

Imperial College
London

The RCOG/RCM ABC initiative to improve intrapartum care

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each baby COUNTS.

2015 full report



October 2017

<https://www.rcog.org.uk/eachbabycounts>

- Adverse outcome 1136
- Intrapartum SB 126
- Early NND 156
- Severe brain injury 854

- Adequate quality review in 727
- Substandard care in 552 (76%)





each baby COUNTS.

2018 progress report



November 2018

<https://www.rcog.org.uk/eachbabycounts>

- Adverse outcome 1123
- Intrapartum SB 124
- Early NND 145
- Severe brain injury 854

- Adequate quality review in 955
- Substandard care in 674 (71%)



each baby COUNTS.

2019 progress report



March 2020

<https://www.rcog.org.uk/eachbabycounts>

- Adverse outcome 1130
- Intrapartum SB 130
- Early NND 150
- Severe brain injury 850
- Adequate quality review in 1041
- Substandard care in 674 (72%)



each baby COUNTS.

2020 final progress report



March 2021

<https://www.rcog.org.uk/eachbabycounts>

- Adverse outcome 1145
- Intrapartum SB 121
- Early NND 165
- Severe brain injury 859

- Adequate quality review in 687 (Covid restricted)
- Substandard care in 508 (74%)



Each baby counts 2015

- Fetal monitoring a factor in 409 (74% of those with substandard care)
- At fault:
 - CTG interpretation 294 (72%)
 - Auscultation 68 (17%)
 - Both in 47 (11%)



Each baby counts 2015 (p57)

- Average 6 risk factors per case
- p 57 - When reviewing a CTG, identification and consideration of risk factors must become standard practice:
 - reduced fetal movements
 - FGR
 - previous CS
 - thick meconium
 - suspected infection
 - vaginal bleeding
 - prolonged labour



Each Baby Counts 2019

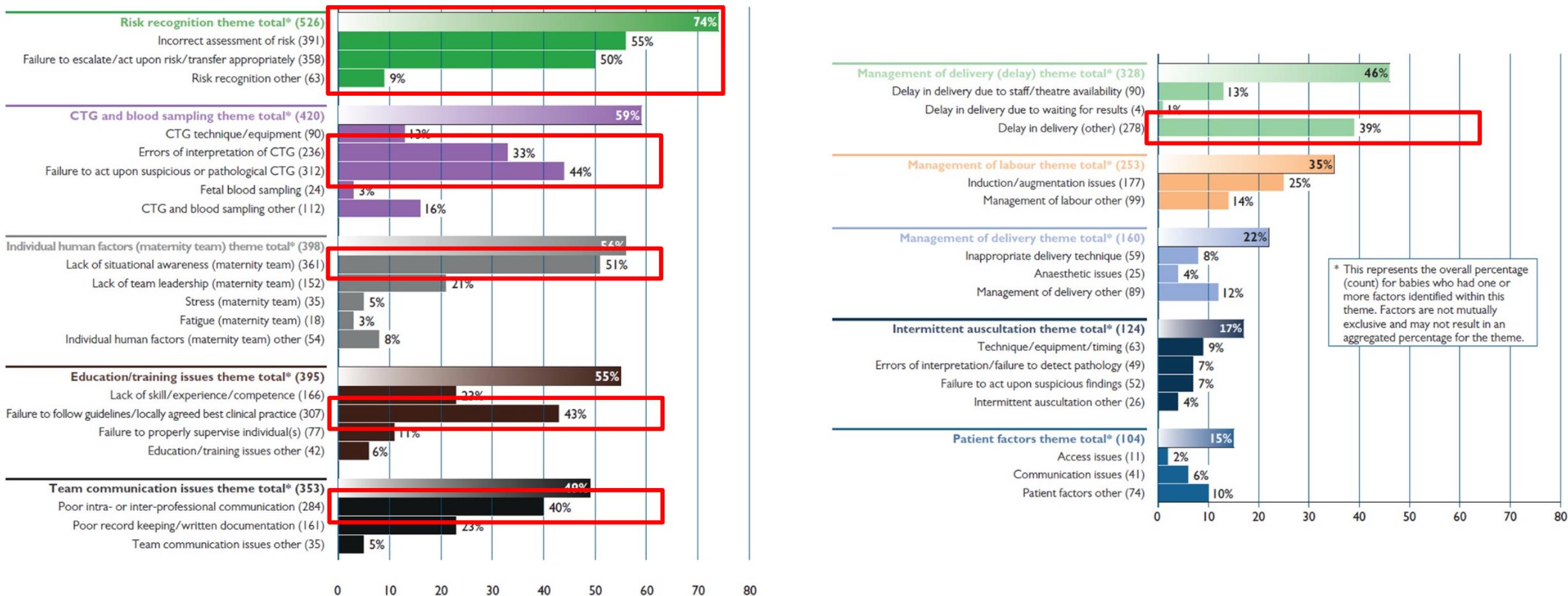


Figure 10 Critical contributory factors identified in babies for whom different care might have made a difference to the outcome (N=714); note that each baby has potentially two or more reviewers identifying contributory factors and multiple factors may apply to the same baby



