Evidence for reduced length of stay for elective caesarean sections

Report

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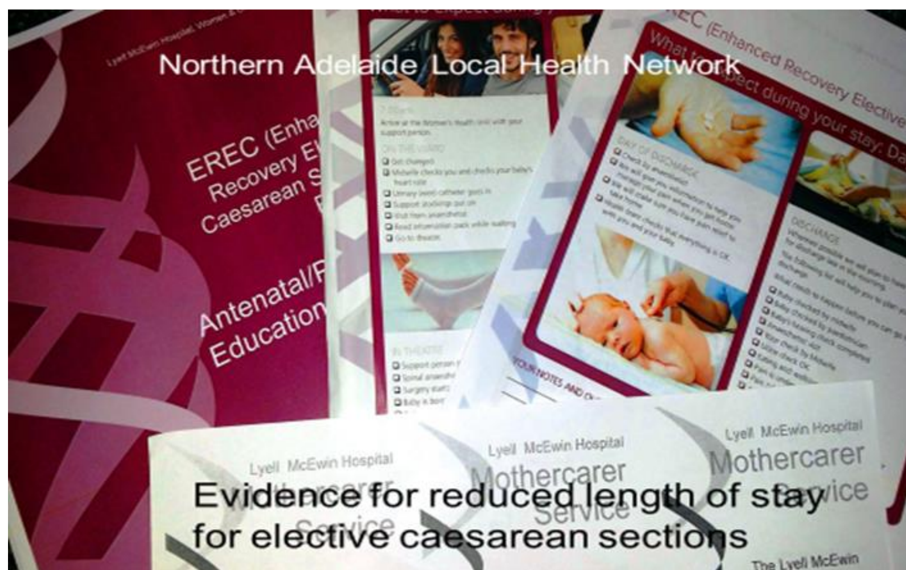

Contents

Acronyms v
List of Tables vi
Executive summary vii
Background vii
Aim vii
Ethics vii
Methods vii
Findings viii
Conclusions ix
Introduction 1
Background 1
Significance 2
Literature review 2
Introduction 2
Literature Search 2
Literature Review 3
Methodology 6
Aims 6
Design 7
Populations 7
Research ethics approvals 7
Data collection 8
Phase 1: Hospital resource use 8
Phase 2: Economic analysis 8
Phase 3: Interviews 8
Results 9
Eligibility and uptake of EREC 9
Patient Characteristics 10
Phase 1 Hospital resource use 10
Phase 2: Economic analysis 14
Phase 3 Interviews 15
Discussion 30
Limitations 34
Conclusion 34

References 35
Appendices 37
Appendix A. 37
EREC Pathway: suggested changes based on the evidence from this study. 37
Appendix B.. 40
Appendix C.. 42
Appendix D 44
Appendix E.. 45
Appendix F 50
Appendix G 51
Appendix H 52

Acronyms

Acronym	
BFED	Breastfeeding Clinic
CALHN	Central Adelaide Local Health Network
CI	Confidence Intervals
CS	Caesarean Section
ECS	Elective Caesarean Section
ED	Emergency Department
EREC	Enhanced Recovery Elective Caesarean
LMH	Lyell McEwin Hospital
LoS	Length of Stay
LSCS	Lower Segment Caesarean Section
MH	Modbury Hospital
NICE	National Institute of Clinical Excellence
PNC	Post-natal Care
RM	Registered Midwife
SD	Standard Deviation
WAU	Women's Assessment Unit

List of Tables

Table 1 Reasons that 287 mothers birthing in 2015 would have been ineligible for the EREC program if it had been available. 9
Table 2 Numbers of previous LCSCs across the 2015 and 2016 samples 10
Table 3 Comparison of outcomes for EREC eligible mothers in 2015 and 2016. 11
Table 4 Summary of home visits to new mothers by midwives and mothercarers ... 12
Table 5 Numbers of mothers with 1, 2, 3 or 4 readmissions. Data for 2016 is also provided separately for EREC completers and those who opted out at the antenatal stage. 12
Table 6 Reasons for re-admission for the 2015 and 2016 populations. The 2016 data is also provided separately for the three sub-groups (87 mothers who completed EREC and 119 who opted out at the antenatal stage – data was missing for 11 mothers in 2016). 13
Table 7 Breakdown of the 2015 and 2016 cohorts by whether they experienced an ED visit, BFED, WAU visit or a readmission. 13
Table 8 Additional costs associated with the delivery of the EREC program 14
Table 9 Demographics of interview participants 15
Table 10 Thematic analysis of interviews 16

Executive summary

Background

The Australian Institute of Health and Welfare indicate that in Australia in 2011 95,894 women gave birth by caesarean section. This is one in three births. In addition caesarean section rates increased from eighteen percent in 1991 to thirty two percent in 2011. Given the high and increasing rate of elective caesarean sections a quality improvement project on an alternative pathway for the safe transition of maternity care from hospital to home, for women and their babies 24 hours after an Elective Caesarean Section (ECS) was undertaken in October 2014 by the Women and Children's Division at the Lyell McEwin Hospital in South Australia. The project titled 'Enhanced Recovery Elective Caesarean' (EREC) was initiated based on evidence from the literature that identified key aspects of safe practice for this model of care. The outcome of this research is to provide the evidence on whether or not EREC is a cost effective intervention which is also safe and acceptable to women and their family.

Aim

The study investigated if an early discharge model of care titled 'Enhanced Recovery Elective Caesarean' (EREC), which incorporates an additional antenatal visit with a midwife, a reduced length of hospital stay following an ECS and follow-up home visits by a midwife, is a safe and cost effective pathway of care and is acceptable from a consumer perspective.

Ethics

This research was approved by the Northern Adelaide Local Health Network Human Research Ethics Committee: The Queen Elizabeth Hospital.

Site Specific Agreement Lyell McEwin Hospital, Site Specific Agreement Flinders Medical Centre. The University of Adelaide Human Research Ethics Committee. The project was conducted at the following organisations:

- Lyell McEwin Hospital, South Australia
- Modbury Hospital, South Australia
- Flinders Medical Centre, South Australia

Methods

Economic evaluation, retrospective medical record review and exploratory descriptive approach was used to undertake this study in 3 phases at the Northern Adelaide Health Network, Lyell McEwin Hospital and Modbury Hospital, Women's and Children's Division. The maternity service implemented EREC pathway (1st January 2016 to 1st January 2017) so the focus of the research design was on evaluating components of EREC.

Findings

Phase One and Two: Hospital utilisation, costs and readmission rates within 3 months post discharge from an ECS at Lyell McEwin Hospital were compared in women experiencing pre-EREC care (1st January 2015-31st December) and post-EREC care (1st January 2016 - 31st December 2016). A comparison population of women (and their neonates) who underwent ECS at Flinders Medical Centre (where EREC was not implemented) in 2015-16 was also included. Readmissions were defined as admissions to the hospital within 3 months of ECS.

In 2015, of the 538 ECSs, just under half (251, 46.7%) were retrospectively assessed as being potentially eligible for the EREC program if it had been in place.

In 2016 there were 622 ECSs, of which 348 women were prospectively judged not eligible for EREC, and 274 were initially identified as being eligible for EREC. Of these 274, 92 women (33.6%) completed EREC and were discharged in 24-30 hours post ECS, 24 (8.8%) had emergency caesarean section (CS), 33 (12.0%) were not fit for discharge within the 24-30 hour timeframe and had a longer Length of Stay (LoS), and 125 (45.6%) who were initially classified as suitable were subsequently taken off the EREC pathway within the ante-natal period.

There was a significant reduction in the birth admission LoS in 2016 (2.13 days) compared to 2015 (2.55 days) (mean difference: -0.42 days, -0.71 to -0.13 95% CI). Therefore, the mean cost of the birthing admission across was slightly lower in the cohort of women experiencing EREC in 2016 ($7151) than those judged to be eligible for EREC in 2015 ($7,500). However, the difference in the mean birth admission costs (-$349) between 2016 and 2015 was not significant.

All-cause maternal readmissions were slightly, but not significantly, increased in the 2016 EREC group. The proportion of mothers experiencing a readmission was 0.028 (ie 2.8%) in 2015 and 0.063 (6.3%) in 2016. Conversely, the proportion of neonates experiencing a readmission was slightly, though not significantly less in the 2016 EREC group (0.011) compared to 2015 (0.048). Rates of maternal readmissions were similar between Lyell McEwin Hospital and Flinders Hospital, however, the proportion of neonates admitted at Flinders was approximately twice that of Lyell McEwin Hospital.

There was an increase in the midwife and mothercarer mean visits per woman in 2016 compared with 2015. From 2015 to 2016 the mean number of home midwife visits per mother increased from 2.3 to 2.8 ($t=-4.0$, $P=0.000$). From 2015 to 2016 the mean number of mothercarer visits per mother increased from 0.5 to 1.1 ($t=-3.1$, $P=0.002$).

The estimated additional costs associated with the delivery of the 2016 EREC program (comprising antenatal visits, and additional post-natal midwife and mothercarer visits) summed to $251.65 per eligible women. Combining this amount with the costs of the birth (which were slightly lower in the 2016 cohort), resulting in a net saving of just under $100 per ECS in the 2016 EREC program.

The mothers' use of Emergency Departments (EDs), Women's Assessment Units (WAUs) and Breastfeeding Clinics (BFEDs) between 2015 and 2016 were similar. In 2015, 39/251 (15.5%) mothers experienced either an ED visit, a BFED visit or a WAU

visit. In 2016, 14/87 (16.1%) mothers experienced an ED visit, a BFED visit or a WAU visit. When this data was combined with whether a mother had experienced a readmission, it was revealed that 81% of mothers did not experience any either an ED visit, a BFED visit, WAU visit or a readmission, whereas 19% did. There were similar proportions between 2015 (83%) and 2016 (76%). There were no safety incidents reported in the 2016 post-EREC group.

Phase Three: This section of the study explored the women's experiences of an enhanced recovery pathway for elective caesarean section. A better understanding of the key issues from a consumer perspective demonstrated that for a cohort of women and their family the pathway was acceptable and the experience positive. These women met a specific medical, obstetric and social inclusion criteria to make sure that an enhanced recovery process would be safe and appropriate for their circumstances. Most of the women in this study (n=11) were organised, keen to get home as soon as they could and had good supports at home. These women on this model of care felt safe, supported and were very satisfied with their experience.

The women interviewed identified a few points in the model of care where improvements could be considered (Appendix A). Some key considerations are: the inclusion of extra information about the pathway from the moment an ECS is considered including reassurance from obstetricians that if there were any complications following birth the woman could stay longer in hospital. Discharge medications organised in the antenatal period. The staffs' positive attitude towards early discharge planning was also a consideration for the women. Any negativity expressed by staff had the potential to undermine the women's decision and confidence that she could manage at home so soon after the caesarean section. The women also mentioned their preference for continuity of care by the same home visiting midwife.

Critical parts of the current pathway were the extra antenatal visit with the midwife to answer questions and reinforce the importance of the woman being prepared for early discharge and home visits by midwives as well as the option for extra support through the availability of the mothercarer.

Conclusions

In the light of the positive attitude of women who had actually completed the EREC program, quality and safety of the intervention due to the similarity in readmission rates and the use of EDs, WAUs, and BFEDs, and the estimated cost saving associated with EREC indicate that the EREC program may be a dominant model of care, i.e. it reduces costs, is safe and improves women's experience of childbirth. However, it would be beneficial to examine more recent data from 2017 to determine if any other trends in this data is apparent. Additionally, further investigation of the 2016 group of mothers who were not fit for discharge within 24-30 hours post ECS (n=33, 12% of eligible women) and the group who were eligible for the program but taken off in the antenatal period (n=125, 46%), is warranted to better understand how EREC can be best implemented into practice.

Other maternity services should consider introducing an EREC pathway.

Introduction

The Australian Institute of Health and Welfare indicate that in Australia in 2011 95,894 women gave birth by caesarean section (AIHW 2011). This is one in three births. In addition caesarean section rates increased from 18% in 1991 to 32% in 2011. Given the high and increasing rate of elective caesarean sections a quality improvement project on an alternative pathway for the safe transition of maternity care from hospital to home, for women and their babies 24 hours after an Elective Caesarean Section (ECS) was undertaken in October 2014 by the Women's and Children's Division at the Lyell McEwin and Modbury Hospital. The project titled 'Enhanced Recovery Elective Caesarean' (EREC) was initiated based on evidence from the literature that identified key aspects of safe practice for this model of care. The outcome of this research is to determine whether EREC is a cost effective intervention and examine its acceptability to women and their family.

Background

The Lyell McEwin Hospital is a large public maternity service in metropolitan Adelaide, South Australia, which serves a catchment comprising people of middle and lower socioeconomic status. The EREC project included three key activities:

- comprehensive review of the literature;
- mapping of the current and future pathway for discharge post ECS;
- consumer group consultation with women who had experienced an ECS.

The comprehensive literature review identified that a reduced length of stay of 24 hours following ECS was being undertaken for eligible women by a number of health services internationally such as England. There was, however, very little evidence-based research on cost-effectiveness to the health service and the impact on women's experience related to earlier discharge.

