Cord Blood Analysis

Classification :	Guideline
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Departments/Group this Document applies to:	Maternity

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Guideline to be followed by (target staff): Obstetricians and Midwives

To be read in conjunction with the following documents:

Are there any eCARE implications? No

CQC Fundamental standards:
Regulation 9 – person centred care
Regulation 10 – dignity and respect
Regulation 11 – Need for consent
Regulation 12 – Safe care and treatment
Regulation 13 – Safeguarding service users from abuse and improper treatment
Regulation 14 – Meeting nutritional and hydration needs
Regulation 15 – Premises and equipment
Regulation 16 – Receiving and acting on complaints
Regulation 17 – Good governance
Regulation 18 – Staffing
Regulation 19 – Fit and proper

Disclaimer

Since every patient's history is different, and even the most exhaustive sources of information cannot cover every possible eventuality, you should be aware that all information is provided in this document on the basis that the healthcare professionals responsible for patient care will retain full and sole responsibility for decisions relating to patient care; the document is intended to supplement, not substitute for, the expertise and judgment of physicians, pharmacists or other healthcare professionals and should not be taken as an indication of suitability of a particular treatment for a particular individual.

The ultimate responsibility for the use of the guideline, dosage of drugs and correct following of instructions as well as the interpretation of the published material **lies solely with you** as the medical practitioner.

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Guideline Statement

- Provide a rationale for undertaking cord blood analysis.
- Reiterate important points to remember when taking cord blood.
- Outline situations which require cord blood analysis.
- Provide normal blood gas values for comparison.

Executive Summary

Umbilical cord blood gas and acid base assessment provide information about a baby's respiratory and metabolic status. It is recommended in all high risk deliveries. The degree to which blood gas results vary from normal limits helps staff to understand the effectiveness of organ function and the ability of the baby to compensate for acute or chronic changes at the moment of birth.

To understand the significance of these changes it is necessary to look at the normal values and limits.

To ensure that cord blood sampling is undertaken in line with the evidence-based practice, both arterial and venous cord pH, pO2, pCO2 and base deficit should be measured.

1.0 Roles and Responsibilities:

For use by midwives and obstetricians in order to make evidence based decisions when caring for labouring women, whose babies fall under the criteria for Cord blood analysis.

2.0 Implementation and dissemination of document

This Guideline is available on the Intranet and has followed the Guideline review process prior to publication

3.0 Processes and procedures

3.1 Rational for obtaining cord blood

Paired cord blood gases should not be taken routinely. They may be taken when there has been concern about the baby either in labour or immediately following birth.

When to cut the umbilical cord has long been debated and the RCOG recommends that the time at which the cord is clamped should be recorded; "Timing needs to be based on clinical assessment and the cord should not be clamped earlier than necessary.

An additional clamp to facilitate double clamping of the cord, if indicated, should be available for all birth settings. (NICE,2014 updated 2017,CG190,Section 1.15.5)

Cord blood MUST always be obtained in the following:

- All emergency caesarean sections and instrumental births
- Delivery for presumed ' fetal distress'
- Shoulder dystocia
- If a FBS has been performed during labour
- Following birth if the baby's condition is poor (low apgars = to / less than 7)
- Significant meconium stained liquor present
- APH/Abruption
- Preterm birth
- Multiple pregnancy
- Pyrexia in labour

Note:

If baby is unexpectedly born with possible signs of neonatal compromise, admitted to NNU or pregnancy is complicated (e.g., preterm / stillborn / abruption / chorioamnionitis), send placenta for histology.

The neonatal and obstetric team will work together to explain as soon after the birth as possible the cord blood analysis results; and provide appropriate support and information to the parents.

3.2 Method

If it has been necessary to do a fetal blood sample during labour, then at delivery, cord pH should be performed as soon as possible after delivery and no later than 30 minutes;

- Cord blood analysis should be assessed by collecting paired samples from the umbilical artery (UA) and umbilical vein (UV) of a segment of cord that has been double clamped to isolate it from the placenta.
- The sample (segment of cord) must be at least 15cm long, it is important to ensure that the cord segment is full of blood, by milking the cord from the placenta if necessary, before clamping.

