

Quality Improvement of a Safe Home Blood Pressure Monitoring in Pregnancy Programme
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Introduction

Blood pressure disorders in pregnancy are one of the leading causes of maternal morbidity and mortality. Pregnant women with hypertension (either pre-existing or developed in pregnancy) need close surveillance throughout their pregnancy and often need to have their delivery expedited to minimize adverse maternal and fetal outcomes. During the Covid-19 pandemic, a home blood pressure monitoring programme was implemented for pregnant women at risk of or with confirmed blood pressure disorders with a dedicated team of 2 midwives overseeing the program to closely monitor these women whilst reducing face to face interactions. However due to the national midwifery staffing crisis the program was embedded within the Maternity Day Assessment Unit (DAU) team to manage together with their workload of walk-in patients.

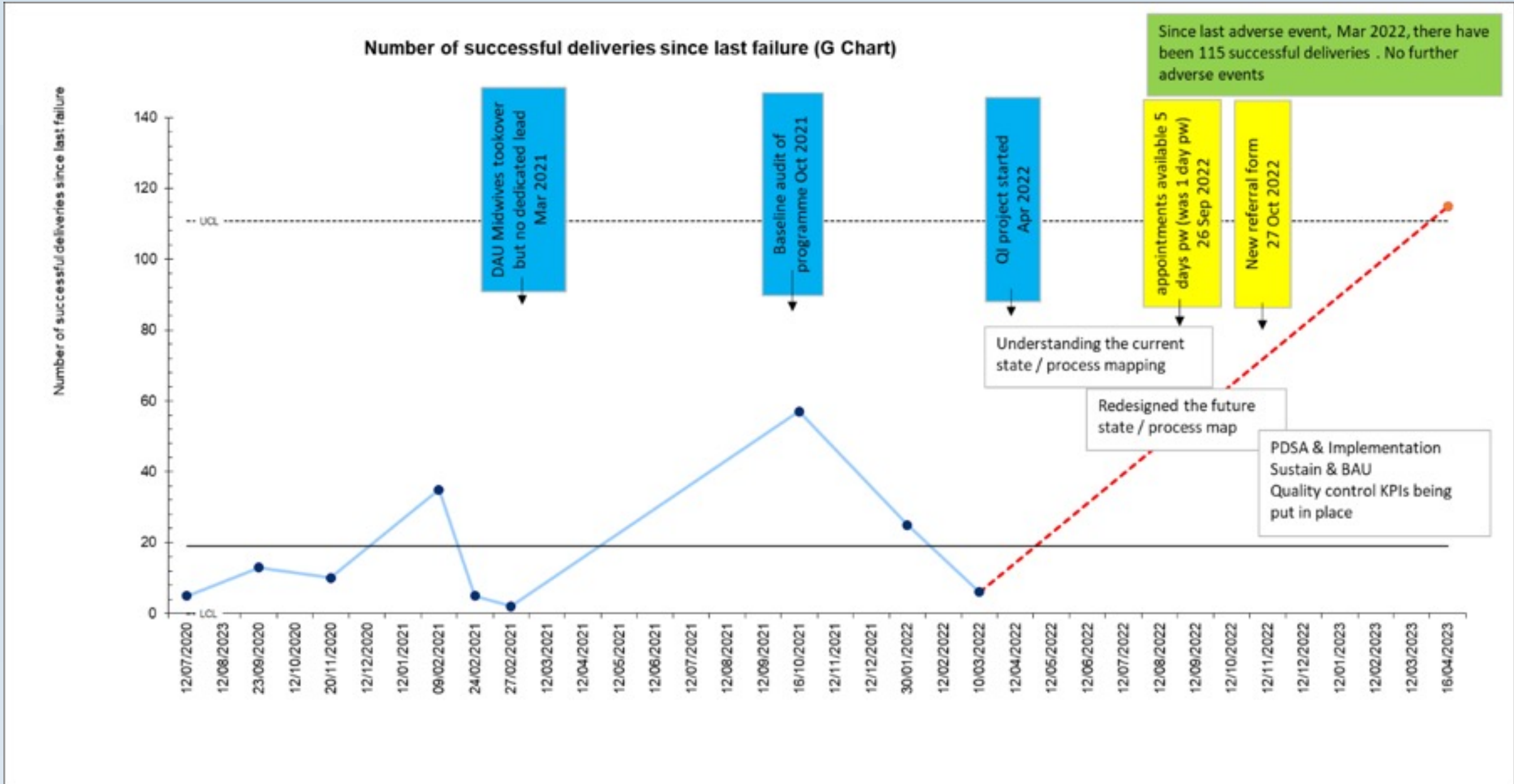
A baseline audit had been carried out against the standard operating procedure with assessment of staff awareness, patient safety and patient satisfaction. During a 5 month period in 2021, the audit showed a long referral to initial appointment time, poor follow-up and 3 potentially avoidable adverse outcomes. Our staff survey showed that 87% of staff were aware of the home blood pressure monitoring system but much improvement in the referral procedure and education was needed. Only 1/3 of patients were regularly compliant with the app and 2/3 had not returned their machines. However, all women on the programme gave positive feedback and wanted a home monitoring system to be maintained. Our quality improvement project commenced in April 2022 and was designed to assess the safety of the program with the ongoing staffing challenges. Our overall aim was to reduce avoidable adverse events caused as a result of an inadequately implemented system and therefore improve the overall safety of the service.

