

**Homer CSE, Davis GK, Cooke M, Barclay LM.** (2002) Women's experiences of continuity of midwifery care in Australia: A randomised controlled trial. *Midwifery* 18 (2): 102-112.

## **Women's experiences of continuity of midwifery care in Australia: A randomised controlled trial**

Caroline SE Homer RM PhD *Midwifery Consultant Practice Development*

Gregory K Davis MD FRANZCOG *Staff Specialist Obstetrician*

Margaret Cooke RM PhD *Senior Research Midwife*

Lesley M Barclay RM PhD *Professor of Family Health*

*Midwifery Practice and Research Centre*

Centre for Family Health and Midwifery, Faculty of Nursing, Midwifery and Health at the University of Technology Sydney and the Division of Women's and Children's Health, St George Hospital, Kogarah, New South Wales, 2217, Australia

Correspondence to CSE Homer: email [homerc@sesahs.nsw.gov.au](mailto:homerc@sesahs.nsw.gov.au). Address: Ward 1 West, St George Hospital, Gray Street, Kogarah, New South Wales, 2217, Australia.

## **Abstract**

**Objective:** To compare the experiences of women who received a new model of continuity of midwifery care with those who received standard hospital care during pregnancy, labour, birth and the postnatal period.

**Design:** A randomised controlled trial was conducted. One thousand and eighty-nine women were randomly allocated to either the new model of care, the St George Outreach Maternity Project (STOMP), or standard care. Women completed a postal questionnaire 8-10 weeks after the birth.

**Participants:** Women in the trial were of mixed obstetric risk status and more than half the sample were born in a non-English speaking country.

**Results:** Questionnaires were returned from 69 per cent of consenting women. STOMP women were significantly more likely to have talked with their midwives and doctors about their personal preferences for childbirth and more likely to report that they knew enough about aspects of labour and birth, particularly induction of labour, pain relief and caesarean section. Almost 80 per cent of women in the STOMP group experienced continuity of care, that is, one of their team midwives was present, during labour and birth. STOMP women reported a significantly higher 'sense of control during labour and birth'. Sixty three per cent of STOMP women reported that they 'knew' the midwife who cared for them during labour compared with 21 per cent of control women. In a secondary analysis, women who had a midwife during labour who they felt that they knew, had a significantly higher sense of 'control' and a more positive birth experience compared with women who reported an unknown midwife.

Postnatal care elicited the greatest number of negative comments from women in both the STOMP and the control group.

**Conclusion:** The reorganisation of maternity services to enable women to receive continuity of care has benefits for women. The benefits of a known labour midwife needs further research.

## Introduction

Women's dissatisfaction with maternity services has been widely reported in recent years. This dissatisfaction includes a lack of continuity of care, a lack of control and involvement in decision making, insufficient information and a perception that caregivers are unhelpful (Green et al. 1990; Brown & Lumley 1994; Kaufman 1993). Government reports in Australia and the United Kingdom (UK) have recommended the establishment of models of care that provide continuity of care as a way to address women's dissatisfaction (Department of Health Expert Maternity Group 1993; NSW Health Department 1989).

Women's satisfaction with care during childbirth is complex and includes the nature and quality of information (Fleissig 1993; Waldenström & Nilsson 1993); the sense of control over care and the childbirth process (Hundley et al. 1997; Green et al. 1990); and the existence of a trusting relationship with midwives (Tinkler & Quinney 1998). Brown and Lumley (1994; 1998) identified 'having an active say in decisions made during labor and birth' as an important factor in satisfaction and Green et al (1990; 1998a) have linked 'feeling in control' to fulfillment and postnatal emotional well being. Having caregivers during labour who are perceived as being helpful has also been associated with a higher rating of intrapartum care (Brown & Lumley 1998). Obstetric intervention has been shown to be an important factor in predicting a negative experience (Brown & Lumley 1994; Jacoby 1987; Seguin et al. 1989).

Continuity of care and carer are also important determinates of a positive experience (Green et al. 1998b; Page et al. 2000). In this paper, continuity of carer refers to care by a midwife whom the woman has met previously and feels that 'she knows'. Continuity of **care** refers to a consistent philosophy or organisational structure around which care is provided. For example, a team of midwives may provide care although the woman may not 'know' each individual midwife as she has not met each of them.

The *Cochrane Review* on continuity of care through pregnancy, labour and birth by teams of midwives found that there were benefits for women who had continuity of midwifery care. Women who received continuity reported feeling better prepared for, and more 'in control' during labour and more pleased with their antenatal, intrapartum and postnatal care than women who did received standard care (Hodnett 2001). Models of

care that provided continuity of midwifery care have been shown to improve women's experiences with care during pregnancy and childbirth (Waldenström & Nilsson 1993; Rowley et al. 1995; MacVicar et al 1993; Flint et al. 1989; Kenny et al. 1994; MacVicar et al. 1993). In particular, women who have received continuity of care report greater preparedness for birth and early parenting (Flint et al. 1989; McCourt et al. 1998), increased satisfaction with psychological aspects of care (Waldenström & Nilsson 1993) and higher participation in decision making (Turnbull et al. 1996) than women who received standard care.