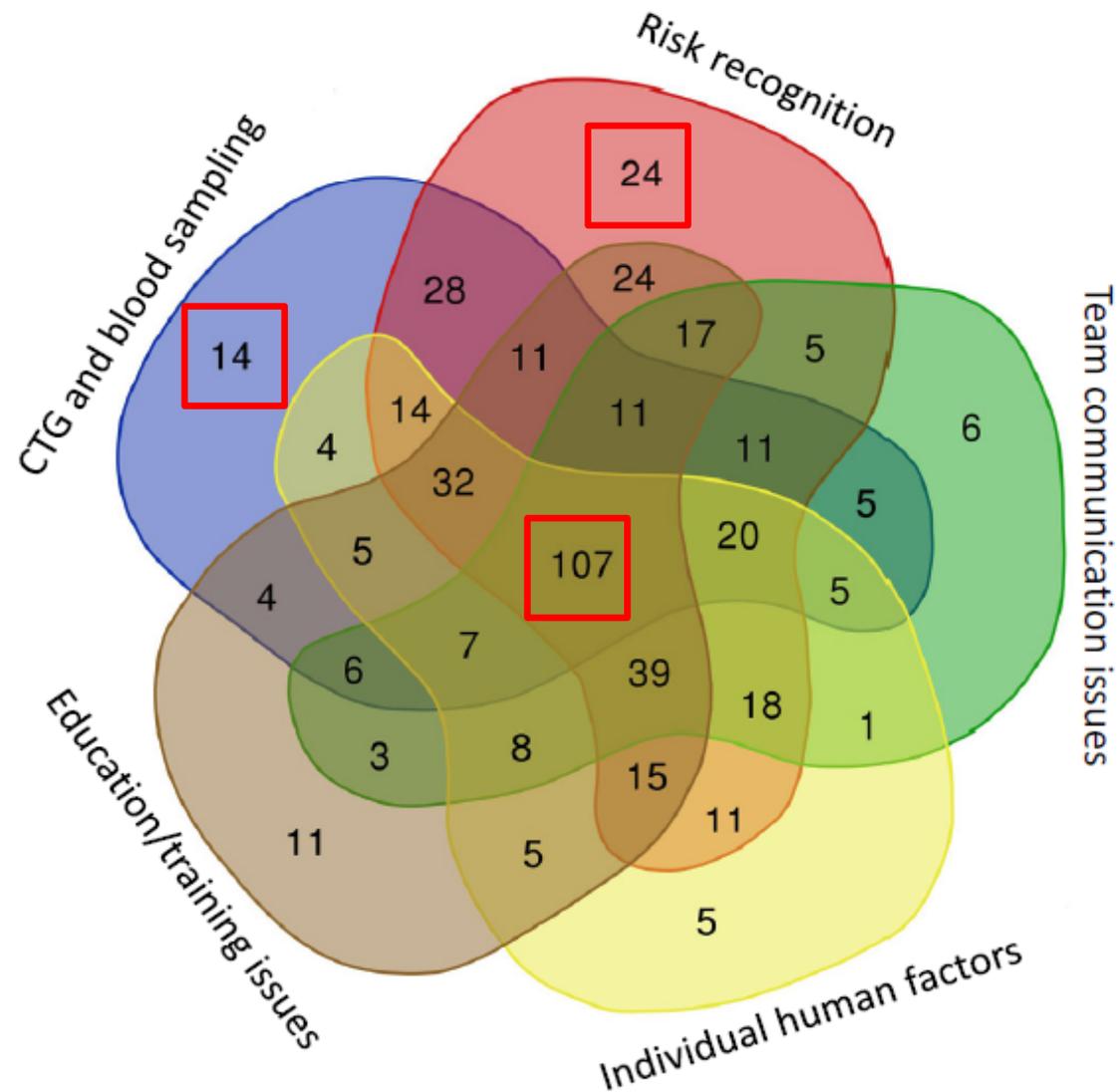


Figure 17 Interrelation of the five most commonly identified themes; diagram produced using <http://bioinformatics.psb.ugent.be/webtools/Venn/>

Each
Baby
Counts
2020



The INFANT trial

Intelligent Fetal Assessment

- Randomised trial of decision support
 - computerised interpretation of CTG during labour
- HTA (health technology assessment programme) grant £5.9M Dec 2008

Brocklehurst P, Field DJ, Juszczak E, Kenyon S, Linsell L, Newburn M, Plachcinski R, Quigley M, Schroeder L, Steer P. Lancet. 2017 Jul 1;390(10089):28.



Intrapartum risk factors in the adverse outcomes group:

| Risk factor | N | % |
|---|----|------|
| Oxytocin administration | 46 | 64.8 |
| Labour induced | 29 | 40.8 |
| Maternal BMI > 30 | 24 | 34.3 |
| Maternal age ≥ 35 | 18 | 25.4 |
| Meconium staining of the amniotic fluid | 18 | 25.4 |
| Labour > 12 hours | 16 | 22.5 |
| Hypertension | 12 | 16.9 |
| Preterm labour (35-36 ⁶) | 11 | 15.5 |
| Temperature in labour ≥ 37.5°C | 9 | 12.7 |
| Previous caesarean section | 8 | 11.3 |
| Twin pregnancy | 7 | 9.9 |
| Suspected fetal growth restriction | 7 | 9.9 |
| Conceived by IVF | 6 | 8.5 |

} Tachysystole

Meconium (X 2.5)
Slow progress

Pyrexia (X 4)

FGR (X 4)



