

Special report

Screening for the detection of congenital dislocation of the hip

The last guidance on screening for the detection of congenital dislocation of the hip was published in 1969. Since then, results of various research studies have become available. The Standing Medical Advisory Committee and the Standing Nursing and Midwifery Advisory Committee agreed that the 1969 guidance needed to be reviewed and a Working Party was set up to recommend good practice in screening for this condition. This report has been accepted and endorsed by the full Committees.

This handbook is concerned only with screening for congenital dislocation of the hip and offers no advice on the clinical management of the condition.

Congenital dislocation of the hip encompasses varying degrees of instability, subluxation and dysplasia of the hip joint and should no longer be regarded in terms of simple “dislocation”. The term is strictly speaking therefore inaccurate but is being retained because of its long standing usage.

Congenital dislocation of the hip (referred to in the following paragraphs as “CDH”) is defined as “a congenital deformation of the hip joint in which the head of the femur is (or may be) partially or completely displaced from the acetabulum. The term embraces secondary hip dysplasia whether or not hip instability or dislocation persists”

A glossary of terms used is at Table 1.

It is estimated that in 15 to 20 per 1,000 live births there is evidence of hip instability at birth. However, in a large proportion of these cases the signs resolve without treatment in the first weeks of life. This does not guarantee normality however. Approximately 10% of unstable hips will persist to show classic signs of dislocation in infant life while a further 10% are likely to show evidence of dysplasia and/or subluxation.

It is clinically impossible to detect every CDH at birth. It is also impossible to identify those babies whose hips will not recover spontaneously. There must therefore be continuing surveillance at least until the child is seen to be walking normally. Guidance on how to undertake examinations for CDH at different ages is at Annex A. It is important

that all health professionals who have responsibility for newborn babies and young children are:

- (1) aware of risk factors suggestive of CDH;
- (2) alert to the signs suggestive of CDH;
- (3) alert to observations made by parents;
- (4) able to ensure that all infants are screened in the way described in following paragraphs.

Accurate records should be kept whenever and wherever the examinations are carried out—at hospital, at home or elsewhere.

As outlined later in this handbook, a number of people from different disciplines are involved in screening for CDH. The statutory authorities and training bodies are invited to review training needs in the light of the recommendations contained in this handbook.

Aetiology and “at risk” groups

The hip joint develops during the first trimester of pregnancy and, in the absence of malformation, is initially a normal joint.

Table 1 Glossary of terms and definitions

Term	Definition
Congenital Dislocation	Existing at or before birth Displacement of articulating bones leading to a separation of joint surfaces
Hip	The articulation between the femur and the pelvis
Congenital dislocation of the hip	A spectrum of deformation of the hip joint, present at birth in which the head of the femur is, or may be, partly or completely displaced from the acetabulum. The term embraces secondary hip joint dysplasia whether or not hip instability or dislocation persists
Subluxation	A partial dislocation
Subluxable hip (Dislocatable hip)	A normally located hip which may be provoked into subluxation (or dislocation) by gentle manipulation (Synonyms—unstable hip, preluxation hip.)
Congenital malformation	A primary error in morphogenesis present at birth (an embryopathy)
Congenital deformation	An alteration, present at birth, of a previously normally formed part of the body (a fetopathy)
Dysplasia	An abnormality of development

In utero, the fetus lies in a flexed position. This physiological state changes only slowly during the first few months of life so that forced extension of the hips at, or soon after, birth may encourage an unstable hip to dislocate. It is reassuring to learn from the professions that normally babies are no longer held upside down by their legs after delivery. Such a practice is to be discouraged. Likewise, when measuring the length of a newborn baby, or if any surgical attention is required, care must be taken not to extend the hips forcibly. Tight swaddling of newborn babies should be discouraged as this holds the hips in extension and adduction and limits all movement. Newborn infants should whenever possible sleep in a prone position.

The condition is more common in girls and in first born babies. In addition the following factors place babies at greater than average risk of CDH:

- (1) family history of the condition;
- (2) infants presenting by the breech;
- (3) other congenital postural deformities, such as those of the foot;
- (4) births by caesarean section;
- (5) oligohydramnios;
- (6) fetal growth retardation;

and particular care should be taken to ensure that these babies are regularly examined at least until they are seen to be walking normally. However, in 40% of affected babies no risk factors are found.

