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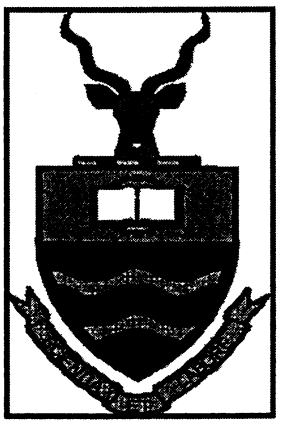
Pillay, Neelanrajah

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OUTCOME OF EARLY HOSPITAL DISCHARGE AFTER CAESAREAN SECTION AT THE CHRIS HANI BARAGWANATH HOSPITAL

Dr Neelanrajah Pillay



Master of Medicine dissertation

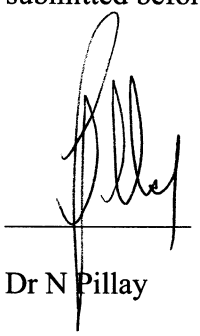
Department of Obstetrics and Gynaecology

University of the Witwatersrand

DECLARATION

I, Neelanrajah Pillay, declare that this research is my own work.

It is being submitted to the University of the Witwatersrand in partial fulfillment for the degree of Master of Medicine in Obstetrics and Gynaecology. It has not been submitted before for any other degree or examination at this or any other University.



Dr N Pillay

23 Day of May ,2011.

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PRESENTATIONS AND PUBLICATIONS

1. Early discharge from hospital after caesarean section at Chris Hani Baragwanath Hospital. 28th Conference on Priorities in Perinatal Care in Southern Africa. Champagne Sports Resort, KwaZulu-Natal, March 2009.

2. Pillay N, Buchmann EJ. Early discharge from hospital after caesarean section at Chris Hani Baragwanath Hospital. S Afr J Obstet Gynaecol 2011; 17:17-18.

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I would like thank all the patients at the Chris Hani Baragwanath Hospital who were involved in this study.

I would also like to thank my supervisor, Professor EJ. Buchmann, for helping me with the organization, analysis and presentation of this research report.

DEDICATION

I would like to dedicate this work to my family who has always supported me and to God who has always guided me.

ABSTRACT

Objective: To determine the outcome of discharging mothers at low risk of postoperative complications, two days after caesarean section, without home visits.

Design: Prospective descriptive study.

Setting: Chris Hani Baragwanath Hospital postnatal ward.

Participants: 98 women, who were at low risk for postoperative complications and, are were discharged two days after caesarean section.

Methods: Mothers were approached two days after caesarean section. Their antenatal information, caesarean section details, contact numbers and chosen method of infant feeding were documented. Fourteen days after discharge, the women were contacted telephonically and asked a series of questions. Data analysis was done using Epi-Info software.

Main outcomes: Rates of choosing early discharge again, maternal and infant re-admission, wound complications, postnatal depression, and breast feeding.

Results: There were three maternal readmissions, for endometritis, eclampsia and a sprained ankle. There was no infant readmission. Sixty (83.3%) of HIV negative women chose to exclusively breastfeed on discharge, and of these, 54 (90.0%) were

exclusively breastfeeding after two weeks. Eighty-eight women (89.8%) would again choose to have early discharge should they require another caesarean section in a future pregnancy. Nine women (9.2%) experienced minor wound dehiscence and eight wounds (8.2%) were described as infected. Four of the wounds (4.1%) were said to have bled excessively. Thirteen women (13.2%) experienced some degree of wound pain. Seven women (7.1%) reported postnatal depression.

Conclusions: In this environment, it appears safe to discharge low-risk postoperative mothers two days after caesarean section without midwife visits or home follow-up. Most women were satisfied with early discharge, as opposed to staying in hospital for longer.

LITERATURE REVIEW

1.1 Introduction

Caesarean section is the most common operation performed in modern times. It initially started off as an emergency procedure that was coupled with great fear and complication. Today, however, caesarean section has become much more acceptable with many women choosing it electively as a mode of delivery. However many questions surrounding caesarean section still remain unanswered.

1.2 Early postoperative complications of caesarean section

Caesarean section does not come without complications to both mother and child. In an overview conducted by the National Institute for Clinical Excellence in the United Kingdom, the relative risk (RR) of maternal death in that country was found to be 4.9 (95% confidence interval (CI) 3.0-8.0), derived from 0.82 maternal deaths/1000 caesarean sections, compared to 0.17 maternal deaths/1000 vaginal deliveries. [1].

A retrospective review was carried out by Moodliar and Moodley at King Edward VIII Hospital in Kwazulu-Natal. They found that out of 737 caesarean sections done by registrars, using standard techniques, the overall complication rate was 14.2%. Injury to the bladder, postoperative endometritis, postpartum haemorrhage, and wound sepsis made up the majority of complications. Other serious morbidity associated with caesarean section includes admission to intensive care unit, thrombo-embolism, and even return to the operating theatre. [2]. Caesarean section may also be associated with negative maternal psychological outcomes, such as disappointment

and lowered self-esteem. Delays in mother-infant bonding have also been described. [1]

During the 1980s, a number of investigators attempted to define factors that, prior to a caesarean, would make a woman more prone to febrile morbidity. A study was undertaken by Rehu and Nilsson in Finland to correlate post-operative endometritis with commonly observed predisposing factors. Postpartum endometritis was diagnosed when two or more of the following signs were present: axillary temperature greater then 37.5 degrees Celsius on any of the five days postpartum except the first 24 hours, a tender uterus, or foul smelling lochia. All patients were given prophylactic antibiotics. Of the total number of caesarean sections, 9.8% were complicated by endometritis and 4.8% by wound infection. There was a statistically significant correlation between infection and the duration of labor, number of vaginal examinations, duration of rupture of membranes, above average birth weight and postpartum endometritis. Maternal morbidity appears to be higher after emergency caesarean section. The pre-operative haemoglobin concentration had no significant correlation with endometritis. [3].

A Canadian study, conducted in Toronto, had similar findings. However, the study showed that the post-operative haemoglobin level was the most significant risk factor for predicting post-operative endometritis, followed by the duration of membrane rupture, number of vaginal examinations in labor, and, least important (but still statistically significant) the duration of labor. [4].

Nielsen et al reported results concordant with the previous two studies. However, obesity was shown to be a significant risk factor for infection, with 31.2% of obese women developing post-partum infection as opposed to 20.7% of non-obese women. Of note was their documentation of a post-partum infection rate (endometritis and wound infections) of 59.1% in women who had undergone a caesarean section in which the presenting part of the infant was at or below the level of the ischial spines. Their explanation for this was that such caesarean sections are complicated by significant tissue trauma and ischemia, both of which predispose to infection. The wound infection rate in this study was however surprisingly low and occurred in 1.6% of the participants. The explanation for this was the large amount of elective caesarean sections that were enrolled in the study. The authors showed that the infection rate among women having emergency caesarean sections was 22.6% as opposed to a low 4.1% infection rate among women undergoing elective caesarean section. [5]

A unique retrospective study was conducted at Strong Memorial Hospital in New York from 1994 to 2000 involving 239 obese women. This study investigated the risk of wound complication, which was defined as requiring opening of the wound. The authors showed that the risk of wound complications was higher in women who had a vertical skin incision as opposed to a transverse incision. [6].

