

## Guidelines on Neonatal Examination

<b>For use in (clinical areas):</b>	All clinical areas
<b>For use by (staff groups):</b>	Midwives, Paediatricians, HVs, GPs, SCBU, Paediatric Nurses
<b>For use for (patients):</b>	Neonates/ Infants
<b>Document owner:</b>	Child Health
<b>Status:</b>	Approved

Every neonate should have a thorough physical examination. This constitutes the first part of the Child Health Promotion Programme and **is not** an examination to ascertain fitness for discharge from the hospital; it is also an opportunity for health promotion.

The purpose of the examination is to:

- (a) Ascertain parental concerns
- (b) Identify risks - perinatal/family history
- (c) Reassure parents where possible
- (d) Offer advice on health promotion – e.g. prevention of Sudden Infant Death Syndrome (SIDS); immunisations

### Timing:

- Ideal time is between 24-72 hours, though may be undertaken after 6 hours of age and no later than 7 days of age.

### Content and skills required:

- Similar to the 6 weeks examination.
- A refresher course in the examination of the newborn can be arranged by the Paediatric Department on request from Practitioners.

### By whom:

- Midwives with appropriate training may take on the responsibility for healthy/term infants.
- General Practitioners – for babies staying in the hospital for less than 6 hours or going home at short notice.
- Paediatric Senior House Officer/Registrar for the remaining babies as well as babies for whom the Midwives have identified problems.

### History

Identify parental concerns; review family history with particular attention to:

- (a) [Dysplasia of the of hip](#), particularly in 1<sup>st</sup> degree relatives (parents/siblings).
- (b) Early onset of sensori-neural hearing loss or [visual impairment](#) in 1<sup>st</sup> degree relatives.
- (c) TB – history of active TB in close family contacts within previous ten years

(Details of action in the respective Policy/Guidelines)

## Examination

Suggested order is as outlined below. Details of what to look for and action if problems are identified are summarised in enclosed explanatory notes.

### Babies should be examined undressed

Look at-            general appearance and alertness.  
                      -            facial features and colour.

Listen to heart.

Feel anterior fontanelle and sutures.

Examine            -            scalp/skull  
                      -            ears/eyes  
                      -            nose/mouth - including palatal sweep  
                      -            neck including clavicles  
                      -            arms and hands  
                      -            legs and feet  
                      -            genitalia and anus

Palpate abdomen.

Feel femoral pulses.

Turn baby to prone position and examine back and spine.

Place supine and examine hips.

Measure head circumference.

**Complete Neonatal Examination page in the PCHR.**

**Explanatory Notes on Common Findings and Suggested Action****Skin Colour**

Cyanosis	Peripheral cyanosis of hands, feet, circumoral area is common during the first 48 hours. Central cyanosis needs urgent investigation, pulse oximetry on upper right <b>AND</b> lower limbs will help differentiate.
Pallor	Unusual in the newborn; may indicate anaemia or poor perfusion. Check capillary return (>3 seconds = abnormal) and haemoglobin, particularly if Antepartum Haemorrhage.
Jaundice	Clinical assessment comes with practice – sclera and nasal tip useful sites. Jaundice in first 24 hours is abnormal and needs investigation. See "Phototherapy Charts" for details.

**Skin Texture**

Peeling	Common in post term babies.
Oedema	Pitting – check for hypoalbuminaemia. Non-pitting – (particularly of feet) consider Turner's Syndrome in females.

**Skin Rashes/Birthmarks**

"Stork marks"	Capillary naevi on forehead/back of neck – common and will fade.
Port wine stains	Remain static: on the face may indicate intra-cranial problems (Sturge – Weber syndrome – Paediatric Registrar to see).
Strawberry naevi	Will increase in size over 1-2 years and then resolve.
Bruising	Normal after instrumental deliveries, but spontaneous petechiae, purpura or ecchymoses need immediate investigation.
Mongolian blue spot	Slate coloured mark over the lower spine and buttocks. Commoner in babies of non-caucasian parentage. No medical significance.
Extensive flat naevi/ Haemangiomas	Are unusual: may be part of a "neuro-cutaneous syndrome" – Paediatric Registrar to see.

**Face**

General appearance – if any unusual features search for other "dysmorphic features/minor variants" and look at parents.

**Nose**

- Nares
- For patency
  - Flaring indicates respiratory illness and needs prompt assessment/treatment
- Swelling at root of nose
- Unusual, may be an encephalocele.
  - Needs careful assessment.
  - Paediatric Registrar to see.

**Eyes**

History: Infants at risk of eye problems because of family history are congenital cataract, congenital glaucoma, retinoblastoma, metabolic or genetic disease should be referred to the Consultant Ophthalmologist.