The literature highlighted a number of aspects that should be considered before implementing earlier discharge, such as selection criteria for eligibility into the pathway, engagement with women early in their pregnancy to better prepare them for this model. Additionally, support by midwives following discharge was central to perceptions of a positive experience of early transition home post ECS. Post discharge support for breast-feeding was also considered essential. Prior to discharge the new pathway should include neonatal screening processes. The principles of 'good practice' for fast-track surgery were also identified as being appropriate for the new ECS pathway. The literature review did not capture the financial impact for the health service moving to this model, nor did it capture any patient (defined as the woman and her neonate) safety risks or perceptions of quality of the women's experience.

Based upon the literature review findings, the participating maternity service implemented the new pathway, EREC, in December 2015 for women who were required to undergo an ECS and met specified criteria (e.g. no complex co morbidities or pregnancy related conditions) (Appendix 1).

Significance

This research will provide the evidence on whether an enhanced pathway for ECS is a cost effective intervention which is also acceptable to women and their family.

This research will better inform maternity service policy across Australia on a different pathway of care that has a reduced length of hospital stay for the increasing number of women undergoing ECS, both in the public and private sectors. It will also fill the gap in the published evidence, particularly around the economic costs and benefits, and safety and acceptability to women of introducing early discharge transition pathways post ECS.

Literature review

Introduction

The purpose of this literature search was to explore the practicalities and risks associated with 24 hours discharge post elective caesarean section (ESC).

Literature Search

The literature search explored the following data-bases:
CINAHL, COCHRANE, PubMed, and SCOPUS with the following key words:

Midwifery practice	Caesarean/Caesarian section	Length of stay	Patient Discharge	Model of care
Midwife* Obstetric*	Planned caesarian section Surgical procedures elective delivery mh Cesarean section[mh] OR ceasarian[tiab] OR cesarian[tiab] Abdominal delivery Elective[tiab] OR planned[tiab] OR surgical procedures, elective[mh	Post operative period	Fast track recovery Transition of care Early discharge Dismissal Enhanced Length of stay[mh] OR length of stay[tiab] OR stay length[tiab] OR recovery[tw] OR convalescence[mh] OR convalesce*[tiab] OR patient discharge[mh]	Home care Out of hospital care

The search strategy included searching bibliographies of all final articles and hand-searching research journals and national standards and guidelines. A total of 16 papers were identified. Papers included full reports of research studies, literature reviews, discussion papers, clinical guidelines and abstracts of poster presentations.

There appeared to be small periods in time when early discharge for ECS was discussed in the literature. The first was in the early 1990s (Coody et al 1993; Strong, Brown & Curry 1993; Brooten et al 1994) and then later between 1997-1998 (Grullon & Grimes 1997; Brumfield 1998; Kiely, Drum & Kessel 1998). The next period was in 2010 (Zanardo, Svegliado, Cavalin, et al 2010). A few more articles and professional standards emerged in 2012-2015 (Tan, Norazilah, Omar 2012; Prior, Santhakumaran, Gale et al 2012; Lucas & Gough 2013; Damluji, Maclennan, Jamieson, Tower 2014; Abell, Pool, Sharafudeen, Skelton, Dasan, Fleming 2014; Wrench, Allison, Galimberti, Radley, Wilson 2015).

Practice standards /guidelines include the National Institute for Clinical Health and Excellence, United Kingdom 'Performing Caesarean Section' (2014) and the National Health Service 'Newborn and Infant physical examination programme Programme statement on early discharge' (NHS, n.d.).

Literature Review

A number of themes emerged from the literature relevant to the focus of this project: explore and identify a safe transition of maternity care from hospital to home for women and their babies 24 hours after a planned caesarean section.

Themes from Literature

Themes	Sub-themes
Fast-tracking surgery.	
Caesarean sections and early discharge.	
Preparing and caring for the woman.	Preoperative engagement and preparation. Actual day of the ESC, Post-operative care
Neonatal welfare and screening.	

The first theme relates to the general approach to *Fast-tracking surgery*.
Pressure to reduce length of stay and to improve patient health outcomes for a range of surgical procedures has led to the development of the practice of "fast-track" surgery and recovery. The purpose of an early transition or enhanced recovery pathway following surgery is to speed up a patient's recovery after surgery, which benefits both the patient and the health care system (Brooten 1994; Brumfield 1998; Lucas & Gough 2013; Wrench, Allison, Galimberti, Radley, Wilson 2015). Even a one-day earlier discharge was noted to have the potential to impact on health services' access to beds and cost savings (Wrench et al 2015).

Lucas and Gough (2013) identified four fast-track post-surgery recovery pathway principles. These include: the patient being in the best possible physical and psychological condition

before surgery, proactive management of the components of the recovery pathway, patients taking responsibility to participate in the process and having an active role in their recovery.

The next theme considered issues related to *Caesarean sections and early discharge.* In the 1950s the average length of stay post caesarean section (CS) was 12-14 days. The average length of stay after a CS is now 3-4 days in contrast to a vaginal delivery of 1-2 days (Abell et al 2014; Lucas & Gough 2013; NICE 2014).

It was further noted by Lucas and Gough (2013) that there would be a cost shift from hospital care to community care for those women and their babies being discharged home 24 hours after an ECS. Therefore the overall health cost benefit of a much earlier discharge for ECS should be carefully calculated.

Tan, Norazilah and Omar (2012) and Wrench et al (2015) noted there was very little literature available on next day discharge post ECS. Tan et al (2012) identified two key points from their review of the literature. The first point was that the woman must be carefully selected and consented to an early discharge post caesarean section and secondly, that breast-feeding may be negatively affected. This second point was also emphasized by Zanardo, Svegliado, Cavalin, et al (2010). Wrench et al (2015) also found that intention to breastfeed was associated with a longer post-operative stay.

A more recent study by Bayoumi et al. (2015) examined the readmission rates and maternal and neonatal outcomes between patients discharged after 24 hours versus 72 hours following a caesarean section. No difference in maternal hospital readmission was identified between the two groups in the first 6 weeks. However, a significant increase in neonatal readmission in the 24 hour group was identified due to neonatal jaundice. Similar to previous research, this study identified the importance of a late discharge for initiating proper breast-feeding. Overall, this study concluded that even though a discharge 24 hours after caesarean delivery did not increase any maternal morbidities, their recommendation continued to be in favor of a later discharge. If early discharge is initiated then follow-up into the community by a midwife to continue the observation of both mother and neonate is important.

Further principles for consideration to support the safety for both mother and neonate includes robust community care provision; monitoring of mother and neonate to prevent delayed recognition of illness and timely access to required services once discharged home. (Brumfield 1998; Ellberg, Hogberg, Lundman, Kallen, Hakansson, Lindh 2008; Lucas and Gough 2013; NICE 2014, Wrench et al 2015).

The third theme that emerged from the literature was the importance of actively managing the process of *preparing and caring for the woman* before an ECS, during the CS and post CS. The literature highlighted the need to ensure that an early discharge transitional home program is centered on the mother's and baby's needs and safety and is developed on an evidenced based recovery pathway (NICE 2014).

The pathway commences as soon as the decision is made to have surgery (Lucas & Gough 2013). <u>Preoperative engagement</u> was identified as an important component of care with the patient. In particular through information and education about keeping well, what to expect during the operation and immediate recovery phase and what to prepare for when going home

(Lucas & Gough 2013; Abell et al 2014). This is particularly so for the preparation of the woman and her baby anticipating an early discharge (Brumfield 1998; Wrench et al 2015). The preparation should also include information and teaching on breastfeeding, post-operative pain management and risks such as thrombosis prophylaxis (Prior, et al 2012).

Other criteria identified for early discharge included no complex co morbidities or pregnancy related conditions. This would exclude those patients with diabetes, cardiac problems, BMI >39, haematological disorders, placenta praevia, multiple pregnancies, pre-eclampsia and surgery that is expected to be complicated (Lucas & Gough 2013; NICE 2014; Abell et al 2014).

On the actual day of the ECS, the NICE standards (2014) identified hemoglobin optimization, prophylactic antibiotics, excellent pain management and minimization of starvation times as important considerations. Wrench et al (2015) also mentioned the use of non-fizzy carbohydrate drinks, for non-diabetic women, before ESC, noting that it is common practice for enhanced recovery pathways.

A critical factor for post-operative care is excellent pain relief (NICE 2014; Abell et al 2014) highlighting the need to ensure adequate analgesia is taken. The use of non-steroidal anti-inflammatory drugs if there is no contraindication, is suggested as an adjunct to other analgesics (NICE 2014).

Post-operative observation of women who have had epidural opioids or patient controlled analgesics with opioids was also highlighted, including carrying out routine hourly monitoring of respiratory rate, sedation and pain scores throughout treatments for at least 2 hours after discontinuation. With the use of intrathecal opioids, the standards suggest hourly observations of respiratory rate, sedation and pain scores for at least 12 hours for diamorphine and 24 hours for morphine (NICE 2014 pg10).

Tan et al (2012 p. 1274) outlined the criteria they used to assess for early discharge which included "surgically uncomplicated; blood loss was 800 mL or less; postoperative heamoglobin was 80g/L or greater; unassisted ambulation to the bathroom; established urination; tolerated at least one normal meal; afebrile (temperature less than 38°C in the last 24 hours); normal blood pressure; and health care provider willingness to be discharged".

The NICE (2014) standards also identify the importance of the early establishment of eating as soon as the woman feels hungry or thirsty and of having no post-surgical complications and encouraging early mobilization. Removal of catheter and voiding urine were also important to manage prior to discharge (Abell et al 2014).

Additional support to establish breastfeeding is recommended during the early post CS time. Both elective and emergency caesarean section have been shown to have a negative impact on breastfeeding for a number of reasons including the mothers experiencing discomfort in positioning the baby for feeding immediate post-delivery and immediate post-partum (NICE 2014).

Once discharged, as well as the usual midwifery care, there needs to be observations for thromboembolic disease (DVT and Pulmonary embolism), because women are at increased risk following CS (NICE 2014).

Wound care is the other clinical issue that needs to be monitored and discussed with the woman (NICE 2014).

Appropriate level of community care should be considered to support the transition to home, based on the particular needs of the woman and her baby (NICE 2014; Abell et al 2014).

The literature provided little evidence on readmission rates for CS with fast track surgery and early discharge. It was stated by Brooten and Chong (1994) and Tan et al (2012) that readmission rates were similar to that of the control group. In addition the NICE standards (2014) suggest that if women are recovering well, are apyrexial and do not have complications following CS they should be offered early discharge after 24 hours because this is not associated with more infant or maternal readmissions. Wrench et al (2015 p 129) also noted that from the introduction of their enhanced recovery pathway "that there did not appear to be any increase in post-operative maternal readmissions after early discharge".

The final theme relates to *neonatal welfare and screening*. Lucas and Gough (2013) and Ellberg et al (2008) identify that a neonate discharged early is at greater risk than the mother. There are higher mortality and morbidity rates in babies discharged early after delivery (Ellberg et al 2008; Lucas & Gough 2013). Reasons for readmission identified by Ellberg et al (2008) include jaundice, feeding problems, and infections. In relation to the neonate, Ellberg et al (2008 p. 583) concludes "A final infant examination at 49-72hr and an active follow-up program significantly reduce the risk of readmissions" The hospital stay must be long enough to allow for the identification of early problems and to initiate comprehensive screening of newborn examinations within the first 24 hours (Brumfield 1998; Ellberg et al 2008; Lucas & Gough 2013; NHS n.d.). While early discharge may support parental autonomy, alternative post-delivery care options for the neonate may need to be considered by staff in discussion with the parents. Staff should provide guidance and education concerning the infant's needs, to assist the family in making an informed choice about an early discharge for the neonate (Ellberg et al 2008).

Methodology

Aims

The study investigated (i) if an early discharge model (EREC), which incorporates a reduced length of hospital stay following ECS, is a safe and cost effective pathway of care and (ii) what are the key issues from a consumer perspective.

Design

Economic evaluation and exploratory descriptive approach was used to undertake this study in 3 phases at the Northern Adelaide Health Network, Lyell McEwin Hospital and Modbury Hospital, Women and Children's Division. The maternity service had implemented the EREC pathway (1st January 2016), so the focus of the research design was on evaluating components around EREC.

Populations

There are three populations included in this study:

- A control population of women (and their neonates) who underwent ECS at Lyell McEwin Hospital in 2015 prior to the implementation of EREC. Eligibility for EREC in 2015 was determined retrospectively using the EREC inclusion criteria and inspection of the full maternal medical record of all women undergoing elective LCSC to identify who would have been eligible for EREC if it had been in place in 2015. There were 251 EREC-eligible mothers in 2015).
- An implementation population of women (and their neonates) who were eligible for EREC in 2016 (n=206 mothers) according to the ECS inclusion criteria.
- A comparison population of women (and their neonates) who underwent ECS at Flinders Medical Centre (where EREC was not implemented) in 2015-16.

Phase 3 participants were those women who met the inclusion criteria and were placed on the EREC pathway in the antenatal period for a planned Caesarean section and were discharged home around 24 hours after delivery between 1st January 2016 and 31st December 2016.

Research ethics approvals

The research process protected the privacy of participants and maintained the confidential status of data acquired. All data was de-identified and stored in a password-protected computer accessible only to members of the research team according to NHMRC guidelines. Hardcopy data was stored in a locked filing cabinet accessible only by the researchers.

