Single room maternity care: perinatal outcomes, economic costs, and physician preferences

Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
The study examined the use of single-room maternity care (SRMC) to improve perinatal outcomes among women giving birth.

Type of intervention
Other: Care management.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised women in labour presenting to the hospital.

Setting
The setting was secondary care. The economic study was carried out in Canada.

Dates to which data relate
The effectiveness evidence was collected between December 1997 and July 1998. Resource use was compared before and after the implementation of SRMC (1995 - 1996 and 1997 - 1998).

Source of effectiveness data
The effectiveness data were derived from a single study.

Link between effectiveness and cost data
The costing was undertaken prospectively on the same patient sample as that used in the effectiveness study.

Study sample
No power calculations to determine the sample size were conducted. This was a convenience sample, with all consecutive women who presented in labour to the British Columbia Women's Hospital being assessed for eligibility using a triage tool. All eligible participants (n=976) were asked if they wished to be placed in the SRMC unit. Of these, 583 women were allocated to the SRMC unit. The remainder (n=393) were allocated to the LDR/PP procedure on the basis that a physician had preferred not to allow their entry to the SRMC unit (n=128), or that the SRMC unit had reached full capacity (n=265). Women who expressed a wish not to go to the SMRC unit (n=17; 2%) were not included in the study.
Study design
This was a prospective cohort study that was conducted in a single centre.

Analysis of effectiveness
The primary outcomes were those relating to the perinatal period, and were derived from the hospital perinatal database (see Effectiveness Results). Women who were transferred from the SMRC unit during the study period were included in the SMRC group for purposes of the analysis. It was unclear whether all of the included participants were accounted for at analysis. The survey responses of physician preferences for mode of care were also analysed. The groups were deemed comparable at analysis for some demographic characteristics. Significant differences were noted in the larger proportion of Caucasian women, more births attended by family practice physicians or midwives in comparison with obstetricians, and fewer women who had undergone a Caesarean section in the SRMC unit. Potential confounding variables were addressed in a multivariate analysis using logistic regression.

Effectiveness results
Fewer women in the SRMC unit needed continuous or intermittent electronic foetal monitoring, 45.8% versus 52.7%, (p=0.04).

No differences were found between the groups in terms of labour augmentation, use of epidural analgesia, use of narcotics, rates of Caesarean or forceps delivery, and use of episiotomy.

Women in the SRMC group experienced a longer first stage of labour (9.2 +/- 6.2 hours versus 8.3 +/- 5.5 hours; p=0.01) and second stage of labour (76.1 +/- 105.5 minutes versus 58.4 +/- 65.7 minutes; p=0.002) than those in the LDR/PP group.

The differences were limited to nulliparous women. There were no differences in the rates of postpartum haemorrhage or pyrexia.

Women in the SRMC group experienced a shorter mean total hospital stay (55.1 +/- 26.5 hours) than those in the LDR/PP group (61.0 +/- 24.3 hours), (p<0.001).

Fewer 1-minute Apgar scores below 7 were observed in infants in the SRMC group (10.3% versus 15.8%; p=0.01). No differences in the rates of thick meconium or need for aspiration were noted.

There were no differences in the rates of admission to an observation nursery or intensive care, nor were any observed in newborn temperature or rates of breastfeeding upon discharge.

The multivariate analysis did not reveal any additional statistically significant associations.

Survey responses showed that prior to the opening of the SRMC unit, 11.1% of physicians supported the idea. Six months after it had opened, 45.8% preferred working in the SRMC unit and this increased to 78.7% at 1 year, (p=0.003).

Clinical conclusions
The authors concluded that SRMC is an effective method of care that maintains good perinatal outcomes and attracts the support of physicians.

Measure of benefits used in the economic analysis
No summary measure of benefit was derived. In effect, a cost-consequences analysis was performed.

Direct costs
Hospital staffing costs were calculated from the number of full-time equivalent (FTE) positions required as a result of
an efficiency programme aimed at cross-training nurses. The average direct costs for 1998 - 1999 were reported. Existing hospital information was the source of the quantity and cost data, although these components were not reported separately. To evaluate the influence of differences in resource consumption between categories of patients, a Canadian-based resource intensity weighting (RIW) index was used to allow for cost comparisons across the interventions.

**Statistical analysis of costs**
The costs were reported as descriptive statistics.

**Indirect Costs**
In line with the perspective of the study, the indirect costs were not reported.

**Currency**
Canadian dollars (Can$).

**Sensitivity analysis**
No sensitivity analysis was conducted.

**Estimated benefits used in the economic analysis**
See the 'Effectiveness Results' section.

**Cost results**
The number of FTE positions in the hospital maternity programme was reduced from 206 (before the SRMC unit was opened) to 193.7. The reduction in FTE positions (i.e. 12.3) translated to an annual saving of approximately Can$670,240 (based upon mid-range nursing wages).

The total direct cost (1998 - 1999) of the SRMC unit was Can$1,363,206. The cost of all other inpatient units was Can$19,108,365.

The authors produced a cost per RIW unit (SRMC versus LDR/PP). For the SRMC this was Can$1,809, compared with Can$2,377 in the LDR/PP unit, which represented a reduction of 24%.

**Synthesis of costs and benefits**
Not applicable.

**Authors' conclusions**
Single-room maternal care (SRMC) offered cost-savings without compromising perinatal outcomes in women at low risk for intrapartum complications.

**CRD COMMENTARY - Selection of comparators**
The choice of the comparators was implicitly justified on the basis that SRMC represented a new woman-centred philosophy to maternity care and this was compared with standard practice. You should decide if these represent valid comparators in your own setting.

**Validity of estimate of measure of effectiveness**
The analysis was based on a prospective cohort study. Potential biases arising from the absence of randomisation (e.g.
physician preference for mode of care) and blinding (e.g. caregiver decisions might have been influenced by knowledge of birth location) present threats to the internal validity of the study. The results cannot be generalised beyond women at low risk of intrapartum complications (defined by the triage tool in this study). Some appropriate analyses were undertaken to address potential confounding factors. However, since no power calculations were reported, it was not possible to determine whether the results obtained were due to the intervention or to chance.

**Validity of estimate of measure of benefit**
No summary measure of benefit was derived. The reader is referred to the comments in the 'Validity of estimate of measure of effectiveness' field (above).

**Validity of estimate of costs**
The cost analysis was narrowly defined in terms of staffing for the hospital maternity care service. The exclusion of other costs means that the study is likely to be of limited use to those interested in the wider economic implications of the new service. The costs were not reported separately from the quantities, although resource use per unit was recorded. However, this would not enable the analysis to be easily be reworked in other settings. The resource quantities were weighted by an index about which the authors did not provide any further information (Canadian RIW). Presenting the cost per RIW unit may help comparability with other Canadian studies producing a similar output. No statistical or sensitivity analysis was performed for the costs or quantities.

**Other issues**
The authors compared the findings of their study with data from other hospitals that had introduced SRMC units. This comparison showed a trend towards reductions in FTEs and other resource requirements. The generalisability of the results to other settings was not addressed. The authors acknowledged several limitations of their study. For example, the insufficient power to address outcomes with low prevalence, the absence of randomisation and the non-blinded assessment of the outcomes.

**Implications of the study**
The authors did not state any recommendations for policy or practice.

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None stated.

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**MeSH**
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