Milton Keynes University Hospital NHS Foundation Trust

Guideline

Title: Cord Blood Analysis

Classification :	**Guideline**		
Authors Name:			
Authors Job Title:	**Obstetric Registrar**		
Authors Division:	**Womens and Childrens**		
Departments/ Groups this Document Applies to:	**Maternit**		
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Scope: Obstetricians and Midwives	**Document for Public Display:** No	
To be read in conjunction with the following documents:		
Required CQC evidence? Yes	**Key CQC Question:** Safe/Effective/Responsive/Caring/Well Led	

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.

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

- 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; if a delay is anticipated place the capped syringes in ice or cold water.

In the event of the blood gas analyser being out of order, the samples will be need to kept cool i.e. in cold water, ice or fridge until transported to the lab. They will require the baby's details on them including MRN therefore the baby will need to be registered. The biochemist should be informed that the analyser is not functioning and that the samples are on their way to the lab. These will need to be transported within 30 minutes. A datix should be generated regarding the faulty equipment.

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

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

4.0 Statement of evidence/references

Statement of evidence:

National Institute for Health and Clinical Excellence (NICE) (2016*) Intrapartum care for healthy women and babies* Clinical guideline [CG190] London. NICE

National Institute for Health and Clinical Excellence (NICE) *Clamping of the Umbilical Cord and Placental Transfusion* (Scientific Impact Paper No. 14) London. NICE.

References:

Plymouth Perinatal Research Group (1994-2000) *Umbilical Cord Blood Sampling & Expert Data Care.* Available from: http://www.k2ms.com

Wong, L. & Maclennan. (2011). *Gathering the evidence: Cord gases and placental histology for births with low Apgar scores*. Australian and New Zealand Journal of Obstetrics and Gynaecology. 51, 17-21.

Harris, M., Beckley S.L., Garibaldi, J.M. et al. (1996). *Umbilical cord gas analysis at the time of delivery*. Midwifery.12:146-50.

5.0 Governance

5.1 Record of changes to document

Version number: 5		**Date:**		
Section Number	**Amendment**	**Deletion**	**Addition**	**Reason**

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

5.3 Audit and monitoring

This Guideline outlines the process for document development will be monitored on an ongoing basis. The centralisation of the process for development of documents will enable the Trust to audit more effectively. The centralisation in recording documents onto a Quality Management database will ensure the process is robust.

Audit Criteria	Tool	Audit Lead	Frequency of Audit	Responsible Committee	How changes will be implemented	Responsibility for Actions
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	Action plan to be developed	Matrons

5.4 Equality Impact Assessment

This document has been assessed using the Trust's Equality Impact Assessment Screening Tool. No detailed action plan is required. Any ad-hoc incident which highlights a potential problem will be addressed by the monitoring committee.

Impact	Age	Disability	Race	Gender	Religion or Belief	Sexual Orientation
Do different groups have different needs, experiences, issues and priorities in relation to the proposed Guideline?	No	No	No	No	No	No
Is there potential for or evidence that the proposed Guideline will not promote equality of opportunity for all and promote good relations between different groups?	No	No	No	No	No	No
Is there potential for or evidence that the proposed Guideline will affect different population groups differently (including possibly discriminating against certain groups)?	No	No	No	No	No	No
Is there public concern (including media, academic, voluntary or sector specific interest) in potential discrimination against a particular population group or groups?	No	No	No	No	No	No