Researchers monitored for any signs of anxiety or distress among the participants during the Phase 3 interviews, and if any maternity or neonatal issue or concern was raised the participants were referred to either their General Practitioner or back to the LMH for follow up.

This research was approved by the Central Adelaide Local Health Network (CALHN) Human Research Ethics Committee TQueen Elizabeth Hospital (HREC/15/TQEH/286: Ref No. Q20151221) and Site Specific Agreement Lyell McEwin Hospital, Site Specific Agreement Flinders Medical Centre (No.388.16). The University of Adelaide Human Research Ethics Committee accepted the CALHN approval. The participating sites played a significant role in facilitating access to participants, advertising the project and in supporting data collection in all phases.

Data collection

Data was collected in three phases using a combination of medical records reviews, hospital administrative data and interview methods.

Phase 1: Hospital resource use

Patient level resource use data was extracted from the hospital's data system (OACIS) using casemix criteria. Data was extracted for EREC eligible women who underwent an ECS between 1st January 2015-31st December 2015 (n=251) (ie before EREC) and between 1st January 2017-31st December 2016 (n=206) (ie during EREC).

ECS has National Casemix funding established and patients tracked through the Unique Record Number (Case note file number) for each eligible woman. Reporting requirements were established and data extraction occurred for analysis for hospital costs. No names were recorded only the case note file number to allow for tracking across Casemix. The following data was collected: length of stay (LoS) for mother and neonate, number of all-cause maternal readmissions within 3 months of discharge, length of stay of maternal readmissions, cost of the birth admission and cost of the birth admission plus any maternal readmission. Please note, data on neonatal re-admissions (number, reason, length of stay) for 2015 and 2016 is expected to be provided by the end of 2017. When available, the hardcopy medical records were also reviewed for evidence of maternal and neonatal readmissions and emergency department (ED) visits within 3 months of discharge, including reasons and length of stay (for readmissions) and duration (for ED visits, Women's Assessment Unit (WAU) and Breastfeeding Clinic (BFED)), and to compare against the Casemix data. Review of the medical records also allowed extraction of the post-natal home midwifery and mothercarer visits.

Readmissions were defined as admissions to the hospital within 3 months of ECS. As per the OACIS classification, post-natal care visits to the WAU and BFED were only considered readmissions if the length of stay exceeded 4 hours. Regardless of duration, visits to the emergency department (ED) were not considered to be re-admissions. We compared the proportion of re-admissions, ED, WAU and BFED visits in 2015 and 2016 using a two sample Z-test for independent proportions and independent samples t-test for LoS.

The proportion of mothers and neonates who were readmitted (as defined above) were collected from hospital records systems at Flinders Medical Centre.

Phase 2: Economic analysis

Identification and analysis of economic data (resource use and costs) pre and post introduction of EREC was conducted. For each episode of care, resource use associated with relevant inpatient/outpatient/home visits was costed per patient. Actual costs of providing care for mothers and neonates (including readmissions) were derived from the hospital system for 2015 eligible for EREC and 206 eligible for EREC.

Phase 3: Interviews

This phase gathered qualitative data using face to face/telephone interviews with women who experienced EREC. The original number of participants planned was (n=20) or until data saturation. Data saturation occurred after 10 interviews. The interviews were approximately

60 minutes duration and provided an opportunity for participants to discuss in detail their experience of an enhanced recovery pathway including positive/negative impacts on them, their baby and family.

Interviews were audiotaped (with participant consent) and transcribed verbatim. The transcripts were analysed to identify key themes. A thematic analysis, a widely used method in qualitative research (Braun & Clarke, 2006), provides a systematic recording of themes and issues found in interview data (Burnard, 1991).

A thematic analysis was undertaken of the data between two researchers who analysed the data separately and then came together to compare coding and analysis of transcripts and finalising thematic categories.

Results

Eligibility and uptake of EREC

In 2015, of the 538 elective caesarean sections, just under half (251, 46.7%) were assessed as being potentially eligible for the EREC program if it had been in place. The main reasons for ineligibility were: maternal comorbidities (eg cardiovascular disease, diabetes mellitus, pre-eclampsia) (25.8%), living outside the postcodes in which EREC was available (25.1%), first birth (17.8) and lack of psycho-social support (9.1%) (Table 1).

Table 1 Reasons that 287 mothers birthing in 2015 would have been ineligible for the EREC program if it had been available.

Reasons for ineligibility in the 2015 cohort	n	%
Comorbidities (CVD, Diabetes, pre-eclampsia)	74	25.8
Postcode	72	25.1
First birth	51	17.8
Psychosocial	26	9.1
Twins	23	8.0
Other	22	7.6
Post-op issues	12	4.2
Placenta previa	7	2.4

In 2016 there were 622 elective LSCS, 274 (44%) were initially identified as being eligible for EREC:

- 24 were on the EREC pathway but ended up having emergency LSCS
- 92 completed the EREC program and were discharged within 24 hours
- 33 were 'not fit for discharge' within 24 hours
- 125 were initially identified as possibly suitable for EREC but were later classed as not suitable during the antenatal period.

There were 348 (56%) women in 2016 that did not meet the inclusion criteria for EREC.

Patient Characteristics

Patient characteristics were obtained through medical record review of 2015 'eligible for EREC' (n=251) with 2016 'completed EREC' (n=92). The 2016 sample tended to be slightly older (mean age 32.1 years, 95% CI = 29.7, 30.9) than the 2015 sample (mean age 30.3 years, 95% CI = 31.0, 33.2). Overall, about 90% of the mothers were married (48.1%) or in a de facto relationship (40.9%). On average, there were 2.5 children at home in both 2015 (range 1-7) and 2016 (range 1-4). Over 70% of participants were described as Caucasian, with other ethnicities being represented as: Asian (16%), Aboriginal (4%), Middle Eastern (4%) and African 2.7%. The numbers of previous LSCS are presented in Table 2. Two thirds of women had had only one prior LSCS, while a little over a quarter had previously had two LSCS.

Table 2 Numbers of previous LCSCs across the 2015 and 2016 samples

	1		2		3		4		Grand Total	
Year	n	%	n	%	n	%	n	%	n	%
2015	141	66.8	58	27.5	8	3.8	4	1.9	211	100.0
2016	52	62.7	23	27.7	6	7.2	2	2.4	83	100.0
Grand Total	193	65.6	81	27.6	14	4.8	6	2.0	294	100.0

Hospital resource use

There was a significant reduction in the birth admission LoS in 2016 (2.13 days) compared to 2015 (2.55 days) (mean difference: -0.42 days, -0.71 to -0.13 95% CI) (Table 3). However, the difference in the mean birth admission costs (-$349) between 2016 and 2015 was not significant (Table 3). In 2015 there were 7 all-cause readmissions per 251 mothers (0.028) compared to 13 per 206 mothers (0.063) in 2016; although the mean difference between the years (0.0027, -0.0027 to 0.073 (95%CI) was not significant (Z=1.8, P=0.069) (Table 3). The comparative data from Flinders Medical Centre for proportion of mothers experiencing a readmission were 0.05 from 2015 (37 readmissions from 735 mothers) and 0.04 from 2016 (27 readmissions from 680 mothers). The proportion of maternal readmissions is similar between hospitals.

The mean LoS per readmission was 2.63 days (2.50 SD) in 2016 (2.47 days) compared to 1.20 days (0.94 SD) in 2015 (0.81 days), however, this was not statistically different (t=1.64, P=0.115). Summing the birth admission LoS and any readmission LoS showed no difference between 2016 (2.34 days) and 2015 (2.59 days) (Table 3).

Table 3 Comparison of outcomes for EREC eligible mothers in 2015 and 2016.

Variable	2015 EREC eligible cohort	2016 EREC eligible cohort	Difference (95% CI)
n	251	206	
Birth admission LoS (mean, days)	2.55	2.13	-0.42 (-0.71 to -0.13)
Birth admission cost (mean, $)	$7,500	$7,151	-349 (-6536 to 5838)
All-cause maternal readmissions (proportion)	0.028	0.063	0.03 (-0.01 to 0.08)
All-cause maternal readmissions LoS (mean days, (SD))	1.20(0.94)	2.63(2.50)	
Birth admission + all-cause maternal readmission LoS (mean, days)	2.59	2.34	-0.26 (-0.58 to 0.07)
Neonatal readmissions (proportion)	0.048	0.011[@]	0.037 (-0.0099 to 0.084)
Midwife visits (mean visits per patient (SD))	2.3 (1.1)	2.8 (0.8)	
Mothercarer visits (mean visits per patient (SD))	0.5 (1.2)	1.1 (1.6)	

[@] data so far only been collected from 2016 EREC completers. Other data will be collected shortly for all 2016 EREC eligible.

There were 12 neonatal readmissions in 2015 from 251 births (0.048) and one in 2016 from 87 births (0.011). There was no statistical difference between these two proportions (Z=1.5, P=0.122) (Table 3). The comparative data from Flinders Medical Centre for proportion of neonates being admitted was 0.094 (69 readmissions per 735 births) in 2015 and 0.125 (85 neonatal readmissions per 680 births) in 2016. In general the neonatal readmission rate appears lower at Lyell McEwin Hospital.

As expected there was an increase in the midwife and mothercarer mean visits per woman 2016 compared with 2015. From 2015 to 2016 the mean number of home midwife visits per mother increased from 2.3 to 2.8 (t=-4.0, P=0.000) (Table 3). From 2015 to 2016 the mean number of mothercarer visits per mother increased from 0.5 to 1.1 (t=-3.1, P=0.002) (Table 3). Additional visits were built into the formal EREC pathway for 2016.

In 2015, midwives visited 228/249 (91.6%, 95% CI = 88.1%, 94.7%) of mothers. In 2016, midwives visited 85/87 (97.7%, 95% CI = 94.6%, 100%) of mothers (Table 4). The confidence intervals of the two estimates just overlapped (indicating that the two measures are not significantly different from each other).

In 2016, mothercarers visited 44/248 (17.7%, 95% CI = 13.0%, 22.5%) of mothers. In 2016, mothercarers visited 35/87 (40.2%, 95% CI = 29.9%, 50.5%) of mothers (Table 4). The confidence intervals of the two estimates do not overlap, indicating that the proportion of mothers receiving mothercarer visits was significantly greater in 2016.

Table 4 Summary of home visits to new mothers by midwives and mothercarers

		Count of number of visits								
Group	**Year**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Grand Total**
Midwives	2015	21	19	110	74	21	3	0	1	249
	2016	2	0	22	42	10	2	0	0	87
	Grand Total	23	19	132	116	31	5	0	1	336
Mothercarers	2015	204	8	4	10	21	0	1	0	248
	2016	52	10	5	5	15	0	0	0	87
	Grand Total	256	18	9	15	36	0	1	0	335

The breakdown of number of readmissions per mother is provided in Table 5. Most mothers (17/20) only had a single readmission. Two mothers in 2015 had two readmissions and one mother in 2016 had four readmissions.

Table 5 Numbers of mothers with 1, 2, 3 or 4 readmissions. Data for 2016 is also provided separately for EREC completers and those who opted out at the antenatal stage.

Number of readmissions	1	2	3	4	Grand Total
2015 – total	5	2	0	0	7
2016 – total	12	0	0	1	13
EREC completers	8	0	0	1	8
Opted out at AN	4	0	0	0	4
Grand Total	17	2	0	1	20

The reasons for readmission for 2015 and 2016 cohorts are presented in Table 6. There were five reasons for re-admission that were responsible for more than one readmission; these were: Crohn’s disease (two readmissions), post-operative infections (two readmissions), renal colic / cholecystectomy (two readmissions), post-natal care wound review (two readmissions) and sigmoidoscopy (two readmissions). The Crohn’s disease and sigmoidoscopy readmissions were for the same mother, who completed EREC in 2016 and had a total of four readmissions.

Table 6 Reasons for re-admission for the 2015 and 2016 populations. The 2016 data is also provided separately for the three sub-groups (87 mothers who completed EREC and 119 who opted out at the antenatal stage – data was missing for 11 mothers in 2016).

Reason for re-admission	2015 Total n=251	2016 Total n=206	2016 Completed EREC n=87	2016 Opted out at AN n=119
Anemia	1	0	0	0
Appendectomy	0	1	1	0
Breast abscess	1	0	0	0
Burn	0	1	1	0
Crohns disease	0	2	2	0
Elevated blood pressure	1	1	1	0
Gastritis/chest pain	0	1	1	0
Groin abscess	0	1	1	0
Mastitis	1	0	0	0
Pneumonia	0	1	1	0
Post op ileus pain constipation	0	1	1	0
Post op infection	0	2	0	2
Pulmonary embolus	0	1	0	1
Renal colic /cholecystectomy	2	1	1	0
PNC wound RV	2	0	0	0
Sigmoidoscopy	0	2	2	0
Test of Void	0	1	0	1
Wound cellulitis	1	0	0	0
Grand Total	9	16	12	4

In 2015, 39/251 (15.5%) mothers experienced either an ED visit, a BFED visit or a WAU visit. In 2016, 14/87 (16.1%) mothers experienced an ED visit, a BFED visit or a WAU visit. When this data was combined with whether a mother had experienced a readmission, it was revealed that 81% of mothers did not experience any either an ED visit, a BFED visit, WAU visit or a readmission, whereas 19% did (Table 7). There were similar proportions experiencing post-discharge care (ie a readmission, ED, BFED or WAU visit) between 2015 (83%) and 2016 (76%) (Table 7).