There is controversy about the provision of continuity of carer in labour, that is, having a known midwife. Most qualitative studies support the provision of a known midwife in labour (Garcia et al. 1998; McCourt & Page 1996; Morrison et al. 1999; Walsh 1999). There are some who argue that the evidence does not support the provision of a known midwife during labour. Green et al (1998b; 2000), in a structured review of the evidence from quantitative studies concluded that, while women prefer a smaller number of caregivers, having a known midwife during labour was 'the icing on the cake' and it seemed more important to women to have a midwife who was competent and caring than one whom she had met before. Green et al (1998b) argue that there is no justification in making a known midwife during labour the main determinate of a service. More recently, research has suggested that women attribute importance to knowing small groups of midwives who will provide care rather than having an individual, named midwife (Spurgeon et al. 2001).

In an attempt to improve women's experience of care during childbearing in an Australian hospital, we developed a new model of continuity of maternity care, known as the St George Outreach Maternity Project (STOMP). The STOMP model was established within the existing budget of a metropolitan teaching hospital and evaluated in a randomised controlled trial. The clinical outcomes, antenatal experiences of women and costs are reported elsewhere (Homer et al. 2000; Homer et al. 2001b; Homer et al. 2001a). An important outcome measure in the trial was the experience of women as measured in the postnatal period. Our hypothesis was that the new model of care (STOMP), which incorporated both continuity of care and carer, would result in a better experience for women, with improved information, an increased opportunity to discuss preferences for childbirth and a higher feeling of personal control during labour. This

paper reports a comparison of the experiences of women who received the new model of care for labour, birth and the postnatal period with those who received standard care.

## **Methods**

### *Study population*

The trial was conducted in a hospital with a large non-English speaking childbearing population, mainly from Chinese and Arabic-speaking countries (Nivison-Smith 1998). Interpreter services were available in both models of care.

Women were eligible for the trial if they were less than 24 weeks gestation at their first visit and lived in the catchment area. Exclusion criteria included the presence of significant maternal disease (for example, renal disease with impaired renal function, essential hypertension or insulin dependent diabetes), two previous caesarean sections or a previous classical caesarean section. Women who developed medical complications during their pregnancy were not transferred out of the intervention group. Women from all language groups were included in the sample.

### *Intervention: the STOMP model*

Two teams, each with six full-time midwives, provided continuity of antenatal, intrapartum and postpartum care for 600 women per year, that is, 25 births per team per month. Antenatal care was provided from two community-based clinics, with two midwives and an obstetrician or obstetric registrar attending each clinic. Some women did not meet all the six midwives during their antenatal care. 'Meet the Midwives' evenings were conducted bimonthly and women, their partners and others were invited to attend. On these informal occasions, all six midwives were present to answer questions, provide information and discuss issues as they arose.

The STOMP model aimed to provide continuity of care during labour, that is care from one of the STOMP team midwives. One midwife from each STOMP team was always 'on call' to provide care during labour or to give telephone advice. Care during labour and birth was provided in the Delivery Suite at the hospital in 12 hour shifts. If women required labour care for longer than 12 hours, the midwife handed over responsibility to another midwife in the team. For women who underwent a caesarean section, the STOMP midwife provided midwifery care in the Operating Theatre. If two STOMP

women were in labour at the same time, the midwife could choose to call another STOMP midwife in to assist, or the midwives in the Delivery Suite would assist the STOMP midwife.

After the birth, women could either choose to remain in hospital for postnatal care with STOMP midwives caring for them or be discharged early and receive domiciliary care by the STOMP midwives. Women were not forced out of hospital early. One STOMP midwife from each team was rostered onto the postnatal ward each day to provide postnatal care to women in hospital and in the community.

#### *Control group: Standard care*

Standard care was characterised by fragmented care with different caregivers across the antenatal, intrapartum and postnatal periods. A large number of clinicians provided care. Standard care was provided in the hospital-based antenatal clinic, the delivery suite, the postnatal ward and in the community. Different midwives and doctors saw women in the antenatal clinic. Women with risk associated pregnancies were seen by an obstetrician or obstetric registrar. Women with uncomplicated pregnancies were seen by midwives. Hospital-based antenatal care could also include visits to the women's general practitioner (GP).

Midwives and doctors on duty at the time provided care in the delivery suite. Midwives in the control group worked conventional eight hour shifts and handed over care to the next midwife coming on duty at the completion of the shift. Midwives in the ward provided postnatal care in hospital and a different group of midwives provided postnatal care in the community.

#### *Design*

The study used the randomised consent design described by Zelen (1979). This design was selected to overcome the disappointment bias that exists in the conventional consent-randomisation progression. Women were randomly allocated to either the STOMP group or the control group (standard care) prior to obtaining consent. Women allocated to STOMP were then approached for consent and were able to reject participation and receive standard care. Women in the control group received standard care and were asked to participate in a survey about their experiences of this care. Records of women in the control group were not marked and their names were not available to the maternity staff.

Women in both groups were able to withdraw from the study at any time. The trial was approved by the Institutional Ethics Committee of the South Eastern Sydney Area Health Service (Southern Section).

#### *Sample size*

The sample size was calculated using the primary clinical outcome measure in the main trial, that is, caesarean section rate (Homer et al 2001a). At a significance level of 0.05 with 80% power, a sample of 1000 women was required to detect a fifty per cent reduction in the caesarean section rate. Caesarean section was chosen as it is an important clinical outcome that is easy to measure. It also has significant physical and emotional implications for women and for the costs of providing maternity care.

A separate sample size calculation was not performed for 'satisfaction' or positive experiences. It was hypothesized that women in the intervention group would have more positive experiences with their care during labour and birth.

#### *Random allocation*

Random allocation was based on information in the referral letters from general practitioners. A list was generated using computer generated random numbers and women were stratified by parity. To obtain each woman's allocation, the research midwife telephoned an administrative assistant who was not associated with the study in any other way. The group allocation was not revealed until the woman's details were recorded by the administrative assistant.

