

Fetal monitoring, competency and assessment: A best practice toolkit

Aim

To reduce intrapartum stillbirths and hypoxic-ischaemic encephalopathy by improving multidisciplinary competency in fetal monitoring during labour.



This toolkit has been produced as part of the London Maternity Strategic Clinical Network's strategy to identify best practice for implementation across all maternity units in the capital, ensuring equally good outcomes for all pregnant women and their babies.

A priority for the network is to reduce both the number of stillbirths in London and the incidence of avoidable harm during the intrapartum period. It is recognised that poor intrapartum fetal outcomes are the result of many factors and that focusing on one only will not provide a universal solution. However, this toolkit provides a framework in relation to the training and assessment of competency of staff in fetal monitoring, including intermittent auscultation (IA) and cardiotocography (CTG), as this is an area where the evidence suggests performance is variable and can be improved¹.

It is anticipated that over time the requirements of this document will align with internal management and communication mechanisms such as labour ward forums and annual reviews.

Description

The basic principle of intrapartum fetal monitoring is to identify hypoxia before it is sufficient to lead to long term poor neurological outcome for babies.

Background

Guidance on fetal monitoring has been available for a number of years and recommendations cover clinical assessment, measuring fetal heart rate, the use of continuous electronic fetal monitoring and record keeping.

It is now recognised, in line with the evidence and recommendations, that for women entering labour at low risk of developing intrapartum complications, IA should be the method of monitoring that is used and the indications for changing from IA to continuous CTG include risk factors for IP fetal hypoxia, clinical factors and maternal choice².

The Royal College of Obstetricians and Gynaecologists (RCOG) has also recently established a national quality improvement programme to bring together the results and recommendations of local incident investigations concerning stillbirths, neonatal deaths and brain injuries in order to share learning and improve practice at a national level³.

Rationale

A key objective for the health service is to reduce the incidence of avoidable harm and improve safety during the intrapartum period⁴, and it is evident that there is a need to increase competence and reduce variation in the standards of fetal monitoring to meet this goal.

The NHS Litigation Authority's *Ten years of maternity claims*⁵ highlighted that from 1 April 2000 to 31 March 2010, there were 300 claims relating to CTG interpretation at a value of £466 million. The main allegations within the claims focused on the failure of healthcare professionals to recognise an abnormal CTG and act on it, and failure to refer appropriately and document sufficiently.

A review of all intrapartum stillbirths in London several years later, from 2008 to 2013, suggested that failure to recognise fetal hypoxia indicated by CTG abnormalities was a factor in over one-third of cases reviewed¹. Issues included recording maternal pulse instead of fetal heart rate and failure to correctly interpret CTG traces¹. There is also wider evidence to suggest that auscultation skills are variable and CTG is reverted to unnecessarily⁶.

Such findings have promoted the importance and endorsement of multidisciplinary surveillance training. A recent Maternity Strategic Clinical Network survey confirmed that CTG training is considered mandatory by all London trusts.

This then raises the question of why failure to correctly interpret fetal monitoring in these situations is so prevalent; possible answers include training assessment packages that are ineffective or are not accessed by all relevant staff. We know that there are differences across London in terms of fetal monitoring training content, frequency of completion and there is significant variation in the number of trusts expecting staff responsible for intrapartum fetal monitoring to provide objective evidence that they are competent in the interpretation and management of CTG⁷.

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In the absence of a national standard for training content and competency testing, this document represents a consistent approach to fetal monitoring, competency and assessment in London. It is applicable to all staff caring for women in labour.

Whilst this might be difficult to implement, particularly for agency staff, the need to ensure that staff who do not routinely work in the unit are competent, makes this all the more important to achieve.

Recommendations for action

Training and competency testing

Each unit must ensure that resources and time are made available to facilitate fetal monitoring training and verify that all staff caring for women in labour:

- » Complete a comprehensive training package on intrapartum fetal monitoring including IA and CTG interpretation.
- » Undergo an annual assessment on CTG interpretation following training.
- » Have passed the relevant CTG interpretation assessment to be deemed safe to care for women in labour.
- » Undertake and pass mandatory annual updates on CTG interpretation – no member of staff should care for women in any birth place setting without evidence of passing an annual update.
- » Keep accurate records of compliance in line with the NICE guideline² (see section 1.10, *Record keeping in guideline*).

Currently we are unable to identify assessment packages relating to IA; we cannot therefore mandate for annual assessment until methods to achieve this become available.

It is recommended that CTG competency testing is conducted at the same time as annual fetal monitoring training and a pathway should be in place locally to include support and re-training for staff who have not undertaken or passed a mandatory CTG training and interpretation annual update.