Table 7 Breakdown of the 2015 and 2016 cohorts by whether they experienced an ED visit, BFED, WAU visit or a readmission.

	Did not experience		Did Experience		Total	
Row Labels	**n**	**%**	**n**	**%**	**n**	**%**
2015	208	82.87%	43	17.13%	251	100.00%
2016	66	75.86%	21	24.14%	87	100.00%
Grand Total	**274**	**81.07%**	**64**	**18.93%**	**338**	**100.00%**

Economic analysis

Table 8 Additional costs associated with the delivery of the EREC program

Resource	**Additional resource use**	**Unit cost**	**Extra cost per EREC eligible woman**
Antenatal visits	1 extra visit per woman deemed eligible for EREC	$217	$217
Postnatal midwife visits[$]	0.5 extra RM1/2 visit per woman completing EREC*	$44.80	$20.01
Mothercarer visits[$]	0.6 extra Assistant 1/2 visit per woman completing EREC*	$37.30	$16.66
Total			$253.67

* proportion of eligible cohort incurring additional postnatal and mothercarer costs = 92/206 = 0.422; unit costs include $10 travel costs based on a cost of $0.5 per km

[$] - postnatal and mothercarer visits collected in phase 2

Maternal readmissions were slightly increased in the 2016 EREC group, but readmissions for the neonates were reduced, so the net cost impact of readmissions is not clear at this stage. The maternal LoS post ECS for 2016 compared to 2015 was shorter 0.4 of a day less. However the length of stay of readmissions was much greater in 2016 compared to 2015. When the birthing length of stay is added to the readmission length of stay, the total length of stay is not different between the two years (Table 3).

In the (current) absence of cost information on the readmissions (for mothers and for babies), the EREC was associated with a reduction in the mean cost of the birthing admission across the cohort of women judged to be eligible for EREC from $7,500 in 2015 to $7,151 in 2016 (Table 3). The estimated additional costs associated with the delivery of the EREC program summed to $255.67 per eligible women, comprising:

- an extra visit to the hospital for antenatal education
- an extra 0.5 of a visit per mother by a midwife
- and an extra 0.6 visit per mother by mothercarer.

The total additional cost per mother completing EREC was estimated as $253.67, which suggests a net saving of $93.33 per mother.

In the light of the positive attitude of women participating in the EREC program, the estimated cost saving associated with EREC indicate that the EREC program may be a dominant model of care, i.e. it reduces costs and improves women's experience of childbirth. However, this analysis does not yet include the neonatal readmissions data.

Interviews

This section of the study explored the women's experiences of an enhanced recovery pathway for ECS. This is with the aim to provide a better understanding of the key issues from a consumer perspective. These women were some of the first to experience a new pathway of care introduced into the maternity system and so it was recognised that they may be aware of some issues that could to be considered to improve the future experience of women in the program.

Originally it was planned to interview 20 women as part of this study. However it was clear by interview number 10 that there was already data saturation related to the overall experience of the women on the EREC pathway. Though the interview number was small the consistency of their overall experience does suggest, with some confidence, that the enhanced recovery pathway was acceptable to them though there is room for some areas of improvement.

1) Demographics

A total of 11 women who were eligible for EREC were interviewed after they had been discharged home for at least 2 weeks. The women's' ages ranged from 21 to 37. All of women have previously had an emergency cesarean section (Table 9). Days in hospital after their previous cesarean section was on average 5 days. The women interviewed came from a range of cultural backgrounds including Caucasian, Asian and African.

Table 9 Demographics of interview participants

	Age	**No previous Children**	**Prev CS Emerg/elect**	**Days in Hosp for each one**
1	21	2 (3 total)	Emerg 1 Elect 1	2-3 days
2	33	3 (4 total)	Emerg 2 Elect 1	5/5days 4 days
3	26	1 (2 total)	Emerg 1	5 days
4	29	1 (2 total)	Emerg 1	5 days
5	37	2 (3 total)	Emerg 1 Elect 1	5 days 2 days
6	29	1 (2 total)	Emerg 1	5 days
7	20	1 (2 total)	Emerg 1	Unknown
8	32	2 (3 total)	Emerg 1	5 days
9	33	2 (3 total)	Emerg 1	Unknown
10	unknown	1 (2 total)	Emerg 1	5 days
11	32	2 (3 total)	Normal Del 1 Emerg 1	Unknown 8 days

2) Themes

A number of themes emerged from the evaluation data (Table 10).

Table 10 Thematic analysis of interviews

	Major Themes	Sub Themes
1	Experience of an enhanced recovery following ECS.	• Informed of the options • Knowing what to expect • Experiencing a quicker recovery • Experiencing effective pain relief Finding staff supportive • Sometimes experiencing delay during the discharge process
2	Experiences following arrival home	• Just happy to be home • Coping in the home environment
3	Information 3a) Information provided during their pregnancy	• Coping with masses of written information • Receiving verbal information from staff as well as written
	3b) Information provided to their family during their pregnancy	• Persuading family I'm ok
	3c) Information provided while in hospital about being prepared to go home early	• Remembering little • Appreciating the support of others in acquiring information • Essential information
4	Support 4a) Support of self – hospital	• Assistance with developing skills • Reassurance that they and their baby were well enough to go home. • Leaving the ward
	4b) Support of self – at home	• Having the support of family and friends • Having the support of midwives • Having the support of the mothercarer
5	Advice	• Suggested additional information that might be helpful for the future

2.1) Women's experience of an enhanced recovery following an elective caesarean section.

The following themes summaries the womens' experience of an enhanced recovery that reduced their length of stay while in hospital following ECS.

Most women on this study reported favorably on their experience post ECS. Women who were commenced on the EREC pathway who had experienced a previous cesarean section indicated that they knew what to expect post-operatively.

Due to their previous experience, as well as good pain management post operatively, which assisted them to feel like they were recovering well, and when they found the midwives encouraging, supportive and skilled, the women indicated that they were more confident to be at home earlier, and more satisfied with their experience.

Informed of the options

Even though many of the women were informed that they will be on the EREC pathway most women participants felt that it was a good option for them while knowing that if they changed their minds, or became unwell they could stay longer:

> Interview 1 -*Yeah it's my choice I say because I want to go home, I don't want to stay in hospital.*

> Interview 2 - *when the nurse told me that you will stay one day in hospital and others at home, the rest of days, I thought yeah that's a good idea.*

> Interview 3 and 10 - *… if things weren't going right then you can stay in hospital.*

> Interview 6 - *... was like when can I go home, can I leave*

Being informed and aware early in their pregnancy that should they or their baby require more support after the ECS they would be able to remain in hospital reduced their anxiety:

> Interview 9 - *at first it was never mentioned that you could come off if there were going to be complications, … so once it was mentioned later on throughout my pregnancy that there is the potential for you to come off this program if they feel that there is any sign that you're not going to be well enough to go home, I think that's more reassuring. I think I would've felt better about it if that was mentioned from day dot.*

Knowing what to expect

All the women interviewed had experienced at least one previous caesarean section so they felt that to some extent they knew what to expect.

> Interview 9 - … *I think because I had experienced a caesarean before a lot of it was just a refresher, oh yeah that's what happens, okay this is happening a lot sooner than what it was before*…

They also had more confidence in going home with a new born baby having had at least one previous child so parenting a new-born was not unfamiliar to them:

> Interview 5 - *Being my third, I guess I'm not a real worrier as well so I felt comfortable.*

> Interview 8 - *Because it's not my first baby it was fine, I mean I wouldn't probably recommend it for first baby. Because it was my second baby I kind of knew a lot.*

Interview 10- My very first day [with this baby] I was perfect [confident] in terms of breastfeeding......

Experiencing a quicker recovery

Several of the participants had previously experienced emergency caesarean sections so felt in comparison their latest experience was very good. Much easier both physically and emotionally.

Interview 2 - *this caesarean I think it's different than others. A bit easier*

Interview 3 -. *In the morning I had the catheter taken out and then I got up by myself and had a shower and walked around the room.*

Interview 4 -*I actually felt really good the next day, I probably felt better the next day than I did the days after, you're kind of still running on adrenalin. I was a bit crook when I got back to the ward the first night, I was vomiting just from the pain-killers, then once the catheter came out about 9 o'clock that night and I was all fine after that and I felt really good the next day'.*

Interview 5 - *Very good. I was treated very well, it was, you know as traumatic as it can be just having a caesarean and not being very mobile it was a good experience.*

Interview 10- *I had the catheter taken out and then I got up for a shower*

Interview 11- *Experience this time was very good .... I was prepared in my mind ... that I have to get up from bed the next day.*

Experiencing effective pain relief

Experiencing effective pain relief was important for women because it was an indicator that they were to recovering well. The importance of ensuring effective pain relief was highlighted by these women:

Interview 2- *appreciated medicine* [for pain relief]

Interview 3 - *… pain relief appreciated.*

Interview 4 - *The first night I came home I actually forgot to take it [(pain relief) before I went to bed and I woke up the next morning and I was in so much pain, my husband had to bring them to me and I couldn't move I was in so much pain so I definitely learnt my lesson. So I took them and about half an hour later I was good to go but that definitely taught me to be vigilant and stay on top of it.*

Interview 9 - *…information given make sure about pain relief and then having the medication as well*

Interview 10- *This time I tried to take Panamax rather than Oxycodone... It actually was good. ... We were prepared and I know that if I feel pain I can take painkillers* [Panamax].

Finding staff supportive and positive about EREC

A positive experience with midwives during their stay in hospital was also important to the women and enhanced their overall confidence and experience:

Interview 3 – *The nurses* [midwives] *were nice, everything was relaxed compared to the last caesarean, yeah just really good even though I was there for twenty-four hours.*

Interview 6 – *The midwife that I had that was with me overnight, she was excellent, I don't know who she was but she was brilliant, she was really, really good. She was helping me, she was actually coming in and she was checking on me. She was like really, really good.*

Interview 10- *They [midwives] were just really helpful.*

Interview 11- *The midwife came told me tomorrow were going to take a shower before 10 o'clock. So I was like OK. She said I will tell you how to get up from bed, how to take a shower, everything. It just went really well.*

It made a big difference to the woman's progress if the staff were aware they were on the EREC program

Interview 9 - *From the moment I got into the hospital they knew I was on the EREC program and it was mentioned numerous times throughout the whole twenty-four or however long it was that we were there.*

Interview 10- *they has the little sticker on the front [casenotes].*

Occasionally there was an indication that not all midwives were aware or supportive of enhanced recovery process. This has the potential to affect a woman's confidence in their ability to go home earlier as mentioned by this participant:

Interview 4 - *some nurses and students didn't know I was going home in 24 hours. I told them. I felt confident my choice but felt that other women who were less confident may have experienced anxiety.*

Interview 5 - *And at the time Dr C said to me on the last visit, if there are any issues that you're uneasy about just come back in and see us and I think I did the wrong thing because a couple of days later I did go back and of course I didn't have an appointment but I said to the lady at the counter I'm happy to see anybody but I was told I could come back if I've any concerns. They sort of said to me, we don't work like that. I thought*

well that may be the case and maybe I shouldn't have come in I should've rung up first.

Sometimes experiencing delay during the discharge process

Some women were keen to go home but had to wait for the discharge process to be completed. They needed review by a number of different health professionals and if one or more of these reviews was not timely discharge was delayed:

Interview 1- *waiting for the doctor* [to see the baby]…I *just want to go home*.

Interview 10 - *I just had to wait for the baby doctor to come and check him [baby] out and me....drugs...had to wait for that.*

2.2) Experiences following arrival home

All women participants were pleased to be heading home early:

Just happy to be home

Interview 1- *Good. Happy to be home.*

Interview 3 - *It's nice to be home straight away.*

Interview 4 - *I elected to have the caesarean because it just ticked so many boxes. I'm a very organised person and to be able to plan everything and know what's going on and go yep this is what's happening. Even for my partner because we had all the complications with her* [first C-section] *and she was two weeks late, she came home and he had to go back to work pretty much straight way so he didn't get any time with her whereas this time he went on leave the day before so he had the longest time.*

Interview 8 - *I really loved it to go home early, it was good for me because I felt ready and I feel more comfortable at home, so for me it was a great experience but I guess it depends on the person and how anxious they are.*

Interview 9 - *I think this program honestly it works, I think it's going to work very well for healthy mums….*

Interview 10- ...I feel very lucky that I came home next day and I can see my son in front of me you know that kind of feeling. That satisfies me... He [the son] said [when visiting her in hospital] Mumma lets go home.