When to screen

Screening for CDH should be regarded as an integral part of overall child health surveillance. As outlined in previous paragraphs, it is essential to re-assess the possibility of this condition until a child is seen to be walking normally. The child should always be undressed for these examinations.

The following times for screening are recommended and may coincide with other routine developmental tests.

Within 24 hours of birth. This examination is particularly important as some affected hips may temporarily lose the signs of instability shortly after birth. In view of the risks associated with excessive manipulation of the hip joint, duplication of the examination by both midwife and doctor should be avoided. Each maternity unit should determine its own policy in this respect to ensure that there is only one examination.

Arrangements should be made within each maternity unit to ensure that babies admitted to neonatal units, or babies who are to stay in hospital for only a few hours following delivery, do not miss this first examination. For babies born at home, the

examination should be undertaken by the general practitioner (GP) or the midwife.

At the time of discharge from hospital. This will depend on the timing of the baby's return home but normally the second examination will be undertaken within 10 days of birth.

Written information on the examination for CDH should be sent together with information on any other tests undertaken in hospital, to the mother's GP and community midwife or health visitor as soon as possible following discharge. Full details should be recorded in the neonatal discharge record and parents should always be kept fully informed.

At 6 weeks of age. By this time the Child Health Record should have been opened. This examination and the examinations carried out at the times recommended in the following paragraphs should be carefully recorded in this by whoever undertakes them.

Between 6 and 9 months of age.

Between 15 and 21 months of age. Even if a child has been examined at earlier stages, this is a most important time as the child can be seen to be walking and some may now present with a limp or other abnormality of gait.

The child's gait should be reviewed at 2½ years and again at pre school entry medical examination.

Who should screen?

A number of health professionals may at some time have to examine a child's hips. It is important that whoever actually undertakes the examination should be proficient in the skill.

District Health Authorities should have a clear policy outlining who is responsible for undertaking the examination for CDH at the ages outlined above and for passing the results, or notification that the examination has not been done, to the GP and the community midwife or health visitor.

A designated officer within each District should keep the whole screening programme under review and record and evaluate the incidence of cases detected late. Such information should be made available to health professionals concerned.

It is important whenever an abnormality is suspected that the child is referred *without delay to a consultant with experience in this condition*, usually a paediatrician or an orthopaedic surgeon.

Training in the examination of a child's hips is of crucial importance. Although well-described in the

literature, the techniques can be difficult to learn without experiencing the “feel” of the normal and unstable hip during the manoeuvre. The repeated examination of a neonate’s hips for training purposes is not justified, particularly as this may cause damage in a hip that is already unstable. A training aid, in the form of a model of a newborn’s pelvis, which simulates the “feel” of both the dislocated and dislocatable hip, is now available, although not on general sale within this country. (See Annex B for further details.)

Advice and support needed by parents

If an abnormality is suspected, parents will obviously be in some distress and may need advice from their GP and from other health professionals whether working in hospital or in the community. It is helpful if that advice is consistent and based on known fact.

Once the condition has been diagnosed parents will need to be advised of the natural history of the condition, the programme and probable length of treatment, follow up and the likely outcome. It may be helpful for health professionals to offer to put parents in touch with other families who have had a baby with the same condition. Above all, parents should be reassured that CDH is a treatable condition. It must also be never forgotten that the baby has the same needs in all respects as any other baby.

Health professionals should be aware of the need to counsel parents on the possibility of CDH occurring in future pregnancies. As mentioned in earlier paragraphs the incidence of CDH is many times higher than average if there is a family history of the condition. (Professor P S Harper’s “Practical Genetic Counselling”—referred to in Annex B—gives specific figures on the risk of recurrence of CDH within a family.)

Future developments

The use of radiographic examination of the hips as part of a screening programme is contraindicated as it would result in an unacceptable number of infants being exposed to radiation. An ordinary AP radiograph of the pelvis will not usually demonstrate an unstable hip and therefore will generally be uninformative before a baby is 3 months old. X-ray examination of the hip is however most important for a child in whom a clinical diagnosis of hip displacement has been made.

Over the last few years much work has been done on the use of ultrasound scans in the diagnosis of CDH. Some centres in Europe now use the method

in a neonatal screening programme and this work is now being evaluated in the United States and in the United Kingdom (see suggested further reading listed in Annex B). An ultrasound scan enables the examiner to evaluate and record the anatomy and some of the functions of the hip joint and such an examination can be undertaken soon after birth.

