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# Postpartum discharge of normal vaginal deliveries and its impact on the obstetric bed-state in the main general hospital in the Maltese Islands

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## Summary

The most effective and immediate measure to free beds in the Obstetric wards is an efficient postpartum discharge of normal vaginal deliveries. Normal vaginal deliveries comprise more than 60% of women delivered at Mater Dei Hospital. An extensive literature review suggests postpartum discharge can be broadly divided in three categories. Very early discharge (6-24 hours postpartum), early discharge (24-48 hours), and late discharge 48+ hours. Very early and early postpartum discharge has positive effects on maternal health and satisfaction. Very early and early discharged mothers are less prone to puerperal depression, ingest less sedatives, score high on satisfaction, and persist in breastfeeding. On the contrary, very early postpartum discharge (12-24 hours postpartum) has been associated with more neonatal readmissions and adverse events affecting the newborn. Moreover neonatal adverse events also seem to occur when postpartum discharged occurred within 30 hours of delivery. Discharge beyond 36-48 hours since delivery appears the safest and most beneficial time interval for both maternal and neonatal health. *Conclusion:* Discharge following uncomplicated normal vaginal deliveries at 36-48 hours may achieve an average gain of 12 hours bed-stay for each Obstetric bed at Mater Dei Hospital. To achieve this goal, post-partum discharge following uncomplicated normal vaginal deliveries should occur from 8.00 am to 10.00 pm. If this discharge policy is adhered to, the Obstetric bed-stay would gain 21-25% of beds following normal vaginal deliveries which translates to a net of five to six Obstetric beds daily.

*Key words:* Postpartum discharge; Normal vaginal deliveries; Obstetric bed-stay.

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## Introduction

From both local experience and a literature search on bed-state management in Obstetric Wards, there are a number of variables which may aid in the transfer of delivered mothers reducing the resultant Labour Ward overcrowding.

After reviewing several variables, the most propitious implementation with possible immediate impact is maternal and neonatal discharge following normal vaginal delivery. With more than 60% of neonates in Mater Dei Hospital, born via a normal vaginal delivery, it may be appropriate to focus on this group as this is likely to reap significant results in the immediate short-term.

## Literature review

A review of the literature search broadly categorises postpartum discharge into: (1) very early (discharge within 12-24 hours delivery), (2) early (discharge within 36-48 hours delivery, and (3) late discharge (delivery 48+ hours following delivery).

## Maternal safety

From the maternal point of view, there appears no risk across all three categories of post-partum discharge after normal delivery. Moreover there appear several advantages of very early and early postpartum discharge for the mother.

Persistence at breast-feeding is one advantage with early postpartum discharge. In one study by Carty *et al.* more early discharge (12-48 hours) mothers were breastfeeding without supplement at one month than were mothers in the long-stay group (48+ hours) [1]. Standard hospital care with early discharge and home support from nurses who were certified lactation assistants, has been shown to facilitate positive breastfeeding outcomes for mothers of term neonates [2]. However a small study from Sweden, reported that early discharge with home help had more negative emotions towards breast feeding compared with the control group. In this study at three months post-partum, significantly less newborns (74%) were fully breast fed versus 93% in the control group ( $p = 0.02$ ) [3].

Patient satisfaction, maternal confidence, and a reduction in postpartum depression are two other positive outcomes

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of early postpartum discharge. Carty *et al.* showed that mothers in the early discharge groups were significantly more satisfied with their care than were those who remained longer. Long hospital stays scored higher on measures of depression and lower on scores of confidence at selected time periods. On the other hand, prolonged discharge beyond 24 hours correlated strongly with postpartum depression and lower satisfaction scores [1].

In a randomized control study, no significant difference in puerperal complications was demonstrated, but the intake of sedatives by early (24-48 hours) discharged mothers was smaller than that of control group mothers during the first puerperal week ( $p < 0.01$ ) [4]. Three population-based surveys of recent mothers conducted in the State of Victoria, Australia have shown no adverse impact of shorter length of stay on breast feeding and women's psychological well-being [5]. Early postpartum discharge has also positive effects on bed-turnover and is economically feasible. In a study by Rhodes (1994), a policy of 24-hour discharge of mothers and babies resulted in the postpartum bed-stay reduced by 48% [6]. The maternal/neonatal readmission rates were 0.59% and 0.29% respectively. It was the opinion of this author that 24-hour discharge is safe, cost effective, and promotes patient satisfaction. Petrou *et al.* have shown that early postnatal discharge combined with home midwifery support, resulted in a significant reduction in postnatal hospital care costs [7]. The above mentioned favourable effects of early postpartum discharge in the main are beneficial to the mother. These factors appear to be influenced by a number of significant biopsychosocial variables [8].