Coping in the home environment

While being at home much earlier was appreciated, it was not without its challenges:

Interview 3 – *It was good, it was difficult at first because I've got stairs … the bedrooms are upstairs.*

Especially when there were other young children to care for:

Interview 6 -*I went home with A and T was here with me the first day but mum would come and take her at night because I didn't want her to feel like I was just getting rid of her because I had her sister, so I didn't want her to feel left out or jealous.*

Interview 9- *So much different and we also, … had a toddler that we had looked after for three nights [by someone else], so the night before, the first night and the second night. … I think just for both of us because all we had experienced was only ever one child and coming home to peace and quiet and no chaos so we just thought it would be easier on both of us and especially with lack of sleep, you've got to do it for yourself.*

Interview 10- *I was defiantly worried about him [eldest child] but my husband and my family is there to help and support him too. They drop him off to childcare*

3) Information

This section explored the information women received during their pregnancy and while in hospital in preparation for going home early. The questions further explored what information was useful and what other information they would have liked to receive. What was evident was that different women preferred information in different formats. Some preferred written information while others did not read the information they were provided with and preferred to ask questions. Others chose to do neither. Simply taking the process as it came.

3a) Information provided during their pregnancy

During their pregnancy the women were provided with much information. A considerable amount of information was provided in writing. Some appreciated the written material, reading everything avidly, while others read nothing preferring to ask questions of staff when they had the opportunity. Some preferred to rely on their previous life experience with a cesarean section. It was also possible some had other sources of information that they did not share with the interviewer such as family, friends and internet sources.

Coping with lots of written information

Interview 1- *they give lots of paper, I forget.* [English was not first language]

Interview 4 - *… received all the written info and read it. Particularly interested in pain relief info…. there's lots of pamphlets and stuff.*

Interview 5 - *Fairly clear to me, I don't feel that I sort of missed any information, I think it was all clear. I don't feel that I had to ask a lot of questions because of the information that I'd been given.*

Interview 7 - *A lot of pamphlets they gave.*

Interview 8 - *I got two. I got the leaflet and one big booklet and all the information.*

Interview 9 - *Oh yeah, there was lots of reading, lots of paperwork ….*

Interview 11- *Yes I got enough information and I read those handouts as well. I was prepared this time.*

Receiving verbal information from staff as well as written

The opportunity for women to ask staff questions about the process was just as important as the written information. For some the verbal information was more useful.

Interview 1 - … and *the doctor tell me.*

Interview 1 - *They have many people come* [talk to her about the going home].

Interview 2 - *don't remember written information and didn't read it. Remembered what nurse told me.*

Interview -3 - *I saw one particular doctor at … and he went through the program with me and then I saw a midwife who also went through the program and gave me some forms and things*.

Interview 5 - *I was given both. I did have the caesarean pack sent out to home so that had all the information in there sort of what I should be expecting and what I will experience and what do to when I'm at home in regards to medication and care and all of that. I had one appointment in there at the .X. where we sort of went all of that verbally as well*.

Interview 7 - *The midwife X went through them* [with me].

Interview 8 - *For me yes, one of the midwives came and talked to me about what to expect. I read a lot.*

Interview 9 - *I had a lot of discussion prior to actually my hospital visit so my antenatal thing about chewing gum and all of that stuff which I never even knew.*

Interview 10- *I saw one particular doctor and he went through the program [EREC] with me. Then I saw a midwife who also went through the program.*

Interview 11- *Every time I see Dr or midwife they give me information about pathway. If everything goes well you're going to be discharged the next day and you will be fine ...medicines for pain, mothercarers. So you kind of get everything to help and support you.*

3b) Information provided to their family during their pregnancy

One of the questions explored with the women how their family were assisted in the antenatal period to adjust to the idea of an early discharge.

Persuading family

Interview 3 - *No he [partner] didn't even read the information I told him about it. He agreed because it is what I wanted.*

Interview 3 – *mum was a bit worried. She did ask some questions and I did read some of the brochure out to her.*

Interview 4 – {The woman's mother} *Mother concerned about my early discharge. Different to what happened in the past* [with c-sections]

Interview 4 - *I guess to me I'm the type of person that loves information so like I read up a lot about it online, like if there was anyone else that had the same experience. So when people asked me questions I already had the answers for them and because I was confident in it I guess that gave other people confidence in it so mum never doubted it for a second. I guess also knowing that we had that option if we weren't ready to go home there was no pressure to go home, it wasn't like you've signed up for this program we're going to kick you out the next day, and even J said to me, if you're not happy and he's not feeding and you don't feel comfortable don't go. So having that option you know that you're covered sort of thing.*

Interview 5 - *: He [husband] was shocked as well, I mean they tend to not think of the consequences of that as much as I do I guess. I mean I was shocked when I first had my initial appointment and it was all news to me too because of my past experiences I thought wow that's quick. People would say to me, oh they kick you out, so I guess that's the first thing that comes to peoples' mind.*

Interview 5 - *I know personally that my family probably wouldn't go to an information session about it, they'd probably go on what I feel about it.*

Interview 7 – *'My mum was a bit wary but she was here for a couple of days so she was alright*

Interview 8 - *Well considering now everyone goes home earlier no-one was too shocked, I mean some people said it was surprising*

Interview 11- The information was relayed through me, so I kept discussing with my family.

3c) Information provided while in hospital about being prepared to go home early

Post caesarean hospitalization was for some women a bit "hazy". The women were recovering from surgery and generally found it quite hard to remember any information they had been provided with in the early stages of their recovery.

Remembering little

Interview 5 **–** *I was a bit out of it to be honest'. Remembers pharmacist explaining medications. Don't remember being talked to about first night fears'.*

Appreciating the support of others in acquiring information

Partners being available in the hospital to listen to and remember the information was useful for women:

Interview 5**- '***I probably used my husband as an extra set of ears regarding the information about medication and things like that'*

Midwives in the postnatal area reaffirming key messages in discussion with women was important:

Interview 3 - *Not so much information it's just having somebody here [midwives] to help is probably the main thing that helps out.*

Interview 4 –. *When in hospital appreciated verbal rather than written info from midwives.*

Interview 6 - *She [midwife] let me know what was going on, she talked me through things.*

Interview 10- *Doctor visited me, midwife visited me, mothercarer visited me. They [midwife, mothercarer] said they are going to come home and I think there is one pharmacist as well who gave me medications like pain management. ... and written information about dosages.*

Some women in the study mentioned that when in the post-natal ward the midwives did not discuss with them any expectations about what to expect physically/emotionally or about the babies care when home. They relied more on their own pervious experiences of a caesarean section:

Interview 5 - *No it wasn't sort of discussed about what to do in the future it was just about the now.*

Interview 6 – *can't pin point any new information received that was helpful. Just got on with it based on my previous experience of a section.*

Essential information

Information that appeared to be lacking for a few of the participants was particular information about who and how they should contact people if they have any concerns either due to an emergency or general health for both themselves or their baby.

Interview 2 - *when asked who she would contact if she had a problem she said ambulance.*

While other participants were able to recall this information:

Interview 5 - *[Was aware of] the numbers that I needed to ring if I had a problem so I knew that that was an option if I needed it.*

And had used the essential information as this participate discusses:

Interview 8- *if you want to go home and you feel you know a majority of stuff and the fact that you can always call Women's Assessment and have someone explaining if everything is alright or not, because I did need to call once and luckily it was alright, I just had a bit of blood and I wasn't sure whether it's normal or not. We also went to our GP.*

4) Support

This section explores the support the women received during their hospital stay from staff that helped prepare them to go home early as well as the support they received when home from family/friends, midwives and mothercarers.

4a) Support of self – hospital

Reassurance that they and their baby were well enough to go home.

After their ECS the women felt reassured that should they or their baby develop complications immediately after their surgery then they would not be expected to go home.

> Interview 5 – *I felt well informed and I guess because I was always reassured that if there were any problems or any complications then you would automatically stay an extra day. As long as everything went well then I'd be probably out the next day*

> Interview 3 – *If I did not feel ready to go home I could stay.*

> Interview 9 - (Partner speaking*) -Yeah I think the one thing that probably made us feel most comfortable was that we knew that she would have to be, that a doctor would have to say whether or not she could go home. So if the doctor said yep she's fine I would have the confidence.*

Leaving the ward

A few women mentioned having some difficulty walking to their car when leaving the ward.

> Interview 3 - *It wasn't bad, I took my time*

> Interview 5 - *... I do remember saying to my husband slow down, but I just went at my own pace…: I didn't have any difficulty in getting from the ward to the car, I think you're running on adrenalin as well.*

> Interview 9- *Do you know what I really like … someone else's suggestion about the wheelchair, the more I think about it the more I think about how hard it was to get to that car and then there's the car ride home when you go over bumps to get home out of the hospital … .*

> Interview 10 -*They say you can't have wheelchair you can walk... I went to multi storey carpark and it was like walking too much*.

4b) Support of self – at home

Access to family and friends for support was mentioned as important components to preparing for being at home early:

Having the support of family and friends

> Interview 1- [supported by] *Sister with my husband.*

> Interview 2- *difficult to not move or bend etc. when you have other children to look after so having the support of family and friends vital. [*0ther children did not come home until day 3. Time to be with partner and new baby].

Interview 3- *my partner and my mum and friends, there was a lot of people* [to provide support]

Interview 3 –*because we were coming home earlier a lot of people were like, we'll take time off work to help'. Knew the day of the section so could plan support in advance.*

Interview 4 - *And I've got wonderful support from my parents and they pretty much said look we're taking her [other child], we'll bring her back…*

Interview 5 – *I was well-prepared, obviously I was given a lot of information and I was prepared and if I had any issues ….I had that support there.*

Interview 6 **-** *It was really good because my mum had her[eldest child] so that I didn't have to worry, so my mum had T for the simple fact that I couldn't move as quickly as what I needed to and I couldn't lift her or do the little things like put her to bed.*

Interview 10- *We had midwives, mother-carer, my parents, partner, friends. Lots of support.*

Having the support of midwives

The visits by the community midwife soon after the women returned home was a very important part of the EREC pathway. Not only was it reassuring for the women to know that a midwife would visit to see that all was well with them and the baby, it was also a chance to have one-to-one time with the midwife to ask any questions.

Interview 2 -*midwife came twice [thinks]. Helpful*

Interview 5 **-** *It came about [additional support with breast feeding] because [baby] lost 12% of her body weight. And so right from then on the milk was an issue and the midwives were on top of that.*

Interview 5 **-** *The midwives and just that reassurance that they're on top of it all, I mean they were very consistent in their visits and letting me know where H was at without making me worry as well, you know letting me know that she was making those small steps to regain that weight….. I ended up having, the second week when I was home I still had the midwife coming out every couple of days.*

Interview 7-*midwife came out 2 or 3 times.*

Interview 8- *I was just happy to have the midwife come, unfortunately they only came three times.*

Interview 9 - *It wasn't an option,(Midwife visits) it was just going to happen … once you get home you don't think of questions when you're in the hospital you're probably still a bit drugged up and you've got questions then afterwards when the midwife comes about bleeding, about how your scar feels, so having those midwives come out or even for baby and you, should I be feeding like this, should I be doing this.*

Interview 10- *Midwives visits every second or third day was reassuring.*

Though lack of continuity of the midwife was for some frustrating, especially when they were having specific problems as this woman mentions:

Interview 5 - *I suppose I found it a little bit frustrating sometimes having a different midwife, I mean I did see some of them more than once…. I mean you're very tired and very drained and a lot of it, the basics are there in the notes anyway, but just kind of having to go over that again and re-explain.*

Having the support of the mothercarer was valued

Access to a mothercarer was greatly appreciated by several participants.

Interview 2 -*The carer that came to help helped a lot.. Because it made everything easy.*

Interview 3 - *We also had the Mothercarer come out which was good so she helped.*

Interview 3 -*They did the washing, the dishes, the vacuuming, all things I couldn't do'…. 'having someone you don't know and do your laundry and your dishes and things, it was a bit strange.*

Interview 8 - *…she came for a few hours she was lovely…*

Interview 10-....*she helped me with the bottles*

Interview 11- *There a good help. Looked after my little one [toddler] ... so I could rest...did laundry. Looked after my baby so I could sleep.*

Extra support can be provided if a situation arises as discussed in this case, however it is always the woman's choice:

Interview 4 – *We had the Mothercarer and she came on the Sunday and the Monday for a couple of hours each day and then on the Tuesday we had the home midwife come and so the Mothercarer didn't come on the Tuesday. Because it was on the Tuesday that the jaundice got picked up so then once they spoke to each other she rang me [mothercarer] and said do you feel like you want another visit because we kind of decided that, ……. she rang a couple more times throughout the week just to follow up on how he was going.*

Sometimes participants felt self-conscious and reluctant to ask mothercarers to do things for them that they would normally do for themselves as this participant highlights:

Interview 10- I feel a bit reluctant to say to them can you do this thing, can you please help me with this thing. Like ...they are not young…

Some women who had family support declined this service.

Interview 1 - *My husband one who said no, he handle everything'*

Interview 5 and interview 7 – *mothercarer declined. Knew option existed.*

Interview 8- *Mothercarer, I did sign for that but because I had the support from my husband, ...changed mind.*

Interview 9 - *did not need home carer had parents living close by.*

5) Advice

Following is advice that the woman would give to other women preparing for an early discharge post elective caesarean section.

What advice would you give to other women?

