



Place of Delivery for babies with antenatal diagnosis of Congenital Heart Disease

Issue Date: 1/10/21 (updated 3/10/23)

Next Review Date: 1/10/24

Objective

To ensure that babies with confirmed or suspected congenital heart disease, (CHD), are delivered in the most appropriate setting to allow the optimal management of their condition whilst maintaining care of the family as close to home as possible.

Summary of Guideline

Background

Around 8 per 1000 babies will have CHD. Some of these have duct dependent systemic or pulmonary circulations which mean they need urgent intervention after birth. A very small number will need emergency treatment within hours of birth. In the Y&H Network approximately 205 infants are born with critical congenital heart disease requiring intervention per year. It is important that wherever possible the right baby is delivered in the right place at the right time to optimize their outcome. These decisions need to be made on an individual case by case basis, directed by this guidance, but taking into account the specific cardiac anatomy, family circumstances, geographical location, past obstetric history and cot capacity.

Diagnosis

Around 60% of babies with significant CHD will be diagnosed antenatally. These will usually have been seen in the fetal cardiology clinic in Leeds Teaching Hospitals NHS Trust, (LTHT), on the basis of a family history, other genetic associations or an abnormality seen on the 18–20-week anomaly scan. The fetal cardiologist will work closely with the fetal medicine consultant or local obstetrician to communicate a plan for delivery. Within Leeds these cases will be discussed at the weekly fetal medicine meeting and the agreed plan for delivery communicated to the neonatal team by the attending neonatologist. These plans will be recorded on PPM, alongside a plan for immediate treatment and assessment after birth. Where delivery is planned outside of the Leeds Cardiac Centre, the fetal cardiologist will communicate with the local obstetrician +/- paediatrician with expertise in cardiology.

Time of Delivery

There is evidence of worse outcomes if babies with CHD are delivered even a few weeks early and so wherever possible delivery should be planned for full term or if booked delivery around 39+0 weeks. This date may need to be brought forward if there are specific fetal or maternal health concerns or a strong history of earlier onset of labour. Planned delivery of babies with significant duct dependant CHD, especially where immediate intervention might be anticipated should be Monday to Friday preferably during working hours where possible. Timing of delivery will be agreed and confirmed at the fetal medicine/fetal cardiology/neonatal MDT (Friday mornings).

Obstetric management

Close team working between fetal medicine and local obstetrician, fetal cardiology, neonatal team and genetics is essential - cases to be discussed at weekly MDT meeting. Major changes in plan must be communicated, consultant to consultant by letter or telephone depending on time frame and documented

on PPM and on local maternity records. The local obstetrician should be responsible for liaising with the local paediatrician if the baby is to deliver locally.

Maternity/obstetric care can normally be delivered locally until late third trimester or date of planned delivery, and should follow normal antenatal management similar to unaffected pregnancies. If there are fetal medicine or obstetric reasons to transfer care to LTHT earlier then the mother should be referred to Leeds by the local obstetrician. Aim for normal vaginal delivery unless obstetric indications, although delivery by elective LSCS should be considered for Transposition of the Great Arteries (TGA) or Hypoplastic Left Heart Syndrome (HLHS), if the septum is restrictive such that immediate septostomy may be required (this now has to be done in the catheter lab, which would require booking). This will be determined on a case-by-case basis by the fetal cardiologists and communicated to the fetal medicine and neonatal team via existing MDT structure.

Persistent fetal arrhythmias may make intrapartum fetal monitoring uninterpretable.

Place of Delivery




Advantages to Delivery in Leeds

- On site rapid access to paediatric cardiology team for cases that require this
- Eliminates need for postnatal transfer of baby and mother
- Reduced time to definitive postnatal confirmation of diagnosis
- Reduced time to intervention if required
- Reduces potential separation of mother and baby
- Reduces need to transfer out of the cardiac network

Advantages to Local Delivery

- Is suitable and safe option for many cases
- Maintains capacity in the Leeds Neonatal Unit which is a quaternary NICU with paediatric surgery and other specialist services taking referrals from a wide area
- Allows for unexpected earlier delivery and local management of obstetric or maternal emergencies
- Allows compassionate care close to home for palliative cases
- Maintains better family support
- Facilitates family links with local paediatrician- for on-going support including post operatively
- Builds up local expertise with managing CHD

Place of Delivery

-  Must be delivered in a Cardiac Centre
-  May be delivered locally in certain circumstances
-  Can usually be delivered in local hospital

1. Conditions that should always be delivered in Cardiac Centre

This will normally be in Leeds.

If there are significant **capacity issues** the Neonatal Admission SOP should be followed.

<http://www.lhp.leedsth.nhs.uk/common/guidelines/detail.aspx?ID=5806>

In the very rare cases where neonatal capacity cannot be created consideration should be made to deliver in Leeds but with neonatal management on PICU or in utero transfer to another cardiac centre. If an in-utero referral of a cardiac baby who was planned to be delivered in the cardiac centre cannot be accepted

in Leeds then the Embrace transport team will facilitate a conference call between the referring clinician (Consultant Obstetrician or Neonatologist) and the on-call Leeds Neonatologist and Paediatric Cardiologist to ensure an appropriate alternative plan is made. This may involve delivery locally, administering prostaglandin as required and post-natal transfer to the cardiac centre, or in very rare circumstances transfer out of the Y&H Cardiac Network (usually Alder Hey or Newcastle).

