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Dr Emma Curtis, Community Paediatrician, HSE ECA and AMNCH, Tallaght
Ms Dorothy Niall, Consultant Orthopaedic Surgeon, HSE Midlands
Dr Louise Power, Area Medical Officer, HSE Midlands
Ms Maura Connolly, Development Officer, Institute of Public Health Nursing
Dr Hilary Greaney, Community Paediatrician, HSE NW
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<tr>
<td>ASD</td>
<td>Atrial Septal Defect</td>
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<tr>
<td>BHFC</td>
<td>Best Health For Children</td>
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<tr>
<td>CAH</td>
<td>Congenital Adrenal Hyperplasia</td>
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<tr>
<td>CHD</td>
<td>Congenital Heart Disease</td>
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<tr>
<td>DDH</td>
<td>Developmental Dysplasia of the Hip</td>
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<tr>
<td>PAC</td>
<td>Programme of Action for Children</td>
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<tr>
<td>PDA</td>
<td>Persistent Ductus Arteriosus</td>
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<td>PHR</td>
<td>Parent Held Record</td>
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<tr>
<td>RR</td>
<td>Respiratory Rate</td>
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<tr>
<td>SCBU</td>
<td>Special Care Baby Unit</td>
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<td>SIDS</td>
<td>Sudden Infant Death Syndrome</td>
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<td>VSD</td>
<td>Ventricular Septal Defect</td>
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<td>UDT</td>
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Introduction

Evidence

There is strong evidence from international research for the positive effect of good universal primary health care provision on child and population health outcomes. Content and timing of child health surveillance and screening programmes have been increasingly subjected to scrutiny, and evidence from international research supports a shift in focus from clinical examination at regular intervals to health education, health promotion and support for parents. A medical examination of infants during the newborn period and at the age of approximately two months is nevertheless considered useful, with a smaller yield than the neonatal examination, but one that is still significant. GPs have been found effective in detecting key physical abnormalities in preschool children in the context of child health surveillance and screening programmes. There is little evidence for or against physical examinations for screening purposes beyond this age.

The following describes the available evidence for or against screening and surveillance in relation to particular conditions. In some cases, there is little evidence available to guide the development of good practice recommendations. It also has to be borne in mind that the available evidence is often not unequivocal or prescriptive and does not in all cases fully support recommendations for good practice.

Congenital heart disease

Early detection is desirable to avoid children presenting with acute deterioration due to cardiac decompensation or with irreversible haemodynamic changes secondary to undiagnosed congenital cardiac malformations. These might also predispose to endocarditis if antibiotic prophylaxis is not prescribed during invasive procedures. Most cases present shortly after birth, but some conditions like small ventricular septal defects (VSD), atrial septal defects (ASD) or coarctation of the aorta may not present until later and might be more easily detected at 6 to 8 weeks of age. Routine cardiovascular examination as part of a screening programme for all infants at the neonatal and 6 to 8 weeks of age is therefore indicated, including history, observation and palpation of femoral pulses.

Testicular descent

Incomplete or abnormal testicular descent is a common problem in infant boys—approximately 6% are affected at birth. In the majority of these children, testicular descent is complete by 3 months of age. In babies born preterm, i.e. prior to completion of 36 weeks gestation, testicular descent can occur until 6 months of (uncorrected for prematurity) age. Thereafter, spontaneous resolution of the problem is very unlikely. It is therefore necessary to screen all boys at birth and at 6 to 8 weeks of age. If testes are found undescended, review between 3 and 6 months of age is necessary with a view to confirming persisting UDT and deciding on referral. Abnormal findings are referred to a surgeon with appropriate skills before the child reaches one year of age to undergo surgery during their second year, if required, to avoid damage to the undescended testis and fertility problems. Bilaterally undescended testes can be an indicator of congenital adrenal hyperplasia, a potentially life threatening condition, and require referral at any age.
The age of orchidopexy can be significantly lowered to the optimal age of 1–2 years by:

- Written advice and training to General Practitioners.
- Information to parents.
- Amended child health record to reflect need for early identification and referral.

**Developmental dysplasia of the hip**

This term is now preferred to ‘congenital dislocation of the hip’, as it covers a broader range of conditions affecting the stability of the hip joint. The aim of a screening programme is early identification of children at risk of hip dislocation in order to commence treatment. Both ultrasound imaging and clinical examination as primary screening procedures produce a significant number of false negative results and have not been shown conclusively to reduce the number of children requiring surgery for congenital dislocation of the hip (CDH). There are also high numbers of false positive results, leading to unnecessary referral, investigation and conservative treatment with abduction splinting. The main means of finding late or missed cases is detection of limited abduction and asymmetric skin creases after the neonatal period.

**Parental concerns**

These should be taken into consideration, as parental observation has been shown to be as effective as assessment by health professionals in detecting problems in many areas of child health and development.