A Cochrane systematic review of 81 trials showed that prophylactic antibiotics reduced the risk of post operative morbidity after caesarean section, with regards to endometritis, urinary tract infection, wound infection and other serious infection after

caesarean section. The relative risk reduction 'for all patients (n = 11,937) was 0.39 (95% CI 0.31 to 0.43)'. [7]

Classen et al showed in 1992 that administering preoperative antibiotics within 2 hours of skin incision had a lower risk of postoperative surgical wound infection (0.6%) as opposed to perioperative antibiotic administration (1.4%), which was defined as antibiotic administration 3 hours after skin incision. [8].

A Spanish study showed that HIV infected women were at higher risk of morbidities after caesarean section. These included anemia, pyrexia, urinary tract infections and wound infection as well as more serious complications such as pneumonia and peritonitis. Women with a lower CD4 count were at greater risk for developing these complications. [9]

A South African study, conducted in Bloemfontein, showed that HIV-infected women had a statistically significant increased risk of post-caesarean endometritis. This association was strengthened in the presence of a low CD4 count, in particular if the CD4 count was less then 200/mm^3. [10]

1.3 Early discharge after caesarean section

Prior to 1940, the in-hospital confinement period after vaginal delivery was between seven and ten days. This period was subsequently shortened due to economic strains and overcrowding in European maternity wards due to World War II and the subsequent baby boom. It was Gerriero who in 1943 "dispelled the notion held by many physicians, that by allowing women out of bed too soon after delivery would

put them at risk of suffering a prolapsed uterus and (suggested) that early ambulation was beneficial rather than harmful". [11].

Improvements in surgical techniques, development of antibiotics, and post operative care allowed the convalescent period after an uncomplicated caesarean section to be reduced. In Pennsylvania, for example, there was a decrease in the length of hospital stay after caesarean section from an average of 6.1 days in 1962 to a mean of 4.4 days in 1990. [12].

Sedeh-Mestechkin et al undertook a retrospective study in 2007 at Soroka University Medical Centre, Israel, in women who had just had a vaginal delivery. The primary aim of the study was to describe maternal postpartum complications. Fever was the most common complication of delivery (36%), with excessive vaginal bleeding the second most common, (22%) followed by, thrombophlebitis (15%) and severe anemia (12%). Even more important were the findings of the length of time that had lapsed between the delivery and the appearance of the respective complication. For example, the mean delivery to complication time for fever was 31.1 ± 17.2 hours, excessive vaginal bleeding 4.2 hours ± 2.9 hours, thrombophlebitis 33.1 ± 15.7 hours and anemia 28.2 ± 14.8 hours. The study also showed that the etiology of postpartum fever in 64% of women was unknown, with 11% caused by endometritis, 9% by pneumonia, 8% by urinary tract infections and 8% by other causes. The time interval to onset of these complications could be used as a guide to how long to keep women in hospital after giving birth. [13]

Strong et al carried out a retrospective quasi-experimental study in 1993 based on the observation that most major complications of caesarean section presented in the first 48 hours after delivery. Their study was conducted in Fresno, California, USA, in 1991, when patients that had a caesarean section were discharged early, on day two after operation (as opposed to day three), provided they met certain strict criteria. These patients were not scheduled for routine home visits by nurses after discharge. The criteria to allow for early discharge were a) willing patient who had a medically and obstetrically uncomplicated pregnancy, b) Pfannenstiel skin incision with no intra-operative complications, c) no surgical drains left in place, d) normal vital observations, e) fully ambulatory state, f) able to pass urine independently, and g) normal bowel sounds. All patients were given prophylactic antibiotics. Of note was the fact that patients at risk of developing post-operative sepsis, for example women who had a caesarean section for cephalo-pelvic disproportion or chorioamnionitis, were not excluded from the study. The control group was formed by patients who had a caesarean section in the six months prior to the institution of an early discharge policy. The average length of hospital stay in the early discharge group was 44.3 ± 8.4 hours and that of the historical control group 70.8 ± 16.8 hours. [14]

The results of the Fresno study showed that there was no significant difference in the post-operative complication rate between the two groups. Significantly, 71% of the postoperative complications in the early discharge group, and 67% of those in the control group, occurred four or more days after surgery. If all the patients in the study group had remained in hospital and were discharged on postoperative day three, only two patients with post-operative complications would have been identified. While the study was limited by its design (quasi-experimental with historical controls, rather

than being a randomized trial), the results provided some reassuring evidence of good outcome with early hospital discharge in the absence of home visits by nurses. [14]

Fasubaa et al conducted a controlled trial in, Ilesha, Nigeria, to determine the effect of a shorter hospital stay after caesarean section on both the mother and the infant. The authors sought to explore ways of making caesarean section more acceptable to the Nigerian population. One hundred patients were recruited for this study, of which half were discharged early on the third postoperative day, and half were discharged on the usual seventh or eighth day. Exclusion criteria were prolonged rupture of membranes, chorio-amnionitis, obstructed labor, medical disorders and clinical evidence of wound sepsis when reviewed on the third postoperative day. All caesarean sections had lower segment uterine incisions. The patients were given a three day course of prophylactic antibiotics. All wounds were inspected on the third day and sutures removed on the seventh day. Patients in the early discharge group were sent home after wound inspection, on day three. There were no routine home care visits in the early discharged group. On the seventh day women from both groups were assessed by independent observers. The wound infection rate for the short hospital stay group was 6% as opposed to 10% in the prolonged hospital stay group. Also, the neonatal sepsis rate was significantly lower in the shorter hospital stay group. All patients that were discharged early were satisfied as it enabled them to return to their families earlier and decreased their hospital bills. Convalescence rates, judged by 'the ability to maintain an erect posture while walking without, holding the abdomen by the hand', were better in the early discharged group, and early postpartum depression too was less frequent. [15]

Brooten et al added a few more interesting variables in 1994 to an early discharge policy. A randomized controlled trial was conducted on 122 women who had either vaginal or caesarean delivery at the University Hospital of Pennsylvania, USA. The women were followed up for eight weeks. Sixty-one women formed the intervention group and were discharged within a mean time of 3.6 days with nurse visits and phone calls, and 61 women made up the control group who were discharged within a mean of 4.8 days after delivery. Outcome variables included maternal and infant duration of initial hospitalization, rehospitalization, acute-care visits, maternal satisfaction, maternal depression and functional status. The early discharged group was more satisfied with their treatment when compared to the control group, using the La Monica-Oberst Patient Satisfaction Scale. Even though all three maternal re-admissions came from the control group, this was not enough to provide a statistically significant result. There was also no significant difference between the two groups with regard to maternal anxiety, depression and functional status. With regard to infant outcomes, there were two hospital readmissions from the intervention group and six from the control group, a result that also did not reach statistical significance. A total of 56 "acute-care visits" occurred during the study of which 25 came from the intervention group and 31 from the control group, again a result that did not reach statistic significance. In addition to the above findings there were significantly more infants in the intervention group who were immunized by the end of the study (90% versus 73%; $P = 0.048$). While this study found no statistically significant differences in most of the variables being measured, there was a trend to better outcomes in the early discharged group. [12]