Substandard care

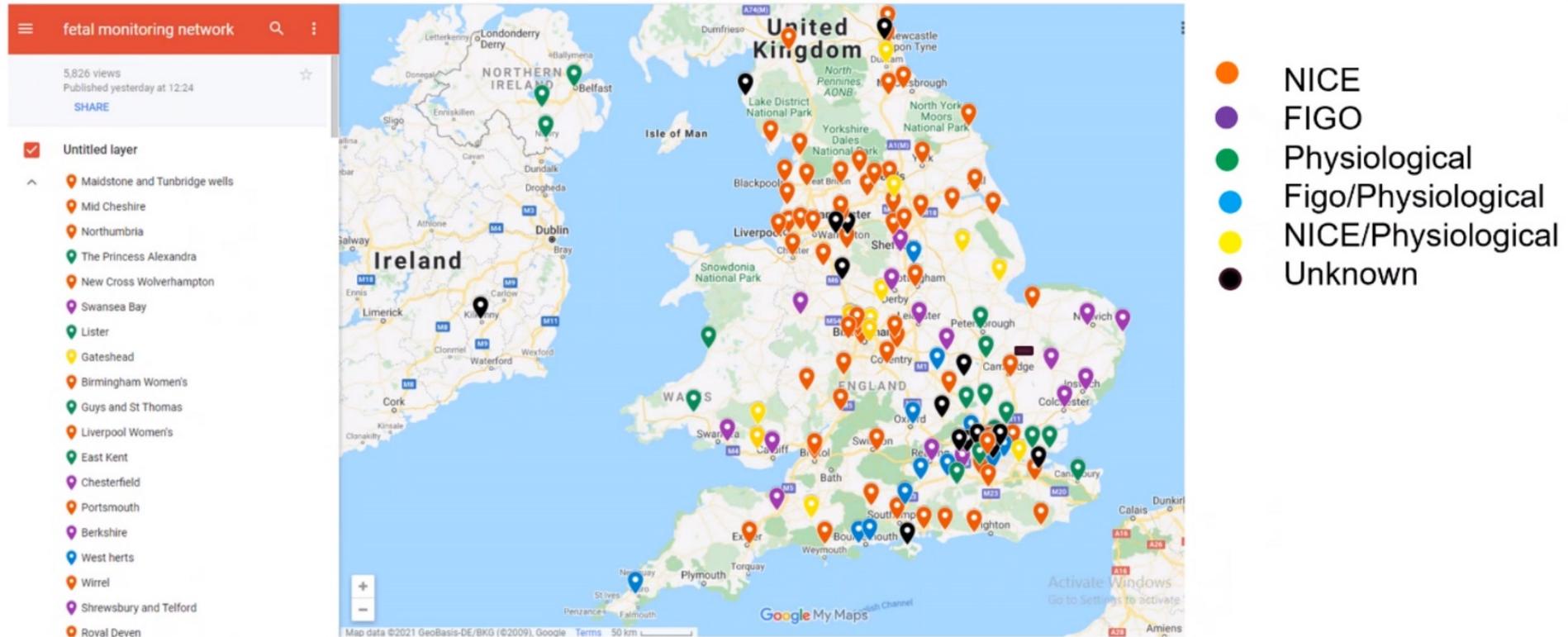
- Not failure to *recognise* CTG abnormality
- Failure to *interpret*
 - (i.e. *assign appropriate significance*)
- Failure to take into account additional risk factors



Progress

- Concern about lack of standardisation of CTG interpretation

Variation in practice



RCOG fetal monitoring resource review

- 12th April 2018 - Current training in intrapartum surveillance not fit for purpose and new programme proposed
- 11th May 2018 – RCOG Officers approve a new, national, mandatory, blended learning training programme in Intrapartum Fetal Surveillance
- Likely to be two days including accreditation test at the end



Progress

- 15th August 2019 – new RCOG/RCM committee convened led by Lesley Regan and Gill Walton
- 10th October 2019 – meeting to discuss new consensus
- 3rd March 2020 – meeting at RCOG of \approx 60 delegates



RCOG fetal monitoring resource review

- 16th October 2020 – further meeting with senior officers including new President Eddie Morris to discuss progress – confirmed the decision to set up a ‘task and finish’ committee to take the project forward



'Task and finish' committee appointed by Eddie Morris to develop pilot schema

- Tim Draycott (Chair)*
- Maggie Blott*
- Phil Steer*
- Cathy Winter**
- Zeenath Uddin**
- Jenni Burt***

*RCOG

**RCM

***THIS (The Health Improvement Studies Institute, Cambridge)



Data presented in the following slides are preliminary until published, and are not to be represented as the official view of the ABC Consortium



Woman's name: _____

Date of birth: _____

Hospital No: _____ Audit No: _____

Date: _____ Time: _____

Documented evidence that full clinical assessment has been carried out at start of labour comprising: (Enter 1 or 0 for each question):

1. Maternal and Fetal assessment (review of notes and US scans, maternal observations, abdominal palpation, fundal height, presentation, FHR)
2. Assessment of labour*: strength/frequency of contractions, status of membranes, liquor colour, presentation
3. Vaginal examination (VE) offered
4. Recommended initial method of intrapartum fetal monitoring:
 - Intermittent Auscultation (IA) as NO RISK FACTORS
 - Maternal request for IA
 - CEFM as ONE OR MORE RISK FACTORS
 - Maternal request for EFM
5. Based on the presence or absence of risks listed, was the correct method of intrapartum fetal surveillance allocated?
YES / NO

If NO, explain what method of intrapartum fetal surveillance should have been recommended and why:

* Confirmation of active labour:

- Spontaneous onset – cervical dilatation of 4cm or more
- Induction of labour – cervical dilatation of 4cm or more, or when IV syntocinon commenced (irrespective of cervical dilatation)

| Maternal conditions that can <u>directly</u> impact on the fetus (Enter 1 or 0 for each risk): | |
|--|--|
| Previous caesarean section/uterine scar/myomectomy | |
| Previous labour/birth that indicates EFM this time | |
| Maternal diabetes (Gestational & Pre-existing) | |
| Pre-eclampsia/hypertension (B/P > 140/90, Proteinuria 1+ or more) | |
| Ruptured membranes > 24 hours (at time of assessment) | |
| Suspected Chorioamnionitis or maternal Sepsis | |
| No antenatal care/ late booker | |
| Substance misuse and/or smoking (CO level > 4 at 36 wks) | |
| Group B Streptococcus (with other risk factors) | |
| BMI at booking greater than 35kg/m ² | |
| Other antenatal risk factors to consider e.g maternal age > 40: | |

| Increases risks to the fetus in labour (Enter 1 or 0 for each risk): | |
|--|--|
| Prolonged latent phase of labour (extended period of regular contractions but cervix remains < 4cm dilated, or more than 1 previous admission) | |
| Fresh PV bleeding on admission | |
| Temperature of 38°C or above on a single reading, or above 37.5°C on 2 consecutive occasions 1 hour apart | |
| Induced labour - including planned oxytocin use | |
| Too frequent contractions (more than 4:10) | |
| Other maternal intrapartum risk factors/complications: | |

| Increases risks to the fetus in labour (Enter 1 or 0 for each risk): | |
|--|--|
| Diagnosed fetal growth restriction or small for gestational age (less than 10 th centile) | |
| Pre-term (less than 37 weeks) | |
| Post term pregnancy (41 weeks onwards) | |
| Presence of meconium-stained liquor at start of labour | |
| Reduced or increased amniotic fluid volume | |
| History of reduced fetal movements requiring surveillance or reduction/change in FM in last 24 hours | |
| Multiple pregnancy | |
| Breech presentation/ mal-presentation (V-scan) | |
| FHR abnormalities suspected at initial assessment | |
| Other fetal risk factors/complications: | |

| Mother and fetus needing <u>immediate</u> review (Enter 1 or 0 for each risk): | |
|---|--|
| Describe emergency obstetric complication, including difficulty auscultating FHR: | |

