Title of Document:	US PROTOCOL FOR INFANT HIP SCANS
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Key amendments:	Date:
Changes to timeliness of ultrasound scan in line with Standards and pathway in the NHS NIPE- SO3, SO4Changes to clarify hip ultrasound pathway. Addition of DNA flowchart to appendices	March 2021
Changes to re-scan timing to allow onward referral < 10 weeks	May 2022
Change to timing for scanning Babies with Talipes to 4-6 weeks of age (Previously within 2 weeks)	June 2024
New KPI change NIPE – S04. Trust agreement to keep current practice and not change timeliness of scans for an outcome to be obtained by 6 weeks of age.	August 2026
Individuals involved in developing / reviewing / amending this document: (titles only)	
US Lead sonographers Paediatric Hip scanning sonographers Family Health Governance	

AIM AND SCOPE OF PROTOCOL

Definition: Ultrasound screening of the infant hip for Developmental Hip Dysplasia (DDH) and dislocated hip in high-risk infants.

To include:

Hip ultrasound pathway

National hip risk factors

Timeliness of ultrasound scan.

Non-attendance (DNA) pathway

Exclusions, limitations and repeat scans

Guidelines on obtaining, recording and reporting images

Around 1 or 2 in 1000 babies have hip problems that require treatment. Undetected unstable hips with delayed treatment may result in the need for complex surgery and/or long-term complications such as

- Impaired mobility and pain
- Osteoarthritis of the hip and back

Early diagnosis and intervention will improve health outcomes and reduce the need for surgical intervention.

Babies with hip screen positive results are identified at the 'Newborn and Infant Physical Examination' (NIPE) check. The scan referral outcome is entered onto the NIPE (S4N) system by the Antenatal and Newborn screening team. Public Health England (PHE) audit these outcomes quarterly directly from S4N.

Hip pathway: The screen positive pathway will apply to babies with either:

- Suspected dislocated or dislocatable hip(s) at clinical examination
- The presence of one or more national hip risk factors.

Screen positive results following new born examination are:

- Hip risk factors (NIPE hip examination)

Clinical findings:

- Different leg length
- Knees different level when hip and knee bilaterally flexed
- Restricted unilateral limitation of hip abduction (20% difference between the hips)
- Gross bilateral limitation of hip abduction, loss of 30% abduction or more
- Palpable 'clunk' when performing Ortolani manoeuvre- ultrasound within 2 weeks of age

National hip risk factors

- **Breech presentation**:
  - At birth (≥28weeks gestation)
  - If breech presentation is corrected spontaneously or by external cephalic version at or after 36 weeks' gestation, the infant hips should be scanned.
  - Where one of a set of twins was breech presentation, both twins should be scanned. Where both twins are vertex presentation, no hip scan is required.

- **Family history**: DDH in a first degree relative (parent or sibling and half sibling) that required orthopaedic treatment i.e. splint or surgery for DDH. This does not include relatives with 'clicky' hips or those 'treated' with double nappies alone.

NOTES:

- Isolated ‘clicks’ in the absence of other positive factors are **NOT** screen positive. Where a second clinical opinion is obtained and the outcome still unclear an ultrasound may be considered. This is considered a local clinical referral and as such is not part of the national NIPE hip screening pathway.
- Asymmetrical skin creases are **NO** longer part of the NIPE screen.

Timeliness of ultrasound scan of the hips for developmental dysplasia

From 1 April 2024 NIPE-SO4 states:

Number of babies for whom an outcome decision was made by 6 weeks of age born ≥34weeks and zero days (34+0) gestation and by 40+0 weeks corrected gestational age for babies born <34+0 gestation.

An outcome decision is either:

- Discharge from the hip screening pathway after review of normal hips ultrasound scan results.
- Attendance for clinical assessment by orthopaedic specialist.

The Trust do not have an in-house orthopaedic specialist available to review these babies if they are not suitable for discharge from the hip screening pathway. Therefore the Trust is unable to complete baby hip screening for DDH in-house as stated in NIPE-SO4. This means that the Trust are unable to meet the performance thresholds of:

- Acceptable level ≥90.0%
- Achievable level ≥ 95%.

One option is that all of these babies are referred to our tertiary centre for review – however, due to the nature of performing ultrasound before 6weeks of age, babies often have immature hips on their initial scan and this referral is subsequently found to be unnecessary.

Therefore, after review and consideration by the Family Health Care Group (formerly Women and Childrens Division), it has been decided that:

- Infants with screen positive results on new born clinical examination should attend for hip ultrasound scan by 2 weeks of age.
- If this scan result describes immature hip(s) a re-scan will be arranged in another 4 weeks by local agreement.
- If this scan still identifies concerns, then a referral will be made to the tertiary centre for orthopaedic specialist review.