**Summary**

The quality of a screening programme as described here depends on the context of an adequate early detection programme and systems to support it. This should include:

- Clear examination protocols
- Appropriate staff training
- Clear referral criteria and pathways
- Standardised follow-up procedures
- Good communication between service users and professionals in primary and secondary care settings
- Clear documentation of clinical findings and outcome measures
- Strategies to reach children from marginalized groups
- Audit

The Irish setting differs from the situation in other countries, which have universal free access to primary care, making the provision of a standardised and quality assured child health surveillance and screening programme a higher priority. Prevention and health promotion are set to become an increasingly important part of primary care provision.
Conclusion

Quality assurance through evidence based practice, staff training, improved communication, service monitoring, outcome measurement and accountability underpin the vision for child health outlined in *Best Health for Children-Developing a Partnership with Families (BHFC)*. There is a need for more integration of child health services to develop child and family centred models of service provision. This will lead to improved outcomes and better use of resources.
NATIONAL CORE CHILD HEALTH STANDARD

Medical Examination

Working Group Membership

Dr Hilary Greaney, Community Paediatrician, NWHB
Dr Louise Power (chair), Area Medical Officer, MHB

Rationale

• Due to the very small number of significant findings from cardiovascular examination as part of screening programmes in children, continuation of such examinations after 8 weeks of age is not justified. It remains good clinical practice for suitably trained professionals to include cardiovascular examination in any examination of children.

• Testicular descent in boys is unlikely to occur after the third month of age in term infants and after 6 months of age in preterm infants. There is evidence for irreparable histological changes to occur in testes remaining undescended beyond two years of age. Where testes are found to be impalpable bilaterally, the presence of Congenital Adrenal Hypoplasia needs to be considered, and immediate referral is mandatory at any age to minimise the risk of life threatening complications.

• Developmental dysplasia of hips (DDH) is detected mainly by clinical examination. There is a need to ensure that children at particular risk of DDH have been appropriately investigated. Ongoing professional and parental observation is important to detect late presenting cases. Ortolani Barlow manoeuvre is inappropriate after the age of 8 weeks.

Recommendations

• Medical examination at birth and 6 weeks of age.
• Early referral for orchidopexy of boys with UDT to achieve surgery prior to boys reaching 2 years of age.
• In the absence of a record or other documentation that testicular descent has been confirmed in an individual child, clinical examination for UDT is necessary at any age.
• Detection of DDH at different ages
  o Ortolani Barlow manoeuvre from birth until 6 to 8 weeks of age
  o Symmetry of skin folds and range of movement/abduction
  o Galeazzi sign from birth to walking age
  o Recognition of risk factors (family history, breech presentation) and appropriate referral for DDH until walking age
  o Delayed walking beyond 2 years of age
  o Waddling gait
## Clinical Examination

<table>
<thead>
<tr>
<th>Timing</th>
<th>History</th>
<th>Examination</th>
<th>Equipment</th>
<th>Health Promotion</th>
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<tbody>
<tr>
<td>Birth</td>
<td>Antenatal, birth and family history.</td>
<td>Heart, Respiratory system, Skin appearance, Fontanelles, Features, Mouth, Neck, Eyes, Abdomen, Genitalia (exclude UDT in boys), Hips (exclude DDH), Spine, Limbs</td>
<td>Ophthalmoscope</td>
<td>Managing acute illness</td>
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<tr>
<td></td>
<td>Parental concerns.</td>
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<td>Stethoscope</td>
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<tr>
<td>Postnatal</td>
<td>As above</td>
<td>Skin appearance, Fontanelles, Ears, Eyes, Mouth, Chest inspection and respiration, Abdomen and umbilicus inspection, Genitalia (check for UDT in boys), Upper and lower limbs, Spine</td>
<td></td>
<td>As above Parental awareness of developmental nature of DDH</td>
</tr>
<tr>
<td>visit</td>
<td></td>
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<tr>
<td>6 to 8 weeks</td>
<td>As above</td>
<td>Respiration, colour, skin, fontanelles, Palate, hands, feet, eyes, ears, heart, Femoral pulses, Genitalia (check for UDT in boys), DDH (Ortolani-Barlow manoeuvre, asymmetry of appearance and range of movements/abduction, risk factors)</td>
<td>Ophthalmoscope</td>
<td>As above</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Stethoscope</td>
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<tr>
<td>3 months</td>
<td>As above</td>
<td>Skin, fontanelles, Genitalia (ensure UDT checked for in boys and referred as appropriate), DDH (asymmetry of appearance and range of movements/abduction, risk factors, Galeazzi sign), Signs of heart failure</td>
<td></td>
<td>As above</td>
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<tr>
<td>7 to 9 months</td>
<td>As above</td>
<td>UDT- ensure that testicular descent has either been documented or referral initiated DDH (asymmetry of appearance and range of movements/abduction, risk factors, Galeazzi sign) CVS- not supported by evidence, but remains routine medical practice</td>
<td></td>
<td>As above</td>
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<td>18 to 24 months</td>
<td>As above</td>
<td>Observation of gait- waddling gait and difference in leg length</td>
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<td>As above</td>
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ASSESSMENT, EXAMINATION TECHNIQUES AND REFERRAL CRITERIA

Parental concerns should always be listened to and taken into consideration, as parental observation has been shown to be as effective as assessment by health professionals in detecting problems in many areas of child health and development.