Interview 1 – *many friends they say why you come back quick, I say no I want to go home because I want to walk and get better quick'….. 'Yeah it's my choice I say because I want to go home, I don't want to stay in hospital…..I think it's better you go home because you can do anything and then if you want to get better quick you have to go home and little bit exercise, …..………., because if you lay down in the bed in hospital you don't get better quick.*

Interview 3 *I've already had a few friends say they're going to have another baby and do the same program*

Interview 4 - *I honestly think that this program might be more difficult for women if it's their first baby, I guessed a lot of what made it easy for me is that I knew what to expect baby-wise and I kind of had that confidence in my ability to care for a baby but for a first time mother if she's electing to have a caesarean I think that it would be too much to go home the next day.*

Interview 4 – *all I can recommend is go into it with all the information and if you're not sure, ask*

Interview 6 - *if it was a friend having their first baby I'd maybe advise them against it only because with your first one because you don't know what you're doing you need that extra help from your midwives just for information wise and for help. Whereas if it was their second one it would be a lot easier for them I'm pretty sure. But apart from that it was all really, really good.*

Interview 7 *Make sure you get your medications.*

Interview 11. ...you're getting discharged next day, it will be really good for you because you're going home. You're in your home environment. You can see your kids and your family around.

Suggestions about what could be done to improve the experience.

Suggested additional information

Most of the participants commented on the **unexpected cost of pain medication**. When they were about to leave the hospital they unexpectedly received an invoice with their medication.

> Interview 2 - *… I took the medicine because they didn't told me how much I have to pay, so when I came home I just look at the papers and I found the bill.*

> Interview 4 - *I think the only thing that I wasn't aware of was the cost of the pain killers, that wasn't mentioned throughout the program and then someone came and they're like, here's your bill, and I was like what are you talking about….: It was about $70 for the pain killers to take home and you don't really get a choice because they come with them all, already there and go, here you go, here's your bill, you've got a week to pay it'.*

> Interview 8 - *I had $75 to pay for the whole medication but considering everything was for free.*

> Interview 9 - *I got sent home with quite a bit so $50 something or $60.*

> Interview 9 - *… I got sent home with tablet form and powder form of stuff to help me use my bowls and I've paid for them and I've not opened the box and I think maybe that should just be an option maybe for people with families where the partner can go out, like give them a script if they need a script.*

One participant suggested raising the issue in the antenatal period to encourage women to consider organising family members to **help with looking after a toddler** for a few days after going home

> Interview 9 *There was information in there about what you do probably before to prepare your toddler … but not so much afterwards so that probably would've been more sort of thing.*

One participant felt she had not had sufficient information to make an informed decision about whether to have another C-section or try for a vaginal delivery.

> Interview 3 - *Maybe like a comparison of risks, like if you have a caesarean and then go natural what are the risks because you don't really have any pamphlets'.*

Expectation that there would be no issues with **breastfeeding** following and ECS was raised by one participant. This participant was not aware of the potential to have some delay in her milk supply because of the c-section:

Interview 5 - *Mainly one thing, the only real issue that I had was having the caesarean that my milk took a while to come in…. You just sort of assume that you'll go home and you'll feed, you don't always expect to come up to those sort of hurdles…*

Discussion

Given the high and increasing rate of ECS a quality improvement project on an alternative pathway for the safe transition of maternity care from hospital to home, for women and their babies 24 hours after an ECS was undertaken in October 2014 by the Women and Children's Division at the Lyell McEwin and Modbury Hospital. The project titled 'Enhanced Recovery Elective Caesarean' (EREC) was initiated based on evidence from the literature that identified key aspects of safe practice for this model of care. The maternity service implemented EREC pathway (1st January 2016) so the focus of the research design was on evaluating components of EREC.

Funding by the HCF Research Foundation enabled an evaluation of the implementation of EREC.

The outcome of this research suggests that EREC is a safe pathway for maternity services to consider implementing, which incorporates a slightly reduced LoS and cost post ECS. Maternal readmissions were slightly, but not significantly increased in the 2016 post-EREC group; and neonatal readmissions were slightly, but not significantly decreased in this group compared to the 2015 pre-EREC group. We therefore conclude that overall the introduction of EREC as an intervention has not increased risks to the mothers or neonates; however, the strength of this conclusion is limited by the slightly lower than ideal sample size for the study (see Limitations), the lack of uptake across the whole of the 2016 eligible cohort, and the existence of some missing data. It is anticipated that the missing data on neonatal readmissions will be provided by early 2018 and will therefore be included in a revised report and published journal articles from the study.

Our estimate for cost savings from implementing EREC is quite modest – only $100 per mother when the completion rate of mothers in the program is 33%. This measure is based on a saving of approximately $350 per mother due to a slightly shorter mean LoS and a cost of approximately $250 per mother in the EREC program. The $250 cost mainly comprises an additional antenatal visit ($217, 87%) and midwife home visits ($20, 8%) and mothercarer home visits ($17, 5%). It is important to note that the mean LoS in the 2016 post-EREC measure is 2.13 days, significantly greater than the 1-1.2 days experienced when EREC is completed. If the EREC completion rate were doubled from 33% to 66%, we estimate that the mean LoS would decrease to approximately 1.64 days, leading to substantially greater cost savings. Clearly, increasing the program completion rate by mothers is one of the keys to unlocking the potential for significantly reduced healthcare costs. The EREC program did not seem to lead to significantly greater use of other hospital resources, such as the ED, WAU, or BFED.

Overall the introduction of EREC as an intervention has not increased risks to the mothers or neonates as demonstrated through very low readmission rates for mothers and neonates, and a lack of safety incidents reported in the 2016 post-EREC group.

The planned elective caesarean following the enhanced recovery pathway proved to be a very positive experience for the women participants. The one-on-one quality time with the midwife in the home environment was valued by the women and this may have helped the women to mention any concerns that they may have about their recovery or their babies wellbeing thus enabling an earlier intervention by the midwife or mothercarer.

A better understanding of the key issues from a consumer perspective demonstrates that for a cohort of women and their family the pathway was acceptable and the experience positive. To be kept in mind is that these women met a specific medical, obstetric and social inclusion criteria to make sure that an enhanced recovery process would be safe and appropriate for their circumstances. Exclusion criteria includes obstetric complications or comorbidities requiring extensive observation or investigation post-surgery; history of deep vein thrombosis, pulmonary emboli, or substance misuse. Women who have transient housing, no support person at home, physical or intellectual disabilities, domestic violence, current social service involvement, as well as first time mothers. Most of the women in this study were organised, keen to get home as soon as they could and had good supports for when they went home.

The women identified a few points in the model of care where improvements could be considered (Appendix A). Some key considerations are: the inclusion of extra information about the pathway from the moment an ECS is considered including reassurance from obstetricians that if there were any complications following birth the woman could stay longer in hospital. Discharge medications organised in the antenatal period. The staffs' positive attitude towards early discharge planning was also a consideration for the women. Any negativity expressed by staff had the potential to undermine the woman's decision and confidence that she could manage at home so soon after the caesarean section. The women also mentioned their preference for continuity of care by the same home visiting midwife.

Critical parts of the current pathway were the extra antenatal visit with the midwife to answer questions and reinforce the importance of the woman being prepared for early discharge and home visits by midwives as well as the option for extra support through the availability of the mothercarer.

There are a small number of points in the pathway where improvements should be considered (Appendix A), but as a new program that has only been in place for just over one year these women felt safe, supported and were very satisfied with their experience.

Translation into Practice –Recommendations for EREC Pathway quality improvement

This is a summary of recommendations for reviewing aspects of the current EREC pathway as a quality improvement process. These recommendations come from the evidence provided by this study. A revised pathway is located at Appendix 1.

<u>Prepared in the antenatal period</u>

Once the decision has been made between the woman and the obstetrician that an ECS was the safest option for her and the baby it is important for the Medical Officer to provide reassurance that at the time of delivery if either her or the baby were unwell then they would remain in hospital until it was safe to discharge them home. This discussion is followed up

with written information about EREC provided by the Medical Officer. There is also an opportunity for the woman to ask any questions of a midwife later in her pregnancy. The point that the women participants highlighted was the need for assurance that the woman's' and their baby's safety and wellbeing would always be central to the decisions made about their care.

A few women mentioned delay in their milk arriving which impacted on the timeliness of their breast feeding. With the visiting midwives support they were able to continue to breastfeed. It may be appropriate to introduce women on EREC to commence expressing antenatally given the evidence related to delay in breastfeeding for women who have an ECS.

Prepare the family

Some women expressed their husbands and mothers concern about coming home too early. Even though in the end the decision was the women's. Specific information could be provided for partners and others, to support the woman in her decision. Consideration of a brief FAQ sheet for either the husband or the women's mother would be useful to consider providing at this point. In most situations as long as the woman was comfortable with the process and felt reassured that she and the baby would be safe then the family were supportive too. An early return home was particularly popular where the husband had limited time off and so with an earlier discharge they could spend more time together with the new baby. Women were also keen to be back in familiar comfortable surroundings and some did not like being away from their other children for too long.

Prepare the household

The key for most women was the ability to plan and be able to prepare the household for her early return home. Some examples provided by the women included moving the bed downstairs if in a double story house; having meals prepared, extra help with other small children was a suggestion from a number of the women especially in the first few days, even if it was just for a few hours so that they could sleep, organising when it was best for her and her family for when friends could visit.

A suggestion to consider is preparation in the antenatal period for having over the counter medication such as Panadol, laxatives at home before going into hospital. It may be better to have the pharmacist or midwife go through the medication regime in the antenatal period about taking medication and her buying them before rather than just as she is leaving the ward. Most women indicated that the immediate postnatal period was *a bit hazy*.

Prepare the maternity system

Staff awareness and attitudes

For the Enhanced recovery pathway to be truly successful and a positive experience of maternity services for the women and her family all of the staff along the maternity care continuum (antenatal, delivery and immediate postnatal) must be aware of this option and be positive in their attitude towards the experience and outcome for the women. This is a particular challenge with Medical Officers rotating through the services and midwives new to the service, but is important to put effort into addressing this issue.

Prepared on the postnatal ward

It is important to acknowledge that the women greatly appreciated the support of the midwives in the immediate post-natal period. If the women were cared for by midwives who were aware that they were on the EREC pathway then the process of enhancing the recovery timeframe became a positive partnership between the midwife and the women. For women on the program a more intense intervention by the midwives was required such as earlier mobilization. With the midwives encouragement and clarity to the woman that this is what is expected*, that these things will happen and I will be there to assist you* the women's attitude was positive *ok I can do this*. Once the urinary catheter was out, pain was managed well and the women felt steady on their legs and were showered they felt ready to go home.

The efficiency of the pathway also relied on when discharge checks of the baby could be undertaken. Delays were mainly experienced by women when they had to wait for the baby to be cleared by a medical officer. The literature recognised that the specific health checks on the baby are critical in identifying any health problems early, however consideration could be given to whether or not this could be carried out by the midwife on the postnatal ward or home visiting midwife with immediate access to a paediatrician appointment for the woman should they identify an issue that would not be in scope of a GP.

Prepared to access immediate support options

The provision of immediate support options to the women to contact if they have a concern about either their own health or the babies is important information for the women to have available once home. However these contact points must also be aware of this group of women and that they are a point of immediate contact for the women if needed. If the GP is not available for immediate assessment or it is out of hours then the women need to know where they can go and will get an appropriate response. It will not be a good message from women to others should they feel that the system has abandoned them once they have gone home and the visiting midwives or mothercarers are no longer available.

Prepared for community support

The EREC program provides visiting midwives and mothercarers for a limited period of time based on the woman and baby's needs. Both of these services are very important to the success of the pathway.

Where possible having met the midwife and mothercarer who will be visiting them at home was reassuring for the woman and added to their confidence that they will be able to cope.

The women knowing that the midwife will visit provided the necessary reassurance and back up should they be having any concerns. Having the midwife visit also reassured the family that a qualified health professional was keeping an eye on their partners and babies wellbeing. Trust in the midwives ability to respond to any of their concerns was important to both the woman and her partner. It was mentioned however by one woman who was having problems with her baby that she did find it very tiring to have to retell her history to different visiting midwives and would have preferred to have continuity of care at a time when she was feeling very stressed.

Access to a mothercarer was optional. Deciding whether or not to have the extra support of a mothercarer at home was carefully considered by the women. For those women who chose to have the support of a mothercarer to help out with a range of activities it was a positive

experience. Though some women did feel uncomfortable or guilty asking the mothercarer to undertake house hold tasks while they took the opportunity to rest.

Limitations

This was a real world evaluation not amenable to RCT or in-depth qualitative approach.

Only 1/3 of participants originally deemed eligible for an enhanced recovery program completed EREC. Better understanding the reasons for non-completion of the program by the majority of participants is essential to inform the future implementation of the program.

As a retrospective study there were a number of missing case notes and transcription errors that affected the quality of the data obtained. In particular, we are still seeking data on neonatal readmissions, which could potentially impact the economic analysis. Additionally, we did not have access to healthcare utilisation at general practices, or in private hospitals, or public hospitals outside of the catchment.

Lastly, our power analysis assumed a readmission rate of 5% in the pre-EREC phase and was based on a sample of 500 mothers (250 in both the pre- and post-EREC groups). The sample size for the 2016 post EREC groups was less than this, suggesting we are slightly underpowered to detect a difference in the readmission rates.