Infants with NIPE hip risk factors should undergo hip ultrasound by 6 weeks of age. For timeliness of scan see below:

- 4 to 6 weeks of age for babies born ≥34 weeks.

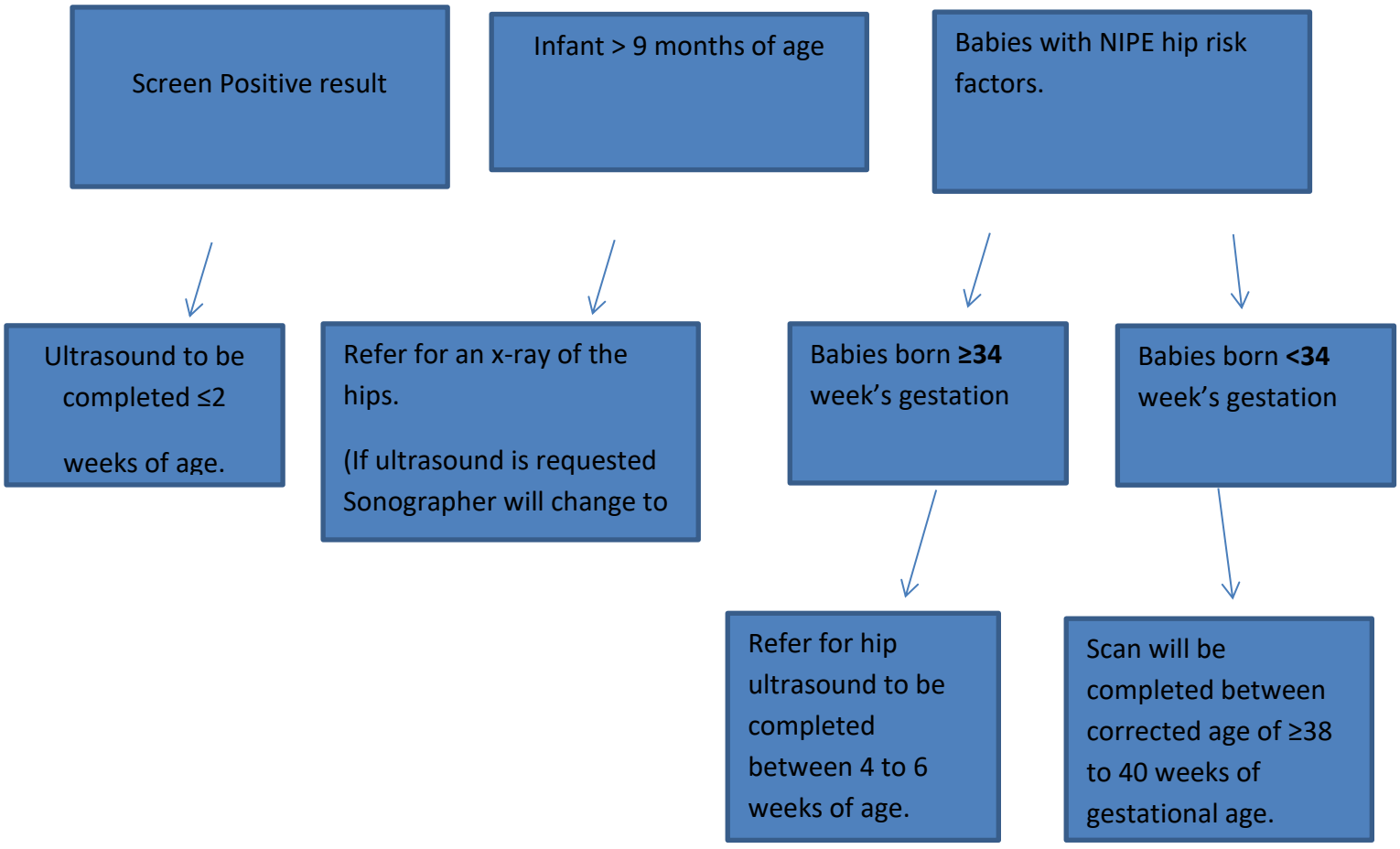
- 38 to 40 weeks corrected gestational age for babies born < 34 week's gestation.

If babies attend for ultrasound later than 6weeks of age and appear immature then a re-scan can be completed if possible by 10weeks of age. If concerns are identified, a referral will be made to the tertiary centre for orthopaedic specialist review.

If attendance is ≥10weeks and ≤9months of age and the ultrasound is abnormal then immediate referral by the trusts paediatric team to the tertiary centre for review is required.