Boulvain et al looked at breastfeeding in another randomized trial of postpartum women conducted at a maternity unit at a Swiss teaching hospital. Women were randomized either to a home-based care group (hospitalized for 24 to 48 hours and then discharged to be followed up at home by a midwife; n = 217), or to a hospital based care group (kept in hospital for four to five days; n = 223). If the patient had undergone caesarean section, she was kept two days longer than the average stay in each of the respective groups. The primary outcome measure of this study was the proportion of women still breastfeeding after 28 days postpartum and the total duration of breastfeeding, women's views on the quality of postnatal care, and maternal and infant morbidity. The study showed that 90% of women in the early discharged group and 87% of the late discharged group were breastfeeding at 28 days. Fewer infants in the 'home-based care' group received complementary feeding in the first postpartum week compared to the hospital-based care group 14% versus 28% (RR = 0.50; 95% CI 0.33-0.74). Satisfaction with care received was similar in the two groups. There were more infant admissions in the home-based care group, which was initially not statistically significant. However, as the six month period was approached, the difference became statistically significant.[16]

Another study, conducted in Sweden, looked at breastfeeding after early discharge (defined as discharge 24-48 hours after birth). It showed that 76% of women discharged early as opposed to 87% not discharged early were breastfeeding after two months, a difference which was not statistically significant. However, in multiparae there was a trend to greater breastfeeding rates in the early discharged group at six months (63% versus 41%; $P = 0.06$). Even more noteworthy was that 2% of the early discharge group as opposed to 72% of the control group gave their babies

supplementary feeds in the first week after birth ($P < 0.001$). The reason for the results obtained when interviewing the mothers was that the home environment was more "calm and comfortable" for breastfeeding. Also, women who stayed longer in hospital were disturbed from establishing breastfeeding by the presence of other mothers and the hospital routines such as the baby not sleeping in the same room as the mother at night. [17]

In contrast to the above findings of Brooten et al, Hickey et al from Sydney, Australia, found in an observational study that an earlier discharge policy was associated with an increased risk for postnatal depression, based on meeting the criteria for major depression as outlined by DSM-III-R. [12,18]. Women were assessed at 2 to 3 days and again at 6, 12, 16 and 24 weeks after vaginal delivery or caesarean section using the Edinburgh postnatal depression scale. [19]. Early discharge in this study was defined as discharge before 72 hours post delivery. There was a higher incidence of postnatal depression among the early discharged group as opposed to discharge after three days. Twenty two (14%) of the 153 women who were discharged early, developed postnatal depression, and 20 (7.4%) of the 272 women who were discharged after three days developed postnatal depression (odds ratio (OR) 2.12; 95% CI 1.07-4.21). The shorter the in-hospital stay, the greater the chances of developing postnatal depression: 23.1% of patients discharged within 24 hours, 15.5% of those discharged between 24 and 48 hours, and 12.2% of the mothers discharged between 48 and 72 hours developed postnatal depression. This association, while reaching statistical significance, and showing a dose-response relationship, could however have been confounded. It would be incorrect to state, on the basis of these findings, that early discharge was causal in the onset of postnatal depression. [18].

Post partum depression affects 10-15% of mothers within the first year after giving birth. [20]. Two questions have been tested as a depression case-finding instrument (to find postpartum women that are most likely to develop postpartum depression) namely: "since your new baby was born, how often have you felt down, depressed, or hopeless?" and "since your new baby was born, how often have you had little interest or little pleasure in doing things?" The response choices were "always," "often," "sometimes," "rarely," and "never". Women whose response was "often" or "always" to either question were classified as experiencing self-reported postpartum depressive symptoms. These questions have a high sensitivity (96%), and have been recommended as a depression case-finding instrument. [21].

Results from a recent Cochrane systematic review, of 8 trials involving a total of 3600 women, concerning the issue of early discharge of healthy mothers and term infants after vaginal delivery, showed no evidence of adverse outcomes associated with policies of early discharge. However, due to methodological limitations, the risk of certain adverse outcomes could not be ruled out. The findings of this review are currently considered inconclusive. No data was available for early discharge after caesarean section in the Cochrane Library. [22].

2 BACKGROUND TO THE STUDY

2.1 Problem statement

Given the results shown by Strong et al and Fasubaa et al, combined with the equivocal results of the Cochrane review, it seemed feasible to investigate the effects of an early discharge policy after caesarean section in a South African setting. [14,15,22]. It appeared that such as investigation has not yet been undertaken.

The results obtained from the literature review suggested that an early discharge policy (on day two after caesarean section) would be safe and acceptable provided certain strict criteria are met. [14,23]. These criteria included a willing patient, an uneventful caesarean section, a low risk for developing postoperative infection, and a mobile patient with a clean dry wound and normal vital observations after operation. [13].

A suitable site for such a study was Chris Hani Baragwanath Hospital, a tertiary and secondary level referral centre, situated in Soweto and serving the greater part of the South of Johannesburg. To date it remains one of the busiest obstetric units in the world, with over 23 000 deliveries per annum, and 11 000 at associated referring Midwife Obstetric Units. About 31% of the hospital deliveries are caesarean sections. (Chris Hani Baragwanath Hospital Statistics 2009).

Due to the large number of caesarean sections being performed at Chris Hani Baragwanath Hospital, the postnatal wards were continuously pressured for beds. This led to a situation where many women had to be discharged on the second day after

caesarean section, to cope with the ever increasing need for hospital beds. They only returned seven to ten days later to have sutures removed at their local clinics. This violated hospital and departmental guidelines, which stated that women should be discharged no earlier than three days after caesarean section.

However, many women appeared to welcome early discharge from hospital, and there had been no reports of complications directly related to early discharge. There also appeared to be several more potential benefits for discharging women early after caesarean section. Early return home brought women back to their families. There may have been a benefit in better mother-to-infant bonding, due to the mother being in a familiar environment where she could wake up at any time and tend to her infant, thus improving breastfeeding. [16,17,24]. While the findings of the literature review above support some of these contentions, little was known about the women discharged early, and systematic follow-up was not conducted.

Therefore, there appeared to be value in performing a study to determine the outcome of discharging mothers at low risk of post-caesarean section complications two days after caesarean section. The effect of early discharge on infant and maternal morbidity, postnatal depression, and acceptability of early discharge would be determined. Such a study, although similar to previous studies, would be unique, owing to the fact that it would be the only such study conducted in a resource-constrained setting, with women from a poor socio-economic background discharged home two days after caesarean section, without home visits. The study conducted by Fasubaa, even though similar, differed by discharging women on post-operative day three. [15]. In the Chris Hani Baragwanath Hospital setting, it was considered that

working-class South African women could be different from those in developed countries. Returning home to overcrowded homes with poor sanitation, and often no electricity, may have proved challenging for women who had major surgery just two days before. Poor access to transport and therefore health care if there were postoperative complications at home would have complicated matters further. These possibly negative influences on early discharge justified that a study be done to confirm the impression of the low complication rate among women discharged on day two after caesarean section, and provide evidence to change guidelines on discharging low-risk patients two days after operation, at Chris Hani Baragwanath and in similar environments elsewhere.