#### *Outcome measures*

Data were collected postnatally through a nine page questionnaire posted eight to ten weeks after the birth of the baby. A reminder letter was sent after one month. A midwifery research unit associated with the hospital posted the questionnaires. Women's caregivers were not involved in the distribution of questionnaires. The questionnaire was adapted with permission from similar questionnaires used in the UK (Green et al. 1988; Sikorski et al. 1996) and translated into Arabic and Cantonese/Mandarin. Three Arabic speaking women identified that they could not read English or Arabic. It was not possible to collect data from these women.

Women were asked if they were given an opportunity in the antenatal period to discuss their preferences for the management of labour and birth. This included preferences

“about pain relief, being attached to a monitor, having an episiotomy, whether to be awake or asleep for a caesarean section”. Women were asked if they would have liked more time to discuss their preferences. These variables elicited categorical responses.

Women were then asked whether the amount of information they received antenatally on eight topics was adequate. The topics were pain relief in labour, induction, complications during labour, caesarean section, what happens immediately after the birth and in the first few days, infant feeding and care of the new baby. Women rated each of the eight items as either “I knew enough” or “I would have liked to know more”. The overall score (a continuous variable) reflected the women’s ‘level of knowledge’.

Women were asked whether they knew the midwife who cared for them during labour and birth to assess ‘continuity of carer’. Continuity of carer or a ‘known’ labour midwife was left for the woman to define and decide upon for herself. Women who answered in the affirmative were subsequently asked if having a midwife they felt they knew ‘made a difference’, while those who answered in the negative were asked if they ‘would have liked to have had a known midwife’.

Women were asked to rate their experience of childbirth using a scale from one to ten. The explanation for this question was: “ten out of ten would mean an absolutely wonderful experience that could not have been better, zero out of ten would mean a thoroughly unsatisfactory experience with nothing good to be said for it”.

Two questions related to the woman’s sense of personal control during labour. One asked whether she ‘felt in control of what was being done to her’ and the other, whether she ‘felt in control of the way she managed herself’. These two questions used a Likert scale which were combined to form a ‘sense of control’ score.

Obstetric intervention during labour and birth was calculated through an audit of the women’s medical records using the *Obstetric Procedure Score* devised by Elliot et al (1984) and subsequently used by Brown and Lumley (1998). This score takes into account the number of type of procedures occurring in each woman’s labour and birth, with higher scores assigned to more complex interventions such as epidural anaesthesia and caesarean section.

Finally, a section at the end of the questionnaire gave women the opportunity to write open-ended comments about their care.



### *Analysis*

Data were analysed using SPSS for Windows on an intention to treat basis. Women who declined STOMP care were analysed in the intervention group. The  $\alpha$  level for statistical significance was set at less than 0.05.

Chi-squared tests were used for categorical data (primiparity, language, need for interpreter, residential area, allocated group, mode of birth, domiciliary care and breastfeeding on discharge). Student t-tests were used for continuous data (including age, weeks postpartum at the completion of questionnaire, need for more knowledge, control during labour and rating of childbirth experience).

A secondary analysis was conducted on having continuity of carer in labour, that is, a known midwife. Women were categorised into two groups: continuity of carer and unknown carer. This analysis was regardless of allocated group. Student t-tests were used to examine differences in sense of control and rating of childbirth experience.

Linear regression was used to estimate the most important predictor of a positive experience of childbirth. Covariates in this model included: allocated group; opportunity to talk about preferences during labour and birth; adequate knowledge; sense of control; and, amount of intervention. Linear regression was used as a secondary analysis to determine the factors that influenced 'control' during labour and birth. Covariates in this model included: allocated group; opportunity to talk about preferences; adequate knowledge; and, amount of intervention. The selected covariates were factors that potentially could have been affected by the intervention. It was decided that other factors, such as parity and language group, could not be altered by the model of care and were therefore not included. It is acknowledged however that they may also be relevant predictors.

The final question, where women were invited to write anything good or bad about their maternity care experiences, elicited open-ended responses. Where necessary, these responses were translated into English. A content analysis was conducted. Responses were grouped into common themes, for example postnatal care, continuity of care and positive and negative responses about care. This was done by the primary researcher (CH) and formal reliability checks were not conducted. Examples from the open-ended responses are presented within the relevant sections in this paper. Open-ended responses are presented as a percentage of total respondents to the questionnaire.

Not all women responded to each question in the questionnaire. This means that the denominator varies for the percentages calculated on some variables.

## **Results**

### **Sample**

Sixty-nine per cent of consenting women (n=658) responded to the postnatal questionnaire. This response rate was not significantly different between the STOMP or control groups. Women responded at a mean of 11.5 weeks postpartum. More than half of the women responded to the open ended questions (STOMP=184 [56%]; Control=178 [54%]).

Women who responded to the questionnaire were slightly older on average (by one year), more likely to speak English or Chinese than Arabic or other languages and to not require an interpreter compared with non-responders. Responders were also more likely to be primiparous. There were no differences between responders and non-responders in allocated group, residential area, type of birth, use of community midwifery services and infant feeding on discharge (Table 1).

### **Discussion of personal preferences**

A significantly larger proportion of women from the STOMP group reported that they had an opportunity to talk about their preferences for labour and birth (Table 2).