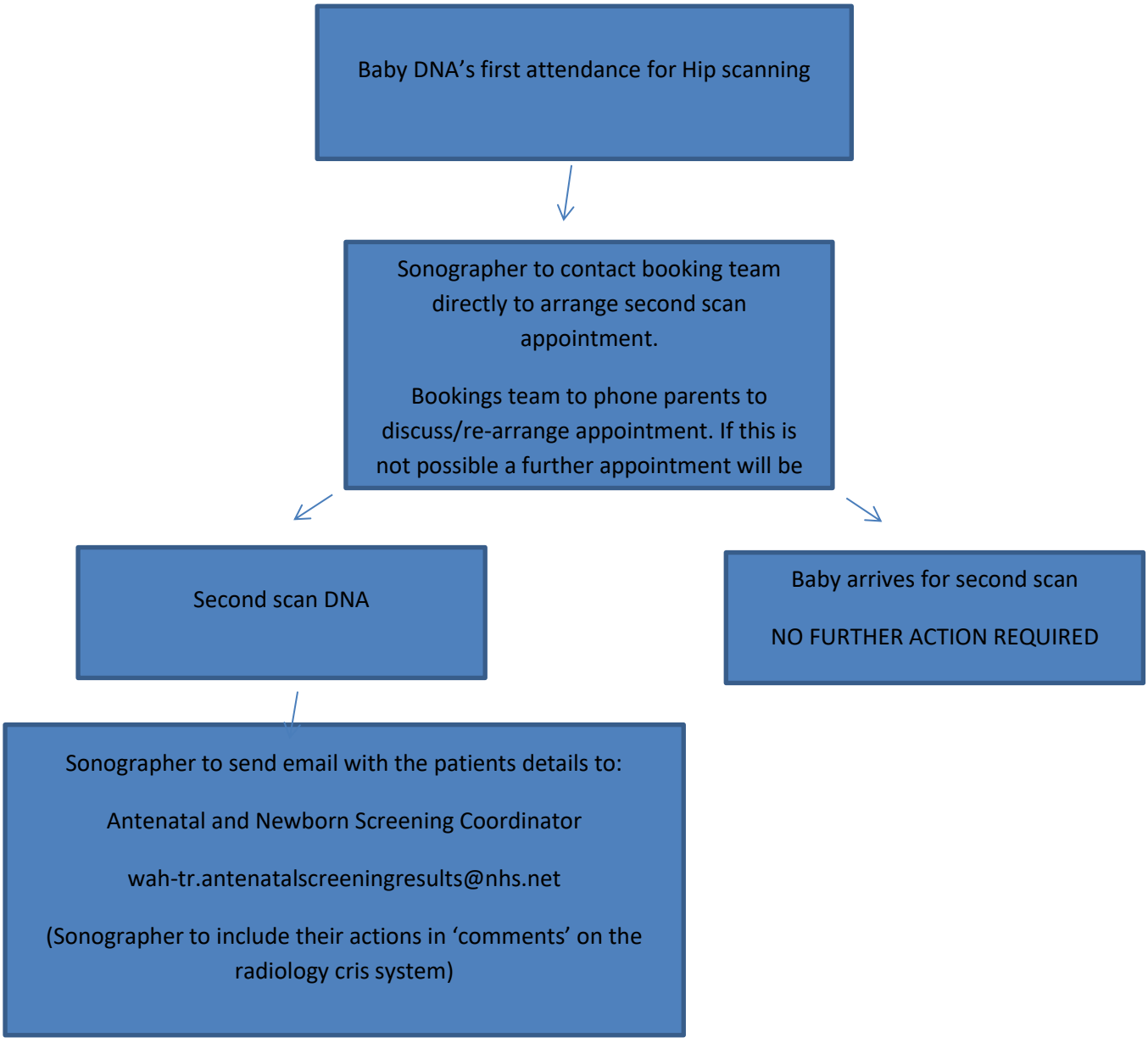
Time scale of Initial ultrasound referral for screening of the infant hip for Developmental Hip Dysplasia (DDH) and dislocated hip in high-risk infants.

ALL requests require justifiable history, EDD and gestational age at delivery. Insufficient/incorrect history – request rejected and Antenatal & Newborn Screening Co-ordinator notified:



Non-compliance /DNA pathway

- A missed appointment (DNA) will trigger one further re-scheduling discussed with the family by telephone where possible. If this is not possible then a further appointment will be arranged and letter sent.
- Ultrasound referral cancelled after any further unexpected non-attendance and Antenatal and Newborn Screening Coordinator informed by e-mail (wah-tr.antenatalscreeningresults@nhs.net).



Exclusions:

- Ultrasound performed only at request of Consultant Paediatrician. General Practitioner concerns to be referred to Paediatrics for assessment.
- Infant aged over 9 months to be referred for x-ray rather than ultrasound. The limiting factor is the calcification of the femoral head nucleus. Where ultrasound is not successful due to calcification of the femoral head nucleus, the request will be converted to x-ray by the scanning sonographer.

