Cord Blood Sampling Guideline

Specialty:	Maternity Services
Date Approved:	May 2026
Approved by:	Intrapartum Forum
Date for Review:	May 2029

Aim of policy and introduction

This document provides guidance for clinicians on the safe collection of cord blood samples and supports decision-making in ongoing clinical management. Paired cord blood gas sampling (arterial and venous) offers an objective assessment of the newborn's condition at birth. Arterial samples reflect the neonate's acid–base status, while venous samples provide information on maternal acid–base status and placental function. Together, these results help identify potential neonatal oxygen deficiency.

Criteria for cord gas analysis

NICE [1] does not recommend routine cord gas analysis for all births. However, selective sampling may result in missed opportunities to identify high-risk cases and infants with birth asphyxia. Local reviews of DATIX and ATAIN themes have highlighted recurrent gaps in the collection of paired cord gases.

To address this, it is now required that paired cord gases are obtained for all babies who were monitored with a CTG during labour.

Criteria for cord gases, but not limited to:

- **Any** baby that has had CTG monitoring in labour
- Unplanned caesarean birth (to include category 3)
- Instrumental births
- Any preterm birth <37/40
- Meconium stained liquor
- Shoulder dystocia
- Ante/intra partum haemorrhage
- Apgar <7 at 5 minutes
- Any baby born in poor condition (including Bay Birth Unit)
- Maternal temperature of ≥38°

It is expected that any baby not born in a good condition will have had cord gases performed.

Birth Occurring at Home or at Neath Birth Centre

Cord blood gas analysis is not available in home or freestanding midwifery units. These settings do not have immediate access to a blood gas analyser and delayed sampling following transport of a cord segment from community settings is not recommended as results may not reliably reflect the baby's condition at birth.

Obtaining paired cord samples

PLEASE DOUBLE CLAMP ALL CORDS, IRRESPECTIVE OF PLACE OF BIRTH, TYPE OF BIRTH, OR OUTCOME. This is important for cases where a newborn initially appears well but later demonstrates signs of deterioration.

You will need…

- 3 clamps (one for baby and two for the cord, as pictured)
- 2x pre-heparinised syringes and needle
- Gloves
- ID labels to identify samples

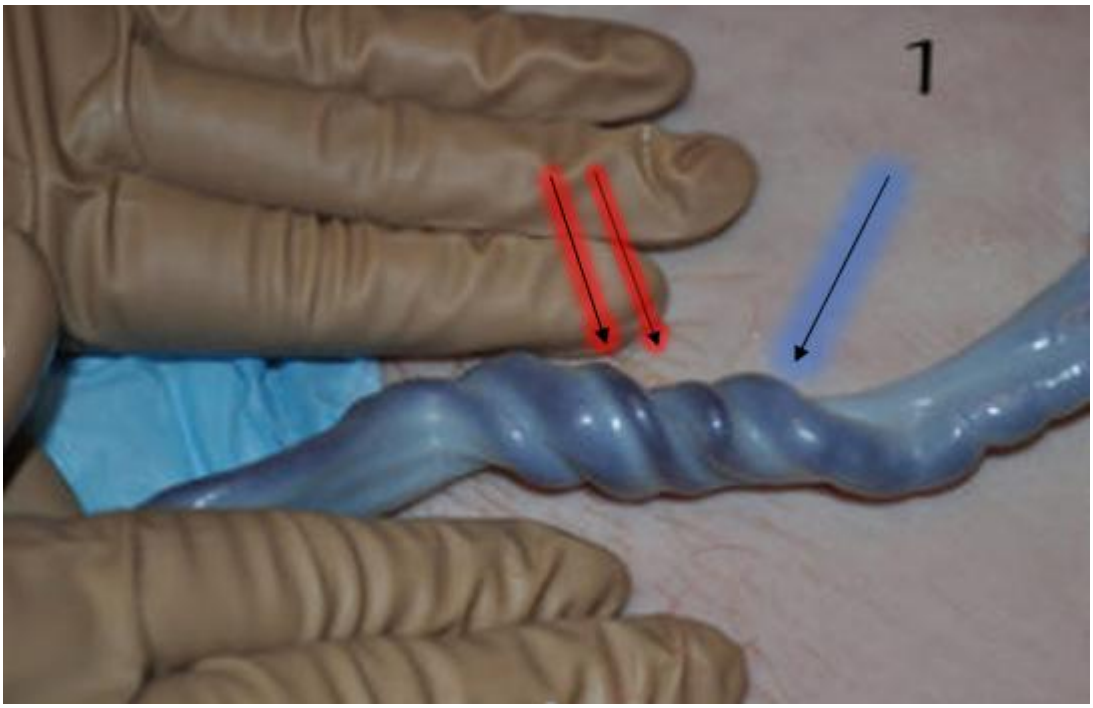
Both arterial & venous samples are required (paired cord sampling). The venous sample is used to confirm that there are two different samples from a vein and an artery.

