



## **Clinical Practice & Referral Guideline - Developmental Dysplasia of the Hip**

*\*This guideline was developed from the American Academy of Pediatrics' Clinical Practice Guideline: Early Detection of Developmental Dysplasia of the Hip, April 2000. The recommendations in the below guideline do not indicate an exclusive course of treatment. The guideline's intent is to build a consensus of care in the pediatric market and provide a framework for clinical decision making.*

### **Clinical Protocol:**

**Purpose:** To assist the clinician in the early diagnosis and treatment of DDH.

**Introduction:** Developmental dysplasia of the hip is the condition in which the femoral head has an abnormal relationship with the acetabulum. It includes frank dislocation (luxation), partial dislocation (subluxation) and several radiographic abnormalities of inadequate formation of the acetabulum. The left hip is more commonly affected (about 60% of the time). Because many of these findings may not be present at birth, the problem is best described by the term “developmental” rather than “congenital”. The earlier a dislocated hip is detected, the simpler and more effective is the treatment. Unfortunately, dislocated hips continue to be diagnosed later in infancy and childhood which may delay appropriate therapy and outcome. Delayed or untreated DDH can lead to osteoarthritis, pain, flexion contractures, abnormal gait and abnormal agility. This has led to a number of malpractice cases. The objective of this clinical protocol is to help the clinician evaluate and detect early DDH as well as make appropriate referrals to the orthopedist.

**Evaluation should be performed at each well visit through 18 months of age.**

**History: The items below increase the risk of DDH**

1. Sex (increased in females)
2. Family History of DDH in 1<sup>st</sup> degree relative (parent or sibling)
3. Breech
4. Infant of multiple birth or uterine crowding or compromise
5. Infants with neuromuscular abnormalities

**Physical Exam:** DDH is an evolving process and its physical findings on clinical examination change.

There are many maneuvers used to assess DDH. They are best performed in a relaxed supine infant on a firm surface.

1. Assess for a positive Galeazzi sign with infant in a supine position. Galeazzi sign is a relative shortness of the femur with the hips and knees flexed 90 degrees. Assess for femur length discrepancy.
2. Assess for abduction limitation or asymmetry. After assessing for a positive Galeazzi sign, then abduct the hips together ensuring the pelvis is level on the table. Measure the amount of abduction of each hip. 90 degrees is when the hips abduct all the way and the outside of the knees touch the table. Any difference between hips of more than 10 degrees is significant as well as less than 60 degrees abduction of either hip. Limited or asymmetric hip abduction may be the only abnormal PE finding in an older infant or child with DDH.
3. Assess for asymmetry of thigh and gluteal creases.
4. Assess for leg length discrepancy with legs extended.
5. Perform Instability Tests – Instability tests include the Barlow and Ortolani signs. These are most helpful in infants up to age 6 months of age. After that age, these signs may be negative even if the hip is dislocated or unstable.

The **Ortolani** maneuver elicits the sensation of the dislocated hip reducing. The examiner places their index and middle fingers along the greater trochanter and the thumb along the inner thigh. The hip is flexed to 90 degrees, but not more, and the leg is held in a neutral rotation. The hip is gently abducted while lifting the greater trochanter anteriorly with your index and middle fingers. If a “clunk” is felt as the dislocated femoral head is reduced into the acetabulum, this is a positive Ortolani sign.

The **Barlow** maneuver detects the unstable hip dislocating from the acetabulum. The newborn is positioned supine and the hip is flexed to 90 degrees. The leg is gently adducted while posteriorly directed pressure is placed on the knee. A palpable “clunk” or sensation of movement is felt as the femoral head leaves the acetabulum posteriorly. This is a positive Barlow sign.

These maneuvers are performed one leg at a time and with gentle force.

**Remember, a “click” is not significant.**

SOFT SIGNS are asymmetric leg length, asymmetric thigh/gluteal creases or folds, abnormal Galeazzi sign (unequal knee height when supine and knees are flexed), and limited abduction of a hip. In a child that has started to walk, scoliosis, leg length discrepancy, asymmetric in-toeing/ out-toeing, hyperlordosis, and waddling gait can also be soft signs for DDH.