Good practice for clinical examination – an approach to examining children

Adequacy of the examination
- Whilst it may be difficult to examine young children fully, it is usually possible with resourcefulness and imagination on the examiner’s part.

Obtaining cooperation
- Make friends with the child.
- Be confident but gentle.
- Avoid towering over the child.
- Short mock examinations, e.g. auscultating a teddy or the mother’s hand may allay a young child’s fears.
- When touching a young child, do so first on an area he feels is non-threatening, such as a hand or knee.
- A smiling, talking examiner appears less threatening, but this should not be overdone as it can interfere with one’s relationship with the parents.

Developmental skills
A good overview of developmental skills can be obtained by watching the child play. A few simple toys, such as some bricks, a car, a doll, ball, pencil and paper are all that are required, as they can be adapted for any age. If developmental assessment is the focus of the examination, it is advisable to play with the child before the physical examination, as cooperation may then be lost.

Explanation
Explain to the child what you are about to do and what you want him to do, in language he can understand. As the examination is essential, not optional, it is best not to ask his permission, as it may well be refused.

Adapting to the child’s age
Adapt the examination to suit the child’s age.
- Babies in the first few months are best examined on an examination couch with a parent next to them
- A toddler is best initially examined on his mother’s lap. Parents are generally reassuring for the child and helpful in facilitating the examination if guided as to what to do.
Pre-school children may initially be examined whilst they are playing.
Be aware of cultural sensitivities in families, which may differ from your own.

Undressing children
The area to be examined must be inspected fully. It is usually best to do this in stages and redress the child when each stage has been completed. It is easiest and kindest to ask the parent or child to do the undressing.

Warm, clean hands
Hands must be washed before examining a child. Warm hands and a warm stethoscope also help.

The Well Child
Small babies should feed, sleep and handle well.
Meeting parents with their small babies offers the opportunity to remind parents, especially new, first time parents, of the behaviour of well infants.
Observation is the most helpful tool.
Questions include how the baby is feeding - how much, how often, how much is being brought back, whether “winding” is a problem - and this leads onto weight gain and growth.
One should ask about sleep, has the baby established her own pattern and responsiveness.
It is important to help parents to feel confident about their ability to recognise their baby’s regular behaviour and when it has changed.

Signs of Serious Illness
Small babies’ illnesses can become serious quite quickly. A very ill baby may:

- Be unusually sleepy and hard to wake up
- Be unusually quiet or still
- Refuse food and drink
- Have difficulty breathing
- Have an unusual continuous cry, a high pitched scream or make grunting, groaning noises
- Stop having wet nappies or have frequent dirty nappies
- Begin to vomit frequently
- Have fits or convulsions
- Go very pale, blue or mottled all over

In situations like this, parents should be advised to seek medical attention urgently.

Signs of Chronic Illness
These are subtler and rarely present in the community without having already been brought to the attention of primary or secondary service providers, leading to investigation and treatment. Failure to thrive, insufficient longitudinal growth, pallor, listlessness and recurrent acute illness can accompany a broad range of chronic conditions, including renal, autoimmune and neoplastic disease.
Congenital Heart Disease (CHD)

While many of the infants with CHD will be identified in the neonatal period it is important for community health professionals, and parents, to be aware of signs and symptoms of CHD. A small number of children with CHD will be picked up opportunistically during infancy and childhood.

Epidemiology and clinical signs

- Birth prevalence of CHD is 6 to 8 per 1000 live births
- One third of babies with CHD present before the newborn examination
- Normal newborn or 6 to 8 week examination does **not** exclude CHD
- Clinical signs of CHD include:
  - Cyanosis or pallor
  - Tachycardia or arrhythmia
  - Tachypnoea (no precise definition for infants under 6 months but suspect when RR > 60 persists or if sleeping RR > 30 observed)
  - Persistent recession, chest infections or wheeze secondary to pulmonary oedema
  - Failure to thrive
  - Sweating
  - Difficulty in feeding
  - Heart murmur in a well baby

Risk factors:

- Premature infants
- Infants of parent or sibling with CHD
- Down syndrome as 40% have CHD
- Children with dysmorphic syndromes

Refer babies with:

- Heart murmur
- Signs of heart failure (see above)
- Abnormal or absent femoral pulses

Some Common Congenital Cardiac Conditions

**Patent ductus arteriosus (PDA)**

- Common in premature infants
- Most close spontaneously or with treatment
- Harsh ejection systolic murmur at upper left sternal edge and left infraclavicular area in the neonate

Murmur becomes continuous, i.e. “machinery” murmur with bounding pulses as pulmonary vascular resistance falls following birth.
Atrial septal defect (ASD)
- Infant usually well, even with large ASD
- Systolic ejection murmur
- Loud S1, pulmonary ejection click and split S2

