November 2018

Electronic fetal monitoring

Benefit Review

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# Introduction

As part of Imperial College Healthcare NHS Trust and Chelsea and Westminster Hospital NHS Foundation Trust’s jointly developed Global Digital Exemplar (GDE) Programme, a number of key projects / programmes of work have been planned to deliver digital transformation. One of these projects is the rollout of continuous electronic foetal monitoring[[1]](#footnote-1) which is fully integrated into the Electronic patient record. As part of our support to assist trusts with their benefit management responsibilities, a baselining exercise followed by a post implementation review of the benefits was undertaken at Queen Charlotte’s labour ward to assure and verify the benefits claimed from the implementation of fetalink. A baselining exercise was undertaken pre deployment in May 2017, and a subsequent post deployment comparison in November 2018. We have compared the pre go-live working practices with the post go-live measurements, and observed and interviewed staff to ascertain the benefits being realised.

# Background

The trust has rolled out FetaLink, which is part of Cerner’s PowerChart Maternity functionality and compatible with the trusts current EPR system. FetaLink is a maternal and fetal monitoring system that enables digital transmission from the CTG monitors into the electronic patient record in real time and gives graphical display of the relationship between fetal heart rate and the mother’s contractions which can be monitored remotely

The roll out of FetaLink across the trust was staged across multiple phases. Initially, FetaLink was deployed on the labour wards of both Queen Charlotte’s and St Mary’s hospitals in June 2017. The deployment was staggered with one site going live a few days in advance of the other.

The paper CTG has been kept as a back up so that it is always available for downtime and is still the “legal copy”. The Trust has decided to keep the paper CTG in place until 6 months of continuous fetalink has passed with no downtime.

# Project objectives

The cardiotocograph (CTC) readings of the contractions and fetal heart beat were previously printed on a continuous fetal strip which the midwifes would annotate with clinical information and observations. During the labour the midwifes interpreted the CTGs to make critical decisions about the management of labour. An hourly check via a buddy system was also in place to limit the risk of misinterpretation of CTG readings however there was still a possibility that a CTG could be misinterpreted in the intervening time. Over a 5 year period the trust had four cases brought against them were poor interpretation of CTG had been a factor.

The paper CTG readings would sometimes go missing from the patients notes and the likelihood of finding a lost CTG was highly unlikely. Although very few CTG related serious incidents (SIs) occur approximately 4 to 5 CTGs have to be viewed each day in relation to Datix incidences (SIs). In instances of clinical negligence claims that related to CTG misinterpretation or failure to act on CTGs, cases cannot be defended if the CTC strip has been lost or is unlabelled. Paper CTGs fade over time, also if a CTG was needed for training purposes or has to be reviewed as part of an investigation of a SI, staff have to spend time copying and copying and scanning the CTG. In past CNST inspections, the maternity service achieved level 3 with compliance in 46 of the 50 criteria, however the notes spot check for continuous fetal monitoring did not demonstrate the required 75% compliance with the necessary record keeping standard. In order to address these issues all maternity staff needed the capability to view all CTG outputs across the labour ward so that concerning CTGs could be spotted and acted upon sooner, as well as being able to store all CTG outputs electronically to eliminate the risk of loss or fading of paper read outs.

In 2013 a business case was approved for the purchase of Cener’s Fetalink system.

The benefits identified in the original business case where as follows:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **KPI description** | **Measurement** | **Target** | **Projected achievement date** | **Owner** |
| Reduction in the number of incidents relating to CTG misinterpretation | Number of incidents of CTG misinterpretation | TBC | TBC | TBC |
| Reduction in the number of incidents relating to failure to act on suspicious CTGs | Number of incidents of failure to act on suspicious CTGs | TBC | TBC | TBC |
| Reduction in number of medico-legal cases and payouts relating to CTGs | Number and value of medico-legal cases and payouts relating to CTGs | TBC | TBC | TBC |
| Reduction in CNST insurance premium | Cost of CNST insurance premium | TBC | TBC | TBC |