Observe "visual behaviour"

- Look for
- check red reflex
  - abnormal eye movements e.g. nystagmus
  - asymmetry in shape
  - cloudiness of cornea
  - coloboma
  - ensure can fixate and follow (eye contact should be achieved)

- If poor vision is suspected
- For urgent ophthalmological assessment

- Conjunctivitis
- Mild/mucoid discharge – common, needs topical care
  - Purulent – urgent swabs for Gonococci/Chlamydia. Discuss need for treatment with Paediatric Registrar.

**Mouth**

- Cleft lip +/- palate
- may be unilateral/bilateral
  - isolated or associated with cleft palate
  - refer to Cleft Lip & Palate Team at Radcliffe Infirmary, Oxford
- Epstein's Pearls
- White blobs on gums/palate – of no significance
- Short frenulum/ "tongue-tie"
- NO SIGNIFICANCE in terms of feeding or speech; does not require surgery
- "Natal Teeth"
- Natal teeth are rare and pose a potential risk from inhalation, or discomfort to the mother whilst breast feeding.
- Contact Consultant Orthodontist, MKGH for advice re: management.

## Ears

- Look at general shape, size, position of ears.
- Check auditory meatus for patency but do not attempt to visualise drum.
- Tags are often familial and if removal is desired by parents refer to plastic surgeon.

## Head

Size - Occipito-frontal circumference should be checked (largest diameter), **recorded and plotted on centile chart**. Get Paediatric Registrar to check if less than 0.4% or above 99.6%. Large fontanelle and separated sutures may be seen in normal babies, but warrant an ultrasound scan to exclude hydrocephalus.

Shape - Moulding and mild plagiocephaly are common, but marked asymmetry may indicate craniosynostosis and needs investigating with skull films.

Swellings - Non-fluctuant swelling of the presenting part of the head and the "chignon" following ventouse extraction will settle quickly.

Fluctuant swelling confined by suture lines – cephalhaematoma does not need treatment but may take several weeks to settle fully.

Fluctuant swelling of a large area of scalp – "subgaleal haemorrhage" can be associated with significant blood loss and needs urgent assessment. Midline swellings should be treated with suspicion.

## Neck

Size - Very short neck – may be indicative of cervical vertebrae anomaly, e.g. Klippel/Feil – get Paediatric Registrar to check and consider cervical spine x-ray.

Shape - Webbed neck – can be associated with various syndromes including Turner's/Noonans.

Swellings - Cystic hygroma – soft, transilluminable, fluctuant swelling in the posterior triangle.

- Sternomastoid tumour – "swelling" in the muscle, often associated with torticollis. Refer to Physiotherapist.

- Fractured clavicle – felt as crepitus. Confirm with x-ray.

Restricted movement - e.g. Torticollis: refer to physiotherapy and arrange an ultrasound scan of the hips, as this is a recognised risk factor for developmental [dysplasia of the hips](#).

## Chest and Cardiovascular System

Rate and pattern of respiration:

Periodic breathing	Not uncommon in babies, with apnoeic spells of 5-10 seconds. Longer spells are significant and need investigating.
Tachypnoea	Sign of pulmonary/cardiac pathology (normal respiratory rate: 40-50/minute).
Palpation	Apex beat – should be in left 4 <sup>th</sup> ICS, mid-clavicular line. Check peripheral pulses, particularly femorals. If these are weak/absent check BP and inform Paediatric Registrar.
Auscultation	Transient grade 1-2/6 ejection systolic murmurs are very common in first 48 hours.

Distinction between pathological and innocent murmurs can be difficult. The following approach may help.

1. Is there peripheral circulatory collapse?  
  
If so an emergency!
2. Is there central cyanosis?  
If in doubt, check pulse oximetry on the right arm and either leg. and do hyperoxic test.  
  
Are there any signs of heart failure? e.g. . (tachycardia,tachypnoea, breathless on feeding, large liver). If so, urgent investigations are required
3. Are femoral pulses easily felt?  
If absent or weak consider co-arctation. Measure BP in arms and legs.
4. Is baby well and less than 48 hours old?  
Re-check in a few days if possible.
5. Is baby well and over 48 hours old?  
Baseline ECG/CXR – if normal follow up at 6/52.  
If abnormal arrange for ECHO.

## Abdomen

Observe	For distension
Palpate	For organomegaly. Liver edge up to 2 cms, and spleen 1 cm is within normal limits.  Any enlargements warrant investigation.
Umbilicus	Hernia not uncommon. Resolves spontaneously, within few months.
Inguinal hernia	Risk of strangulation. Paediatric Registrar to check and refer to surgeons. Advise parents regarding complications.