Ventricular Septal Defect (VSD)
- Small VSD presents as a loud systolic murmur in asymptomatic infants
- Large VSD may present with signs of cardiac failure
- Large VSD often associated with other cardiac abnormalities

Stenotic Murmurs
- May not present until 6 to 8 weeks postnatally
- Usually aortic or pulmonary stenosis
- Systolic murmur

Coarctation of the aorta
- Additional cardiac abnormalities common (bicuspid aortic valve, VSD)
- Radial- femoral delay
- Systolic murmur, radiating to the back
- Severe coarctation may not present until weeks after birth when PDA closes

Innocent murmurs
- Common
- Low intensity, musical quality
- Localised to a small area
- Occur in the absence of other symptoms or signs

Undescended Testes (UDT)
**Definition**
This condition describes all instances where testes cannot be brought into the scrotum by simple manipulation.

**Epidemiology**
- At birth 5.9% of boys have one or both testes undescended.
- At 3 months 1.6% of males have UDT.
- Only a very small number will descend naturally between 3 and 6 months.
- Testes may be absent, retractile, inguinal, intra abdominal, or perineal.
- Histological changes occur in UDT between 6 and 12 months.
- Orchidopexy should be performed before the age of 2 years.
- Bilateral UDT may occur in Congenital Adrenal Hyperplasia (CAH).
- Increased risk of malignancy, reduced fertility and testicular torsion.
- Risk of malignancy in unilateral UDT is 1 in 80.
- Risk of malignancy in bilateral UDT is 1 in 40 to 1 in 50.

**Examination technique**
- Examination should be carried out in a warm room with warm hands and a relaxed child.
- Palpate with one hand just medial to the anterior superior iliac spine and gently milk the contacts of the inguinal canal toward the scrotum. When this hand reaches the pubic tubercle, use the other hand to palpate the scrotum.
- Manipulate testes gently into the lowest position along the normal anatomical pathway of descent into the scrotal sac.
- Use both hands to examine that particular testis.
- Normal testicular position implies that the testes is well down in the scrotum.

**Position of Testes**

<table>
<thead>
<tr>
<th>Palpable</th>
<th>Impalpable</th>
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| - Normal: testes is well down in scrotum.  
  - Retractile: testes can be brought into base of the scrotum without tension but rapidly retract back into the inguinal canal. No treatment needed.  
  - High scrotal  
  - Suprascrotal: palpable in the line of normal descent but not in scrotum  
  - Ectopic: occasionally testes are palpable, but are outside the normal line of descent. | - No testes can be felt on examination. The testes may be absent, intra-abdominal or inguinal. |
• Retractile testes do not develop until aged 6 months

• Most UDTs are palpable in superficial inguinal pouch

• 20% of UDTs are impalpable

• Milk along inguinal canal, pushing testis towards scrotum

• Grasp testis between finger and thumb; then release

• UDT will immediately spring back out of scrotum

(Slides and text courtesy of Mr. Bill McCallion, consultant orthopaedic surgeon, Royal Hospital for Sick Children, Belfast, Northern Ireland)
Referral Criteria

- Review any child after 3-6 months of age if either testis is undescended, i.e. testes are not bilaterally scrotal.
- Refer if either testis remains undescended, i.e. testes are not bilaterally scrotal at second examination.
- Any child with bilaterally undescended testes needs to be referred urgently at any age, as congenital adrenal hypoplasia could be the underlying condition.
Developmental Dysplasia of Hips (DDH)

- It is now accepted that dislocation of the hips is not always congenital and may be acquired.

- Hip dysplasia can present either early (birth or neonatal period) or late (up to 3 years). Most cases clinically manifest by walking age (12-14 months). The spectrum of dysplasia seen in new born period includes:
  - Frank dislocation (Ortolani positive)
  - The “dislocatable” hip (Barlow positive)
  - The “subluxatable” hip (Barlow suggestive)

- True congenital dislocation (“teratological” DDH) is rare and is always part of a neuromuscular disorder such as arthrogryphosis, Larsen’s syndrome, spina bifida etc. The majority of dysplastic hips present as hips that are in joint but subluxatable when stressed (Barlow suggestive).