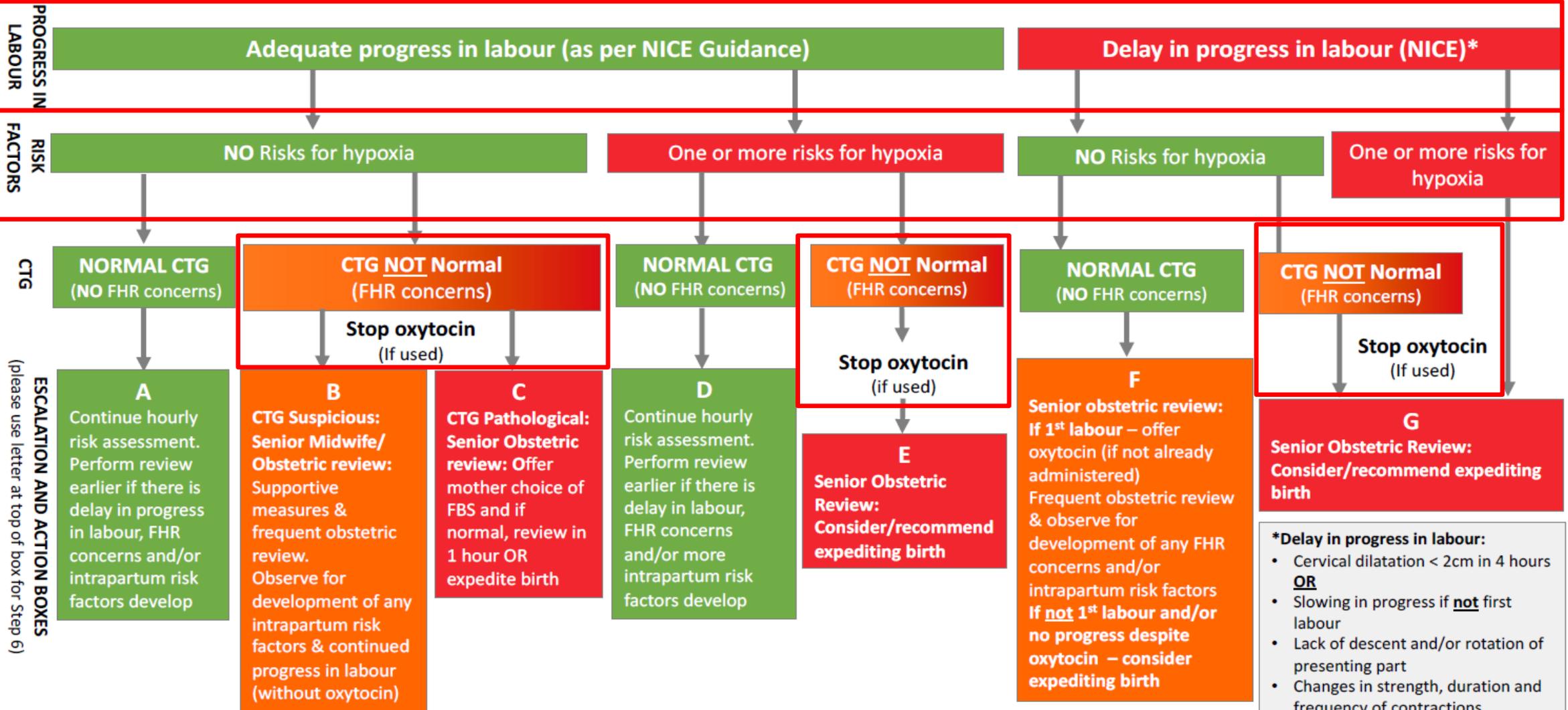
Total Score at initial intrapartum fetal surveillance assessment:

Onset of labour Risk Assessment



Continuous Electronic Fetal Monitoring (CEFM) in labour – Risk assessment/Review

CEFM is only recommended if there are identified antenatal risk factors, or developing intrapartum risk factors, that may impact on how the fetus copes with the stresses of labour



Stop oxytocin (If used)

Stop oxytocin (if used)

Stop oxytocin (If used)

- *Delay in progress in labour:**
- Cervical dilatation < 2cm in 4 hours **OR**
 - Slowing in progress if **not** first labour
 - Lack of descent and/or rotation of presenting part
 - Changes in strength, duration and frequency of contractions

(please use letter at top of box for Step 6)



Continuous EFM Intrapartum Fetal Surveillance Risk Assessment Sheet – data collection sheet

Woman's name: _____ Hospital No: _____ Audit No: _____

Risk factors at the start of labour: (Enter 0 or 1 for each risk factor)

| | | | |
|--------------------------|--------------------------|-----------------------------|--------------------------|
| Fetal Growth Restriction | <input type="checkbox"/> | Previous caesarean section | <input type="checkbox"/> |
| Meconium stained liquor | <input type="checkbox"/> | Change from IA | <input type="checkbox"/> |
| Reduced fetal movements | <input type="checkbox"/> | Gestation > 41 weeks | <input type="checkbox"/> |
| Maternal pyrexia | <input type="checkbox"/> | BMI at booking > 35 | <input type="checkbox"/> |
| Induction of labour | <input type="checkbox"/> | Other reasons for CEFM | <input type="checkbox"/> |
| Twins | <input type="checkbox"/> | Please state other reasons: | |