### **Knowledge about labour, birth and a new baby**

STOMP women were more likely to report that they knew enough about induction of labour, pain relief, caesarean section, complications in labour and infant feeding compared with control women. There were no significant differences between the groups in their need for knowledge about baby care and about events during the early postnatal period (Table 3).

### **Continuity of care and carer during labour and birth**

The majority of women in the STOMP group (n=435, 79%) had continuity of **care**, that is they had one of the STOMP midwives present during labour and birth. Twenty-one per cent of the STOMP group and twelve per cent of the control group had one midwife care

for them throughout labour and birth ( $\chi^2=6.5$ ,  $df=1$ ,  $p=0.01$ ). There were no significant differences in the length of labour between the groups.

Sixty-three per cent ( $n=204$ ) of women in the STOMP group reported continuity of **carer**, that is, they had a midwife they felt that they knew, compared with twenty-one per cent ( $n=68$ ) of women in the control group ( $\chi^2=120.4$ ,  $df=1$ ,  $p<0.0001$ ). Of the control group women who reported continuity of carer in labour, 33 (49%) had attended the hospital antenatal clinic and 16 (24%), the birth centre for antenatal care.

Of the women who reported having continuity of carer in labour, most ( $n=180$ ; 91%) indicated that they liked this experience. Overall, few women ( $n=20$ ; 8%) felt that it 'did not make a difference' (Table 4). Of the women reported not having continuity of carer, sixty-nine per cent from both groups reported that they would have liked this experience.

Twenty STOMP women (6%) wrote about their positive experience of continuity of carer:

*It was great to always go to the same clinic with the same six midwives. It was also very good to know the midwife before having the baby.*

*Childbirth was a good experience for me, especially since I know the midwives that looked after me, I feel safe and trusted them.*

Four STOMP women (1%) who had an unknown labour midwife expressed disappointment in their written responses, for example:

*When I did get into labour to give birth, the midwife "On call" called in sick and a midwife in [the] labour ward delivered my baby. I was disappointed because I was looking forward to [having] a midwife I got to know deliver this baby.*

One women from the STOMP group (0.3%) was positive about continuity of care, even though she did not 'know' the midwife who provided care:

*During my labour I hadn't met the midwife that delivered my daughter but she was great! My labour wouldn't have been such a beautiful experience if it wasn't for the [STOMP] midwives - who prepared me very well.*

Only one STOMP woman (0.3%) expressed disappointment with the known labour midwife:

*I found the idea of knowing the midwife prior to labour a very good one but would like to be able to choose which midwife I had as the one I had I wasn't the most comfortable with.*

Seven control women (2%) expressed a desire for fewer midwives antenatally and a known labour midwife, for example:

*It would have been nice to have been able to see the same midwife every clinic appointment and to have the same midwife attend the birth. Instead I had a different midwife every time which meant a lot of the information given was repeated.*

*Generally my care via the hospital was good. I do wish I hadn't seen so many midwives prior to the birth.*

### **Sense of control and rating of childbirth experience**

Women in the STOMP group reported a significantly higher sense of 'control' during labour and birth ( $t(608)=2.7, p=0.005$ ) than women in the control group. Rating of childbirth experience was not significantly different ( $t(629)=1.9, p=0.05$ ).

One hundred and two women in the STOMP group (31%) made positive comments about their care. For example:

*The STOMP program made a huge difference both before and during the birth of my child.*

*The care and help of the midwives before and during the birth of my baby helped make the pain and trauma of giving birth a wonderful experience.*

*I feel that the care which I received during my pregnancy and labour was wonderful. All the midwives were extremely supportive and encouraging right up to the day we left the hospital. At all of my visits to the clinic, all of my questions and concerns were fully discussed and I always left feeling reassured and confident.*

Seventy-two women in the control group (22%) also made positive comments about their care:

*I would like to thank the maternity ward for all the care and good help they attended to me when required. This has helped make the birth of my baby and recovery of my cesarean a much easier and faster process.*

*I found the whole experience very satisfying. A great experience.*

### **The impact of continuity of carer on birth experience and sense of control**

In a secondary analysis, the experiences of women who reported continuity of carer during labour, that is, they felt they knew the midwife, were compared with those who did

not. Women who had continuity of carer during labour had a significantly higher sense of 'control' ( $t(628)=3.1, p=0.02$ ) and a more positive birth experience ( $t(607) =2.4, p=0.002$ ) compared with women who had an unknown carer.

### **Predictors of a better experience during labour and birth**

Linear regression was used to estimate the predictors of a better experience using the rating of childbirth as the dependant variable. Included in the model were: allocated group; continuity of carer during labour, opportunity to talk about preferences; adequate knowledge; sense of control; and, obstetric intervention score.

A higher sense of control and lower level of obstetric intervention during labour and birth were the most significant predictors of a better experience. The STOMP model, continuity of carer in labour, opportunities to discuss preferences and having adequate information did not predict a better experience (Table 5).

Two control group women specifically commented on their need for control:

*[I] would have liked to have had more control during childbirth. I requested pain relief more than once and was told it wouldn't be long to go. But I pushed for an hour and still no pain relief. I wish I had discussed pain relief more at the start of the labour.*

*I would like to have had more say during my labour. All the decisions seemed to be made for me and my husband was pushed to the side for most of the labour.*

### **Predictors of 'control' during labour and birth**

As 'control' was an important predictor of a positive experience, linear regression was used to estimate the characteristics of care which predicted this experience. The opportunity to talk about preferences and having adequate knowledge predicted 'control' during labour and birth positively. Obstetric intervention also predicted 'control', but negatively. Allocated group did not predict 'control' during labour and birth (Table 6).