- The natural history of untreated hip dysplasia includes the longterm development of leg length discrepancy, decreased agility, trendelenburg gait, pain and early onset osteoarthritis,

- Incidence = 2/1000 (varies between studies)

- Risk factors include:
  - Family history
  - Breech presentation
    - Oligohydramnios
    - Twins and other multiple births
    - Torticollis
    - Lower limb anomalies (clubfoot, metatarsus adductus)
    - Prematurity

While the presence of any of these puts an individual child at increased risk of developing DDH, only the first two (in bold) mandate referral of the child for assessment. A child presenting with either a positive family history or breech presentation during the last trimester therefore needs to be referred for specialist assessment at the earliest opportunity. Depending on local agreement with service providers, children with other risk factors might also be considered for specialist assessment.
### Clinical Examination for DDH

<table>
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<th>Time Frame</th>
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<tr>
<td><strong>HIPS (Birth/ Hospital Staff)</strong></td>
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</table>
  - Full physical exam to include checking for DDH using Barlow and Ortolani technique.  
  - Identification of babies with risk factors:  
    - Family history (1st degree relative)  
    - Breech  
    - Oligohydramnios  
    - Twins  
    - Torticollis  
    - Lower limb abnormalities (clubfoot / metatarsus adductus) |
| **Within 48 Hours of Discharge (PHN)** |  
  - No formal exam required  
  - Raise parental awareness of developmental nature of DDH |
| **6 Weeks (GP)** |  
  - Check for DDH  
  - Ortolani-Barlow manoeuvre  
  - asymmetry of appearance  
  - limited abduction  
  - risk factors |
| **3 Months (PHN)** |  
  - Important to ensure that all children with risk factors have been identified and follow up arranged (note: definite x-ray signs to confirm DDH appear at 4 months - refer any infant with suspicious findings to regional orthopaedic unit for review)  
  - Parental awareness  
  - Check for DDH  
  - asymmetry of appearance  
  - limited abduction  
  - risk factors  
  - Galeazzi sign |
| **7 – 9 Months** |  
  - Important to ensure that all children with risk factors have been identified and follow up arranged  
  - Check for DDH  
  - asymmetry of appearance  
  - range of movements/abduction  
  - risk factors  
  - Galeazzi sign  
  - Refer orthopaedic unit for examination and x-ray if concerned |
| **18 – 24 Months** |  
  - Observation of gait – waddling gait and difference in leg length |
Examination Techniques

1. **Barlow/Ortolani Technique**
   - Baby should be placed supine on a firm surface.
   - Pelvis should be stabilised with one hand.
   - With the other hand the examiners middle finger is placed over the greater trochanter and the thumb around the distal medial femur.
   - The hip is held flexed and adducted.
   - The femoral head is gently pushed downwards. If the hip is dislocatable the femoral head will be pushed posteriorly out of the acetabulum (Barlow test).
   - The next part of the examination is to see if the hip can be returned from its dislocated position back into the acetabulum.
   - Elevate and abduct the femur. A dislocated hip will return with a clunk into the acetabulum (Ortolani’s test).

2. **To examine hips of an older infant**
   - Child must be placed supine on a firm surface with nappy off.
   - Observe for any asymmetric creases, supine and prone, although in isolation this is not an accurate clinical sign.
   - In bilateral dislocation symmetry will be retained.
   - Flex the hips and knees to 90 degrees, observe Galeazzi sign: affected side is shorter and knee heights in the flexed position will be different as a result.
   - With hips flexed to 90 degrees fully abduct the child’s legs. Through the first year of life, the thighs can be widely abducted to touch the table. Any child with limited or asymmetric abduction should be referred to regional orthopaedic unit for exam. and x-ray.
Developmental variants of the normally growing child

Lower Limb

A. "In-toeing"

In-toeing gait is a common concern for parents. In almost all cases, this is a normal variant of development, which may be related to intra-uterine positioning. There are three areas in the lower limb where increased internal rotational may predispose to in-toeing. These features are always bilateral and the clinician should be wary of unilateral findings.

The three common causes are:
(1) Metatarsus adductus
(2) Internal tibial torsion
(3) Femoral anteversion

(1) Metatarsus Adductus
Metatarsus adductus is usually seen in the 1st year. The forefoot is adducted at the tarsal-metatarsal joint (midfoot) and the sole of the foot is “kidney-bean” shaped (diagram 1). In severe cases, the forefoot resembles that of clubfoot. Approximately 85% of metatarsus adductus deformities spontaneously resolve and forefeet that can be passively corrected to a neutral position will certainly require no treatment, except advice to the parents re stretching exercises. In the unusual cases where the forefoot cannot be passively corrected, orthotics or serial Plaster of Paris casts over a 6-8 week period will probably correct the deformity. Ultimately, in the rare resistant case, corrective surgery is necessary but is never considered before the age of 4 years. Resistant cases are nearly always associated with other deformity- especially hip dysplasia. Approx 15% of adductus deformities have associated developmental hip dysplasia – so always examine the hips carefully.

(2) Internal Tibial Torsion
This is the most common cause of “in toeing” and is usually seen in the second year. It may be associated with metatarsus adductus and typically resolves spontaneously. The plane of the ankle joint (normally 15 degrees externally rotated in relation to the knee joint) is internally rotated. Operative correction is rarely necessary in the older child.

(3) Femoral Anteversion
This is the commonest cause of in-toeing in 3-10 year olds. These children are often noted to have “squinting” patellae when they walk with an in-toe gait (diagram 3) and they typically sit on the floor in a “W” position (diagram 4). Sometimes a combination of femoral anteversion and tibial torsion can lead to patellofemoral problems. Femoral anteversion will correct by 10 years. Corrective surgery is extremely rare.