Total number of risk factors at start of labour:

| Number of hours from time of admission in labour: | +1h | +2h | +3h | +4h | +5h | +6h | +7h | +8h | +9h |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Progress in labour: (Enter 0 or 1 for each risk factor) Time: | | | | | | | | | |
| Delay in progress in labour in 1 st or 2 nd stage (refer to partogram)? *See definition on Flow chart – Step 5 | | | | | | | | | |
| Oxytocin augmentation | | | | | | | | | |

Risk factors for intrapartum hypoxia: (Enter 0 or 1 for each risk factor)

| | +1h | +2h | +3h | +4h | +5h | +6h | +7h | +8h | +9h |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Diagnosed or suspected fetal growth restriction or small for gestational age (less than 10 th centile) | | | | | | | | | |
| New or increased meconium stained liquor | | | | | | | | | |
| Maternal temperature of 38°C or above on a single reading, or above 37.5°C on 2 consecutive occasions 1 hour apart | | | | | | | | | |
| Intrapartum vaginal bleeding | | | | | | | | | |
| Too frequent contractions (more than 4:10) | | | | | | | | | |

Fetal Heart Rate (FHR) Concerns: (Enter 0 or 1 for each concern)

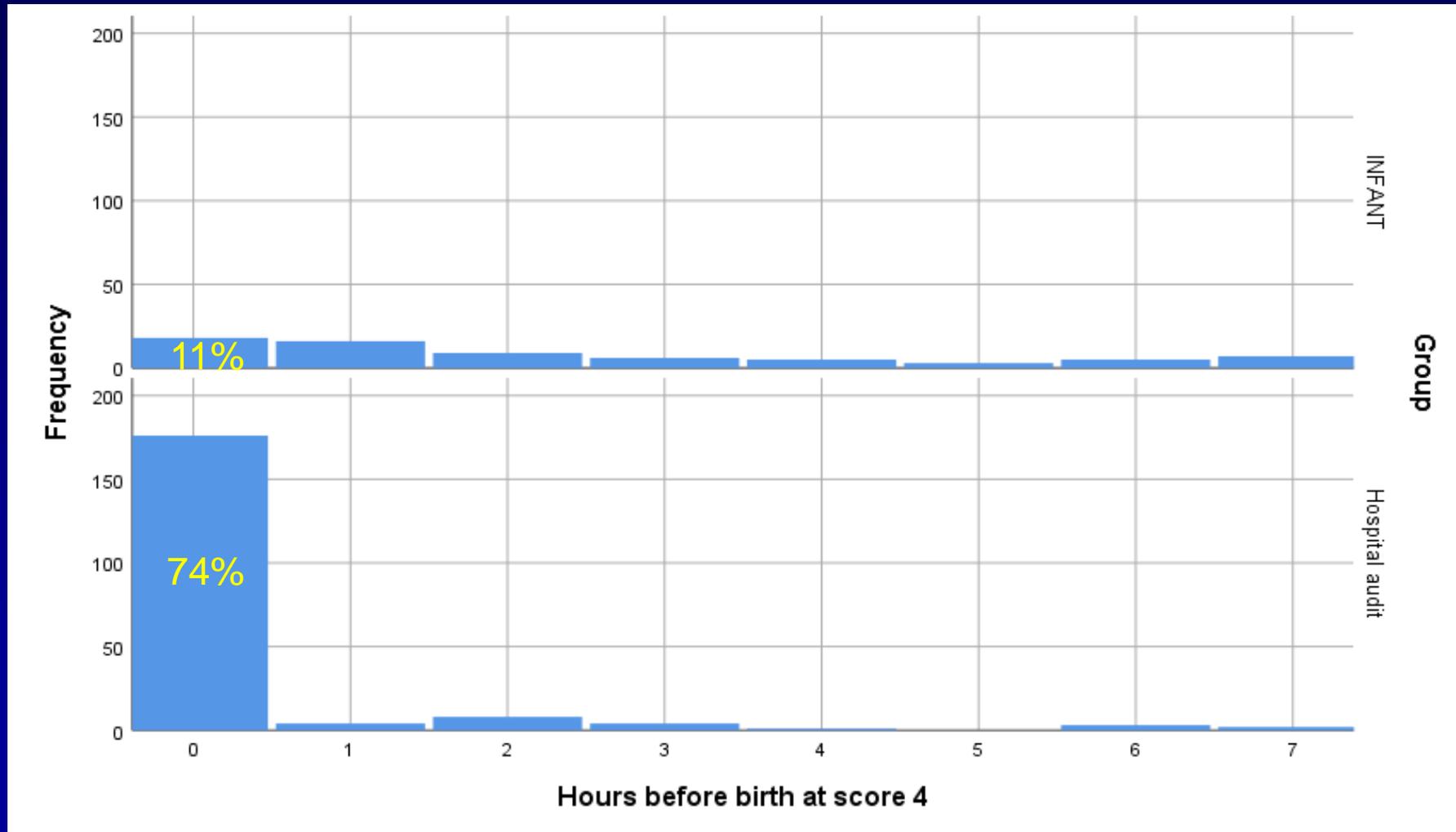
| | +1h | +2h | +3h | +4h | +5h | +6h | +7h | +8h | +9h |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Baseline rate at start of labour (bpm) (write rate in first time slot) | | | | | | | | | |
| Baseline rate at the time of assessment (bpm) | | | | | | | | | |
| Baseline rate less than 110bpm, or more than 160 bpm, for more than 10 minutes | | | | | | | | | |
| Sustained rise in baseline rate of 20 bpm or more (may still be within normal range) | | | | | | | | | |
| Sustained reduction in baseline variability (less than 5 bpm for more than 30 minutes) or absence of variability | | | | | | | | | |
| Presence of repetitive variable decelerations (V- or U-shaped) or Late decelerations with more than 50% of contractions | | | | | | | | | |
| Maternal pulse (write rate in appropriate time slot) <i>If maternal pulse same as FHR for obstetric review and US scan</i> | | | | | | | | | |
| Prolonged deceleration lasting longer than 3 minutes | | | | | | | | | |