Aims

To reduce the number of deliveries with an avoidable adverse event caused by failings in the home blood pressure in pregnancy monitoring program by April 2023.

Methods

The multidisciplinary project team (consultant obstetrician, obstetric trainees and DAU midwives) met weekly with the support of a quality improvement coach to complete process mapping of the programme. (Figure 1) A MUSIQ (Model for Understanding Success in Quality) assessment was completed to assess the likely success of the project, this score was in the 80-119 bracket – ‘project could be successful but with possible contextual barriers’. Formal PDSA (Plan Do Study Act) cycles were attempted but due to lack of a lead midwife overseeing the programme and staffing shortages such that the 2 DAU midwives would never be working on the same day, a pragmatic approach was undertaken and change ideas were proposed and implemented. Retrospective data collection from inception of the programme were also obtained. Since avoidable adverse incidents are rare events, our baseline measures were the number of successful outcomes of deliveries of women on the home blood pressure program between each “failed” adverse outcome at delivery, i.e. those with an avoidable adverse event due to failure of the home blood pressure monitoring program. The hypothesis is that with the implementation of a redesigned, safer system we will show increasing numbers of successful outcomes of deliveries between each avoidable adverse event at delivery.



Change Ideas

Our change ideas included

- a) Formalizing the DAU appointment system (moving the drop in attendances coming to DAU to Maternity Triage) so that dedicated time was allocated for the programme: both monitoring and setting up patients on the programme to 5 days a week (previously only once a week). This strategy was also in line with improving our overall Maternity Triage service.
- b) Reviewing the eligibility criteria to remove the access inequality and making a new referral form with much clearer inclusion and exclusion criteria for staff to assess the suitability of women for the programme and to ensure face to face BP monitoring was available for those who did not meet the inclusion criteria. We also changed the referral criteria to accepting patients <18 weeks gestation which was previously the cut off for DAU patients.
- c) A suitable regularly checked email inbox to streamline the process of referrals from those off site including community and primary care;
- d) A midwifery-led, daily triage process for referrals and actioning so that appointments were offered within 2 weeks of receiving the referral;
- e) The process of contacting patients every week was redesigned so that all staff used the same process and could see what others had done and what needed doing. This involved setting up a shared live Teams spreadsheet with a tracker which would capture real time data and show up in red after 1 week had elapsed since the last successful contact. Additional IT support with weekly coaching was arranged until all staff were confident with the process. The telephone triage midwifery team joined the DAU team to help maintain the programme during sickness or planned leave;
- f) Monitoring and recording all referrals received and referrals rejected on the same live spreadsheet and prospectively recording all outcomes to maintain quality control KPIs (key performance indicators)
- g) Outlining clear guidelines for DNA (did not attend) procedures for women who are non-compliant for staff to follow. This ensures oversight of the programme and safer identification and escalation of women on the programme who may need additional follow-up and may be at risk of developing complications. Clear flow charts for staff and patients have been made to ensure consistency and safety for women on the programme.

Progress

Since our improvements have been introduced we have demonstrated that the number of successful outcomes at deliveries has increased between adverse avoidable outcomes. This would suggest that the overall safety of the program has improved. We hope to continue to collect data showing an onward safety trend.

We are in the process of collecting data for our other quality control KPIs including number of blood pressure monitors not returned. As part of our process measures we are reviewing inappropriate referrals at point of triage, referrals rejected, number of referred women receiving an appointment within 2 weeks. We are also in the process of purchasing a new app for our patients (the previous company discontinued its service in December 2022).

This has been our first QI project for the maternity DAU team and was only possible due to the engagement and commitment of the multidisciplinary team to meet on a weekly basis for over a year.

Future Steps

Our last phase is now to embed and sustain the changes with a lead midwife for the programme, set up quality control key performance indicators for routine use, so that this moves to business as usual. We are redesigning our patient information leaflet and updating our standard operating procedure and will be sharing our learning with our sister sites in the Trust so that we can align our practice and make this program equitable across the three sites.

G chart

This G chart captures the numbers of women on the home blood pressure programme whose pregnancy ended for any reason including delivery, and records whether they had an avoidable adverse event (failures). This was defined as poor monitoring of a patient on the programme (either due to high blood pressure readings out of the normal range and no contact to advise the patient to attend the maternity unit or no blood pressure readings – ideally a minimum of a weekly contact) and the development of a maternal and/or fetal complication. An example of an avoidable adverse event is a patient who was set up on the programme at 16 weeks of pregnancy for chronic hypertension but there was poor compliance, the patient did not upload her BP readings onto the app and there was no documented weekly contact from the HBPM team to check on her, she was later admitted at 21 weeks with severe hypertension and diagnosed with an intrauterine fetal death.

The chart also highlights points at which new interventions were started. On 27th February 2021 due to staffing challenges, the DAU midwives took over running the home BP monitoring in pregnancy programme. The quality improvement project began in April 2022 and the process mapping took 6 months. During this process, change ideas were identified and gradually implemented. Since March 2022 to April 2023, there have been 115 successful deliveries of women on the home blood pressure monitoring programme in pregnancy and no avoidable adverse outcomes.