Treatment
Reassure parents!
Do not need to wear shoes on the opposite feet!

Diagram 1. The “skew” but planter grade foot of metatarsus adductus.
Diagram 2 – note the squinting patellae of the older child with femoral anteversion.
Diagram 3. Children with femoral anteversion often sit in the “w” position.

Other developmental variants

(1) Genu valgum / varum
In normal development, the child is frequently bow-legged (genu varum) on commencement of walking and this evolves naturally to genu valgum (knock knee) by the age of 2 ½. There is then a gradual transition to normal physiological valgus by 4 years.

Exceptions:
Genu varum may be associated with several conditions: osteogenesis imperfecta, post trauma / fracture near the growth plate, rickets, Blount’s disease (a disorder of the physis which is only seen in negroid populations).

Genu valgum – may persist up to the age of 8 years (more likely in the obese child). More persistent valgus may be a marker of renal disease, glucopolysaccharidoses (Hunter’s disease, Hurler’s syndromes) or may occur from injury to the growth plate from trauma or sepsis.
(2) The child with flat feet
The normal child is flat footed at the commencing of walking. Many children remain flatfooted for most of childhood. If the feet are flexible, there is no need for concern.

To determine whether a flat foot is flexible:
- watch the child walk barefoot, from behind.
- now ask the child to walk on tiptoes and watch – the medial longitudinal arch will immediately come up.
- sit the child on the bed and ask the child to swing his legs – again the foot should relax in slight varus and the medial longitudinal arch should be apparent.

Normally flatfoot is bilateral, often associated with ligament laxity, femoral anteversion, genu valgum, or tight Achilles tendons. Physiotherapy is only warranted for those with tight Achilles tendons. Orthotics can be worthwhile in older children but not in children under four years of age.
Scoliosis

The majority of childhood scoliosis is idiopathic and onset is in the peri-menarchal period in girls. Most idiopathic scoliosis is kept under surveillance until skeletal maturity. Occasionally, bracing is required. Surgery is uncommon.

Beware:
- Any scoliosis in a boy.
- Any thorax curve convex to the left may indicate other pathology.

Scoliosis in the infant
Scoliosis in the infant is usually associated with structural anomalies in the spinal vertebrae and hence progression is often rapid and surgery commonly required to control the deformity. Congenital scoliosis is commonly associated with other anomalies – dextrocardia, renal anomalies, diastomatomyelia etc. *It is important to recognise congenital scoliosis and act promptly, to avoid progression.*

Examination of the infant
Lift the infant up prone with one hand under the abdomen, such that the unsupported head proximally and legs distally droop down. Any congenital scoliosis will be apparent as a “localised kink” in the spine, rather than a gradual curve. Surgery for congenital scoliosis is universally required. Ideally, it is deferred until the child reaches sitting age (6-9 months). Frequently, bracing is used until then to control the condition.

The Limping Child

The limping young child without a history of trauma is difficult to diagnose. Common differential diagnosis will depend on the age group.

(a) **1-4 years** – commonest cause is irritable hip syndrome, a non-traumatic hip effusion, thought to be related to a viral illness. This presents as a limp with the hip held in flexion and external rotation. Movement is irritable. When lying, the hip is held flexed off the bed and has a definite loss of internal rotation. Treatment is expectant. Ultrasound is useful for confirmation.

(b) Differential diagnosis – septic arthritis/osteomyelitis of hip or more distally in leg. Diagnosis clarified by blood tests.

(c) Fractures without witnessed trauma can occur. X-ray the whole leg.

(d) An isotope bone scan is an extremely good test to locate the area causing pain.

(e) **4-8 years** – Irritable hip is less common but Perthes disease (osteonecrosis) of the femoral head may occur. X-ray may be useful initially. Clinically, the patients have loss of abduction. Treatment is almost always conservative and involves rest during episodes of pain. Transient juvenile arthralgia can also occur in this age group.
Common Dermatological Conditions

 Bruising

This information is based on a systematic review of all the quality work in the world literature about bruising in children. Bruising is the most common injury to a child who has been physically abused. These key messages should help you to know when to be concerned about bruising on children.

What is known about bruising?

- Bruising is strongly related to mobility.
- Once children are mobile they sustain bruises from everyday activities and accidents.
- Bruising in a baby who is not yet crawling, and therefore has no independent mobility, is very unusual.
- Only one in five infants who is starting to walk by holding onto furniture has bruises.
- Most children who are able to walk independently have bruises.
- Bruises usually happen when children fall over or bump into objects in their way.
- Children have more bruises in the summer months.

Where would you expect to see bruising from an accidental injury?

- The shins and the knees are the most likely places where children who are walking, or starting to walk, get bruised.
- Most accidental injuries are seen over bony parts of the body, e.g. knees and elbows, and are often seen on the front of the body.
- Infants who are pulling to stand may bump and bruise their heads, usually the forehead.
- Fractures are not always accompanied by bruises.