Further Research

Further research could be undertaken to better understand the non-completers especially those who were identified as suitable and then taken off the intervention. These were nearly half of the eligible 2016 EREC group. A prospective, longitudinal study that continued to review presentations to accident and emergency departments and readmissions for women and neonates on the EREC pathway would strengthen the evidence from this study of the low risk.

Conclusion

In the light of the positive attitude of women participating in the EREC program, safety of the intervention due to the low readmission rates and the estimated cost saving associated with EREC indicate that the EREC program may be a dominant model of care, i.e. it reduces costs, is safe and improves women’s experience of childbirth.

Preparation of women, positive attitudes of staff and provision of home visits by midwives are key components to this pathway.

Other maternity services should consider introducing an EREC pathway.

References

Australian Bureau of Statistics. (2004) Disability, ageing and carers, Australia: Summary of findings 2003. Canberra: Australian Bureau of Statistics.

Australian Institute of Health and Welfare (2011) Australia's mothers and babies 2011. Australian Institute of Health and Welfare, Canberra.

Abell, D., Pool, A., Sharafudeen, S., Skelton,V., Dasan, J., Fleming, I. (2014) Enhanced recovery in obstetric surgery (Kings-Eros): early results from one of the UKs first programmes: 11AP5-10, *European Journal of Anaesthesiology*, Vol 31:192.

Bayoumi AB., Bassiouny YA., Hassan AA., Gouda HM., Zaki SS., Abdelrazek AA (2016) Is there a difference in the maternal and nepnatal outcomes between patietns discharged after 24h versus 72h following cesarean section? A prospective randomized observational study on 2998 patients. The Journal of Maternal-Fetal & Neonatal Medicine Vol 29.issue 8:1339-1343.

Brooten D., Roncoli M., Finkler S Arnold L., Cohen A., Mennuti M (1994) A randomized trial of early hospital discharge and home follow up of women having caesarean birth. *Obsts Gyneco,* Vol 84: 832-8.

Braun, V., & Clarke, V. (2006) Using thematic analysis in psychology. *Qualitative Research in Psychology,* 3(2), 77-101.

Brumfield CG (1998). Early Postpartum Discharge. *Clinical Obsts & Gyneco,* Vol 41, Issue 3: 611-25.

Burnard, P. (1991) A method of analyzing interview transcripts in qualitative research. Nurse Education Today, 11(6), 461-466.

Coody D., Yetman T., Montgomery D., Van Eys J (1993) Early hospital discharge and the timing of newborn metabolic screening. *Clin Pediatr,* Vol 32: 463-6.

Damluji N., Maclennan K., Jamieson K., Tower CI (2014) Enhanced recovery in elective caesarean section: early experiences suggests reduced length of stay. *Archives of Disease in Childhood, Fetal and Neonatal Edition.* June Vol 99, Supp 1 A21.

Ellberg L., Högberg, U., Lundman, B., Källén, K., Håkansson, S., Lindh V (2008) Maternity care options influence readmission of newborns *Acta Paediatrica.* May, Vol. 97 Issue 5, p579-583.

Grullon KE & Grimes DA (1997) The safety of early postpartum discharge: A review of critique. *Obsts & Gyneco* Vol 90, Issue 5, p 860-865.

Kiely M., Drum MA., Kessel W (1998). Early discharge risks, benefits and who decides *Clin Perinatal* Vol 25: 539-53.

Lucas DN and Gough KL (2013) Enhanced recovery in obstetrics- a new frontier? *International Journal of Obstetric Anesthesia* 22, 92-95 Elsever.

National Institute for Clinical Health and Excellence. Caesarean section guideline updated (2014)
http://www.nice.org.uk/nicemedia/live.13620/57162/57162.pdf (accessed November 2014)

NHS Screening programmes. NHS Newborn and Infant physical examination programme n.d. Programme statement on early discharge.
http://newbornphysical.screening.nhs.uk/standards (accessed January 2015).

Prior E., Santhakumaran S., Gale C., Philipps LH., Modi N., Hyde MJ (2012) Breast feeding after caesarean delivery: a systematic review and meta-analysis of world literature *Am J Clin Nutr* 95: 1113-35.

Strong TH Jr., Brown WL Jr., Curry CM (1993) Experience with early post caesarean hospital dismissal *Am J Obsts Gynecol*. 169:116-9.

Tan PC, Norazilah MJ, Omar SZ. (2012) Hospital discharge on the first compared with on the second day after a planned caesarean delivery: a randomized controlled trial. Obstet Gynecol 2012;120:1273–82

Wrench IJ., Allison A., Galimberti A., Radley S., Wilson MJ (2015) Introduction of enhanced recovery for elective caesarean section enabling next day discharge: a tertiary centre experience. *International Journal of Obstetrics Anesthesia:* 24. 124-130. http://dx.doi.org/10.1016/j.ijoa.2015.01.003.

Zanardo V., Svegliado G., Cavalin F., et al (2010) Elective caesarean delivery: does it have negative effect on breastfeeding? *Birth*, 37: 275-9.

Appendices

Appendix A.

EREC Pathway: suggested changes based on the evidence from this study.

Transition points of care	*Post ECS days*	*Original EREC pathway*	*Considerations (policies, procedures, practices) additional points of care in pathway from women's view point*
Antenatal Care: **First Visit**		Elective Caesarean Section (ECS). Booked with Medical Officer. Women opted in. Exclusion Criteria applied Medical staff provide initial Information. Extra meeting booked 34 Weeks with Midwife to discuss preparation for discharge. • What to expect post operatively • What to prepare at home • Who will visit at home • What community supports are available Information/pictorial packages: Topics to include (being fit for surgery, pain relief, mobilisation, breast feeding, bowel care, wound care).	Exclusion criteria no including reinforcing first time mothers, no social supports. Reinforce information "if complications arise we will change your plan of care". Consider an antenatal breast expression clinic for this group to improve breastfeeding outcomes post ECS. Also include: • Support with other young children • Discharge information given at this time • What medications to have ready at home (Schedule 4). • Emergency contacts and where to go for help.
Delivery	Day 1 (12 hours post ECS by midnight)	ESC surgery in the morning. Breast feeding commences in recovery. Pain relief By early evening Midwife encourages: • Eating • Mobilising • Showered • Wound checked • Breast feeding/bottle feeding Urinary catheter out and trial voiding	Postnatal staff are aware the mother is on EREC Positive attitude of midwives towards EREC and encouragement to move early

Post Natal Care: **Inpatients**	Day 2 (36 hours post ECS by midnight)	Pain relief continued Confirm that the woman is: • Eating • Mobilising • Showered • Wound checked • Infant feeding • Urinary catheter out and voiding Neonate: (on Day 2 or 3) • Hearing Check • Oximetry Completed before discharge or followed up by midwife at home. Discharge early afternoon.	
Post Natal care: **Community**	Day 3 (60 hours post ECS by midnight)	*Midwife* visits: Usual postnatal assessment. Observations, assessment, care and education for mother. • Wound care • Bowel care • Pain management • • Continue to observe for thromboembolic disease (DVT and Pulmonary embolism)(• Review when next midwives visit is due depending on midwifery assessment. Neonate assessment and routine screening and weight check Oxometry if not done prior to discharge. Continued observation of neonate; jaundice, feeding problems, gastrointestinal obstructions, any further screening requirements *Mother Carer visit* teaches mother/parents bathing the baby.	Continuity of care from the same midwife.

		Education provided on sleeping, feeding/sterilisation. Undertake negotiated home care tasks i.e. changing bed linen.	
	Day 4 (84 hours post ECS midnight)	Midwife phone call: Mother care visits for home support	
Discharge	Day 5; 6;7;8;9	Midwife visit on 5th day. May discharge at this point based clinical assessment/need of mother and baby. Mother care visits based on need for home support	

Appendix B

Schedule of semi-structured interview questions.

Research Project: Evaluating costs and effectiveness of a reduced length of stay for elected caesarean sections: The Women's and Children's Division of the Lyell McEwin Hospital

Check List for Interviewers.

1. For face to face interviews, in participants homes: ensure that you have notified the PI of the location of the interview and ring the PI before you enter and when you leave the premises.

2. Vouchers: For face to face interviews present voucher at the start of the interview. For telephone interviews ask for an address where the voucher can be posted to, or if they would prefer to collect it from the Volunteers Desk in the LMH?

3. Introduction

    a. Introduction of interviewer and brief description of the aims of the project & discuss Information Sheet. Aim: To explore the experiences of women discharged from hospital 24 hour post elective CS.

    b. Run through consent forms. Emphasise that names & details will be de-identified and that the focus group will be audio-recorded.

    c. Participants consent forms signed. Check for any questions about the study prior to commencement.

    d. Right to withdraw from the research before recording starts (by refusing to answer a question).

    e. Validate participants' responses with questions like:
        - "So what you're saying is….?"
          "So what you think is…?"

    f. Explore participants' responses with questions like:
        - "What do you mean by...?"
        - "Can you tell me more about…?"

Demographics

1. Age- Would you mind telling me your age?

2. How many children do you have?

3. Have you had previous caesarean sections?

    a. If yes: The number of previous caesarean sections? Emergency or elective?

    b. How many days did you spend in hospital on each of the occasions after the CS?

Questions

a. General introductory questions (Overview of experiences)**.**

1. Please tell me about your hospital experience following your elective cesarean section?
2. Please tell me about your experience once you arrived home?

b. Information

The next questions are about the **information** you received in hospital after your cesarean section:

1. What information did you receive **before you had your baby** that prepared you for going home early?
2. What other information would you have liked to receive?
3. What information did you receive **in hospital** that prepared you for going home early?
4. What other information would you have liked to receive?
5. Specifically what information did you receive **in hospital** that prepared you for the first night at home?
6. What other information would you have liked to receive?
7. What information did you receive **in hospital** that helped you and your baby in the early days at home?
8. What other information would you have liked to receive?
9. Is there anything else you would like to talk about in relation to the information you received in preparation for discharge 24 hours post elective caesarean section?

c. Support

The next questions are about the **support you received** after your caesarean section**:**

1. Tell me about the support you received from staff during your hospitalization that enabled you to care for yourself and your baby following early discharge?
2. Tell me about the support you received after you returned home?
3. What support did you find most useful?
4. What support was not so useful?
5. What would you like to see changed to assist other mothers in the future?

d. Support for family

The next questions are about the **support your family received** after your caesarean section**:**

1. Are there any issues about the preparation or the support you received when you went home from your family's point of view that you would like to share?
2. What else could have been done to help your family adapt to you and your baby coming home?

e. Concluding questions

1. What advice would you give women preparing for an early discharge after cesarean section?
2. What else could have been done to improve your experience?

Close and thank you/ What happens now with your information?

Appendix C

FACULTY OF HEALTH SCIENCES
TELEPHONE +61 8 8313 0511
FACSIMILE +61 8 8313 3594
nursing@adelaide.edu.au
CRICOS Provider Number 00123M

Date

Dear ,

We would like to invite you to participate in a research study on 'Evaluating the effectiveness of a reduced length of stay for elected caesarean sections'. The study has ethics approval and is being conducted by the University of Adelaide School of Nursing with the Women and Children's Division of the Lyell McEwin Hospital.

We would really appreciate it if you would consent to being contacted either by telephone or email after you have been discharged home from your elective caesarean sections to arrange an interview with you. The interview will take no more than 60 minutes and will be at time that is convenient to you. The interview can be either face-to-face or over the phone, which ever you would prefer. A voucher for $50.00 will be offered in recognition of your time.

You will be asked questions about your experience of preparing for an early discharge and the support provided to you by the hospital services. This is with the aim to improve the future care for women who will have an elected caesarean section.

The core research team comprises of researchers from the University of Adelaide and from the Women and Children's Division of the Lyell McEwin Hospital

- Dr Lynette Cusack, Senior Lecturer, School of Nursing, University of Adelaide.
- Dr Tim Schultz, Research Fellow, School of Nursing, University of Adelaide.
- Prof Jon Karnon, Health Economics, School of Public Health, University of Adelaide
- Meredith Hobbs, Divisional Director, Lyell McEwin Hospital, Women and Children's Division.
- Bronwen Klaer, CSC Maternity Home Visiting Services, Lyell McEwin Hospital, Women and Children's Division.
- Dr Simon Kane, Head of Obstetrics, Lyell McEwin Hospital, Women's and Children's Division.

For any concerns in relation to the research please contact :-

Principle Researcher Dr Lynette Cusack RN on 83133593 (The University of Adelaide)

Yours sincerely,

Dr Lynette Cusack

This research project has been approved by the Human Research Ethics Committee (TQEH/LMH/MH) and the Adelaide University Human Research Ethics Committee (Project Number. HREC/15/TQEH/286. Reference number is Q20151221.

For more information regarding ethical approval of the project or any ethical concerns you can contact Melissa Kluge, Executive Officer Human Research Ethics Committee (TQEH/LMH/MH) on (08) 8133 4018

Or

The Research Branch of The University of Adelaide on 8313 5137, or by email rb@adelaide.edu.au.

Appendix D

SCHOOL OF NURSING
FACULTY OF HEALTH SCIENCES
TELEPHONE +61 8 8313 0511
FACSIMILE +61 8 8313 3594
nursing@adelaide.edu.au
CRICOS Provider Number 00123M

Thank you for your support

Thank you for consenting to being contacted by a researcher from the University of Adelaide School of Nursing. The researcher will contact you about 2 weeks after you have been discharged from hospital.

