female sex: 80 per cent of cases of DDH occur in females and it is thought that maternal hormones predispose females to greater ligamentous laxity.
- Family history of DDH: The incidence increases if a first-degree relative is affected.
- Breech presentation: In utero, two factors seem to be important, the position of the hips and legs which are in extreme flexion (the legs are held straight upwards towards the head) and the limitation of the hip movement that is the result of the breech position. They both disrupt the normal development of the hip.
- Intrauterine crowding which may also be associated with other so-called '*packaging problems*' (DDH, plagiocephaly, torticollis, and foot deformities)
 - Reduction in the volume in the uterus.
 - First pregnancy.
 - Birth weight over 4 kg.
 - Over 42 weeks.

- Muscle problems such as cerebral palsy and spina bifida

Other interesting facts

- 60% of affected infants do not have risk factors.
- Most significant risk factors are family history and breech presentation.
- Frank breech presentation has the highest risk.
- Recurrence risks:
 - Healthy parents, one affected child: 6 per cent risk.
 - One affected parent: 12 per cent risk.
 - One affected parent and one affected child: 36 per cent risk.
- The role of tight infant swaddling with the baby's legs extended has been questioned as a possible contributing factor in at-risk infants.

SCREENING

- In Australia as part of the routine examination of the newborn, clinical screening for DDH is performed. Subsequently the infant is examined by a number of other health professionals during routine health checks over the first 12 months.
- Routine ultrasound examination of all infants is currently not recommended because of the risk that it may over diagnose the condition and result in over treatment.

DIAGNOSIS

Clinical examination

- Examination by an experienced health professional can detect more than 65 per cent of cases
- The infant must be in a warm environment and be relaxed.
- Two specific manoeuvres are performed in the newborn period and are named after the doctors who described them:
 - **Barlow** test or *stress test*: helps to identify hip instability.
 - **Ortolani** test or *reduction test*: is used to reduce the hip (move the femoral head back into the hip joint) where it is already dislocated. A positive test occurs when the examiner feels a clunk as the hip reduces.
- These clinical tests may look terrible, but if performed correctly do not require any force and cause only minimal discomfort.
- After 3 months of age the newborn tests are less sensitive and the clinical signs of DDH are:
 - Limitation of abduction especially if there is asymmetry. Most infants should be able to abduct their hips by 60 degrees.
 - Shortened leg, most obvious when the knees are bent and one leg appears longer at the knee than the other.
- Other signs include asymmetry of the buttocks or thigh creases. Asymmetrical creases are common in all age groups and on their own are not diagnostic of DDH.
- In the first week of life ligamentous laxity is common. The hip can dislocate and relocate, but usually stabilises within a few days, and positive signs on examination often easily resolved. **The American Academy of Pediatrics recommends that ultrasound tests and treatment decisions be deferred until after the hip is reexamined at 2 weeks to avoid over treatment.**

Tests

- Ultrasound is used before the age of six months as the hip is mainly cartilage and it avoids exposure to radiation. It is used to confirm the diagnosis and also to monitor the hip.
 - Must be performed by a person specifically trained in DDH.
 - Can assess both *static* (what the hip looks like at rest) and *dynamic* status (does the hip move out of the joint when pressure is applied to the hip joint).
 - Percentage bony coverage (the amount of bone covering the head of the femur) is used as a measure of likelihood of subluxation or dislocation. More than or equal to the lower limit of normal is the level when treatment is recommended;

Percentage Bony coverage	girls	boys
average	55%	57%
lower limit of normal	44%	47%

- X-rays are used over the age of six months. This is a more useful investigation as it offers a more complete assessment.

GUIDELINES FOR AT RISK CHILDREN

- Because clinical examination only detects around 65 per cent of abnormal hips, infants who are in the high risk group, with a family history or breech presentation and have a normal examination, are usually screened with an ultrasound examination at six to eight weeks.

TREATMENT

- Clinical guidelines have been developed for each health service, with early referral to a paediatrician or orthopaedic surgeon if abnormality is detected, either clinically or through ultrasound examination.
- **Splints:** If detection is early, most babies can be treated successfully with a specially designed hip splint. This holds the hip joint in the right position so that the ligaments can tighten. Two popular hip splints are the Pavlik harness the Dennis Brown Bar. Your orthopaedic surgeon will decide which is the best for your baby.
 - The splint remains in position until it is determined by serial Ultrasounds that the hip is stable. This is usually for 6 to 12 weeks.
 - A small number, estimated at 3.8 per cent, of children fitted with a Pavlik harness suffer a serious side effect, avascular necrosis of the femoral head.
 - It is an emotional time as the harness may not be removed for bathing or nappy changes and can only be adjusted by the orthopaedic specialist or the allied health professional who is caring for you.
- **Closed reduction:** This is performed if the splinting does not work. The child's hip is manoeuvred into the correct position under anaesthetic. They are then required to wear a special plaster called a hip spica.
- **Open reduction surgery:** If the above measures are not effective or DDH is detected late, the child is manoeuvred into the correct position under anaesthetic and surgery is performed on the tissues around the hip to keep it stable. A hip spica is then worn until it becomes stable.

PREVENTION

Watch the Safe Wrapping video from the Royal Children's Hospital

[Safe Wrapping to prevent hip dysplasia VIDEO](#)

03 WHAT OTHERS SAY

- Better health channel fact sheet

[Developmental hip dysplasia explained](#)

- Kids health info for parents

[Developmental dysplasia of the hip \(DDH\)](#)

04 I WANT TO KNOW MORE

- Australian Doctor magazine an excellent article from the Department of orthopaedics at the Royal Children's Hospital Melbourne: [Developmental dysplasia of the hip](#)
- American Academy of Pediatrics: Clinical practice guidelines pediatrics Vol. 105 No 4 April 2000, pp. 896–905

[Early detection of developmental dysplasia of the hip: committee on quality improvement, subcommittee on developmental dysplasia of the hip](#)

- Kids health info for parents: [Dennis Brown Bar](#) [Pavlik harness for DDH](#) [Hip Spica plaster](#)

05 CLINICIANS TOOLS AND RESOURCES

- RPA–newborn care clinical practice guideline: [Development dysplasia of the hip](#)

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