Limitations:

- Infant movement
- Calcification of the femoral head nucleus.

Repeat scans:

- Repeat scan for Graf indicated immature hip booked within 4 weeks. The time-frame of the repeat scan may be adjusted to allow the infant to **SEE** an orthopaedic Consultant by the age of 10 weeks when the hip remains immature for age (pathological).
- Follow-up scan arranged by the reporting sonographer.
- Booking team to escalate ultrasound request to hip sonographers where there is difficulty booking scan within the correct time frame.

Guidelines on obtaining, recording and reporting ultrasound images:

Equipment selection:

- Ultrasound machine with DDH Hip protocol pre-set.
- Appropriate linear transducer (high frequency).
- Graf patient support.
- Foot pedal.

Patient preparation:

- Ask parent/carer to remove infant's lower clothing articles (usually leave nappy on) and place infant in the support.
- Parent/carer to be in the scan room and aid infant during the scan.
- Second member of staff to aide in infant immobilisation/correct placement.

Training:

- All sonographers involved in paediatric hip scanning must complete a recognised Graf technique course prior to commencement of training.
- Sonographers to complete Trust training 'Safeguarding Children level 3'.

Vetting:

- All paediatric hip scans to be vetted by one of the paediatric hip trained Sonographers.

Scanning Protocol:

The Graf technique is a recognised method to obtain reproducible, standardised images of the infant hip. This is based on a coronal image and the use of measurements to qualify the coverage of the femoral head by bony and cartilaginous roof.

Graf Anatomical identification checklist:

Identification of all landmarks on the ultrasound image to avoid diagnostic error

1. Chondro-osseous border
2. Femoral Head
3. Synovial fold
4. Hip joint capsule
5. Acetabular labrum
6. Hyaline cartilage roof
7. Bony roof
8. Bony rim (turning point)

Graf Standard sequence: To ensure that the cartilage roof is identified and not forgotten. Lateral to medial

1. Labrum
2. Hyaline cartilage roof
3. Bony roof

Graf usability check/standard plane: Standardised cross section of hip joint to allow reproducibility for measurement

1. Lower limb of ilium
2. Plane (cross section through mid- portion of the bony roof)
3. Acetabular labrum

Measurement Protocol:

- Measurements must only be carried out in the Graf method 'Standard Plane', therefore images used must comply with the Graf anatomical and usability checklists. Alpha and Beta angles to be on image used for measurement.
- Measurement lines should be drawn on the images using the measurement package on the ultrasound equipment and saved to PACS
- May not be able to perform measurements if the hip is decentred or other abnormality detected. Attempt measurements if possible.

Recorded Images: To include -

- Name of patient
- Date of birth
- Left or right-side marker
- Two standard plane images of each hip (not repeat images)
- One image of each hip with measurement lines included.
- Scale of magnification 1.7: 1

Report: Provided by the scanning Sonographer, to include -

- Name of patient
- EDD and post gestational age (weeks/days)
- Description of the hip
- Graf type
- Alpha measurement to be recorded on all reports to one decimal place.
- Beta angle measurements to be recorded to one decimal place when Alpha measurement is <60 degrees.
- Details of re-scan interval when required.
- Referral recommended for expert consultation and treatment via orthopaedics at Birmingham Children's Hospital (BCH) where the hip is clearly abnormal (very shallow, or dislocated Graf type IIc,III or IV)
- Recommendation to re-scan within 4 weeks if hips are immature at 4-6 weeks of age. Advise referral to BCH if hip is abnormal on the review scan.
- ALL scan reports requiring BCH opinion/referral must be sent to the referrer as a significant finding 'S'.
- Include radiology statistics code.

Graf Descriptive report:

Type	Bony roof	Bony rim region	Cartilage roof
I	good	Angular/blunt	covering
II	deficient/adequate	round	covering
III	poor	flat	Displaced upwards
IV	poor	flat	Displaced downward

Bibliography:

- **Graf, R et al. (2014) Essentials of Infant Hip Sonography According to Graf. Sonocenter Stolzalpe**
- **WHAT –TP-047 Neonatal Guidelines Worcestershire key documents. Paediatric-Neonates Pathway (2015-2017) [**
- **Public Health England (phe screening.blog.gov.uk/2021/01/11) Standards and pathways are changing in NHS newborn physical examination screening (NIPE)**
- **Public Health England (2021) New-born and Infant Physical examination (NIPE) screening programme handbook [updated 28/4/21].** Newborn and infant physical examination (NIPE) screening programme handbook - GOV.UK (www.gov.uk)
- **BMJ Best Practice – Developmental Dysplasia of the hip,** Developmental dysplasia of the hip - Symptoms, diagnosis and treatment | BMJ Best Practice
- **WAHT – Neonatal Key documents: Congenital foot Deformities Local Guideline.**