### **Postnatal care**

Postnatal care elicited the greatest number of negative comments in the open-ended section of the questionnaire. Thirty-one (17%) STOMP and 41 (23%) control women made specific negative comments about postnatal care, particularly the inconsistent advice given by midwives and the lack of support and follow-up. This was not significantly different between the groups. For example:

*Although the level of care postnatally was given with care and professionalism, I did find advice and information given to be very inconsistent and opposing from midwife to midwife causing much confusion [STOMP].*

*[the] STOMP program was fine up to and including childbirth, but as for post-natal care, it fell apart at the seams [STOMP].*

*I was very happy with the care that I received but I got confused about the advice I got from some midwives [Control].*

## **Discussion**

The STOMP model of care was established within an existing budget of a teaching hospital in Australia. It has been demonstrated to be a sustainable, cost effective model of care and continues to be provided for more than 600 women per year. The results of this study suggest that STOMP was perceived by women to be beneficial. Women in the STOMP group: felt more able to discuss their preferences for labour and birth with their caregivers; were better informed about various aspects of labour and birth; and, considered that they were more in control during labour. The majority of STOMP women (79%) had continuity of **care** during labour and birth, and almost two thirds of STOMP women (63%) had continuity of **carer** during labour. The majority of women who had continuity of carer during labour liked the experience. Postnatal care was the area that received most negative responses from women in both groups.

The study was unblinded which may have impacted on women's responses. It is possible that women in the STOMP group felt that they should respond positively as this was an evaluation of the new model of care. The health of the baby must also be an influence on the experience of the birth and need to be considered in future research into women's experiences. There is also controversy over the optimum time to distribute questionnaires assessing childbirth experiences. It has been suggested that there is a 'halo effect' following the birth of a healthy baby, with favourable responses readily reported and that a more realistic assessment of the experience is given seven to twelve months later (Erb et al. 1983). In this study, postnatal questionnaires were mailed to women at eight to ten weeks postpartum. While this is an acknowledged limitation of the study, it was thought that the response rate would be reduced with delayed assessment. The time frame in which the study was conducted also dictated the timing of

questionnaire distribution. A delay in distribution of questionnaires would have meant the study was conducted over a longer period than was sustainable.

The multiplicity of standard care options offered the hospital during the study may have diluted some of the effects measured in the study. These options meant that 21 per cent of women in the control group reported continuity of midwife carer during labour, a higher proportion than was expected.

### **The effect of continuity of care and carer**

Almost 80 per cent of women in the STOMP group experienced continuity of care, that is, one of their team midwives was present, during labour and birth. This proportion was in line with the expectations of the new model of care. More than 60 per cent of STOMP women reported continuity of carer during labour. This is reasonable considering this was a team of six midwives and it was acknowledged that not all women would have a known midwife in labour.

Positive experiences of childbirth were associated with a higher sense of personal control during labour. Control, in turn, was positively associated with an opportunity to talk about preferences and adequate knowledge about labour, birth and the postnatal period. The STOMP model of care resulted in a higher sense of 'control' during labour and birth, although the experience of childbirth was not rated significantly higher. Women in the STOMP group were more likely to report an opportunity to discuss preferences and feel that they had adequate knowledge about aspects of labour and birth. It is possible that women who have a high sense of personal 'control' are more likely to seek information and opportunities for discussion about their preferences. Alternatively, these factors may lead to a higher sense of 'control'. It is not clear why more women in the control group stated that they had no preferences for labour and birth. It may be that having continuity of care and carer meant that women learnt more about labour and birth and so were more likely to express preferences.

Twenty-one percent of women in the control group reported continuity of carer during labour. This confounded the effect of the STOMP model on the rating of childbirth and women's sense of control. In the secondary analysis, women who had continuity of carer during labour rated their intrapartum experience more highly and scored higher on the sense of control score. As this latter analysis is not on an intention to treat basis, it should be interpreted with caution. The results suggest that continuity of carer during

labour has tangible benefits. The probability of receiving continuity of carer in labour can be increased through models of care such as STOMP.

The secondary analysis compared the experiences of women who received continuity of carer with those who did not. Women who received continuity of carer rated their experience higher and reported a higher sense of control during labour. While this is a secondary analysis and must be interpreted with caution, it suggests that continuity of carer does have quantitative benefits. Until now, most research that has identified benefits associated with continuity of carer during labour have been qualitative, with small, often purposive, samples (Morrison et al. 1999; Walsh 1999; McCourt et al. 1998; Coyle 1998; Farquhar et al. 1994; Murphy-Black 1993). It is possible that quantitative measures are insufficient to describe what it is about continuity of carer that is important to women (Page et al. 2000). Green et al (1998b) also suggest that routine questionnaires are unlikely to address the complex and often contradictory values around the importance of continuity of care and carer. Clearly more prospective research in this controversial area is needed.

In Australia, most women have not previously had an opportunity to receive continuity of midwifery carer in labour. Women attending birth centres, or those who have private midwives, experience continuity of carer in labour but the number of women in these groups is small. If models of care providing continuity of carer in labour become more common, expecting a known midwife may become more customary. It is possible that this will change the expectations and experiences that women report and will impact on the perceived importance a 'known' midwife is given.