2.2 Study Aim and Objectives

The broad aim of this study was to investigate the outcome of discharging low risk mothers on the second postoperative day after caesarean section.

The primary objectives were, in women discharged on the second postoperative day after caesarean section:

- To determine the infection rates in the surgical wounds
- To determine the rate of hospital re-admission.
- To determine the rate of infant re-admission.
- To determine the percentage of exclusive breast-feeding.
- To determine the incidence of early postnatal depression.

A secondary objective was:

- To determine the effect of HIV infection on maternal and neonatal re-admission, and maternal infection rate.

3 METHODS

3.1 Study Design

This was a prospective, longitudinal descriptive study, with a cohort analytic component to compare outcomes with respect to HIV sero-status, looking at outcomes in postnatal women discharged early after caesarean section

3.2 Study population

These were women who had a caesarean section carried out at the Chris Hani Baragwanath Hospital during October 2008. Included were women who had elective or emergency caesarean section at Chris Hani Baragwanath Hospital maternity theatre, who were between 31 and 54 hours after operation at 6 a.m. in the morning i.e. two days post caesarean section at 6 a.m. in the morning. For example, if a caesarean section was done at 11 p.m., the patient would be day one at 6 a.m. on the following day and day two the day after i.e. 31 hours post caesarean section. If the caesarean section was done at or after midnight the patient would be day zero post operation at 6 a.m. in the morning and day one the following day, and day two the day after (i.e. 54 hours post operation). In line with departmental protocol, all women were given prophylactic antibiotics (cephalexin or cefozolin 1g intravenously preoperatively). All women were discharged home with ibuprofen 400 mg eight-hourly orally and paracetamol 500 – 1000 mg six-hourly orally for up to five days.

Exclusion criteria

- Women who had a caesarean section and were at high risk for postoperative sepsis e.g. prolonged rupture of membranes (defined as

being longer then 24 hours); cephalopelvic disproportion with prolonged labour (total duration of labor exceeding 20 hours).

- Women who had a caesarean section and in whom it was difficult (according to the surgeon's notes) to achieve haemostasis, or who had drains or packs inserted, or received blood transfusions.
- Women with underlying medical disorders e.g. hypertension, diabetes mellitus.
- Mothers not tolerating food, or vomiting on day two.
- Women with signs of paralytic ileus on day two.
- Maternal pyrexia (temperature> 37.5 °C) more than 24 hours after caesarean section.
- Maternal tachycardia (pulse> 110 beats/min) 24 hours after caesarean section.
- Wound appearing septic or inflamed, or dehiscent on day two.
- Mother not mobilizing on day two.
- Mother not happy to be discharged.
- Mother without a cellular phone or land line on which she could be contacted.
- Mother who had a stillbirth.
- Infant not discharged by day two.
- Age <18 years or >45 years

3.3 Sampling

A convenience sampling method was used. The researcher included mothers eligible from 15 October 2008 until a total of 100 cases had been collected. Approximately 5

to 10 women were approached each day when the researcher (a registrar in obstetsrics and gynaecology with full clinical and overtime duties) had time to visit the postnatal ward to recruit participants. During this period of time the researcher was working at another hospital in the Johannesburg academic circuit and he could only recruit on certain days where time allowed. The researcher did not perform any of the caesarean sections.

3.4 Data collection

Women were approached in the postnatal wards. Eligible participants were informed about the study and asked if they would like to be included. If they agreed, consent was taken and data collected. A follow-up telephone call was arranged, and then made by the researcher, fourteen days after discharge, where a number of questions were posed.

Instruments used included a face-to-face interview in the ward, the hospital case notes, and a telephonic interview. Hospital records of re-admissions or visits to the hospital were used if necessary. For women who were repeatedly unavailable for interview by phone, Chris Hani Baragwanath Hospital postnatal ward records were followed, and hospital computers were also searched for evidence of postnatal hospital visits or laboratory testing.

Variables recorded upon discharge

From the woman's hospital case notes:

- Mother's age
- Reason for caesarean section

- Elective or emergency operation
- Type of skin incision
- Preoperative haemoglobin level
- HIV status
- CD4 count (if applicable)
- Use of antiretrovirals
- Rhesus blood group (Rh)
- Rapid plasma reagin test (RPR)
- Infant's birth weight(s)

On interview:

- Intention to breast- or formula-feed the infant(s)
- Contact telephone numbers
- Contact number of someone living with the women

If the mother had a CD4 of <250/mm^3 and was not on anti-retroviral treatment she was counseled about the need to start highly active antiretroviral treatment (HAART) and given a referral letter to take to her clinic so that she might receive the necessary treatment. She was still however eligible for recruitment into the study.

All HIV-negative women were counseled, by the researcher, on the advantages of exclusive breastfeeding prior to discharge. HIV-infected women were counseled about infant feeding choices.

Variables recorded during the fourteen-day follow-up call, were based on the following questions:

- Was the woman happy to be discharged early?
- Would she choose early discharge again should she have another caesarean section?
- Was she experiencing pain? if so was it mild/moderate/immobilizing
- Was there any pus draining from the wound?
- Was the wound open? If so was it open greater or less then 5cm in length?
- Did she bleed excessively from the wound?
- Was she re-admitted to hospital and for what reason?
- Was she still exclusively breastfeeding if chosen to do so initially?
- Was the baby re-admitted to hospital and for what reason?
- Since the birth, how often had she been down, depressed, or hopeless?
- Since the birth, how often did she have little interest or little pleasure in doing things?

If a mother was experiencing post partum depressive symptoms she was advised to visit her local psychiatric clinic, according to an arrangement made with the Department of Psychiatry at Chris Hani Baragwanath Hospital. If there was any concern about the wound, she was advised to report to the Chris Hani Baragwanath Hospital labor ward admission area according to an arrangement made in the department.

3.5 Sample size

Women who met the criteria were recruited until a total number of 100 cases had been collected. This number is similar to that used by Fasubaa et al in Nigeria. [15]. A number of 100 also provide 95% confidence limits of no more than 10% around observed frequencies for binary categorical variables.

3.6 Data analysis

Data analysis was done using Epi-Info software. Descriptive statistics included statements of frequencies with percentages, and means (±standard deviations (SD)) and medians (with ranges). Comparisons of frequencies, where necessary, were made using the Chi-square test or Fisher's exact test. A P value <0.05 was considered as statistically significant.

3.7 Ethics

The study was approved by the human research and ethics committee of the University of the Witwatersrand (approval number MP080617 attached as Appendix A). The informed consent document is attached as Appendix B.

4 RESULTS

One hundred and seven eligible women were recruited. Nine were lost to follow-up. Full results were available for ninety eight mothers.

Table 1. Discharge data of the 98 mothers followed up (n=98).

