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Background

The Importance of Effective Fetal Monitoring – National Picture

NHS England recommends effective fetal monitoring in labour as one of the key elements of care designed to tackle stillbirth and neonatal deaths¹. Cardiotocography (CTG) is a method of recording the fetal heartbeat and uterine contractions electronically. There has been a well-documented need for multiprofessional improvements to CTG interpretation for decades¹⁻⁶.

From Patterns to Physiology – Changing the Way We Look at CTGs

There is a reliance on morphological identification of ongoing decelerations (“pattern recognition”), rather than applying physiology to understand the wider clinical picture of how the baby compensates following intrapartum hypoxic insults (i.e. contractions, cord compression)^{7,8}. This morphological method of interpretation has proven to be an unreliable method of interpreting the fetus’ wellbeing, and subsequent decision-making regarding interventions⁹⁻¹⁵. Using pathophysiology as a means of interpreting the CTG trace has been shown to have a higher predictive value for fetal wellbeing as it takes account the wider clinical picture^{7,9,16-18}.

Clinical Indicators

Long term damage to a baby due to intrapartum hypoxia, such as cerebral palsy, is not always immediately apparent and surrogate indicators are frequently used to predict babies at a higher risk of poor outcomes¹⁹⁻²¹; low cord pH (<7.0), low APGAR Scores, and HIE are short-term indicators of increased risk of cerebral palsy and neonatal death^{19, 22-25}.

The use of CTG is continuously cited as having contributed to the global increase in caesarean sections over the past few decades^{20,26}. Unnecessary caesarean section is associated with a significantly increased risk of harm to both mother and baby^{19,27-29}.

So...?

The objective of this retrospective research was to report the benefit of effective pathophysiological CTG training on predicting fetal wellbeing; therefore, improving neonatal outcomes and reducing unnecessary operative interventions.

Method

Relevant clinical outcome data was collected retrospectively, for the periods prior to and following the study days at the hospital.