Further time slots over page →

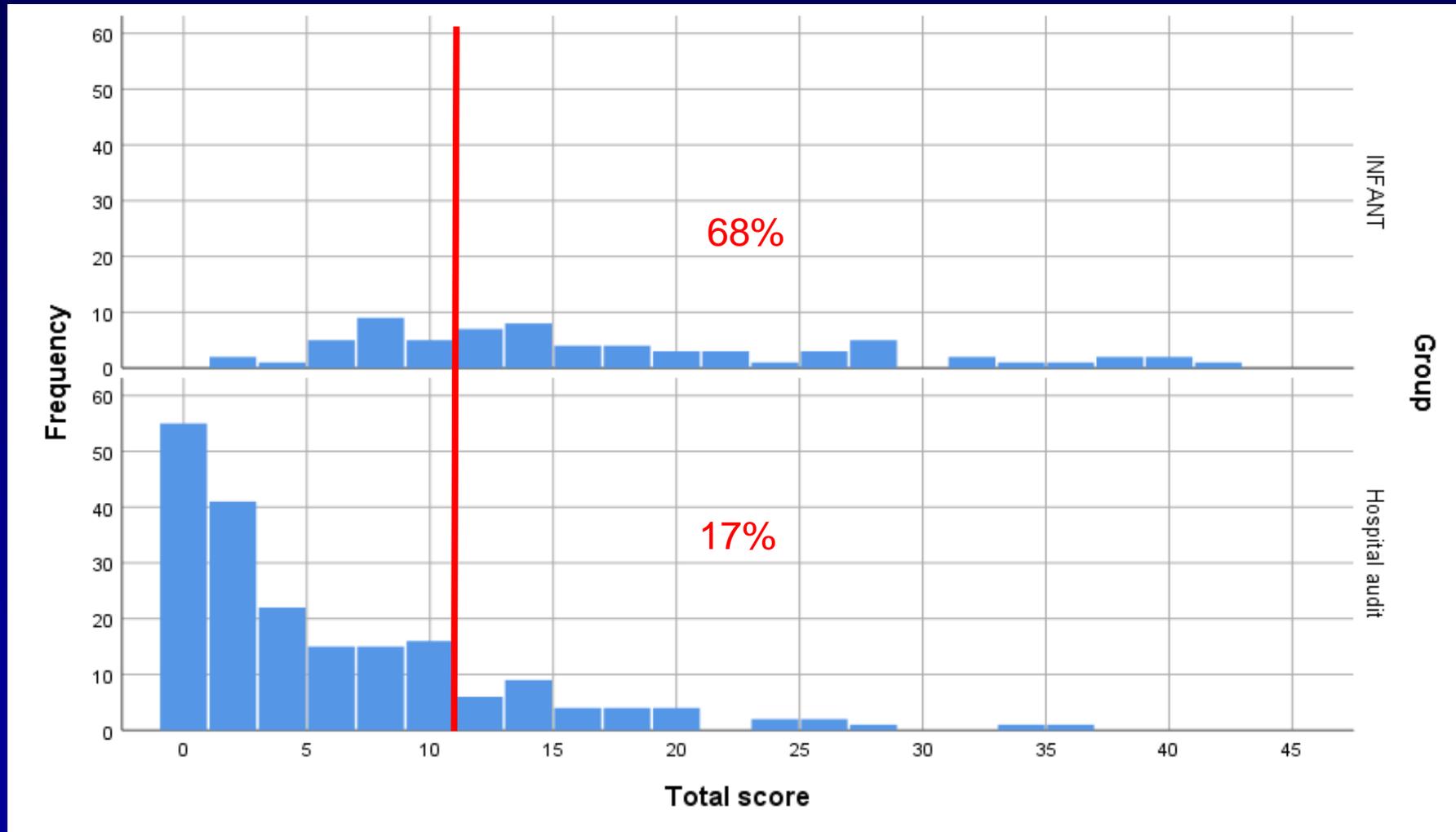
Total risk factor score (including risk factors at start of labour):



Audit of 69 cases with adverse outcome in 24 units of 198 cases from consecutive audit in 4 maternity units



Audit of 69 cases with adverse outcome in 24 units of 198 cases from consecutive audit in 4 maternity units



Univariate analysis (%)