If planned delivery is delayed and mother lives outside Leeds consider admission to antenatal ward in Leeds whilst cot capacity is created.

If baby is born in local unit, discuss with Leeds paediatric cardiologist and Leeds neonatologist on call urgently via Embrace and consider starting prostaglandin infusion if duct dependent lesion suspected.

For advice only: Where clinical cardiology advice but not transfer is required, this should be via the Leeds Paediatric Cardiology Consultant on call. Where Neonatal advice is required, this should be to the Leeds Neonatal consultant on call, usually via Embrace. (Tel: 0845 147 2472)

Transposition of Great Arteries

- Even if Ventricular Septal Defect (VSD) (as may not allow adequate mixing)
- If restrictive atrial septum consider delivery by LSCS
Aim to deliver in morning, where possible, as septostomy will usually require catheter lab. (It should be noted that due to the unpredictability of labour and labour ward workloads that despite planning, morning delivery may not always be feasible.)

Left Heart Lesions (Duct dependent systemic circulation)

- Hypoplastic left heart syndrome (HLHS)
- HLHS with restrictive septum - deliver 'in hours' or LSCS
- Hypoplastic Aortic Arch
- Interrupted Aortic Arch
- Moderate or high suspicion of Coarctation (echo before Prostaglandin)

Duct dependant pulmonary circulation

- Pulmonary atresia (+/- VSD) (may require early stent)

Total Anomalous Pulmonary Venous Connection (TAPVC) - if veins obstructed will need urgent surgery, prostaglandin will not help.

Functional heart disease / severe arrhythmia

- Massive cardiomegaly (Cardiomyopathy, severe Ebstein's anomaly)
- Persistent tachyarrhythmia +/- hydrops fetalis
- Complete heart block with rate <55 (may need early pacing)

Other - requires individual case-by-case decision, by fetal cardiologist

- Complex congenital heart disease (e.g., Double Outlet Right Ventricle (DORV) with unbalanced ventricles)

- Co-existing multiple congenital anomalies including cardiac, (unless palliative care is planned) e.g., Oesophageal atresia/Hydrocephalus etc. This would not necessarily include a simple VSD

2. Conditions that may be delivered locally. Many will be suitable to deliver locally with early cardiology assessment, but some may require delivery in cardiac centre if complex. Individualised clinical assessment by fetal cardiologist will be made and plans made depending on individual anatomy and local expertise.

Parental expectation will need to be considered and managed.

Great vessel anomalies

- Common arterial trunk- depending on complexity and nature of lesion. Needs early assessment as can become unwell.
- Complex CHD with transposed great arteries - will depend on anatomy

Duct dependent pulmonary circulation

- Tetralogy of Fallot- may require delivery in cardiac centre if very small pulmonary arteries and likely to be duct dependent.
- Pulmonary Stenosis- may require early intervention
- Tricuspid Atresia - may not be duct dependant so could consider local delivery

Some other complex anatomy where the immediate neonatal course is expected to be good (e.g., DORV with balanced ventricles)

3. Conditions that can normally be delivered locally, with early PEC / outpatient Cardiologist involvement.

- Selected babies where palliative care is planned (see below)
- Large ventricular septal defect (VSD)
- AVSD with good function
- Simple Tetralogy of Fallot
- Right sided aortic arch
- Double aortic arch
- Intra-cardiac tumours not causing obstruction
- Heart block with rate >55
- SVT that has been controlled and hydrops absent or resolved.

4. Palliative Care

Where cardiac lesions are inoperable, a palliative care plan may be agreed. If there is no requirement for specialist cardiology input after delivery, then it may be appropriate to deliver in the local hospital close to home/hospice services. Postnatal guidance and support may be agreed in advance with the local PEC or neonatologist.

If there is any doubt about the need for postnatal intervention or urgent echocardiography immediately after birth then the baby should be delivered in the cardiac centre.

Audit and Monitoring Compliance

This guideline has been developed in conjunction with the Leeds Congenital Cardiology department and the Yorkshire and Humber Congenital Heart Disease Operational Delivery Network, (Y&H CHD ODN). It will be approved by the governance groups of both organisations and by the maternity and neonatology governance committees. Exception reporting of babies born in the wrong centre will be reviewed annually in conjunction with maternity services where appropriate.

Declarations of Interest

None

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Clinical Condition

Confirmed or suspected CHD

Target Patient Group

Newborn infants and pregnancies affected by CHD

Target Professional Group

Obstetricians

Midwives

Neonatologists

Neonatal Nurses & Advanced Neonatal Nurse Practitioners

Congenital Cardiologists

Congenital Cardiac Surgeons

Cardiac Specialist Nurses

References and Evidence Search Strategy

Expert consensus