Principles of fetal monitoring training content

As a minimum annual training should include the following⁹:

- » Teaching about fetal physiological responses to hypoxaemia, the pathophysiology of fetal brain injury, and the physiology underlying changes in fetal heart rate. In addition, the impact of factors such as fetal growth restriction and maternal pyrexia.
- » Effective fetal monitoring in low risk pregnancies, including the role of intermittent auscultation at initial assessment, in established labour and indications for changing from IA to CTG.
- » Use of CTG including:
 - Normal CTG;
 - Impact of IP fetal hypoxia on the fetal heart rate (FHR);
 - Significance of abnormal CTG patterns;
 - Interpretation in specific clinical circumstances (such as previous caesarean sections, breech, multiple pregnancy).
- » Interventions that can affect the FHR (such as medication) and those that are intended to improve the FHR (such as oxygen).
- » Additional tests of fetal wellbeing that help clarify fetal status and reduce the false positive rate of CTG.
- » Documentation of traces and their storage.
- » Channels of communication to follow in response to a suspicious or pathological trace, risk management strategies including governance and audit.
- » Application of NICE fetal monitoring recommendations for low risk women.

Types of CTG competency testing available and methods for maintaining standards

There a number of ways in which competency can be assessed and these are outlined below. The aim of this toolkit is to establish the principle of competency assessment in London units, rather than to be prescriptive about the methods used.

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The principle is that whatever method used provides assurance to maternity services and those who use them that the staff are competent to identify and act upon evidence of fetal hypoxia.

- » Online learning packages such as the RCOG and the Royal College of Midwives' (RCM) eFM package (free access to NHS staff), K2 and PROMPT include situation based competency testing and case studies.
- » We were unable to identify widely available simulation based training/competency packages that could be used as part of skills and drills training. We are aware that they are being developed by individual units and consider it likely that these will constitute a vital tool because of their ability to replicate the complexities of the clinical environment.
- » Continued professional development, such as RCM accredited CTG master classes.
- » Weekly multidisciplinary team (MDT) CTG review meetings or workshops covering interpretation.
- » Multidisciplinary clinical audits focusing on maternal and prenatal outcomes in relation to intrapartum fetal heart rate monitoring.
- » In house workshops or study days.
- » One to one competency testing.
- » All staff should be expected to meet the same baseline level of competence. It is accepted that beyond this some staff would go on to develop extended skills in fetal assessment.

Intermittent auscultation

Although guidance is available on the frequency and principles of IA, there are no standardised methods for assessing and evaluating competency in the use of intermittent auscultation.

Recommendations for action

Buddy system

- » Each unit should have a CTG categorisation buddy system (such as 'fresh eyes') in place for the interpretation of cardiotocograph recording and auscultation whereby tracings are viewed by more than one person.
- » Each unit should ensure that there is a protocol for escalation in place if concerns are raised, and all staff are trained in the escalation system.
- » There should be clear guidance for the buddy system and it should cover what to do when disagreement over categorisation occurs.

Key factors to aid successful local implementation

- » Nominate a local champion in the unit (a medical and midwifery lead) to provide local leadership.
- » Conduct a regular audit of compliance and feedback to staff.
- » Record all relevant intrapartum events, admissions to the neonatal unit and intrapartum deaths.
- » Monitor caesarean section rate.

Auditable standards

Each unit should audit the percentage of staff who have received training on IA and CTG interpretation, are deemed competent in IA and CTG interpretation and have successfully completed the mandatory annual competency test.

We propose that the only appropriate standard be that all staff working in birth settings can demonstrate evidence of competence to monitor fetal wellbeing during labour (within the last year). This should include temporary staff such as locum doctors and agency midwives.

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Appendices

Further resources to support this toolkit are available in the appendices which include:

- » *Appendix 1 - Fetal monitoring case study from St George's University Hospitals NHS Foundation Trust*

References

1. London Maternity Strategic Clinical Network, (2014), *Review of intrapartum stillbirths, 2008 – 2013*.
2. National Institute for Health and Care Excellence. CG190 (2014). *Intrapartum care: Care of healthy women and their babies during childbirth*. London: NICE | <http://bit.ly/1YtM0zo>
3. Royal College of Obstetricians and Gynaecologists, *Each baby counts* <https://www.rcog.org.uk/eachbabycounts>
4. NHS England, (2014), *Stillbirth care bundle* | <http://bit.ly/1YypOi1>
5. NHS Litigation Authority (2012), *Ten years of maternity claims: An analysis of NHS Litigation Authority data* | <http://bit.ly/1mfxJVm>
6. Harding, C (2014). *Intelligent auscultation - 'listen' for fetal wellbeing*, NICE Shared Learning Database | <http://bit.ly/1ZmXulf>
7. London Maternity Strategic Clinical Network, (2014) *Fetal monitoring survey*.
8. NHS Wales Shared Services Partnership, All Wales Approach to Competency in Respect of Electronic Fetal Monitoring (EFM) | <http://bit.ly/1V2D3HK>
9. Royal College of Obstetricians and Gynaecologists and Royal College of Midwives (2015) *EfM elearning resource* | <http://bit.ly/1Pi7jMw>

Further reading

10. Harding, C (2012). How to listen to fetal wellbeing, *Midwives magazine*, Issue 4, 18 July 2012 | <http://bit.ly/1OkU80i>
11. Royal College of Anaesthetists, Royal College of Midwives, Royal College of Obstetricians and Gynaecologists, Royal College of Paediatrics and Child Health (2007). *Safer childbirth: Minimum standards for the organisation and delivery of care in labour* | <http://bit.ly/1Pk97Xd>
12. Chandharan, E et al (2013) Effectiveness of 'George's intrapartum monitoring strategy' on operative delivery and perinatal outcomes at a teaching hospital in London: A five year experience, presented at 18th World Congress On Controversies in Obstetrics Gynaecology and Infertility.