Mean age in years ± SD	26.5 ± 5.8
Median parity (range)	1 (0-5)
Nulliparas	35 (35.7%)
HIV infected woman	26 (26.5%)
Elective caesarean section	29 (29.6%)
Transverse abdominal incision	78 (79.6%)
Mean birth weight (g) ± SD	3164 ± 669
Intended to breastfeed *	60 (61.3%)
Mean haemoglobin (g/dl) ± SD	12.0 ± 1.1)

** HIV negative women only, n=72*

Table 1 shows characteristics of women discharged on postoperative day two, and followed up to the end of the study. The age range of these subjects was from 18 to 43 years with the mean age being 26.5 years. HIV results were available for all women, 26 (26.5%) were HIV-infected. Two did not have CD4 counts available and seven had a CD4 count less then 200/mm^3. All the subjects with a CD4 count less then 200/mm^3 and 14 of those with a CD4 count greater then 200/mm^3 were on HAART. Most women underwent an emergency caesarean section with 29.6% having elective caesarean sections. Seventy eight women (79.6%) had transverse abdominal incisions and the remainder had vertical midline sub-umbilical incisions. The mean birth weight

including that of twin pregnancies was 3164g with a range of 1645 to 5035. At the time of discharge, all HIV-infected mothers chose to formula feed. Of the HIV-negative mothers, 60 (83.3%) chose exclusive breastfeeding, 5 (6.9%) chose formula feeding, and 7 (9.7%) chose mixed feeding. The mean pre-operative haemoglobin level was 12.0 g/dl, with a range of 10.0 to 14.2 g/dl.

Table 2. Discharge data of the nine women lost to follow up (n=9)

Mean age in years	27.6
Median parity(range)	2 (1-7)
Nulliparas	0
HIV infected	1
Elective caesarean section	4
Transverse abdominal incision	8
Mean birth weight (g)	3312
Intended to breastfeed	7
Hemoglobin g/dl	11.6

Table 2 shows details of the nine patients that were lost to follow up. Their baseline data are similar to those who were followed up, except for a trend to a lower HIV seropositivity rate (1/9 versus 26/98; $P = 0.44$)

Table 3. Primary indication for caesarean section (n=98)

Indication	n (%)
Fetal distress	48 (48.0%)
One previous caesarean section	20 (20.4%)
Twins	7 (7.1%)
Breech	6 (6.1%)
Poor progress	6 (6.1%)
Failed VBAC	5 (5.1%)
Failed induction of labor	3 (3.1%)
Antepartum Haemorrhage	2 (2.0%)
Abdominal cerclage	1 (1.0%)

Table 3 shows the indications for the caesarean sections. Patients attempting VBAC (vaginal birth after caesarean section) that ended in a caesarean delivery made up 5.1% of cases. These were all emergency operations; of note is that if a VBAC had failed due to fetal distress the caesarean section was recorded as a failed VBAC and not for fetal distress. About 7.1% of the caesarean sections were performed for twins that were not suitable for vaginal delivery.

Table 4. Results obtained at the two-week follow-up telephone call (n=98)

	n (%)
Total with no morbidity	74 (75.5%)
Choose early discharge	88 (89.8%)
Wound open	9 (9.2%)
Wound draining pus	8 (8.2%)
Wound bleeding	4 (4.1%)
Wound pain	13 (13.2%)
Postnatal depression *	7 (7.1%)
Maternal readmission	3 (3.1%)
Infant readmission	0 (0.0%)

** Postnatal depression as described by Whooley et al. [21]*

The results of the two-week follow-up telephonic interview are shown in Table 4. Eighty-eight (89.8%) of women discharged on day two after caesarean section said they would choose to have early discharge again should they require caesarean section in a subsequent pregnancy. The reasons commonly cited were that going home early allowed them to be more comfortable in their own home where they could receive family support and develop their own routine, instead of that of the hospital. Ten percent would not choose early discharge in the future. A frequent reason for this was that they did not have enough help with the baby at home. A number of this group were women with twins (i.e. four women out of seven who had caesarean sections for twin deliveries). Another reason given for not wanting to choose early discharge in future was the operation site being very painful. Twenty-four women (24.5%) of

women experienced some morbidity. Nine (9.2%) of women experienced some form of wound dehiscence. This was less than 5 cm in all of these cases. Eight (8.2%) of the wounds drained some pus. Four (4.1%) of the wounds bled excessively but none required admission. Thirteen (13.2%) of women experienced some sort of wound pain, with nine (9.1%) experiencing mild pain, three (3.0%) moderate pain and one (1.0%) experiencing pain severe enough to warrant re-admission. Seven women (7.1%) reported postnatal depression. Two questions were used as markers of postnatal depression, 'since the birth, how often had she been down, depressed, or hopeless?', 'Since the birth, how often did she have little interest or little pleasure in doing things?' If the responses to either question were often or always the woman was classified as having self reported post-natal depression. [21].

4.1 Details of the women re-admitted

Patient A: 21-year old HIV-negative nulliparous woman, with an initial haemoglobin level of 11 g/dl, had an emergency caesarean section for fetal distress, and delivered a 2450 g baby. She was re-admitted seven days after discharge in the orthopedic ward with a sprained ankle. She was at home at the time of the telephone interview.

Patient B: 24-year old HIV-infected (CD4 = 417/mm^3) nulliparous woman, with an initial haemoglobin level of 11 g/dl, had an emergency caesarean section for poor progress in labor, and delivered a 3755 g baby. She was re-admitted ten days after discharge with endometritis. She had no evidence of infection on day two after operation. At the time of the follow-up telephone call she was at home completing her oral antibiotics. She however complained of wound pain, some pus and blood coming

out of the wound, and had features of postnatal depression. All of these symptoms were however improving since the re-admission.

Patient C: A 21-year old HIV-negative nulliparous women, with an initial haemoglobin level of 12 g/dl, had an emergency caesarean section for fetal distress, and delivered a 2655g baby. She was re-admitted in a private hospital four days after discharge with postpartum eclampsia. She had no evidence of hypertension prior to the initial discharge. At the time of the follow-up telephone call she was still in hospital on anti-hypertensives. However she raised no new complaints.

All the readmitted women had transverse lower abdominal wall (Pfannenstiel) incisions.

4.2 Breastfeeding choices

Table 5 compares the breastfeeding methods chosen by the HIV-negative mothers at the time of discharge with the method used at the two-week follow-up (n = 72). Sixty women (83.3%) chose to exclusively breastfeed on discharge; of these, 54 (90%) were still exclusively breastfeeding after 2 weeks.

Table 5. Infant feeding choices of HIV-negative mothers (n = 72).

Method	Intention before discharge from hospital	Feeding method two weeks after discharge
Breastfeeding	60 (83.3%)	54 (75.0%)
Formula feeding	5 (6.9%)	7 (9.7%)
Mixed feeding	7 (9.7%)	11 (15.3%)

4.3 HIV and postoperative outcome

Table 6 illustrates the complication rates in the 72 HIV-negative and 26 HIV-infected women as reported at the two week follow-up interview. There were no statistically significant differences in complication rates between the two groups of women, using Fisher's exact test.