### **Postnatal care**

It was hoped that the STOMP model would reduce the level of conflicting advice that women received in the postnatal period. However, inconsistent advice was reported from both women in both groups. Postnatal care was the most difficult service to provide in the STOMP model. One midwife from each STOMP team was rostered onto the postnatal ward each day to provide care for women in the hospital and those at home. The midwife reviewed all the STOMP women in the ward, provided necessary care, planned the care for the remainder of the day and then they went into the community to provide the domiciliary service for women at home. The midwives on the ward cared for the STOMP women while the STOMP midwives were away. Midwives on the ward also



provided care to STOMP women during the evening and night when STOMP midwives were not rostered to provide postnatal care.

This disrupted style of care may account for some of the dissatisfaction that STOMP women felt towards postnatal care. It is also possible that postnatal care was less valued by STOMP midwives for two reasons. Firstly, it was disruptive and difficult to provide. Secondly, it was seen as the least exciting component of maternity care. There is a balance to be found in the provision of postnatal care as part of a package of continuity of care. If there were more midwives in the team, it would be possible for team midwives to staff the postnatal ward on a 24 hour basis. This would result in less continuity of carer and probably increase the level of inconsistency reported. An alternative is to have smaller teams, in a caseload model like the One-to-One model in the UK (McCourt et al. 1998) where two or three midwives provide care for a smaller group of women.

Duration of care also impacts on the midwives' ability to provide effective and support postnatal care. The mean duration of postnatal care in the study was five days. This contrasts to the duration of postnatal care provided in the UK, where women are visited by midwives at varying intervals up to the 10<sup>th</sup> day, and to the 28<sup>th</sup> day as needed (Garcia & Marchant 1999). Uncertainty exists about the constitution of effective clinical care as most of the research in maternity care has focussed on the antenatal and intrapartum phases (Cooke & Stacey 2000; Garcia & Marchant 1999).

Postnatal care is an important component of maternity care and should not be omitted just because it is problematic to provide. Additional research needs to be conducted into the content and organisation of postnatal care and how effective care can be provided to women within a public health system.

## **Conclusion**

The STOMP model was designed to provide continuity of care and carer, thereby enabling women to be better informed and have more choices during labour and to feel in control during labour and birth. It was hypothesised that continuity of care and carer would deliver these important elements of maternity services more effectively than standard care. It is hoped that the data presented here will add to existing evidence around designing and developing sustainable models of midwifery care that meet the needs and choices of women.

Our results demonstrate that the STOMP model was associated with more positive experiences of childbirth compared with standard care. In a secondary analysis, women who had a midwife during labour who they felt that they knew, had a significantly higher sense of 'control' and a more positive birth experience compared with women who had an unknown midwife. Designing models of care to ensure a known or named midwife remains controversial. More prospective research is necessary if we are to be able to better design and plan maternity services that are safe, cost efficient and provide women with the most positive experiences. Postnatal care is also an important area that still requires more research and development. Even this new model which provided continuity of care and carer was unable to fully meet the needs of women.

### **Acknowledgments**

We would like to thank Elizabeth Nagy who completed all the data entry and we thank the women who participated in the research and the midwives and obstetricians who provided the care to women in both groups.

Caroline Homer was supported by a National Health and Medical Research Council Centres of Excellence in Hospital-based Research Grant (1998-2000). Margaret Cooke was supported by an Australian Research Council (SPIRT) grant (1998-2000).

**Table 1:** Characteristics of responders to postnatal questionnaire compared with non-responders.

		Responder n=658 Number (%)	Non-responder n=431 Number (%)	p	$\chi^2$	df
Mean age [SD]		28.4 [5.3]	27.4 [5.4]	0.003	2.98 <sup>a</sup>	1087
Parity	Primiparous	336 (51.1)	165 (38.3)	0.001	17.1	1
	Multiparous	322 (48.9)	266 (61.7)			
Allocated group	STOMP	326 (49.5)	224 (52.0)	0.4	0.6	1
	Control	332 (50.5)	207 (48.0)			
Residential area	Rockdale	370 (56.2)	264 (61.3)	0.1	2.7	1
	Hurstville	288 (43.8)	167 (38.7)			
Language	English	337 (51.2)	180 (41.8)	0.001	39.3	3
	Chinese	120 (18.2)	63 (4.6)			
	Arabic	70 (10.6)	104 (24.1)			
	other	131 (19.9)	84 (19.5)			
Interpreter need	yes	126 (19.1)	108 (25.1)	0.02	5.4	1
	no	532 (80.9)	323 (74.9)			
Type of birth	Normal	459 (69.8)	317 (73.5)	0.4	1.8	2
	Caesarean	107 (16.3)	62 (14.4)			
	Instrumental	92 (14.0)	52 (12.1)			
Community postnatal care	yes	249 (37.8)	178 (41.3)	0.3	1.3	1
	no	409 (62.2)	253 (58.7)			
Infant feeding	Breast	566 (86.3)	350 (83.5)	0.2	1.5	1
	Artificial	90 (13.7)	69 (16.5)			

Differences in parity, group, residential area, primary language, interpreter need, mode of birth, use of domiciliary care and infant feeding on discharge were examined using  $\chi^2$  tests. Independent sample t-tests were used to examine differences in age. <sup>a</sup>t value, F=0.21.

**Table 2:** The opportunity to talk about labour and birth preference.

	STOMP	Control
	n=325	n=332
	Number (%)	Number (%)
Yes, I talked quite a lot	93 (28.6)	61 (18.4)
Yes, I talked about it briefly	157 (48.3)	132 (39.8)
No, I did not talk about my preferences	19 (5.8)	59 (17.8)
No, I had no preferences	56 (17.2)	80 (24.1)

A  $\chi^2$  test was used to examine differences between groups:  $\chi^2=33.8$ ,  $df=3$ ,  $p=0.001$ .