### **Imaging:**

1. Hip Ultrasound – bilateral static hip ultrasound if the infant is less than 4 months of age.

*The American Academy of Pediatrics recommends a U/S at 4 weeks of age. However, orthopaedic surgeons and radiologists prefer the U/S at 6-8 weeks because it is their experience that an early U/S may give a false positive result and can lead to overtreatment.*

2. Hip X-ray – AP Pelvis if the child is over 4 months of age.

**Recommendations: See Algorithm**

1. All newborns and infants should be screened by physical examination at each well visit from birth through 18 months.
2. If a positive Ortolani or Barlow sign is present on exam, the infant should be referred to an orthopedist. No U/S is needed. Triple diapers are not recommended.
3. In the newborn, if there is a negative Ortolani or Barlow sign but soft signs are present then the infant should be reexamined at two weeks old. If the soft signs persist despite a negative Ortolani or Barlow or other risk factors are present, consider a U/S at 4 weeks (*see U/S description under the Imaging section*) or an orthopedic referral.
4. Risk Factors:
  - a) Girls (newborn risk - 19/1000) have increased risk due to increased sensitivity to maternal relaxin hormone on their ligaments. If girls have soft signs on their exam at 2 weeks of age but a negative Ortolani or Barlow, it is still recommended to refer them to orthopedics, or obtain a screening ultrasound at 4 weeks of age. (*see U/S description under the Imaging section*)
  - b) Positive family history of DDH in 1<sup>st</sup> degree relative (parent or sibling)
    1. Newborn risk for girls is 44/1000. They should have a U/S at 4 weeks (*see U/S description under the Imaging section*) even if exam is normal.
    2. Newborn risk for boys is 9.4/1000. If there are negative Ortolani and Barlow exams then reexamine at 2 weeks. If at 2 weeks there are soft signs even with negative Ortolani and Barlow, then consider U/S at 4 weeks (*see U/S description under the Imaging section*) or orthopedic referral.
  - c) Breech Position (newborn risk for boys 26/1000 and girls 120/1000): Girls should receive a U/S at 4 weeks (*see U/S description under the Imaging section*) and/or a X-rays at 4-6 months. Due to the high incidence of hip abnormalities detected in older children born breech, the above recommendations for girls are also an option for boys born breech.
  - d) For infant in which there was uterine crowding or neuromuscular abnormalities, frequent exams are warranted. U/S at 4 weeks (*see U/S description under the Imaging section*) should be strongly considered if there are any soft

signs even with normal Ortolani and Barlow exams. If exams are difficult consider orthopedic referral.

SOFT SIGNS are asymmetric leg length, asymmetric thigh creases or folds, abnormal Galeazzi sign (unequal knee height when spine and knees are flexed), and limited abduction of a hip. In a child that has started to walk, scoliosis, leg length discrepancy and asymmetric in-toeing/ out-toeing, hyperlordosis, and waddling gait can also be soft signs for DDH.

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**REFERENCES:**

1. American Academy of Pediatrics and the Committee on Quality Improvement, Subcommittee on Development Dysplasia of the Hip Clinical Practice Guideline: Early Detection of Development Dysplasia of the Hip. PEDIATRICS Vol. 105 No 4 April 2000.  
<http://aappolicy.aappublications.org/cgi/content/full/pediatrics;105/4/896>
2. Clinical Guidelines in Child Health: Common Orthopedic Deformities in Childhood. Mary V. Graham, PhD and Constance R. Uphold, PhD, Barmarre Books, Inc, copyright 1999, pgs. 558-560.