Table 6. Comparison of complications between HIV-negative and HIV-infected women (n=98)

Complication	HIV-negative (n =72)	HIV-infected (n =26)	P value
Wound open	8 (11.1%)	1 (3.9%)	0.43
Wound draining pus	7 (9.7%)	1 (3.9%)	0.68
Wound bleeding	3 (4.1%)	1 (3.9%)	1.00
Wound Pain	10 (13.8%)	3 (11.5%)	1.00
Postnatal depression	4 (5.6%)	3 (11.5%)	0.38
Maternal readmission	2 (2.7%)	1 (3.9%)	1.00
Infant readmission	0 (0.0%)	0 (0.0%)	Not calculable

5 DISCUSSION

5.1 The results

Approximately 7000 caesarean sections are performed each year at Chris Hani Baragwanath Hospital. Most of these are at low risk for puerperal sepsis, and discharging these women early creates an avenue for taking the pressure off postnatal wards and saving immediate costs.[3-6]. To date no data is available to document the complication rates among women discharged home on day two after caesarean section. The results of this study suggest that a policy of discharging patients, who have been given prophylactic antibiotics and are at low risk of post-operative complications, two days after caesarean section is safe at Chris Hani Baragwanath Hospital. Wound infection or disruption was uncommon and mostly not serious enough to warrant re-admission. A small number of women complained of significant wound pain. This may suggest insufficient postoperative analgesic medication, although women received a prescription on discharge.

HIV-infected women were not considered in this study to be at especially high risk for postoperative complications. The results showed that HIV-infected women suffered no greater frequency of complications then HIV negative women. A possible reason for this is the wide use of antiretrovirals for prevention of mother-to-child transmission our setting, and the use of prophylactic antibiotics at caesarean section. There seems to be a trend toward a higher wound infection rate in HIV negative women. Although this could well be a chance finding, a possible explanation could be the surgeon being meticulous during the operation of an HIV infected women. However the sample size was small and the study was not powered to show difference in infection rates by HIV infection.

Exclusive breastfeeding rates were high with 90% of women who intended to breastfeed in this way, still doing so after 14 days after discharge. Infant outcomes were reassuringly favorable, with no deaths or re-admissions. However, it should be remembered that early neonatal problems or admission were exclusion criteria for this study. The results are in contrast to Boulvain et al who showed more infant admissions in the early discharge group after 28 days, a number which increased after 6 months. A possible explanation is that the women and infants in our study were only followed for 14 days. However the authors of the above study stated that 'readmissions, early weaning and dissatisfaction with care were all infrequent, thus limiting the power of the trial to detect differences between alternative forms of postnatal care.' [16]

The findings of this study were similar to those of Strong et al and Fasubaa et al, who also discharged patients early after caesarean section. Strong et al's study appears to be the only one ever conducted, where patients that were discharged early on day two post caesarean section and were followed up (retrospectively). The mean length of hospital stay in their study, post delivery, was 44.3 ± 8.4 hours similar to that in this study (40.1 ± 6.4 hours). Fasubaa et al's intervention group (early discharge) was discharged after 72 hours (day 3 post operation). [14,15]

The wound infection rate of 8.2% was higher when compared to that in Strong et al's subjects who had a wound infection rate of 2.6%. [14]. Their study, however, was conducted in a well resourced setting and their method of diagnosing wound infection was direct observation by a clinician, as opposed to telephonic self-reporting by the

women in this study. Fasuaa et al's subjects had a 6% post-caesarean section infection rate similar to our results. [15]

Rehu et al reported a total postoperative morbidity rate of 20.5% similar to the total postoperative morbidity rate of 24.4% in this study, and a superficial wound infection rate of 6.8%. Again, this could be due to the differences in the diagnosis of wound infection. Another possible reason for their study having lower rates of superficial wound infection is that their participants were discharged later and spent a longer period in hospital where they could get proper wound care. Their rate of endometritis of 6.8% was significantly higher than the 1.0% reported here. The reason for the low rate of endometritis in this study could be related to exclusion of women at high risk of developing post-operative infections. [3]

The readmission rate of 3% was higher compared to that in Strong et al's study (0%). [14]. The three readmissions included one with a sprained ankle, which had little significance in terms of early postoperative discharge. The woman readmitted for eclampsia presented on the fourth postoperative day and would likely have complicated in the same way even if discharged on day three.

With regard to postnatal depression, which was measured in this study using the tools outlined by Brett et al in 2008, a postnatal depression rate of 7.1% was found. This was substantially lower than the 16% depression rate reported by Fasubaa et al. A possible reason for this difference is that their tool to determine postnatal depression involved posture and facial expressions. It appears that no studies have been undertaken to validate that method. However Brett et al quoted postpartum depression

rates to be in the region of 10-15%, significantly greater than the figure in this study. Population differences, and timing and method of the interview also differed between the studies. Currently, there appear to be no available data on postnatal depression rates in South African women after caesarean section. [15,20]

Eighty-nine percent of women in this study said that they would choose early discharge again, should they require a caesarean section in the future. This was used as a measure of the women's satisfaction with being discharged early. Among the minority of women not satisfied with early discharge was a disproportionate number with twin pregnancies. It is possible that the rigors of looking after two babies at home so soon after a caesarean section proved too much for them. Clinicians should perhaps be cautious before considering early discharge for a woman with twins.

Current local and international literature is deficient with regard to large, prospective, randomized controlled trials on early discharge post caesarean section. The current evidence stems from a few small trials, with varying definitions of early discharge and outcome measures. Ideally, what is needed to answer this research question is a large multicentre randomized controlled trial. Selection for entrance into this trial would be only after a patient has been screened to be at low risk for post caesarean section morbidity. Such a trial must have uniform definitions of early discharge and outcome measures. In addition, this may have to be conducted separately for well and under-resourced countries, as postoperative morbidity rates could differ significantly in these environments.

5.2 Limitations

The aim of this study was to be reliably representative of women that were discharged home on day two after cesarean section. However, for a woman to be eligible for the study she or someone living with her had to be in possession of a mobile telephone or land line. While this may have led to selection bias, the author estimates that less than 10% of women were excluded on these grounds.

Ideally, the researcher should have interviewed the women and examined their wounds in person at the two week follow-up. However, due to logistic difficulties and financial constraints, this was not possible. Also, questions on vaginal discharge and bleeding were not asked, as these were thought to be difficult to administer and interpret. Hence, secondary postpartum haemorrhage and endometritis as outcomes could not be reliable determined.

Nine women (8.4%) were lost to follow up. It is possible, although unlikely, that some of these women may have suffered serious complications at home or other hospitals. The nine women were comparable to followed up women in pre-discharge characteristics. It is therefore improbable that the results would have been materially different if these patients were eventually followed up.

It would have been ideal to have a control group, being discharged on day three after caesarean section to compare complications rates. This was not possible due to the shortage of beds in the postnatal wards. At the time of the study, the only patients being kept for longer periods were those with specific medical or surgical problems. It

may have caused unacceptable bias to use these patients as a control group as the postpartum complication rate among them would most likely have been higher.

5.3 Conclusion

It appears safe to discharge women on the second day after caesarean section without home follow-up, provided they meet certain criteria. Women mostly prefer going home early after a caesarean section as opposed to staying in hospital for three days. These results therefore support the practice of discharging patients on two day two after caesarean section in similar settings.