The **Arterial** sample reflects the acid base status of the fetus.
It is used to diagnose metabolic acidosis, assess severity, and support decisions around early neonatal management.
The **Venous** sample reflects placental oxygenation and maternal acid–base status
Provides a comparison to ensure that the arterial sample was correctly taken (arterial and venous pH should differ by ≥0.03)

Image shows a double-clamped cord. Blood sampling occurs between the 2 forceps.

Process:

- Identify the segment of umbilical cord between the two clamps
- Insert a heparinised syringe needle at a shallow angle, and withdraw 1-2ml of blood from the artery first. (The vein should help to support the smaller arteries, aiding collection)
- Remove the needle and safely discard in sharps box
- Replace cap with stopper, and expel ALL the air from the syringe
- Repeat for the venous sample
- Analyse as soon as possible (see table below)
- Label and identify samples



Storage & processing:

Studies demonstrate that analysis accuracy falls from time of sampling to analysis and therefore it is recommended that samples are collected and analysed as soon as practically possible [2, 3]

Whether blood is kept in a syringe or in a double-clamped piece of the umbilical cord, the blood cell metabolism continues in the sample, and pCO_2 and lactate increase, and pH and pO_2 decrease [2, 3, 4, 5]

Recommendation

Double clamp all cords. Analyse the cord blood immediately, and as soon as practical to improve analysis accuracy [1]

Stage	Time allowed	Rationale
Cord blood inside a **double-clamped** cord segment (before sampling)	Ideally immediately, up to **60 minutes** at room temperature **2**[6, 7, 8]	More stable than in a syringe. By 60 minutes expect a - pH drop of 0.08mmol/l - base excess drop of 7.1 [3]
Blood drawn into a syringe for gas analysis	Ideally immediately; within **15 - 30 minutes** [9]	Prevents metabolic drift that alters pH, CO_2, base excess

Deferred cord clamping

Deferred cord clamping (DCC) is recommended as the optimal method of cord management for all infants with significantly improved outcomes for preterm (<34 weeks gestation) birth [1,10]. DCC provides significant neonatal benefits, including improved cardiovascular stability and reduced mortality for preterm birth, and at term with DCC 3-5 minutes improved iron stores and neurodevelopmental outcomes at 4 years of age [10.]

For babies born in good condition, immediate skin-to-skin contact should be initiated, and the umbilical cord should remain intact for a minimum of one minute before clamping. Although DCC may make cord sampling more challenging due to reduced residual cord blood following placental transfusion, both NICE and BAPM emphasise that **DCC remains the clinical priority**.

To support both DCC and the need for diagnostic sampling, umbilical cord blood samples can be obtained from the attached, unclamped cord immediately after birth**,** while the placenta remains in situ, for both term and preterm infants. Evidence demonstrates that this approach is safe, does not reduce the blood volume transferred to the baby, and does not compromise the accuracy of results.

Ranges

A VENOUS OR ARTERIAL pH <7.1 AND BASE DEFICIT OF > -12mmol/L

is suggestive of significant metabolic acidosis and increased risk of neonatal hypoxic ischaemic encephalopathy (HIE)

- Inform neonatal team & clarify management plan
- Commence hypoglycaemia pathway
- Complete Datix

Documentation

All staff must document results in both maternal AND neonatal notes, either by printing results or handwriting them. Document clearly:

- The cord gas results
- If a sample has been attempted but unable to be obtained
- It is a suspected duplicate sample

Please complete a DATIX when cord blood results suggest metabolic acidosis (as defined above) or if there are any equipment issues, and record the DATIX number in the notes.

Monitoring Compliance & Effectiveness

Information Category	Detail of process and methodology for monitoring compliance
Element to be monitored	Cord Blood Sampling
Auditable standards	
1	% of babies with intrapartum or immediate postnatal concerns who have paired cord gases recorded
2	% of indicated cases with both arterial & venous gases documented
3	% of cases with cord gas results in both mother and babies documentation
4	% cases where documentation is recorded as attempted (if not obtained)

References

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Maternity Services

Checklist for Clinical Guidelines being Submitted for Approval

Title of Guideline:	Cord Blood Sampling Guideline
Name(s) of Author:	Catrin Elis
Chair of Group or Committee approving submission:	Intrapartum forum
Brief outline giving reasons for document being submitted for ratification	
Details of persons included in consultation process:	
Name of Pharmacist (mandatory if drugs involved):	
Issue / Version No:	2
Please list any policies/guidelines this document will supercede:	Cord Blood sampling 2023
Date approved by Group:	May 2026
Next Review / Guideline Expiry:	May 2029
Please indicate key words you wish to be linked to document	cord, cord gases, cord blood sampling