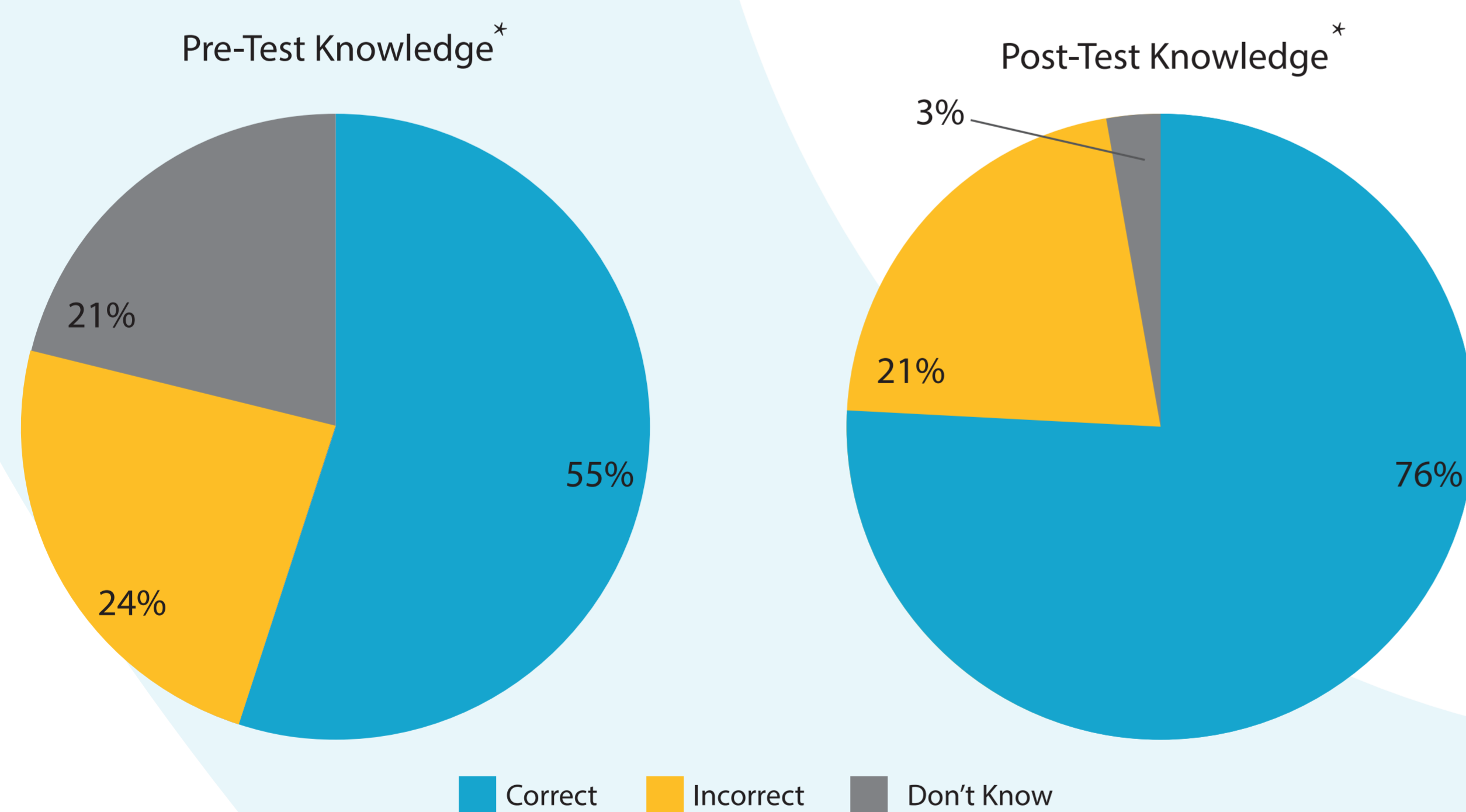
The evaluative data completed by the delegates was collected to measure the effectiveness of the course in the areas of knowledge, confidence, and quality of education, and was recorded prospectively.