Using heparinised syringes

- Take blood from the artery first (reflects the fetal status) and then the vein (reflects the maternal-acid base status and placental function).
- Remove all air bubbles from the samples by gently rolling the syringe between the fingers.
- Analyse the samples as soon as possible after collection.

There are blood gas analysers in NNU and in Phase 1 Theatres which should be used for all theatre cases but can also be used if the analyser on Labour Ward is out of order.

3.3 Results:

Check results are compatible with one arterial and one venous sample by ensuring that the:

- Arterial pH is less than the venous pH (by at least a difference of 0.022units) and
- Arterial pCO2 is greater than the venous pCO2(by at least a difference of 5.3mm Hg)

All results should be recorded in mother's and baby's notes.

The actual pH measurements can be taken at any time in the following 15-20 minutes, allowing birth attendants the opportunity to deal with the immediate needs of mother and baby.

3.3.1 Normal blood gas values

A wide pH range is quoted in literature for acidaemia, but there is general consensus that a cord artery pH < 7.00 is significantly correlated with poor neonatal outcome.

At Term	pH	Base Excess mmol/L	pO_2 mm Hg	pCO_2 mm Hg
UA	7.10-7.38	-9.0 to 1.8	4.1 to 31.7	39.1 to 73.5
UV	7.20-7.44	-7.7 to 1.9	30.4 to 57.2	14.1 to 43.3

3.3.2 Documentation of the Cord Gases:

The paired sample results must be recorded in the mother's and the baby's notes, and at the end of the CTG on the CTG sticker. These results are also recorded on the ECare system. The actual pH measurements should be taken as soon as possible following delivery (and no later than 30 minutes) and the paediatrician informed of the results. The results should be secured in the maternity records in the designated area.

4.0 Statement of evidence/references

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5.0 Governance

5.1 Document review history

Version number	Review date	Reviewed by	Changes made
5	09/2020	Piyal Perera	

5.2 Consultation History

Stakeholders Name/Board	Area of Expertise	Date Sent	Date Received	Comments	Endorsed Yes/No
Matrons			May 2017	No comments	Yes
Head of Midwifery			May 2017	No comments	Yes
Consultant Midwife and Matrons			May 2017	No comments	Yes
Consultants			May 2017	No comments	Yes
Registrars/SHO and Midwives			May 2017	No comments	Yes
Julie Cooper	Head of Midwifery	09/2020	09/2020	What is high risk?	Yes
Jayne Plant	Library	10/2020	10/2020	Reference in put	Yes

5.3 Audit and monitoring

Audit/Monitoring Criteria	Tool	Audit Lead	Frequency of Audit	Responsible Committee/Board
To monitor the amount of cord gases processed and a Datix form to be completed for incidents (E.g. blood gas analyzer out of order)	Statistics	Matrons	Bi-monthly	Labour Ward Forum, Risk meetings, divisional meetings

5.4 Equality Impact Assessment

As part of its development, this Guideline and its impact on equality has been reviewed. The purpose of the assessment is to minimise and if possible remove any disproportionate impact on the grounds of race, gender, disability, age, sexual orientation, religion or belief, pregnancy and maternity, gender reassignment or marriage and civil partnership. No detriment was identified. Equality Impact assessments will show any future actions required to overcome any identified barriers or discriminatory practice.

Equality Impact Assessment			
Division	Women's and Children's	Department	Maternity
Person completing the EqIA	Piyal Perera	Contact No.	
Others involved:	MR Mulki	Date of assessment:	03/02/2021
Existing policy/service	Yes	New policy/service	No

Will patients, carers, the public or staff be affected by the policy/service?	Yes
If staff, how many/which groups will be affected?	

Protected characteristic	Any impact?	Comments
Age	NO	Positive impact as the policy aims to recognise diversity, promote inclusion and fair treatment for patients and staff
Disability	NO	
Gender reassignment	NO	
Marriage and civil partnership	NO	
Pregnancy and maternity	NO	
Race	NO	
Religion or belief	NO	
Sex	NO	
Sexual orientation	NO	

What consultation method(s) have you carried out?
Emails, teams,governance meetings in maternity
How are the changes/amendments to the policies/services communicated?
Email and meetings
What future actions need to be taken to overcome any barriers or discrimination?

What?	Who will lead this?	Date of completion	Resources needed
Review date of EqIA	03/02/2021		