### Neonatal safety

The critical determinant of safe postpartum discharge is neonatal outcome. There are some who have advocated that the very early discharge is safe in low risk cases [9, 10]. It has however been shown that very early postpartum discharge (12-24 hours postpartum) was related to significantly higher neonatal readmission rates. Neonatal readmission occurred in the main clinical reasons such as dehydration, jaundice, and qualms about breastfeeding. The most vulnerable group were single mothers without the help of the extended family. Also at risk were minority groups [11]. On the other hand in the early (36-48 hours postpartum) and late (48+ hours) post-delivery discharged women, there appears no significant differences in maternal and neonatal outcomes. Neonatal visits were significantly more common among those mothers and their newborns discharged early, which was defined as at less than 36 hours [12].

A crucial cut-off point appears to occur in the less than 30 hours postpartum discharge. Two studies [13, 14] indicated that neonatal admission and even death within the first year was significantly higher in women discharged within 30

hours of a normal vaginal delivery. The subgroups at high risk for readmission following early discharge included newborns born to primigravidae (OR 1.25; 95% CI, 1.07-1.45), mothers younger than 18 years (OR 1.22; 95% CI, 0.79-1.91), and mothers with premature rupture of membranes (OR 1.41; 95% CI, 0.85-2.36).

Early discharge was also associated with an increased risk of readmission for jaundice, dehydration, and sepsis [15]. In a large study from the Kingdom of Saudi Arabia, hospital discharge of neonates within 48 hours after delivery significantly increased the risk for hospital readmission during the neonatal period mainly due to sepsis [16]. Moreover neonates discharged within 30 hours from delivery were more likely to die within 28 days of birth (OR 3.65; 95% CI 1.56, 8.54), between 29 days and one year (OR 1.61; 95% CI 1.10, 2.36), and any time within the first year (OR 1.84; 95% CI, 1.31, 2.60) of life than newborns sent home later. Neonates discharged within 30 hours from delivery were at greater risk from dying of congenital heart disease (OR 3.72; CI 1.25, 11.04) and infections (OR 4.72; CI 1.13, 19.67) within one year of birth than newborns discharged late [17].

In the U.S., hospital stays for newborns and their mothers after uncomplicated vaginal delivery had decreased from an average of four days in 1970 to 1.1 days in 1995 [18]. Following the reduction in hospital postpartum stay, in 1996 the Newborns' and Mothers' Health Protection Act was mandated in 42 states of the U.S. This Act was authorised in response to a number of incidents including neonatal deaths in the United States following very early postpartum discharge (12-24 hours). In an effort to reduce the medicalisation of birth following consumer pressure, in conjunction with the economic imperative to reduce insurance costs, a brief period between 1995 and 1996 saw the brisk introduction of the very early postpartum discharge (12-24 hours). The neonatal impact was almost immediate with a significant rise in neonatal admission and adverse outcomes for the neonate. Rates of readmission visits within 21 days increased from 6.0% to 10.4% during periods of increasing short stay (1995-1996), but fell to 8.0% during the year after introduction of the legislation and levelled off when the legislation took effect [18].

In an in-depth review of the impact of the Newborns' and Mothers' Health Protection Act has occurred since its introduction. A differential analysis on a large data base in Ohio has shown a variation in the neonatal outcome depending not only on the social status of the mother, but also on the antenatal history and mode of delivery. Mothers who had complex antenatal care such as hypertension, pre-eclampsia, and complicated deliveries such as cesarean sections and instrumental were more likely to require neonatal readmission and also adverse neonatal outcomes. On the other hand early postpartum discharge in normal vaginal, deliveries did not appear to put the neonate at risk [19]. This work was confirmed by another study by Danielson *et al.*

conducted in the State of California

The proportion of infants rehospitalized for dehydration and low-risk infections over the four study years combined was statistically significantly higher in infants discharged very early. The rate of admissions amounted to 4.37 per thousand (neonatal dehydration) and 10.30 per thousand (neonatal sepsis) compared with infants discharged early (3.59 per thousand (neonatal dehydration) and 8.16 per thousand, (neonatal sepsis) or after a 2+-night stay (2.91 per thousand (neonatal dehydration) and 7.95 per thousand, (neonatal sepsis)). The proportion of infants rehospitalized for dehydration increased statistically significantly from 2.89 per thousand in 1992 to 4.52 per thousand in 1995 [20].