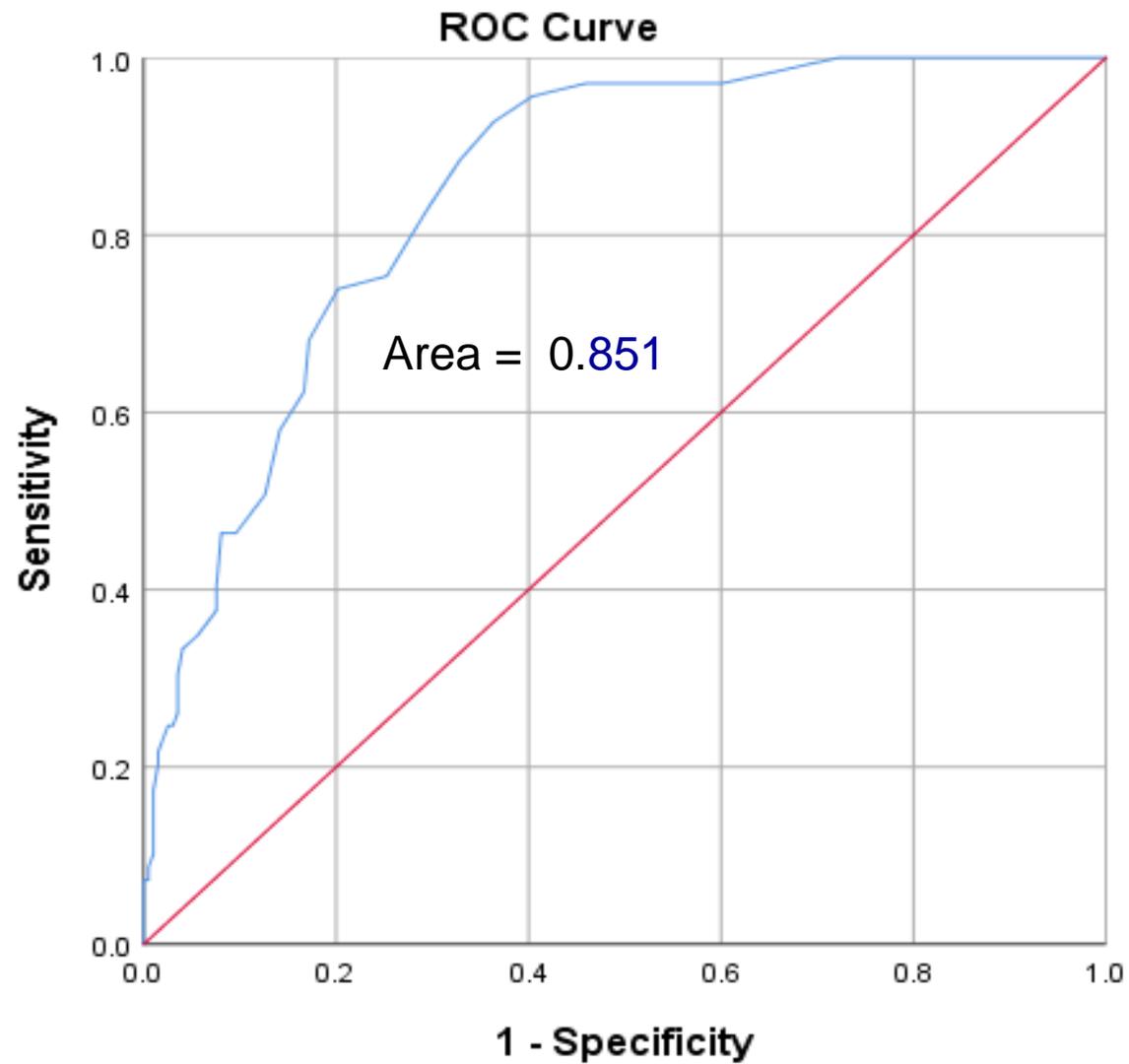
| Variable | INFANT | AUDIT | P |
|---------------------|--------|-------|--------|
| Slow progress | 23 | 24 | NS |
| Syntocinon | 62 | 38 | <0.001 |
| Tachysystole | 49 | 17 | <0.001 |
| FGR | 15 | 5 | 0.01 |
| Meconium | 26 | 13 | 0.02 |
| Pyrexia | 12 | 8 | NS |
| PVBleeding | 6 | 3 | NS |
| Rise in baseline | 4 | 4 | NS |
| Abnormal baseline | 52 | 8 | <0.001 |
| Reduced variability | 62 | 9 | <0.001 |
| Decelerations | 88 | 48 | <0.001 |
| Prolonged decels | 71 | 16 | <0.001 |



Logistic regression

| Variable | Odds ratio | P |
|---------------------|------------|--------|
| Slow progress | 3.08 | 0.08 |
| Syntocinon | 0.91 | 0.91 |
| Tachysystole | 0.28 | 0.023 |
| FGR | 0.06 | 0.001 |
| Meconium | 0.26 | 0.02 |
| Pyrexia | 0.69 | 0.68 |
| Abnormal baseline | 0.12 | <0.001 |
| Reduced variability | 0.08 | 0.018 |
| Decelerations | 0.21 | <0.001 |
| Prolonged decels | 0.10 | <0.001 |





Diagonal segments are produced by ties.

Total Score



The ABC Collaboration

Avoiding Brain injury in Childbirth



Royal College
of Midwives



Royal College of
Obstetricians &
Gynaecologists

THIS.Institute The Healthcare
Improvement
Studies Institute

[thiscovery.org/abc](https://www.thiscovery.org/abc)

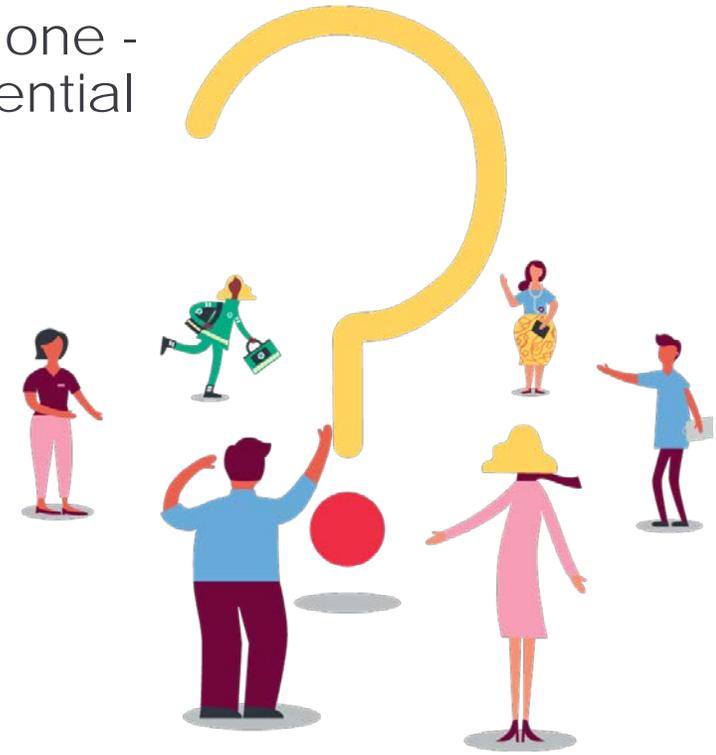
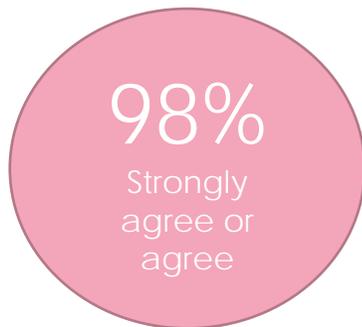
<https://www.thiscovery.org/project/abc/>



Question 1

I support a **personalized approach** to fetal surveillance that includes monitoring the fetal heart rate (FHR) as one - but not the only one - of a range of indicators of potential fetal deterioration.