The business case stated the following Project Objectives

1. To provide real-time access to critical information about a woman’s pregnancy and the health of her baby, improving patient safety and helping clinicians make informed decisions
2. To reduce the risk and incidence of CTG misinterpretation, improving the safety of maternity care
3. To reduce the risk and incidence of failure to act on suspicious CTGs, improving the safety of maternity care
4. To reduce the number of medico-legal claims relating to CTG misinterpretation, thereby reducing the NHSLA premium
5. To improve ICHT’s ability to defend itself against medico-legal cases relating to CTG misinterpretation
6. To maximise midwifery and obstetric productivity
7. To minimise the clinical risk of dual recording in paper notes and PowerChart Maternity on go-live
8. To maintain and increase clinical engagement in the PowerChart Maternity roll-out and broader Cerner@Imperial programme

# Benefits achieved to date

A case study and benefit review has been undertaken and it is clear that the Fetalink system has reduced duplication and associated clinical risk and staff time, improved staff experience and patient safety. Benefits were observed such as;

## Patient Safety

* Clinicians now have real-time access to critical information about a woman’s pregnancy and the health of her baby, this should lead to an improvement in patient safety and help clinicians make informed decisions.
* The Obstetrician or Midwife in charge has site of the CTG reading from any location and screen within maternity
* As there is more visibility of CTGs readings in real time there is reduced risk of failure to act on suspicious CTGs, improving the safety of maternity care
* Electronic records pull through automatically which is minimising the clinical risk of dual recording in paper notes and PowerChart Maternity
* There is now 100% adherence to the trust’s continuous foetal monitoring policy

## Patient Experience

* Reduced interruptions as a second interpretation can be provided instantly without a second midwife or obstetrician having to physically enter the labour room.
* More patient choice as portable tocodynamometers can be used in the birthing pools enabling continuous fetal monitoring is possible. This has given the option of using a birthing pool to more women.

## Staff Efficiency

* Midwifes spend up to 10 minutes less for each birth in duplication of record keeping which has improved midwifery and obstetric productivity. Midwifes are now typing up the notes on the system whilst the labour is in progress and finishing up at the end, the only writing that is taking place is a note of the birth date and time of delivery. Previously the midwifes would not only write the notes on paper and type up at the end but they would also have to enter data in 6 places; pink summary page, paper partogramme, new born record, normal paper notes, birth register as well as typing the notes in the electronic record, the hospital number would also have to be entered in the birth register, taking on average 20 minutes.
* Risk managers no longer have to spend time cross referencing with the notes as the electronic CTG shows the exact time that something has happened, this with the annotations means that the
* It is still necessary to scan CGTs, however the as it is quicker and easier to scan via a pdf on the system rather than scan from a paper copy more lower level cases can be scanned.

**Unobserved benefits**

* Reduced number of medico-legal claims relating to CTG misinterpretation, thereby reducing the NHSLA premium
* As the majority of CTGs are now electronic it will improve ICHT’s ability to defend itself against medico-legal cases relating to CTG misinterpretation

# Issues

Bank and agency staff do not have passwords and so still need to use the paper CTG.

Risk managers are still having to search for CTGs which have gone missing due to not being correctly associated. The Risk Manager confirmed that there had been 2 cases of lost CTGs in the last 3 months