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AppendixA

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Pillay

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER M080617**
PROJECT	Outcome of early discharge after caesarean section
INVESTIGATORS	Dr N Pillay
DEPARTMENT	Obs & Gynae
DATE CONSIDERED	08.06.27
DECISION OF THE COMMITTEE*	Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 08.09.25 **CHAIRPERSON** .....
(Professor P E Cleaton Jones)

*Guidelines for written 'informed consent' attached where applicable

cc: Supervisor : Prof E Buchman

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

Appendix B

INFORMATION LEAFLET AND INFORMED CONSENT

STUDY NUMBER:

STUDY TITLE: Outcome of early discharge after caesarean section

INVESTIGATOR: Dr Neelan Pillay

INSTITUTION: Chris Hani Baragwanath Hospital

DAYTIME AND AFTER HOURS TELEPHONE NUMBER(S): 072 269 1801

I would like to invite you to in a research study. Your participation in this study is entirely voluntary.

PURPOSE OF THE STUDY:

- You have just had caesarean section done here at Baragwanath Hospital and you are going home today. According to our hospital protocol you should be discharged 3 days after caesarean section, I would like you to consider taking part in the research project

The purpose of this study is to determine if women that are discharged 2 days after a caesarean section are well at home

1. If you have any questions, do not hesitate to ask me.
2. You should not agree to take part unless you are satisfied about all the procedures involved.
3. You may not participate in another investigational medicine research study, nor take any other investigational medicine during your participation in this study.
4. If you decide to take part in this study, you will be asked to sign a document to confirm that you understand the study. You will also be given a copy to keep.

5. LENGTH OF THE STUDY AND NUMBER OF PARTICIPANTS:

- The study will be performed in Chris Hani Baragwanath Hospital.
- Approximately 100 participants will participate in this study.
- The total amount of time required for your participation in this study will be a maximum of 15 minutes for the initial questionnaire and 10 minutes for the follow up telephone call that I will make to you after 14 days.

6. PROCEDURES:

- If you agree to take part in this study, you will first be asked questions and your file examined to see if you qualify for this study.
- If you agree to participate in the study I will chart your:

Age; number of children, blood results use of anti-retrovirals , the reason for the caesarean section, the date and time of the operation and the type of skin incision and your babies weight which I will get from your hospital file.

I will also ask for your telephone number as well as that of some one living with you so that I can contact you if your phone is not working.

- Then after 14 days when it is convenient for you I will call you to ask you a few questions about your experience since you were discharged.
- IF I CAN NOT GET HOLD OF YOU I WILL CALL THE OTHER NUMBER YOU HAVE GIVEN ME AND IF THEY TELL ME THAT YOU ARE IN HOSPITAL AT CHRIS HANI BARAGWANATH I WILL COME VISIT YOU TO FIND OUT THE REASON FOR YOU ADMISSION.

7. WILL ANY OF THESE STUDY PROCEDURES RESULT IN DISCOMFORT OR INCONVENIENCE?

- The study will cause no pain or harm to you or you baby.

8. RISKS OF THE STUDY MEDICINE:

- There are no risks involved to you or your baby.

9. BENEFITS:

- There are no financial benefits to you from this study.
- Your participation in this study will contribute to medical knowledge that may help other patients like you.

10-11 RIGHTS AS A PARTICIPANT IN THIS STUDY:

Voluntary:

Your participation in this study is entirely voluntary and you can decline to participate, or stop at any time, without stating any reason. Your withdrawal will not affect your access to other medical care.

Non-participation.

You are free not to participate in the study, Should you wish not to participate this will in no way affect the way you are treated.

12. Withdrawal:

- Your withdrawal will not affect your access to other medical care.
- I retain the right to withdraw you from the study if it is considered to be in your best interest. If I can not contact you on any of the numbers you have given to me you will be withdrawn from the study, however this will not affect the way you are treated.

13. EMERGENCY CARE AND HOSPITALISATION:

- If you seek emergency care or if hospitalisation is required at any time during the study, please tell the treating doctor **that you are enrolled in this research study** and that **i must be called on 0722691801.**

14. FINANCIAL ARRANGEMENTS:

You will not be expected to pay for being involved in the study.

15. ETHICAL APPROVAL:

- This clinical study protocol has been submitted to the University of the Witwatersrand, **Human Research Ethics Committee (HREC)** and written approval has been granted by that committee.
- The study has been structured in accordance with the **Declaration of Helsinki** (last updated: October 2000), which deals with the recommendations guiding doctors in biomedical research involving human participants. A copy may be obtained from me should you wish to review it.

16. SOURCE OF ADDITIONAL INFORMATION:

If at any time you feel that any of your symptoms are causing you any problems, or you have any questions during the study, please do not hesitate to contact me.

Other doctors from this department who are working on this study are: Prof Buchmann 011 933 8000

- **The 24-hour telephone number** through which you can reach me is 072 269 1801.
- If you want any information regarding your **rights as a research participant, or complaints regarding this research study**, you may contact Prof. Cleaton-Jones, Chairperson of the University of the Witwatersrand, Human Research Ethics Committee (HREC), which is an independent committee established to help protect the rights of research participants at (011) 717 2229.
- For **research information** you can contact Me Dr Neelan Pillay on 072 269 1801.

17. **CONFIDENTIALITY:**

- All information obtained during the course of this study, including hospital records, personal data, information from the telephonic questionnaire and research data will be kept strictly confidential. Data that may be reported in scientific journals will not include any information that identifies you as a participant in this study.
- The information might also be inspected by the University of the Witwatersrand, Human Research Ethics Committee (HREC).
- These records will be utilised by them only in connection with carrying out their obligations relating to this clinical study.

Appendix C : Consent form

INFORMED CONSENT:

- I hereby confirm that I have been informed by the study doctor, Neelan Pillay about the nature, conduct, benefits and risks of clinical study I have also received, read and understood the above written information (Participant Information Leaflet and Informed Consent) regarding the clinical study.
- I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerised system by Dr Neelan Pillay and Professor Buchmann or on their behalf.
- I also agree that should I be re-admitted my re-hospitalization information may be used in the study.
- I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.

PARTICIPANT:

Printed Name	Signature / Mark or Thumbprint	Date and Time

I, Dr Neelan Pillay herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

STUDY DOCTOR:

Printed Name	**Signature**	**Date and Time**

TRANSLATOR / OTHER PERSON EXPLAINING INFORMED CONSENT..... (DESIGNATION):

Printed Name	***Signature***	***Date and Time***

WITNESS (If applicable):

Printed Name	**Signature**	**Date and Time**

60

Appendix D Data capture sheet

Date (recruitment): date and time to call:
Study number
Participant's information at discharge
**** Record review***

Age _____
Parity_____
HIV status_____
CD4 count if applicable_____
Use of ARV's: yes/ no
Rapid plasma reagin_____
Rhesus_____
Haemoglobin_____
Reason for caesarean section_____ elective/emergency
Type of skin incision_____
Infant(s) birth weights(s)_____
Date and time of caesarean_____

**** Interview information***

Breast or bottle feeding_____
Patient phone number_____
Contact phone number_____

Information collected at 14 day phone call

Questionnaire

Were you happy to be discharged early _____
Will you choose another early discharge _____
Pain: mild/moderate/immobilizing _____
Did you have excessive wound bleeding _____
Did the wound open up _____(if yes was it > 5cm_____)
Did excessive pus come from the wound _____
Did you have to be re-admitted _____
If yes why_____
Are you breast or bottle feeding _____
Was your baby re-admitted _____
Since your new baby was born, how often have you felt down, depressed, or hopeless : ***always/ often/ sometimes***
Since your new baby was born, how often have you had little interest or little pleasure in doing things: ***always/ often/ sometimes***

Cervical cancer screening programmes in low-resource countries are difficult to implement and maintain for a variety of reasons, including cost, lack of trained personnel, inadequate laboratory support, and low patient follow-up rates. However, the scale-up of ART in low-resource countries provides an unprecedented opportunity to develop cervical cancer screening programmes. It also provides opportunities for the provision of broader gynaecological and other health care for women.