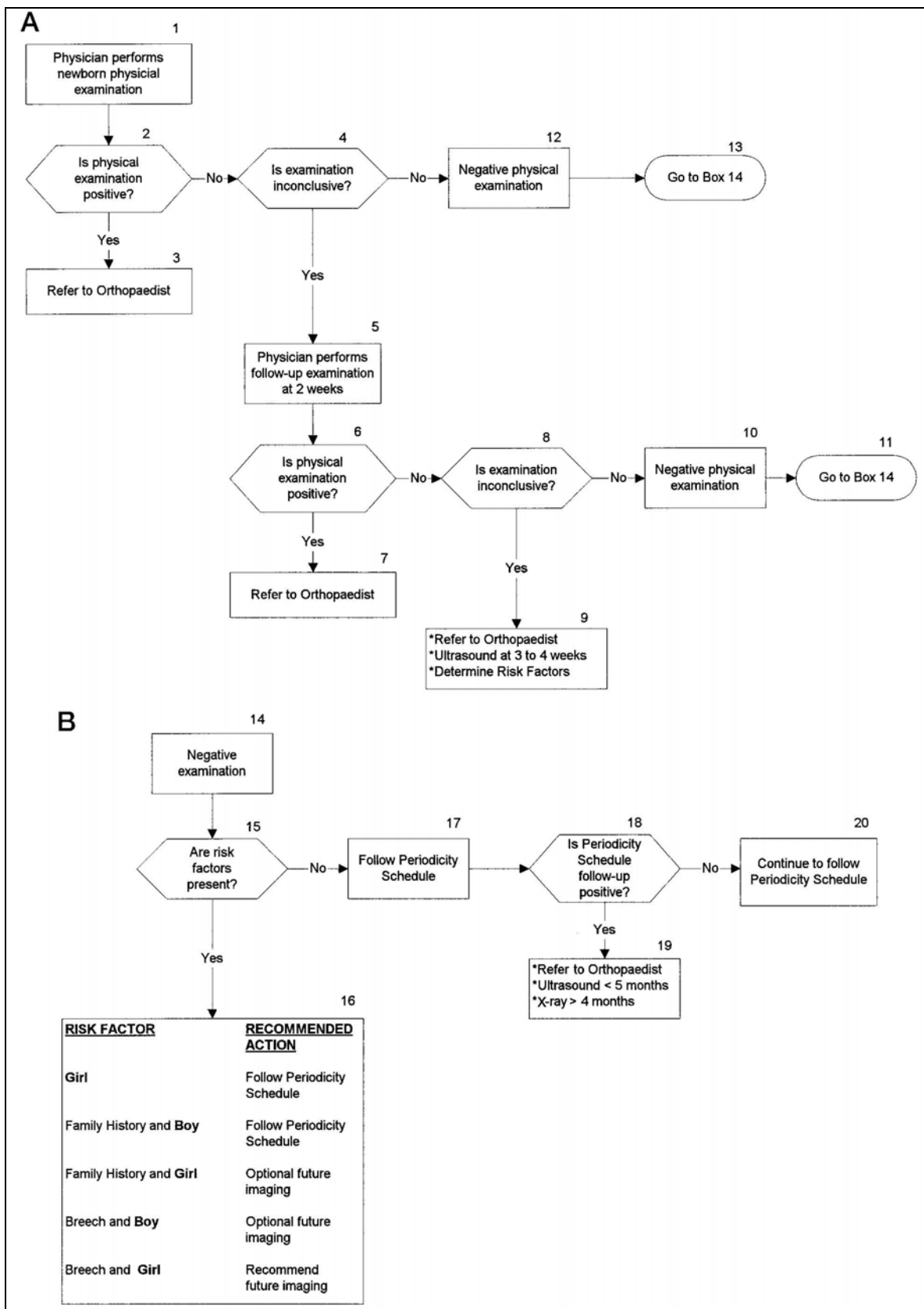


Fig 1. Screening for developmental hip dysplasia – clinical algorithm. AMERICAN ACADEMY OF PEDIATRICS 901

\*The American Academy of Pediatrics recommends a U/S at 4 weeks of age. However, some orthopaedic surgeons prefer the U/S at 6-8 weeks because it is their experience that an early U/S may give a false positive result and can lead to overtreatment. Radiologists suggest that the optimal age for U/S is between 5-10 weeks.