You will be asked questions about your experience of preparing for an early discharge and the support provided to you by the hospital services. This is with the aim to improve the future care for women who will have an elected caesarean section.

The interview will take no more than 60 minutes and will be at time that is convenient to you.

A voucher for $50.00 will be offered in recognition of your time.

For any concerns in relation to the research please contact:

Principle Researcher Dr Lynette Cusack RN on 83133593 (The University of Adelaide)

Yours sincerely

Dr Lynette Cusack RN

This research project has been approved by the Human Research Ethics Committee (TQEH/LMH/MH) and the Adelaide University Human Research Ethics Committee (Project Number. HREC/15/TQEH/286. Reference number is Q20151221.
For more information regarding ethical approval of the project or any ethical concerns you can contact Melissa Kluge, Executive Officer Human Research Ethics Committee (TQEH/LMH/MH) on (08) 8133 4018
Or
The Research Branch of The University of Adelaide on 8313 5137, or by email rb@adelaide.edu.au.

Appendix E

School of Nursing
Faculty of Health Sciences
Telephone +61 8 8313 0511
Facilimile +61 8 8313 3594
nursing@adelaide.edu.au
CRICOS Provider Number 00123M

Participant Information Sheet

Health/Social Science Research - Adult providing own consent

Lyell McEwin Hospital

Title	Evaluating costs and impact of early-discharge for planned caesarean sections
Potocol Number	HREC/15/TQEH/286.
Coordinating Principal Investigator/ Principal Investigator	Dr Lynette Cusack Dr Tim Schultz, Prof Jon Karnon, Meredith Hobbs, Bronwen Klaer, Dr Simon Kane
Location	Lyell McEwin Hospital Women's and Children's Division

Part 1 What does my participation involve?

1 Introduction

You are invited to take part in this research project, which is called: Evaluating costs and impact of early-discharge for elective caesarean sections.

You have been invited because you will experience an early discharge from an elective caesarean section.

This Participant Information Sheet tells you about the research project. It explains the processes involved with taking part. Knowing what is involved will help you decide if you want to take part in the research. Please read this information carefully. Ask questions about anything that you don't understand or want to know more about.

Participation in this research is voluntary. You are under no obligation to participate. There will be no negative consequences to you if you choose not participate or if you commence participation and then decide to withdraw from the research project.

If you decide you want to take part in the research project, you will be asked to sign the consent section. By signing it you are telling me that you:
• Understand what you have read
• Consent to take part in the research project

You will be given a copy of this Participant Information and Consent Form to keep.

2 What is the purpose of this research?

This research aims to improve the experience of women following an early discharge 24 hours after an elective caesarean section.

3 What does participation in this research involve?

A member of the research team will meet with you in Antenatal clinic to introduce the study and gain permission (signed consent) to contact you by telephone or email on discharge from hospital to ask if you will consent to participate in an interview.

When you are contacted after going home from your hospital stay you will be invited to participate in an individual interview with the researcher to discuss a series of questions about your experience of being discharged home early after your elective caesarean section.

The interview will occur at a convenient time either by telephone or in person with yourself and the researcher. Your participation in this project should take no longer than thirty minutes.

You will receive a voucher in recognition of your time given to the research.

The research has been granted ethics approval from the Human Research Ethics Committee (TQEH/LMH/MH) and the Adelaide University Human Research Ethics Committee.

Any information that could identify you or any other persons or places, will be removed from the records and neither your name nor any other identifying information will be used in the reporting of this study.

The data will be kept in a secure location at all times and the transcribed data will be stored by Dr Lynette Cusack, in a secure location at the University of Adelaide, School of Nursing for seven years.

4 Do I have to take part in this research project?

Participation in this research project is voluntary. If you do not wish to take part, you do not have to. If you decide to take part and later change your mind, you are free to withdraw from the project at any stage.

Your decision whether to take part or not to take part, or to take part and then withdraw, will not affect your relationship with the health service.

5 What are the possible benefits of taking part?

You may not receive any benefits from this research. However, your participation will contribute to improving maternity care for other women have an elective caesarean section in the future.

6 What are the possible risks and disadvantages of taking part?

There are no risks or disadvantages in taking part in this study.

7 What if I withdraw from this research project?

If you do consent to participate, you may still withdraw at any time. If you decide to withdraw from the project, please notify the researcher.

If you decide to withdraw, the researcher will not collect additional information from you, although information already collected will be retained to ensure that the results of the research project can be measured properly and to comply with law. You should be aware that data collected up to the time you withdraw will form part of the research project results. If you do not want your data to be included, you must tell the researcher when you withdraw from the research project.

8 Could this research project be stopped unexpectedly?

This research project may be stopped unexpectedly for a variety of reasons. These may include reasons such as the researcher being unable to complete the research project.

9 What happens when the research project ends?

When the research project ends a report will be written with the results and presented to the Lyell McEwin Hospital Executive to discuss to improve the current service to women who have an elective caesarean section. A report will also be provided to the funding organisation for recommendations for other maternity services across Australia.

Part 2 How is the research project being conducted?

10 What will happen to information about me?

By signing the consent form you consent to the researcher collecting and using information that you have provided for the research project.

Any information obtained in connection with this research project that can identify you will remain confidential. Any identifying information will be removed. Interviews will receive a number, date and time.

The data will be kept in a secure location by the Principal Investigator. Access to the data will be limited to the Coordinating Principal Investigator, and Principal Investigators.
The data will be stored for seven years at the University of Adelaide, School of Nursing. At the conclusion of seven years, the data will be destroyed by the University of Adelaide, School of Nursing.

Your information will only be used for the purpose of this research project and it will only be disclosed with your permission, except as required by law.

It is anticipated that the results of this research project will be published and/or presented in a variety of forums. In any publication and/or presentation, information will be provided in such a way that you cannot be identified.

In accordance with relevant Australian and/or South Australian privacy and other relevant laws, you have the right to request access to the information about you that is collected and stored by the researcher. If you would like a transcript of the interview, please inform the researcher who will ensure that you will be identified adequately for this purpose. The interview transcript will then be de-identified.

You also have the right to request that any information with which you disagree be corrected. Please inform the researcher named at the end of this document if you would like to access your information.

11 Complaints and compensation

The study has been approved by the Human Research Ethics Committee (TQEH/LMH/MH) and the University of Adelaide Human Research Ethics committee. If you have questions or problems associated with the practical aspects of your participation in the project, or wish to raise a concern or complaint about the project, then you should consult the Coordinating Principle Investigator.

Any complaint or concern will be treated in confidence and fully investigated. You will be informed of the outcome.
Research Approval number HREC/

Dr Lynette Cusack (Coordinating Principal Investigator)
Work phone: (08) 83133593
Email: lynette.cusack@adelaide.edu.au

If you wish to speak with an independent person regarding concerns or a complaint, the University's policy on research involving human participants, or your rights as a participant you can contact:

Human Research Ethics Committee (TQEH/LMH/MH) 08 8222 6910: qeh.ethics@health.sa.gov.au
University of Adelaide Human Research Ethics Committee's Secretariat: (08) 8313 6028 or by email to hrec@adelaide.edu.au .

If you suffer any distress as a result of this research project, you should contact the researcher as soon as possible. You will be assisted with arranging appropriate treatment and support.

12 Who is organising and funding the research?

There is no funding for this research project.

The researchers will not receive a personal financial benefit from your involvement in this research project (other than their ordinary wages).

13 Who has reviewed the research project?

All research in Australia involving humans is reviewed by an independent group of people called a Human Research Ethics Committee (HREC).

The ethical aspects of this research project have been approved by the TQEH HREC and The University of Adelaide HREC.

This project will be carried out according to the National Statement on Ethical Conduct in Human Research (2007). This statement has been developed to protect the interests of people who agree to participate in human research studies.

14 Further information and who to contact

The person you may need to contact will depend on the nature of your query. If you want any further information concerning this project or if you have any problems which may be related to your involvement in the project, you can contact the:

Research contact person (1)

Name	Dr Lynette Cusack
Position	Principal Investigator
Telephone	Work: 08 8313 3593
Email	Lynette.cusack@adelaide.edu.au

For matters relating to research at the site at which you are participating, the details of the local site complaints person are:

Complaints contact person (1)

Name	Alison Barr
Position	Northern Adelaide Local Health Network Research Governance Officer
Telephone	08 8182 9346
Email	nalhnrgo@health.sa.gov.au

Complaints contact person (2)

Name	University of Adelaide Human Research Ethics Committee
Position	Secretariat
Telephone	(08) 8313 6028
Email	hrec@adelaide.edu.au

If you have any complaints about any aspect of the project, the way it is being conducted or any questions about being a research participant in general, then you may contact:

Reviewing HREC approving this research and HREC Executive Officer details (1)

Reviewing HREC name	Human Research Ethics Committee (TQEH/LMH/MH)
HREC Executive Officer	
Telephone	08 8222 6910
Email	qeh.ethics@health.sa.gov.au

Reviewing HREC approving this research and HREC Executive Officer details (2)

Name	University of Adelaide Human Research Ethics Committee
Position	Secretariat
Telephone	(08) 8313 6028
Email	hrec@adelaide.edu.au

Appendix F

Consent Form - *Adult providing own consent*

Title	Evaluating costs and impact of early-discharge for planned caesarean sections
Protocol Number	HREC/15/TQEH/286.
Coordinating Principal Investigator	Dr Lynette Cusack
Principal Investigator	Dr Tim Schultz, Prof Jon Karnon, Meredith Hobbs, Bronwen Klaer, Dr Simon Kane
Location	Lyell McEwin Hospital. Women's and Children's Division

Declaration by Participant

I have read the Participant Information Sheet.

I understand the purposes, procedures and risks of the research described in the project.

I have had an opportunity to ask questions and I am satisfied with the answers I have received.

I freely agree to participate in this research project as described and understand that I am free to withdraw at any time during the project without affecting my future care.

I understand that I will be given a signed copy of this document to keep.

Name of Participant (please print) ______________________________

Signature ____________________ Date ____________________

Declaration by Researcher†

I have given a verbal explanation of the research project, its procedures and risks and I believe that the participant has understood that explanation.

Name of Researcher† (please print) ______________________________

Signature ____________________ Date ____________________

† An appropriately qualified member of the research team must provide the explanation of, and information concerning, the research project.

Note: All parties signing the consent section must date their own signature.

Appendix G

Form for Withdrawal of Participation - *Adult providing own consent*

Title	Evaluating costs and impact of early-discharge for planned caesarean sections
Protocol Number	To be advised:
Coordinating Principal Investigator	Dr Lynette Cusack
Principal Investigator	Dr Tim Schultz, Pro Jon Karnon, Meredith Hobbs, Bronwen Klaer, Dr Simon Kane
Location	Lyell McEwin Hospital. Women's and Children's Division

Declaration by Participant

I wish to withdraw from participation in the above research project and understand that such withdrawal will not affect my relationships with the researchers or the Northern Community Mental Health Centre.

Name of Participant (please print) ______________________

Signature ______________________ Date ______________________

In the event that the participant's decision to withdraw is communicated verbally, the Coordinating Principal Researcher must provide a description of the circumstances below.

Declaration by Researcher†

I have given a verbal explanation of the implications of withdrawal from the research project and I believe that the participant has understood that explanation.

Name of Researcher (please print) ______________________

Signature ______________________ Date ______________________

† An appropriately qualified member of the research team must provide information concerning withdrawal from the research project.

Note: All parties signing the consent section must date their own signature.

Appendix H

Information for Women to prepare for EREC

Day 1

7.00am

Arrive at the Women's Health Ward with your support person

ON THE WARD

- Get changed
- Midwife checks you and checks your baby's heart
- Urinary (wee) catheter goes in
- Support stockings put on
- Visit from anaesthetist
- Read information pack while waiting
- Go up to theatre.

IN THEATRE

- Support person gets dressed
- Spinal anaesthetic and drip are put in
- Surgery starts
- Baby is born: Time. ……………
- To recovery when surgery is finished
- Drink and chew
- Skin to skin in recovery and usually baby's first feed.

VISITORS

Visitors from 3pm until 8pm, but best to keep these to a minimum.

Rest is vital and a lot of visitors will tire you out and give you more pain. We want you to have as much time as possible to be quiet, rest and bond with your baby.

BACK ON THE WARD

- Eat and drink as soon as you are ready
- We check you regularly until tomorrow
- Urinary catheter is removed and your drip disconnected.

PAIN RELIEF

Request regular pain relief as it is important to move around and be able to rest comfortably

WALK AROUND

- Start to move around out of bed when you are ready – the sooner the better to help you get well more quickly and to feel strong again
- Let us know if you're feeling sick or dizzy
- Enjoy a shower in the evening
- We measure what you drink and how much you wee.

BLOOD CLOTS

- You will have a small injection in your tummy or leg to help reduce the risk of blood clots
- You will need to keep your compression stockings on until tomorrow.

THE FIRST NIGHT

We are sorry, but your partner will need to go home at night. Your baby will stay next to your bed during the night and we will continue to help you with feeding him or her.