Paul *et al.* further discern on the above legislation “*that this well-intentioned legislation and current practice may not be sufficiently protecting the health of newborns and suggests that additional support for mothers and newborns during the vulnerable postdelivery period may be indicated*” [21]. It thus appears that continuity of care in the community is a strong determinant in ascertaining neonatal safety following hospital discharge. In a selected, low-risk, low-income population, maternal/neonatal discharge within 24 hours after delivery with a home follow-up visit was safe and cost-effective [22].

Two crucial Canadian neonatal studies have critically looked at the impact of the pre-24 hour and post-36 hours postpartum discharge period. Millar *et al.* carried out a study whereby a total of 559 neonatal visits were identified [13]. Neonatal admissions to the Paediatric Emergency Department increased 245% compared to an overall increase in of 8.7% during the study period. The most common presenting complaints were jaundice, breathing difficulties, feeding problems, and irritability. The most frequent diagnoses were normal physiology. The length of postpartum hospital stay was identified in 389 neonates (55 early discharges before 24 hours postpartum and 334 non-early discharges. The early discharge group had significantly higher admission rates compared to the normal discharge group, changing from 2% of the total population in study year one to over 31% in the final year [13].

Another Canadian paediatric study by Lock *et al.* assessed hospital readmission rates following a clinical guideline aimed at discharging newborns from hospital within 24 hours postpartum [14]. Prior to the introduction of the early-discharge guideline, the average length of stay declined from 2.25 days (95% CI 2.18-2.32) to 1.88 days (95% CI 1.84-1.92) ( $p < 0.001$ ). After guideline introduction there was a further decline in hospital stay to 1.62 days (95% CI 1.56-1.67) ( $p < 0.001$ ). The main clinical reason for early neonatal readmission was jaundice, with a higher rate among infants in the early-discharge cohort >24 hours) than among those in the pre-guideline cohort (8.6% vs. 3.1%; OR 2.96, 95% CI 2.29-3.84) [14].

## Discussion

From the literature review conducted, it appears that the determining variable influencing postpartum discharge in normal vaginal deliveries is neonatal safety. Very early discharge (12-24 hours) appears to place the neonate at increased risk and should not be implemented at Mater Dei Hospital. Furthermore the critical cut-off point of 30 hours postpartum discharge also appears relevant to conserve neonatal safety.

Discharge after 36 hours postpartum appears as safe as discharge beyond 48 hours for both mother and neonate. To further widen the local safety net, the interval for discharge from Mater Dei Hospital may be extended to span the interval of 36-48 hours postpartum. This arrangement may fit in with the current hospital discharge ward round practices and relative visiting hours.

Currently paediatric discharge policy at Mater Dei Hospital involves 48 hours postpartum discharge and/or the passage of at least two nights. The paediatric discharge round occurs between 8.00-10.00 am. Due to the timing of neonatal discharge, it is not uncommon that some discharges may occur from 48 to 56 hours postpartum in normal vaginal deliveries.

Possible changes to the above discharge policy may encompass the following flow process. On Day 1 post-normal vaginal delivery the Consultant Obstetrician or his delegate assesses the mother. This assessment should include the precise calculation of discharge time within the 36-48 hour bracket. Postpartum discharge is to be enacted between 8.00 am till 10.00 pm. Once the mother is deemed fit for discharge within the 36-48 hour bracket, this is stated clearly in the discharge planning advice in the patient's notes. Official arrangements should be enacted so that the Discharge Liaison Midwife would review the mother the next day following discharge. If the early morning discharge of the mother does not align itself with that of the paediatric review, the child's discharge may be delayed till the evening. It is imperative that in the morning both Obstetric and Paediatric Discharge rounds are carried out as priority early in the morning so as to augment bed-turnover.

If the above recommendations were to be implemented it has been calculated that on average 12 hours of bed-stay could be gained in cases of normal vaginal deliveries. Patients having a bed-stay of 56 hours could be reduced to 44 hours, 52 hours to 40. and 48 to 36 hours. This bed-stay gain could translate itself to a 21-25 % increase in unoccupied beds in relation to normal vaginal deliveries, amounting to four to six beds daily.

## Conclusion

The above implementation of postpartum discharge may help in attenuating the perennial contracted bed-state problem currently present in the Department of Obstetrics and

Gynaecology. With the good will of both the Departments of Obstetrics and Paediatrics, it is hoped that the change in discharge policy will attenuate the bed-state problems in the Department of Obstetrics and Gynaecology at Mater Dei Hospital.

### Declaration

This work reviewed a system of postpartum discharge and utilized scientific literature to improve upon this system. The author administers the Department of Obstetrics and Gynaecology and is responsible for the running of its infrastructure including the bed-state management. No human participants, human data, or human tissue were utilized and accordingly, no consent or ethics approval were required.

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