When should you be concerned?

There are some patterns of bruising that may mean physical abuse has taken place

- Abusive bruises often occur on soft parts of the body, e.g. cheeks, abdomen, back and buttocks.
- The head is by far the commonest site of bruising in child abuse.
- Clusters of bruises are a common feature in abused children. These are often on the upper arm, outside of the thigh, or on the body.
- As a result of defending themselves, children may have bruising on the forearm, face, ears, abdomen, hip, and upper arm, back of the leg, hands or feet.
- Abusive bruises can often carry the imprint of the implement used or the hand.
- Non-accidental head injury or fractures can occur without bruising.

Implications for Practice

A bruise should never be interpreted in isolation and must always be assessed in the context of the child's medical and social history, developmental stage and explanation.
given. Any child who has unexplained signs of pain or illness should be seen promptly by a doctor.

Bruising that suggest the possibility of physical child abuse includes:
- Bruising in children who are not independently mobile
- Bruising in babies
- Bruises that are seen away from bony prominences
- Bruises to the face, back, abdomen, arms, buttocks, ears and hands
- Multiple bruises in clusters
- Multiple bruises of a uniform shape
- Bruises that carry an imprint - of an implement or cord

(Ref.: CORE-INFO; bruises on children produced by CORE-INFO and NSPCC April 2005)

**Milia**

This condition (small white headed spots on the face) is common and resolves spontaneously.

**Eczema**

Eczema is a general term for the several types of inflammation of the skin. This condition may present at any age during infancy and childhood. There may be a family history of infantile eczema and parents may be confident to manage this themselves. They may need advice about emollients and may need to visit their GP, as corticosteroid creams may be required. One should be sure that there is an allergic component before recommending changes in formula feeds etc

**Atopic Dermatitis**

Atopic dermatitis, the most common skin condition in children and the commonest form of eczema, is a chronic (long-lasting) disease that affects the skin.

66% of children with this condition develop it in the first year of life.

In atopic dermatitis, the skin becomes extremely itchy and inflamed, causing redness, swelling, cracking, weeping, crusting, and scaling. Golden crusting is often a sign of staphylococcus aureus infection and the child will require antibiotic treatment. Atopic dermatitis usually affects infants and young children, but it can continue into adulthood or first show up later in life. Exercise, heat and sweating, grass, thick clothing and stress often aggravate it.

**Nappy Rash (Diaper Dermatitis)**

Nappy rash affects about 20% of all infants. It is the result of prolonged exposure of the skin to urine and/or faeces. The diaper prolongs the skin's exposure to these
substances and increases the penetration of the alkaline substances into the skin. This can also lead to a more serious secondary yeast infection.

Diaper dermatitis can be prevented by frequent diaper changes and reducing the amount of fluids that the child consumes before bedtime. It can be treated with moisturizers and anti-fungal cream.

**Heat Rash (Miliaria)**

Miliaria or heat rash is caused by excessive sweating or overheating when the sweat glands are blocked-off. Infants often get heat rash when they get a fever or are over-clothed. They appear as tiny bumps on the neck, armpits, groin, chest and back. To prevent heat rash, the skin must be kept cool. Thus, avoid over-clothing the child. The condition can also be treated with Calamine lotion.

**Urticaria (Hives)**

Hives are a common skin condition that affects 10-20% of the population and all age groups. It is characterised by transient, itchy pink swellings on the body. It can also cause excessive swelling of the eyes and lips and lead to a more serious condition called angioedema.

Hives can be caused by infections. Viral infections are the most common cause of hives in children. Hives can also be triggered by physical stimuli such as heat, cold, sweat, exercise and sunlight. Foods, or reactions to medicines, such as antibiotics, can also cause a breakout of hives. Hives can be treated by either removing the cause or with antihistamines and steroidal creams.

**Common Skin Infections in Children**

Skin infections are common as organisms constantly colonise the skin. However, certain predisposing factors such as a humid climate, poor skin hygiene and pre-existing skin diseases also contribute to infection. Skin infections can be classified into bacterial, viral or parasitic.

**Bacterial Infections**

**Impetigo**

This is a form of bacterial infection that is characterised by erosions on the skin that are covered by moist honey-covered crusts. They usually begin as small vesicles that break off easily. Commonly found on the face, nostrils and limbs, impetigo can be bullous (blister forming) or nonbullous.

Impetigo is highly contagious and is easily spread, by direct contact among siblings, or in crowded living conditions, schools and playgroups or swimming pools. Impetigo
can be treated with oral antibiotics. Creams can be used in mild cases where there are few and small lesions. A liquid anti-bacterial wash is also recommended.

**Staphylococcal Scalded Skin Syndrome (SSSS)**

This is a condition that appears after a child has recovered from a bout of upper respiratory infection. It is characterised by a faint red rash on the face. The neck and groin regions also become swollen and tender. It usually appears on the upper body of children and affects the entire body of babies.