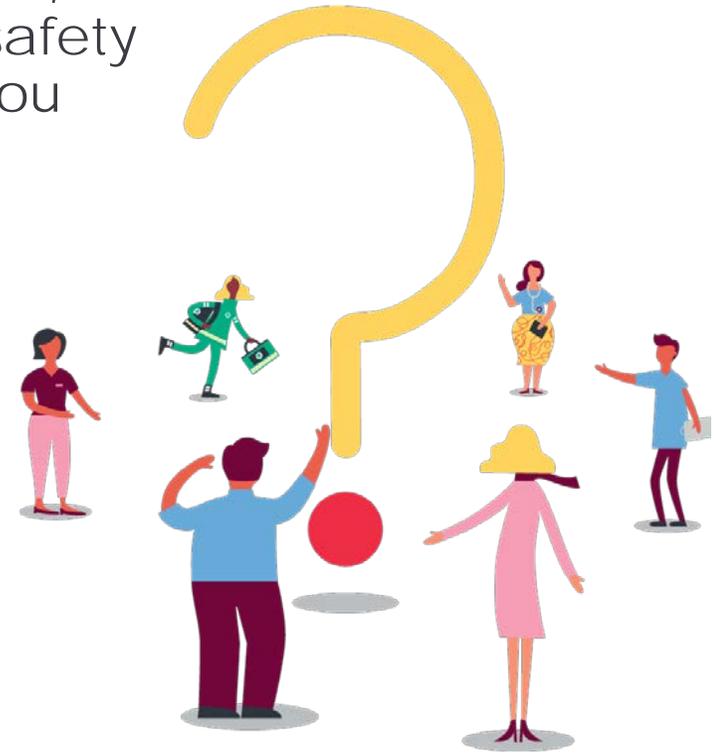
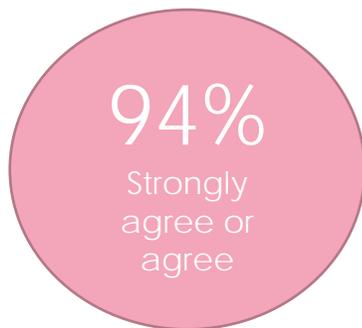
To what extent do you **agree** with this statement?



Question 2

A **national standardized approach** to fetal surveillance, used across all maternity settings, would benefit the safety and quality of intrapartum care. To what extent do you agree with this statement?

To what extent do you **agree** with this statement?



Question 3

How **important** do you think these indicators are in practice when assessing potential intrapartum fetal deterioration?

| Number and percentage of staff answering extremely/very important per indicator | | |
|---|--------|-------|
| Indicator | Number | % |
| Diagnosed or suspected fetal growth restriction or small for gestational age (less than the 10th centile) | 526 | 95.1% |
| Changes in fetal heart rate (for IA) and changes in CTG (for EFM) | 506 | 92% |
| Maternal pyrexia (38C or above on a single reading, or above 37.5C on two consecutive occasions one hour apart) | 507 | 91.9% |
| Hyperstimulation (>4:10) | 500 | 90.4% |
| Oxytocin augmentation | 488 | 88.6% |
| Intrapartum vaginal bleeding | 485 | 88.2% |
| Significant meconium-stained liquor | 468 | 84.7% |
| Delay in progress in labour | 380 | 68.7% |
| Total number of responses per indicator = 550 to 553 | | |

Question 4

Do you think the **current descriptions** for these indicators need to be **improved?**

| Number and percentage of staff answering yes, improvement needed | | |
|---|-----|-------|
| Indicator | Yes | % |
| Changes in fetal heart rate (for IA) and changes in CTG (for EFM) | 415 | 75.7% |
| Significant meconium-stained liquor | 334 | 60.6% |
| Delay in progress in labour | 342 | 62.4% |
| Intrapartum vaginal bleeding | 283 | 51.6% |
| Hyperstimulation (>4:10) | 245 | 44.7% |
| Diagnosed or suspected fetal growth restriction or small for gestational age (less than the 10th centile) | 187 | 34.1% |
| Oxytocin augmentation | 183 | 33.3% |
| Maternal pyrexia (38C or above on a single reading, or above 37.5C on two consecutive occasions one hour apart) | 117 | 32.2% |
| Total number of responses per indicator = 548 to 551 | | |

Usability and shadow testing

- Conducted detailed usability testing interviews with **15 maternity staff** (9 midwives, 6 obstetricians) to refine prototype tools
- Completed shadow testing with the prototype tools at **five NHS sites** involving **over 50 staff**
- Used all insights gained so far to optimise the **prototype fetal surveillance protocol** with its associated tools



What next?

- Further studies of the interaction of risk factors and FHR abnormalities



Outcome measure – Apgar score <7 at 5 minutes

| Risk factor | Score |
|---------------------------|--------------------------------------|
| At onset of labour | |
| Previous Caesarean | +4 |
| Nulliparous | +4 |
| Induced labour | +3 |
| Black ethnicity | +3 |
| Obese | +3 |
| Overweight | +1 |
| Fetal growth restriction | +2 |
| Gestation 37-38 weeks | +1 |
| Gestation 41-42 weeks | +2 |
| Age <25y | +2 |
| Age 35+ | +1 |
| | |
| During labour | |
| Abnormal CTG | +11 |
| Meconium | +8 |
| | -1 if both meconium and abnormal CTG |
| Pyrexia | +5 |
| Haemorrhage | +3 |
| Augmentation | +2 |
| No epidural | +2 |



Lois Kim
 Department of Public Health
 and Primary Care
 School of Clinical Medicine
 Cambridge

AUC of combined score model = 0.7149



Conclusions

- There has been over-concentration on CTG analysis by itself and insufficient attention to other risk factors
- CTG analysis can be simplified and sensitivity specificity enhanced by addition of risk factors
- An hourly review of risk factors will hopefully detect more of the cases at highest risk of substandard care
- Criteria for senior review/expedited delivery need further prospective study



Thank you for your attention