Results

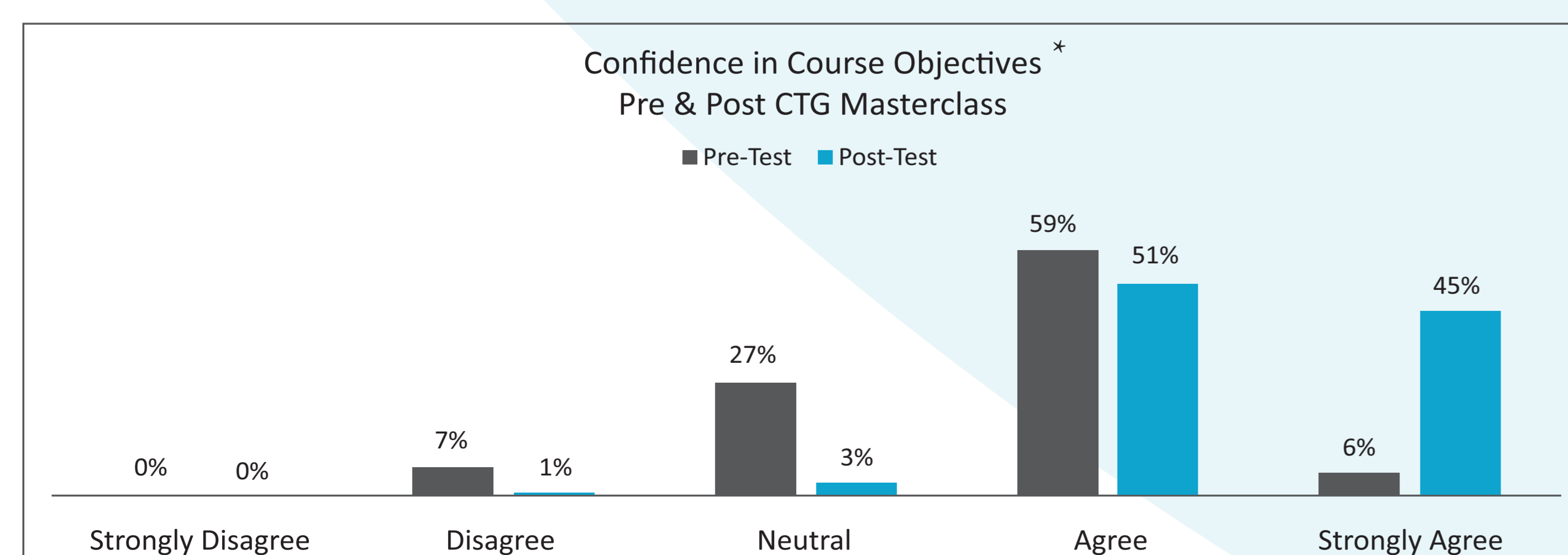
Increased Knowledge & Confidence

We asked the delegates 10 questions to test their knowledge of CTG interpretation pre- and post-course.

The results showed that there was a stark increase in correct responses, and also a reduction in delegates responding with “don’t know”.



Similarly, confidence in the key course objectives improved pre- and post- CTG Masterclasses.