SSSS can be treated with intravenous or oral antibiotics depending on the severity of the condition. Scrupulous hygiene and minimal handling is recommended. The condition will usually heal without scarring.

Following the general rash, smaller scaly patches appear every few days, mainly on the trunk but may spread to the thighs, upper arms and neck. At this stage, no treatment is necessary as this condition usually resolves spontaneously. However, oral antihistamines may be necessary to relieve itchiness.

**Parasitic Infection**

Scabies is a common parasitic infection caused by the scabies mite. The itching is due to an allergic reaction to the tiny mites, and is associated with a rash of red, raised spots. It is spread by close personal contact. The itch is worse at night, and may often affect more than one family member. Treatment of scabies includes antiscabietic scabicidal lotions medications that must be applied to the entire body. Oral antihistamines and steroidal creams can also be used.

**Skin Care Products for Children**

**Cleansing Agents**

A preferred cleanser eg. soap-free cleanser, cleansing bar, shower cream or milk bath, is one with neutral pH, fragrance free, mild and gentle on the skin.

**Moisturiser**

Moisturisers are emollients and lubricants that soften and restore elasticity to the skin by restoring the natural process of moisture balance in the skin. Moisturisers should be applied sparingly after bathing.

**Sunscreen**

Sunscreen works to protect the skin against sunburn, pigmentation, and increased risk of skin cancer and is particularly effective on children. It should be applied at least half an hour before sun exposure. It should be applied even on cloudy days.
APPENDIX 1

INFORMATION LEAFLET FOR PARENTS

Dysplasia of hips in children

(Congenital dislocation of hips)

Developmental dysplasia of hips (Congenital dislocation of hips) is an abnormality of hips which may be present at birth or may develop during infancy and early childhood.

Although some dislocated hips show no signs, contact a doctor if your baby has:

- Legs of different lengths
- Uneven thigh skin folds
- Less mobility or flexibility on one side

In children who have begun to walk, limping, toe walking and a waddling “duck-like” gait are also signs.
Appendix 2

Training in Child Health Screening and Surveillance

Module on Medical and Orthopaedic Assessment
Programme Outline

Overall Aim:
To inform participants on the national standards in Medical and Orthopaedic assessment, specific screening techniques and referral criteria.

Duration: 1 day

Tutor Expertise: Community Paediatrician
Consultant Orthopaedic Surgeon
Physiotherapist (if regional resources allow)

Specific Objectives:

By the end of the session participants
- Will have considered the evidence in relation to effective medical and orthopaedic assessment
- Will be informed on the recommendations of BHFC Report and its review
- Will be informed on the specific screening techniques and referral criteria.
- Will have considered the implications for own practice and professional development

Content

- The Well Child
- Signs of Chronic Illness
- National Core Child Health Standard
- Assessment, Examination Techniques and Referral Criteria
- Congenital Heart Disease (CHD)
- Undescended Testes (UDT)

- Developmental Dysplasia of the Hips
- National Core Child Health Standard
- Clinical Examination for DDH
- Examination Techniques
- Common Orthopaedic Problems

- Identification of clinical training needs
- Clinical training plan

Assessment / Evaluation
Appendix 3

<table>
<thead>
<tr>
<th>Evaluation Sheet</th>
<th>Child Health Screening, Surveillance and Health Promotion</th>
<th>Medical and Orthopaedic Assessment Module</th>
<th>Date __________</th>
</tr>
</thead>
</table>

1. Three words to describe your experience of this training day
   ________________________________________________  ________________________________________________  ________________________________________________

2. How well were the training objectives achieved?
   Not at all  □  Quite well  □  Very well  □  Completely  □

3. Please rate by circling a number on a scale of 1 to 5, where
   1 = inadequate, 2 = poor, 3 = satisfactory, 4 = very good, 5 = excellent

   a. Content
      1  □  2  □  3  □  4  □  5  □
      A reason for your rating __________________________________________________________

   b. Manual/training materials
      1  □  2  □  3  □  4  □  5  □
      A reason for your rating __________________________________________________________

   c. Facilitation of learning by tutors
      1  □  2  □  3  □  4  □  5  □
      A reason for your rating __________________________________________________________

   d. Presentation by tutors
      1  □  2  □  3  □  4  □  5  □
      A reason for your rating __________________________________________________________

4. Gaps in the training, if any?
   __________________________________________________________
   __________________________________________________________

5. What was most relevant/useful?
   __________________________________________________________
   __________________________________________________________

6. What was least relevant/useful?
   __________________________________________________________
   __________________________________________________________

7. A question/concern/comment arising from this day’s work
   Signature (optional) __________________________________________

   Thank you for your help in evaluating the work.
References


Brown, J; Wacoyne, I; Fleckney, S; Jones, L; Barolchain C – Achieving Early Surgery for Undescended Testes – Quality Improvement through a Multifaceted Approach to Guideline Implementation – Child: Care, Health & Development 2004;30.


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