With regard to cost-effectiveness, the costs and clinical benefits of cervical cancer screening of HIV-infected women in low- and medium-resource countries have not been evaluated.

The above cases illustrate that there is a need to incorporate routine Pap smears in HIV/AIDS care programmes. HIV-positive women should have a cervical smear when they are first diagnosed with HIV, 6 months after this, and then every year.

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Early discharge from hospital after caesarean section at Chris Hani Baragwanath Hospital

To the Editor: It has become common practice to discharge women from hospital early after caesarean section, to satisfy their wishes or to reduce workload. This practice has not been evaluated in South Africa. We undertook this study to find out if discharge from hospital on the 2nd postoperative day after uncomplicated caesarean section was acceptable to women, and to what extent it was followed by adverse clinical outcomes. Only one such study has been performed in Africa, in which Nigerian women were discharged on the 3rd instead of the usual 7th postoperative day, with good results.[1] No studies from Africa have investigated discharge from hospital on the 2nd postoperative day, although there have been reports of good outcomes from high-income countries.[2,3] The objectives of this study were to determine women's satisfaction, and rates of wound infection, maternal readmission, infant readmission and early postnatal depression.

We performed a cohort study of women discharged on the 2nd postoperative day after caesarean section at Chris Hani Baragwanath Hospital, with the permission of the University of the Witwatersrand's Human Research and Ethics Committee. The 2nd postoperative day was defined as 'day 2' on the postnatal morning round, from the date of delivery. This corresponds to a surgery-to-discharge interval of 33 - 57 hours. Women were discharged with no arrangement for home visits from nurses, and with routine follow-up only for removal of sutures. The following categories of women were excluded from the study: (*i*) age <18 or >45 years; (*ii*) hypertension, cardiac disease, diabetes mellitus, or antenatal anaemia (haemoglobin <10 g/dl); (*iii*) high risk of postoperative infection (rupture of membranes ≥24 hours, cephalopelvic disproportion, labour duration ≥20 hours, pyrexia in labour; (*iv*) surgical difficulties such as vertical or upper-segment uterine incision or suspected bladder injury, or excessive intra-operative or peripartum bleeding requiring packing, draining or blood transfusion; (*v*) stillbirth; (*vi*) evidence of infection after 24 hours postoperatively (heart rate ≥110 beats/min, temperature ≥37.5°C); (*vii*) poor clinical condition on the 2nd postoperative day, such as not getting up, not eating, vomiting, evidence of ileus, purulent wound discharge or dehiscence; (*viii*) infant not yet discharged from the hospital; (*ix*) unwillingness to be discharged; and (*x*) no telephone contact number for follow-up.

We used a consecutive sampling method. The researcher (NP) collected data from the case notes and conducted a short interview, and then arranged a follow-up telephonic interview 14 days after discharge. At follow-up, the researcher asked the woman her experience of early discharge, and about evidence of wound dehiscence or purulent discharge, bleeding from the wound, pain associated with the wound, and readmission of the woman or her infant. Postnatal depression was assessed using a simple early postnatal depression tool described by Whooley *et al.*[4] Two questions were used as markers of postnatal depression. These were: 'Since the birth, how often have you been down, depressed, or hopeless?', and 'Since the birth, how often did you have little interest or pleasure in doing things?' If the responses to either question were 'often' or 'always', the woman was classified as having self-reported postnatal depression. Data analysis was done using Epi-Info software. Statements of descriptive statistics included frequencies with percentages, means and ranges. Differences in

Table I. Women's answers at the 2-week follow-up telephone call (*N* (%); *N*=98)

Would choose early discharge again	88 (89.8)
Wound open	9 (9.2)
Wound draining pus	8 (8.2)
Wound bleeding	4 (4.1)
Pain associated with the wound	13 (13.2)
Early postnatal depression	7 (7.1)
Maternal readmission	3 (3.1)
Infant readmission	0 (0.0)
No problems reported	57 (58.2)

proportions were assessed using the chi-square test or Fisher's exact test with a p-value <0.05 suggesting statistical significance.

Of 107 women recruited, 9 (8.4%) were lost to follow-up, with no reply at their telephone numbers despite repeated efforts to contact them. Among the 98 who were followed up, the mean age was 26.5 years, with a range of 18 - 43 years. Most women (*N*=69, 70.4%) had emergency caesarean sections. Seventy-eight (79.6%) had transverse abdominal incisions and the remainder had vertical midline incisions. The mean birth weight was 3 164 g. The most frequent primary indications for caesarean section were fetal distress (*N*=48, 49.0%) and elective operation for previous caesarean section (*N*=20, 20.4%). At the 2-week follow-up telephone call, 88 women (89.8%) said they would choose early discharge again. Wound complications were described in a minority of women. Most women (*N*=57, 58.2%) reported no problems (Table I). Comparison of HIV-infected (*N*=26) and uninfected women (*N*=72) showed no statistically significant differences in terms of wound dehiscence, bleeding, pain, postnatal depression or readmission.

Three women were readmitted. One suffered a sprained ankle on the 7th postoperative day. A second was HIV infected and was admitted on the 12th day for endometritis, which was successfully treated with intravenous antibiotics. A third woman was admitted to a private hospital with eclamptic convulsions on the 4th day. There had been no evidence of a hypertensive disorder during her confinement at Chris Hani Baragwanath Hospital. Following treatment for eclampsia, she had a good clinical outcome.

Discharge from hospital on the 2nd postoperative day after caesarean section was found to be acceptable to the majority of women. The 3 maternal readmissions were all for complications that occurred after our standard 3rd-day discharge protocol, suggesting that the standard 3rd-day discharge would probably not have prevented their readmissions. The self-reported wound problems were not serious enough to require professional help, and were managed or tolerated by the women at their homes. A question mark remains over the 9 women who could not be contacted. None of them could be traced in other hospital wards in other institutions in the district, or in maternal death records. Their characteristics on recruitment into the study were not significantly different from those who were successfully followed up. The results of this study cannot be extended to women who had caesarean section for prolonged or obstructed labour, a common indication at this hospital. These women were excluded because of the high associated risk of subsequent infection.[5,6] In conclusion, discharge from hospital on the 2nd postoperative day after uncomplicated caesarean section without home visits in this setting appears to be acceptable and safe.

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Erratum

We regret that an error occurred on page 17 of the March 2011 *SAJOG* (Vol. 17 No. 1) in the scientific letter entitled 'Early discharge from hospital after caesarean section at Chris Hani Baragwanath Hospital', in that the author details were omitted. Their names and affiliations are as follows:

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The online version of the article was corrected soon after publication. We apologise for the error.