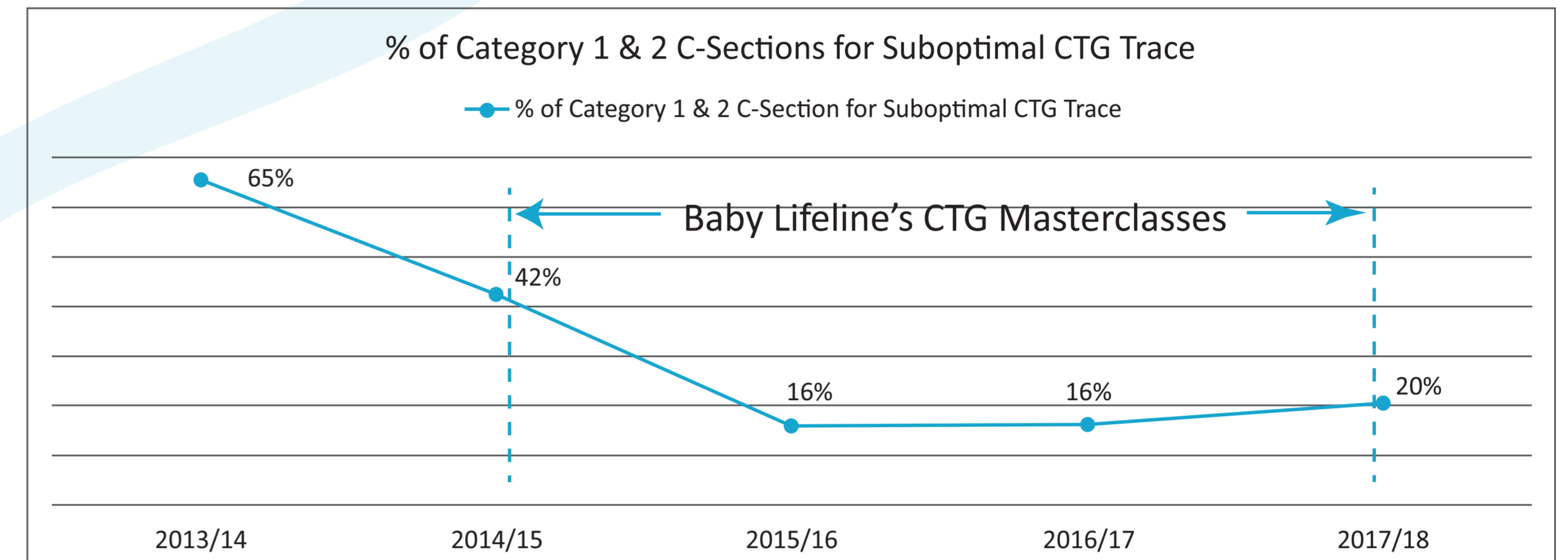


* average results from study day feedback during 2015-2017

Results

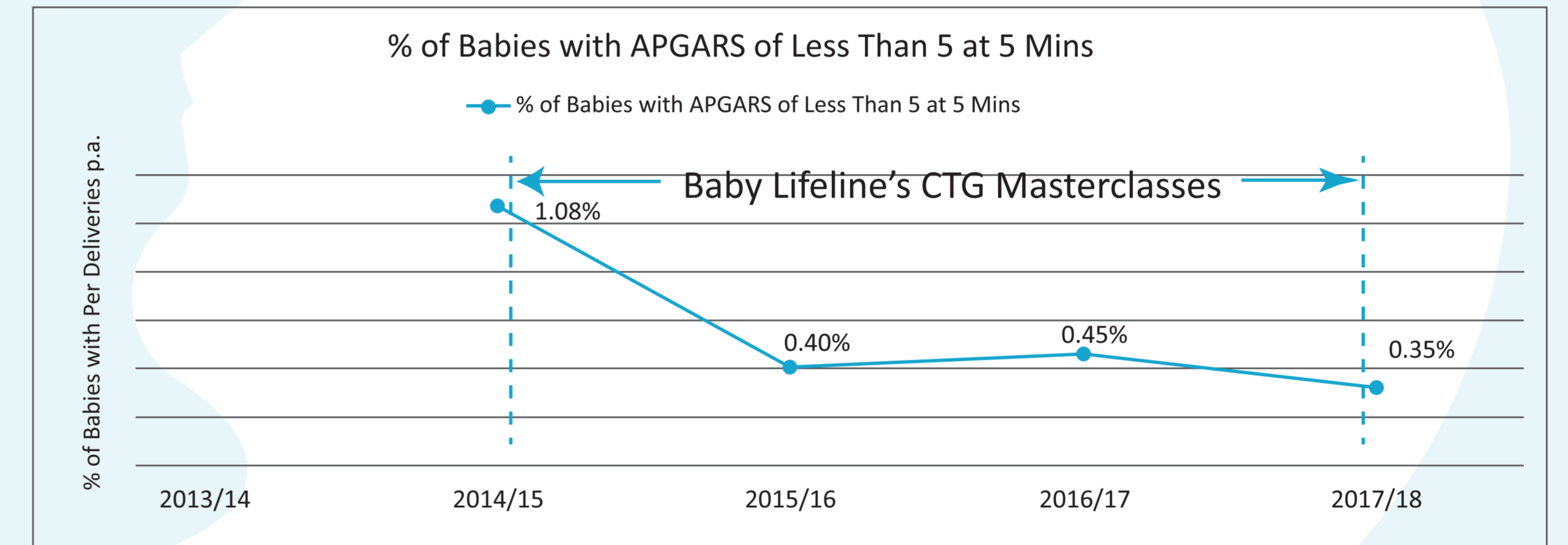
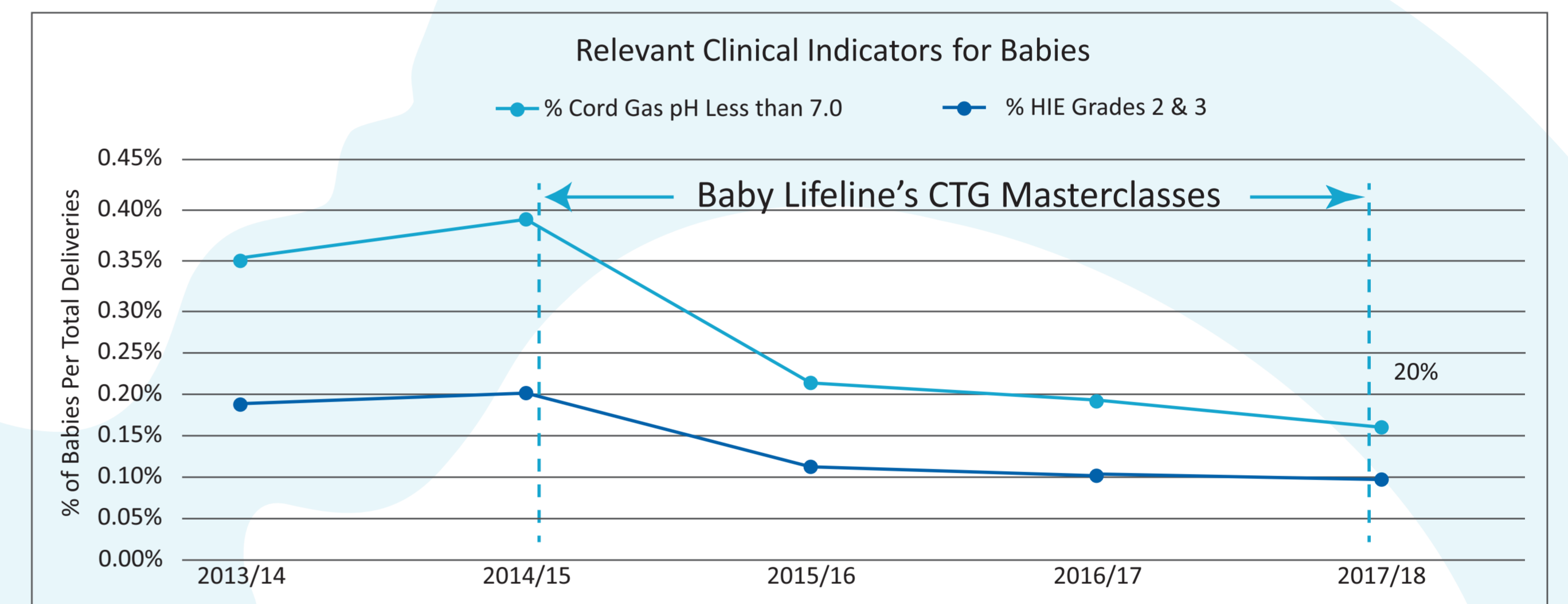
A Reduction in Unnecessary Operative Interventions