**Table 3:** Aspects of labour, birth and the postnatal period that women wanted more information on by allocated group.

	STOMP n=325 Number (%)	Control n=332 Number (%)	p <sup>a</sup>
Pain relief options	56 (17.6)	107 (33.2)	0.001
Induction of labour	116 (36.8)	163 (51.1)	0.001
Caesarean section	139 (44)	177 (49.3)	0.009
Complications in labour	154 (48.6)	185 (57.1)	0.03
Events immediately after birth	134 (42)	153 (44.6)	0.18
The first few days after birth	114 (36)	135 (41.5)	0.14
Infant feeding	114 (35.6)	259 (40)	0.02
Looking after a new baby	111 (34.6)	131 (40.2)	0.13

<sup>a</sup> $\chi^2$  tests were used to examine differences between groups, df=1 for all cross tabulations.

**Table 4:** The opinion of women who reported having continuity of carer regarding whether they valued this experience.

	STOMP	Control
	n=198 <sup>a</sup>	n=65 <sup>a</sup>
	Number (%)	Number (%)
Liked continuity of carer	180 (90.9)	53 (81.5)
Did not like continuity of carer	6 (3)	4 (6.2)
Didn't think it made a difference	12 (6.1)	8 (12.3)
Total	198 (100.0)	65 (100.0)

<sup>a</sup>Only women who reported having continuity of carer during labour were included in this cross-tabulation. A Fisher's exact test was used to examine differences between groups, as the expected frequency of one cell was less than 5: Fisher's exact test=4.1, df=2, p=0.1.

**Table 5:** Predictors of a better experience during labour and birth.

	Standardised	p	95% CI	
	Beta (adjusted)		upper	lower
Allocated group	-0.02	0.63	-0.6	0.4
Continuity of carer in labour	0.07	0.13	-0.1	0.8
Talked about preferences	-0.04	0.34	-0.9	0.3
Adequate knowledge	0.06	0.12	-0.02	0.2
Sense of control <sup>b</sup>	0.35	0.000	0.5	0.7
Intervention score <sup>b</sup>	-0.16	0.000	-0.1	-0.03

Linear regression was used with the rating of childbirth as the dependant variable:  $R^2 = 0.2$ ,  $F(5) = 21.5$ ,  $p < 0.0001$ . Included in the model were: group (STOMP vs control); continuity of carer (yes vs no); opportunity to talk about preferences (yes vs no); adequate knowledge; sense of control; and, obstetric intervention score. <sup>b</sup>These variables significantly predicted a better experience.

**Table 6:** Predictors of 'control' during labour and birth.

	Standardised Beta (adjusted)	p	95% CI	
			upper	lower
Allocated group	0.054	0.23	-0.10	0.43
Talk about preferences	0.115	0.01	0.11	0.83
Adequate knowledge <sup>b</sup>	0.180	0.000	0.05	0.15
Intervention score <sup>b</sup>	-0.198	0.000	-0.08	-0.03

Linear regression was used with 'control' as the dependant variable:  $R^2 = 0.11$ ,  $F(4) = 14.2$ ,  $p < 0.0001$ . Included in the model were: allocated group (STOMP vs control), opportunity to talk about preferences (yes vs no), adequate knowledge and obstetric intervention score. <sup>b</sup>These variables significantly predicted a better experience.



## References

- Brown S, Lumley J 1994 Satisfaction with care in labour and birth: A survey of 790 Australian women. *Birth* 21 (1): 4-13
- Brown S, Lumley J 1998 Changing childbirth: lessons from an Australian survey of 1336 women. *British Journal of Obstetrics and Gynaecology* 105 (2): 143-155
- Cooke M, Stacey T 2000 Understanding postnatal care. *Midwifery Matters: Newsletter of the NSW Midwives Association* 14 (2): 25
- Coyle K 1998 Women's perceptions of birth centre care: a qualitative approach. Unpublished thesis Edith Cowan University, Perth, Western Australia.
- Department of Health Expert Maternity Group 1993 *Changing Childbirth* Department of Health HMSO, London.
- Elliot SA, Anderson M, Brough DI, Watson JP, Rugg AJ 1984 Relationship between obstetric outcome and psychological measures in pregnancy and the postnatal year. *Journal of Reproductive and Infant Psychology* 2 18-22
- Erb L, Hill G, Houston D 1983 A survey of parents attitudes towards their caesarean births in Manitoba Hospitals. *Birth* 10 (2): 85-91
- Farquhar M, Camilleri-Ferrante C, Todd C 1994 An evaluation of midwifery teams in West Essex: executive summary Public Health Research Unit, Institute of Public Health, University of Cambridge, Cambridge
- Fleissig A 1993 Are women given enough information by staff during labour and delivery? *Midwifery* 90 (2): 70-75
- Flint C, Poulengeris P, Grant A 1989 The "Know Your Midwife" scheme - a randomised trial of continuity of care by a team of midwives. *Midwifery* 5 (1): 11-16
- Garcia J, Marchant S 1999 Care of the mother after birth. In *Community-based Maternity Care*, G Marsh, M Renfrew eds, Oxford University Press, Oxford, pp. 398-407

