

## Background

Good record keeping has long since been recognised as the cornerstone of good practice. The Perinatal Institute has developed a suite of [Maternity Records](#) to document the individual aspects of maternity care.

One challenge facing midwives is to retain information obtained at the booking appointment, which can be uploaded into clinical systems held within the maternity unit, whilst the mother retains her hand held [Pregnancy Notes](#). This often requires duplication of documentation and time spent inputting the data into the maternity information system.

Digital pens, which have a miniature infrared camera built in and paper with microscopic pattern of dots applied. When you write on the paper with the pen, the pen is able to record the written strokes as digital data. This data can then be transferred to the information system using either a mobile phone or a docking station.

## Project Leads

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## Aim

To investigate the feasibility of using digital pen technology combined with [Pregnancy Notes](#) and our regional electronic data collection system – [PEER](#), to collect real time maternity data from the antenatal booking appointment.

## Methods

Trial started June 2010.

6 units selected across the West Midlands region:-

- University Hospitals North Staffordshire
- George Eliot
- South Warwickshire Hospitals
- Good Hope
- Solihull
- Birmingham Heartlands

20 midwives recruited, each issued with their own digital pen. In order to keep costs to a minimum it was agreed to produce the notes using copied pattern and for midwives to transmit data via docking stations as appose to mobile

phones. The process for validation required the midwife to log onto [PEER](#) and dock their pen. A PDF image of the Pregnancy notes appears side by side with the [PEER](#) interface enabling the midwife to validate the data in [PEER](#) from the PDF.

Each midwife was already familiar with the layout of the Pregnancy Notes, they received a short training session about how to use the digital pen, and was issued with a helpdesk contact number.

There were 3 phases to the trial.

### Phase One

Each midwife issued with 10 sets of digitalised Pregnancy notes.

The notes were produced with the first 3 pages printed with copied pattern dots applied. The remainder of the booklet was produced as usual. After gaining verbal consent from the mother to take part in the trial, the midwife completed the booking as per her usual practice.

The Pregnancy notes were issued to the expectant mother to be retained by her for the duration of the pregnancy as per usual practice.

Midwives returned to base to dock and validate booking information.

Each midwife was issued with an evaluation form.

### Phase Two

Each midwife issued with 10 sets of digitalised notes.

The notes were produced with 7 pages printed with copied pattern dots applied. This was to enable more information to be recorded electronically from the booking appointment. The remainder of the booklet was produced as usual.

After gaining verbal consent from the mother to take part in the trial, the midwife completed the booking as per her usual practice.

The Pregnancy notes were issued to the expectant mother to be retained by her for the duration of the pregnancy as per usual practice.

Midwives returned to base to dock and validate booking information.

Each midwife was issued with an evaluation form.

This phase is *currently ongoing*.

## **Results**

### Phase One

Evaluation forms received from all participating units. The majority of feedback was positive. The midwives considered them to be time saving and enhanced care provision and would like to see the technology developed further in their clinical practice. Negative comments were slightly bigger than usual, some midwives wouldn't want to use it for all their clinical record keeping.

- 164 notes were completed, 161 - 98% submissions into PEER system. Reasons for submission failures included midwife forgot to tick start box on first page.
- 90% data capture. Reasons for failed data capture included not ticking inside the tick boxes.
- Minimal changes required during validation mainly to free text boxes. Software didn't always recognise individual names which required changing during validation process.
- Validation time minimal. All midwives reported less than five minutes to validate and most time taken to log onto system.
- Helpdesk support. The majority of midwives did contact the helpdesk once. Reasons for this included forgetting passwords, and difficulty logging onto system.

### Phase two

This phase of the project is still on going; therefore evaluation is not currently available. However, the initial feedback is very positive and results similar to-phase one. The validation process is not taking longer despite more pages to validate. Midwives have reported less operator error.

## **Conclusions**

Our preliminary evaluation suggests that digital pens are readily implemented for use within the hand held pregnancy notes and can provide enhancements in the quality of maternity care. The information is easily captured for data collection and /or electronic patient records and will provide immediate, high quality information on maternity care being provided in the community. This method reduces need for laptops in the community which pose a potential security risk and offer variable connectivity.

## **Next steps:**

Phase Three – to commence Spring 2011:

Each midwife will be issued with 10 sets of digitalised notes.

The notes will be produced with 7 pages printed with unique pattern dots applied, to enable episodic data collection to complete the full health and social well being assessments. The remainder of the booklet will be produced as usual.

After gaining verbal consent from the mother to take part in the trial, the midwife will complete the assessments as per her usual practice.

Each midwife will be issued with an evaluation form.

## **Acknowledgements**

We would like to thank all the health professionals for their on going support in this trial, not only for using the pens and the notes to record the care they gave but also for taking time to complete the evaluation forms and partaking in focus groups.

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