## Genitalia

Males	Check position of meatus for hypo/epispadias  Testicles - Check each one for descent and note whether well descended in the scrotal sac or not. Testicles which are <b>not</b> well descended need to be followed up in the community.  Hydroceles. Usually resolve spontaneously. No treatment required.
Females	Inspect vulva for anatomical abnormalities. Blood stained vaginal discharge common. Equivalent of "withdrawal period".
Ambiguous genitalia	This needs sensitive handling.  <b>DO NOT INFORM PARENTS YOURSELF – CONTACT PAEDIATRIC REGISTRAR/CONSULTANT IMMEDIATELY</b>

## Anus

Check position and patency

### Spine

Inspect for curvature and midline abnormality. The presence of a hairy patch, naevus, lipoma, dermoid, deep sinus (base not visible) warrants a detailed neurological assessment of the lower limbs and sphincters by the Paediatric Registrar and a discussion with the Consultant about investigations/follow-up. Dimples with easily visible floor situated in the buttock cleft are common and not of any consequence.

## Upper Limbs

Inspect arms for shape, posture and symmetry. Observe spontaneous arm movements. Lack of active movements suggests palsy. Lack of active movements and pain on passive movements suggest a fracture or infection. Examine the hands for accessory digits, clinodactyly and palmar crease pattern. Each of these can be familial but look carefully for other dysmorphic features. Accessory digits should be removed by the plastic surgeons.

## Lower Limbs

Inspect the legs and feet for posture, symmetry, shape and size as well as spontaneous movements. Deformities of the feet are common in the neonate. The commonest is positional talipes in which the abnormal position of the foot can be corrected passively. True talipes (calcaneovalgus or equinovarus) requires orthopaedic attention. Both forms of talipes are an indication for arranging ultrasound scan of the hips (see Guidelines for DDH). Over-riding toes are nearly always self-correcting, syndactyly (commonest 2<sup>nd</sup>/3<sup>rd</sup> toe) is often familial, and neither need treatment.

## Hips

Details of risk factors for the selective neonatal, ultrasound screening programme and techniques for clinical examination are outlined in the Guidelines on Developmental Dysplasia of the Hip.

## Neurological

Formal testing is seldom needed. Adequate information can be usually gleaned from talking to the mother, carefully watching, handling and listening to the baby throughout the examination.

### General observations should include:

Behavioural status – “degree of alertness”

Posture

Spontaneous motor activity

Muscle tone – with pull to sit manoeuvre in ventral suspension and held upright supported under the armpits

Crying

Feeding and sucking patterns

With practice and experience one is soon able to judge from the history and handling of an infant during the examination whether he/she is behaving normally. Features that should arouse suspicion and need detailed assessment are:

- Persistent failure to suck properly
- A high pitched cry
- Extreme irritability or starry eyed appearance
- Abnormal posturing, e.g. excessive fisting, opisthotonus
- Frog leg posture or generalised hypotonia
- Generalised persistent hypertonia
- Paucity of spontaneous movements or asymmetrical movements

## Dysmorphic Features

The term dysmorphic features include any anomaly of structure that results in an abnormal appearance of any part of the body. The value of their recognition is that they may serve as an indicator of “more significant structural abnormalities” or constitute valuable clues in the diagnosis of a specific pattern of malformations.

The frequency of minor anomalies and association with a significant problem is summarised below:

NUMBER OF ANOMALIES	FREQUENCY IN NEWBORN BABIES	% WITH MAJOR MALFORMATION
0	85%	1.4%
1	13.4%	3%
2	0.8%	11%
>3	0.5%	90%

In summary, the presence of 3 or more minor anomalies is unusual and suggestive of a more serious underlying problem. These babies need a detailed assessment by the Registrar and consultation with the Duty Consultant.

#### Examples of "anomalies" are:

Epicanthic folds	Syndactyly (fusion at any level of digits)
Slanting palpebral fissures	Abnormal nails
Hyper or hypotelorism	Wide gaps between toes
Brushfield spots	Shawl scrotum
Preauricular tags/pits	Large fontanelle
Protruding ear	3 <sup>rd</sup> fontanelle
Low set ear	Accessory nipples
Malformed/underdeveloped ear	Abnormal hair pattern
Abnormal palmar/plantar creases	Micrognathia
Clinodactyly (horizontal curved finger)	Abnormal philtrum

#### References:

Textbook of Paediatrics - Forfar & Arneil  
Informative Morphogenetics in the Newborn  
Infant K. Mehes. Akademiai Kiado – Budapest 1988

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