- Garcia J, Redshaw M, Fitzsimmons B, Keene J 1998 First class delivery: a national survey of women's views on maternity care Audit Commission, London.
- Green J, Coupland VA, Kitzinger JV 1990 Expectations, experiences, and psychological outcomes of childbirth: a prospective study of 825 women. *Birth* 17 (1): 15-24
- Green JM, Coupland VA, Kitzinger JV 1988 Great Expectations: A Prospective Study of Women's Expectations and Experiences Child Care and Development Group, University of Cambridge, Cambridge.
- Green JM, Coupland VA, Kitzinger JV 1998a Great Expectations: A prospective study of women's expectation and experiences of childbirth, 2nd edn, Books for Midwives Press, Cheshire
- Green JM, Curtis P, Price H, Renfrew MJ 1998b Continuing to care: The organisation of midwifery services in the UK Books for Midwives Press, Hale
- Green JM, Renfrew MJ, Curtis PA 2000 Continuity of carer: what matters to women? A review of the evidence. *Midwifery* 16 186-196
- Hodnett ED. 2001 Continuity of care givers for care during pregnancy and childbirth (Cochrane Review). The Cochrane Library Issue 3. Oxford, Update Software.
- Homer CSE, Davis GK, Brodie P 2000 What do women feel about community-based antenatal care? *Australian and New Zealand Journal of Public Health* 24 (5): 590-595
- Homer CSE, Davis GK, Brodie PM, Sheehan A, Barclay LM, Wills J, Chapman MG 2001a Collaboration in maternity care: a randomised controlled trial comparing community-based continuity of care with standard care. *British Journal of Obstetrics and Gynaecology* 108 (1): 16-22
- Homer CSE, Matha D, Jordan LG, Wills J, Davis GK 2001b Community-based continuity of midwifery care versus standard hospital care: a cost analysis. *Australian Health Review* 24 (1): 85-93
- Hundley VA, Milne JM, Glazener CMA, Mollison J 1997 Satisfaction and the three C's: continuity, choice and control. Women's views from a randomised controlled trial

- of midwife-led care. *British Journal of Obstetrics and Gynaecology* 104 (11): 1273-1280
- Jacoby A 1987 Women's preferences for and satisfaction with current procedures in childbirth: findings from a national study. *Midwifery* 3 (3): 117-124
- Kaufman KJ 1993 Effective control or effective care? *Birth* 20 (3): 156-158
- Kenny P, Brodie P, Eckermann S, & Hall J 1994 Westmead Hospital Team Midwifery Project Evaluation: Final Report. Westmead Hospital, Sydney
- MacVicar J, Dobbie G, Owen-Johnstone L, Jagger C, Hopkins M, Kennedy J 1993 Simulated home delivery in hospital: a randomised controlled trial. *British Journal of Obstetrics and Gynaecology* 100 (4): 316-323
- McCourt C, Page L 1996 Report on the Evaluation of One-to-One Midwifery The Hammersmith Hospitals NHS Trust and Thames Valley University, London
- McCourt C, Page L, Hewison J 1998 Evaluation of One-to-One Midwifery: Women's responses to care. *Birth* 25 (2): 73-80
- Morrison S, Percival P, Haucky Y, McMurray A 1999 Birthing at home the resolution of expectations. *Midwifery* 15 (1): 32-39
- Murphy-Black T 1993 Identifying the key features of continuity of care in midwifery Nursing Research Unit, University of Edinburgh, Edinburgh
- Nivison-Smith I 1998 South Eastern Sydney Area Health Service Social and demographic characteristics. Summary Report South Eastern Sydney Multicultural Health Unit, Sydney
- NSW Health Department 1989 Final Report of the Ministerial Task Force on Obstetric Services in NSW: NSW Department of Health, Sydney
- Page LA, Cooke P, Percival P 2000 Providing one-to-one care and enjoying it. In *The New Midwifery: Science and Sensitivity in Practice*, L. A. Page, ed., Churchill Livingstone, Edinburgh, pp. 123-140

- Rowley MJ, Hensley MJ, Brinsmead MW, Wlodarczyk JH 1995 Continuity of care by a midwife team versus routine care during pregnancy and birth: a randomised trial. *Medical Journal of Australia* 163 (6): 289-193
- Seguin L, Therrien R, Champagne F, Larouche D 1989 The components of women's satisfaction with maternity care. *Birth* 16 (3): 109-113
- Sikorski J, Wilson J, Clement S, Das S, Smeeton N 1996 A randomised controlled trial comparing two schedules of antenatal visits: the antenatal care project. *British Medical Journal* 312 (7030): 546-553
- Spurgeon P, Hicks C, Barwell F 2001 Antenatal, delivery and postnatal comparisons of maternal satisfaction with two pilot *Changing Childbirth* schemes compared with a traditional model of care. *Midwifery* 17 (2): 123-132
- Tinkler A, Quinney D 1998 Team midwifery: the influence of the midwife-woman relationship on women's experiences and perceptions of maternity care. *Journal of Advanced Nursing* 28 (1): 30-35
- Turnbull D, Holmes A, Shields N, Cheyne H, Twaddle S, Gilmour WH, McGinley M, Reid M, Johnstone I, Geer I, McIlwaine G, Lunan CB 1996 Randomised, controlled trial of efficacy of midwife-managed care. *Lancet* 348 (9022): 213-218
- Waldenström U, Nilsson CA 1993 Women's satisfaction with Birth Centre care: A randomised controlled trial. *Birth* 21 (1): 3-13
- Walsh D 1999 An ethnographic study of women's experience of partnership caseload midwifery practice. *Midwifery* 15 (3): 165-176
- Zelen M 1979 A new design for randomized controlled trials. *New England Journal of Medicine* 33 (22): 1242-1245