Appendix 1: Case study

St George's University Hospitals NHS Foundation Trust

Approach to fetal monitoring training and competency testing

Aim

- » To improve understanding of intermittent auscultation and CTG interpretation by educating staff in fetal physiology and pathophysiology and ensuring an appreciation of the intrapartum hypoxic process and how this may influence the features of the fetal heart rate.
- » Introduce a mandatory electronic fetal monitoring (EFM) competency assessment for midwives and obstetricians to identify areas for improvement and improve patient outcomes.

Outcome measures

- » Monitor emergency caesarean section rate
- » Monitor hypoxic ischaemic encephalopathy (HIE) rates
- » Monitor serious incidents (SIs) where fetal monitoring interpretation is identified as a factor

Challenge	Proposed solution
A need to provide consistent and comprehensive training	<ul style="list-style-type: none"> » Dedicate a midwife as a CTG specialist to lead on teaching. Works closely with consultant obstetricians with a particular interest in intrapartum fetal monitoring. » Introduction of full day study days for midwives to allow time to improve understanding and reinforce key principles. » Obstetrician's induction to include CTG/STAN training. » Provision of an online training package that can be accessed from home or work to encourage further updating. » Weekly multi-disciplinary CTG meetings with use of a projector to engage staff and facilitate group discussion. » Providing suitable examples from clinical practice: case scenarios with positive and negative outcomes with clear take-home message.
Need for a clear pathway for support in the event of staff being unsuccessful at assessment whilst maintaining patient safety.	<ul style="list-style-type: none"> » Development of a policy for <i>Competency in fetal monitoring</i>. » Supervisors of midwives and managers involved in development of the policy to ensure support, and trained and assessed in the initial stages. » CTG midwife available for one-to-one teaching sessions as required.
Classroom based teaching consolidated by frontline support	<ul style="list-style-type: none"> » CTG midwife regularly works clinically on delivery suite as part of the team. » All delivery suite co-ordinators to be trained and assessed as competent prior to rollout of universal testing. » Central monitoring system on delivery suite to encourage ad hoc teaching using real-time cases. » Daily consultant review of emergency LSCS with feedback to individuals involved as appropriate.
Managing staff anxiety around formal assessment	<ul style="list-style-type: none"> » Emphasise that the learning process is the focus, not the testing process. » Open approach to encourage questioning and respecting other points of view. » Acknowledge that the quality of education may have been poor/confusing up to this point and this may take a while to resolve. » Reassure that all grades of staff are required to complete assessment, and ensure managers/SOMs/lead midwives have completed the process first as they will then be in a position to provide on-going support. » Ensure availability of follow-up sessions tailored to the individual learner.

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St George's University Hospitals NHS Foundation Trust

Approach to fetal monitoring training and competency testing

Funding for the CTG specialist role was fully supported by management and was initially (1x) 0.5 WTE band 7 midwife. **It has always been considered crucial that anyone who facilitates EFM education has a presence on the delivery suite in their own right.** This has several advantages: encourages consistency between classroom education and clinical practice; enhances credibility of facilitators; ensures facilitators have a real appreciation of challenges facing frontline staff; improves opportunities for integrated discussion of overall intrapartum management and appreciation of the whole clinical picture rather than viewing fetal monitoring as a stand-alone subject.

It was recognised that there is no specific training in EFM, but the CTG specialist midwife would need to have an understanding extending beyond application of the NICE guidelines. This had to include understanding the relevant physiology/pathophysiology and applying an understanding of intrapartum hypoxia and other situations associated with poor fetal outcome (chronic hypoxia/chorioamnionitis etc). At St. George's, it also required expertise in the use of fetal ECG (STan).

Competency testing began around 10 years ago, initially with STan assessment as per the manufacturer's guidelines. We then introduced our own CTG assessment in 2008, rolling it out widely in 2009. The needs of the unit have changed over this time. For example, the majority of staff no longer need a full yearly study day and instead have a half-day update; however, other study days are arranged as and when there is a need (for example, for a large group of staff new to the trust).

Outcome data

There was a 50 per cent reduction in the number of our serious incidents from 2012 to 2014 as compared from 2010 to 2012. In addition, we did not have any serious incidents pertaining to CTG misinterpretation during the last three years.

Our emergency caesarean section rate halved from 15 per cent in 2009 to 8 per cent in 2013. For the last two years our emergency caesarean section rate has remained between 6-9 per cent, which is half the reported rate for any London teaching hospital. In addition, our HIE rate has been half the national average in 2013 and 2014. Due to physiology-based CTG interpretation, consideration of types of hypoxia and intensive hands-on training on operative vaginal birth, our emergency caesarean sections for failed instrumental delivery in second stage of labour is also less than half the nationally reported rate.

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