# Next steps

Currently the trust has only added two benefits from fetalink to the benefit register on Project vision (see table below). The full list of benefits that have been observed should be included on the trust’s benefits register. (see Benefits table page 8-10)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Benefit No.** | **Benefit Title / Name** | **Benefit Details** | **Outcome/ Benefit Calculations (Monetised where applicable)** | **Q2 2018 planned** | **Q2 2018 actual** | **Q3 2018 planned** | **Q3 2018 actual** | **Q4 2018 planned** | **Q4 2018 actual** |
| FL-JC03 | The Risk Manager will save time not having to look for missing CTGs | Instead of having to search for missing CTGs the risk managers will be able to call up the CTG electronically on the system. | Hours taken x salary | 0 | 0 | 0 | 0 | 0 |  |
| FL-JC04 | CTG and vital signs monitoring fully integrated into the EPR saving printing costs | Instead of paying for Paragon Printing, CTGs will be available electronically. Fetalink will transmit the information directly into the patient record | Annual invoice cost for the year 16/17 | 0 | 0 | 292.23 | 292.23 | 292.23 |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Benefit Title/Name** | **Benefit details** | **Benefit Type** | **Source of Benefit measurement** | **Baseline Value (e.g. £, %)** | **Target Value (e.g. £, %)** | **Post deployment status** | **Assumptions** |
| Clinicians can support midwife and act on readings via the remote live overview of CTGs leading to reduced risk of incidents relating to CTG misinterpretation | By providing a remote live overview of all CTGs, a reduction in the risk of failure to identify and act upon concerning CTG readings with the potential to save the lives of babies and/or prevent lifelong neurological damage; potential for significant safety and outcome improvement | Q | Number of CTG related Datix instances (2 per year)  Cost of cost of CTC misinterpretation claims | £2.3 M per year |  | Information not available yet | The cost of CTC misinterpretation claims £11.4 M every 5 years |
| Reduction in CNST insurance premium | Reduction in the risk of medico-legal cases and payouts relating to CTG misinterpretation and subsequent reduction in CNST insurance premium. Reduction in legal cases which cannot be defended due to unlabelled or lost CTGs Approximately 2 CTGs a month are found not be labelled. | CR | Cost of premium | Cost of Premium  Approximately 2 CTGs a month are found not be labelled. |  | No reported unlabelled CTGs reported since go live | Premiums will decrease due to increase in safety/less likelihood of CTG misinterpretation |
| The Risk Manager will save time not having to look for missing CTGs | Elimination of the risk of losing CTG traces with the ability to store both the CTG outputs and the clinicians comments, timing of comments and actions, electronically | NCR | Interview with Risk Manager | 32 hours pa | 0 hours | Not fully realised, due to CTG not being associated, 2 cases noted in the last 3 months where a CTG had been missing | Looking for lost CTGs – Band 8 32 hours a year |
| CTG and vital signs monitoring fully integrated into the EPR saving the Risk Manager time as scanning CTCs is no longer required | CTGs fade, and if a CTG is needed for training purposes or has to be reviewed as part of an investigation of a Serious incident, the CTG must be copied and scanned. | NCR | Interview with Risk Manager | 48 hours pa | 0 hours | Scanning is still required but is quicker via pdfs copied in Datix’ | A minimum of 2 CTG to scan a month |
| One true source of information, as reduction in risk of data entry in multiple places resulting in a reduction in clinical risk | Reduction in risk of data entry in multiple places (eg PowerChart Maternity and the paper notes) resulting in a reduction in clinical risk | Q | Staff interviews |  |  | No more duplication |  |
| Adherence to Standards | There will be 100% adherence to the trust’s continuous foetal monitoring policy | Q | Audit |  | 100% | 100% compliant. |  |
| Patient comfort/ more relaxed atmosphere in labour room | Avoidance of unnecessary disruption as the second clinician does not have to enter the room to perform “fresh eyes” and the midwife does not have to leave the room to find a clinician to provide a fresh pair of eye for a CTG | Q | Audit (labour hours) | Number of interruptions pre (one per hour)  Midwife’s estimate it can take between 1 to 5 mins to find another clinician |  | There is more control of the interruptions, and unnecessary interruptions have ceased. |  |
| Time will be saved accessing historic records. | Clinicians will have instant access to past medical history | NCR | Survey staff – time spent looking for records |  |  | Now takes one minute to call up the record. |  |
| Reduced duplication in inputting records | Instead of updating in numerous electronic and paper records, information will pull through automatically saving clinicians time. | NCR | Staff interviews/observations | Average 20 minutes per birth | 10 mins per birth | Staff interviews confirm that current time averages 10 minutes |  |

1. Two sensors are placed on the mothers abdomen, one for the ultrasound to measure the baby’s heart rate to check for signs of distress during labour and a second pressure sensor monitors the mother’s contractions. The cardiotocograph (CTC) readings of the contractions and fetal heart beat are printed on a continuous foetal strip. Obstetricians and midwives working on labour wards are able to interpret CTGs with other clinical factors to make critical decisions about the management of labour [↑](#footnote-ref-1)