A reduction in unnecessary operative interventions was recorded; Category 1 & 2 Caesarean sections due to a suboptimal CTG trace reduced from 42% (2014/15) of category 1 & 2 C-sections to 16% (2015/16) even after the first CTG Masterclass. This change was sustained. In addition, the team at Peterborough City Hospital only performed 1 fetal blood sample (FBS) in the 3-year period (2015-2018), and this was performed by a locum doctor; prior to this, between 50-70 FBS interventions would have been performed for a suboptimal CTG trace.



An Increase in Babies Being Born in a Better Condition

Despite the reduction in operative interventions, the wellbeing of the baby improved. Babies that were recorded to have a cord gas pH of less than 7.0 more than halved from prior to the study days in 2014/15 (17) to after the final CTG Masterclass in 2017/18 (8). In addition, the number of babies that were recorded to have hypoxic ischaemic encephalopathy (HIE) also halved; from 10 babies (2014/15) to 5 (2017/18).



Conclusions & Discussion

In conclusion, our data suggests that following Baby Lifeline’s CTG training based on fetal pathophysiology at Peterborough City Hospital the neonatal outcomes have improved despite the reduction in operative interventions. The main limitation of the research was its retrospective nature; as hospital data occurs in different systems, in different formats and has changed over time, analysis of information or data can prove a challenge when trying to aggregate results. Despite these limitations, a downward trend in the emergency Caesarean sections for suspected fetal compromise as well as a downward trend in the incidence of neonatal metabolic acidosis was noted.

Recommendations for Future Work

A prospective study looking at further analysis of data at Peterborough City Hospital, as well as investigating if the results can be replicated on a national scale.

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