It is well recognised that instability of the hip evident at birth may disappear within 24 hours. An ultrasound examination may be able to act as an additional diagnostic tool at this stage since it has been demonstrated that a scan remains abnormal despite the absence of abnormal signs. It has also been shown that when a unilateral abnormality is present clinically, ultrasound may reveal deformation of both hips.

Annex A

Examination for congenital dislocation of the hip.

A. The signs of CDH, and hence the method of examination, vary with the age of the patient and the progress of the condition. In the early weeks of life usually the only abnormality present is hip instability, which may be detected by the Ortolani/Barlow manoeuvre. The classic signs of dislocation are not seen frequently in the neonatal period but become increasingly common thereafter. In the second year of life these signs include those of abnormal gait when the child has learnt to walk.

B. In examining for CDH it is essential that the infant or child be undressed from the waist downwards.

C. *The modified Ortolani/Barlow manoeuvre*

(1) This method of examination is of particular value in the neonatal period and up to the age of 3 months.

(2) The examiner’s hands should be warm, the examination gentle, and the baby relaxed.

(3) The infant lies on his/her back with legs towards the examiner and the hips adducted and fully flexed.

(4) The hips may be tested for instability one at a time or simultaneously.

(5) Examination of each hip separately—see Figure 1 (page 924).

For examination of the left hip the examiner steadies the infant’s pelvis between the thumb of his left hand on the symphysis pubis and the fingers under the sacrum.

The upper thigh of the left leg is grasped by the examiner’s right hand with the middle digit over the greater trochanter, with the flexed leg held in



Figure 1

the palm, and with the thumb on the inner side of the thigh opposite the lesser trochanter.

An attempt is now made to move the femoral head in turn gently forwards into, and backwards out of, the acetabulum.

In the first part of the manoeuvre the middle digit is pressed upon the greater trochanter in an attempt to relocate a posteriorly displaced head of the femur forwards into the acetabulum. If the head is felt to move (usually not more than 0.5 cm) with or without a palpable and/or audible 'clunk', then dislocation is present.

The second part of the manoeuvre tests for subluxation (dislocatability). With the thumb on the inner side of the thigh, backward pressure is applied to the head of the femur. If the latter is felt to move backwards over the labrum (the fibro-cartilaginous rim of the acetabulum) onto the posterior aspect of the joint capsule (again a movement of not more than 0.5 cm and often accompanied by a 'clunk'), then the hip is said to be subluxatable (dislocatable).

To examine the right hip, the role of the examiner's hands is reversed.

(6) Examination of both hips simultaneously—see Figure 2 (below).

Instead of using one hand to steady the infant's pelvis, the examiner grasps both thighs as described above in section (5) and undertakes the Ortolani/Barlow manoeuvre on both hips simultaneously.

(7) Note that ligamentous clicks *without* movement of the head of the femur in or out of the acetabulum may be elicited in 5%–10% of hips and should be disregarded.

D. Examination for classic signs of dislocation

(1) The classic signs of dislocation may be present at birth. They become increasingly common after the first six weeks as the legs extend, the head of the femur displaces upwards and the soft tissues around the hip joint become shortened.

(2) The signs are much easier to detect when dislocation is unilateral as the abnormal leg may then be compared with the normal side.

(3) *Unilateral dislocation.*

Leg posture: the thigh on the affected side tends



Figure 2

to be held in partial lateral rotation, flexion and abduction.

Limb shortening: there is above-knee shortening as compared with the normal leg. This is most apparent when the hips are flexed and the level of the knees compared (Figure 3, below).

Asymmetry of thighs: asymmetry of the junction of the thigh to the trunk as viewed from the front and of the skin creases on the inside of the thigh may be apparent.

Flattening of the buttock: when the infant is laid prone the buttock on the side of the dislocation may appear flattened.

Limitation of abduction: this is the most important sign of dislocation. The infant lies on his/her back with hips flexed at 90°. The thighs will normally abduct to about 75°. In the presence of dislocation abduction may be limited.

Hip instability: resistance to abduction may give-way with an Ortolani 'clunk' as the head of the femur reduces. Although hip instability gets progressively less common as the infant gets older, it may persist well into the second year. A push-pull manoeuvre of the femur may also be used to demonstrate the phenomenon of "telescoping".

(4) **Bilateral dislocation.** The signs are as above except that there is no normal hip for comparison. The upward and outward displacement of both thighs may leave a perineal "gap".

(5) **Gait.** Most children with CDH stand and walk at the normal time. However, approximately 20% of children with CDH will still not be walking at the age of 18 months (as compared with 5% for the whole population). Therefore, failure to walk by 18 months should prompt examination for CDH.

Unilateral dislocation gives rise to a limp. The child may fall to the affected side. When dislocation is bilateral the gait is waddling in character and there is a marked lumbar lordosis. Abnormality of gait is usually first noticed

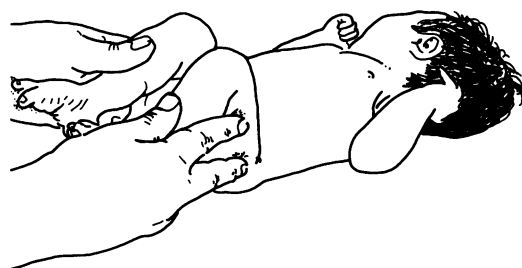


Figure 3

Table 2 The relevant examination for CDH in relation to age

Age	Examination for CDH		
	Ortolani/ Barlow	Classic signs	Gait
Within 24 hours of birth	*	*	-
On discharge from hospital	*	*	-
6 weeks	*	*	-
6-9 months	-	*	*
15-21 months	-	*	*
24 months+	-	*	*

by the parents and their observations should be carefully checked.

(6) **Trendelenburg sign.** The older child (2 years+) may be asked to balance on the affected leg. The hip abductor muscles, having no fulcrum to act on because of dislocation, cannot hold the pelvis level and it drops on the opposite side. The child, in an effort to maintain balance, leans towards the involved side. The Trendelenburg sign is then said to be positive.

Annex B

References and further reading

- Le Damany P. Congenital luxation of the hip. *Am J Surg* 1914;**11**:541.
- Ortolani M. *La lussazione congenita dell'anca*. Bologna: Capelli, 1948.
- Barlow TG. Early diagnosis and treatment of congenital dislocation of the hip. *J Bone Joint Surg* 1962;**44**(B):292-301.
- Hansson G, Nachemson A, Palmén K. Screening of children with congenital dislocation of the hip joint on the maternity wards in Sweden. *J Pediatr Orthop* 1983;**3**:271-9.
- Harper PS. *Practical genetic counselling*. 2nd ed. John Wright and Sons, 1984:326.
- Dunn PM. Screening for congenital dislocation of the hip. In: MacFarlane A, ed. *Progress in child health*. Vol 3. London: Churchill Livingstone, 1986:1-12.
- Clark NMP, Harcke HT, Mettugh P, Lee MS, Bouns PF, MacEwan GD, et al. Real time ultrasound in the diagnosis of congenital dislocation and dysplasia of the hip. *J Bone Joint Surg* 1985;**67**(B):406-12.
- Wilkinson, JA. *Congenital displacement of the hip joint*. New York: Springer-Verlag, 1985.
- Training Aid: "Baby Hippy"*. Enquiries to: Medical Plastics Laboratory Inc, Export Department, Med-

ica International, 205 West Wacker Drive (Suite 621), Chicago, Illinois 60606, USA.

Artwork produced by Peter Jack, Department of Teaching Media, Southampton University, from photographs provided by Dr P M Dunn, Bristol.

Prepared by the Standing Medical Advisory Committee and the Standing Nursing and Midwifery Advisory Committee Working Party (Professor C E Stroud (chairman), Dr S J Carne, Dr P M Dunn, Dr D W Fielding, Mr J A Fixsen, Dr E J Moore, Mrs M Morrell, Mr R E Robinson, Dr D J Stoker, Mrs J B Wilkes, Mr J A Wilkinson, and Dr D C McInnes) for the Secretaries of State for Social Services and Wales.

British Paediatric Association

Annual meetings

At York University:

1987 April 15–19
1988 April 12–16
1989 April 11–15

At University of Warwick:

1990 April 3–7
1991 April 16–20
1992 April 7–11
1993 April 19–23 (provisional)
1994 April 11–15 (provisional)