Early Discharge of Preterm Babies: Gavage feeding in the home

Introduction:

Neonatal intensive care is a limited and resource intensive service\(^1\). The latter period of the hospital stay for most preterm infants is largely determined by the establishment of full sucking feeds, adequate weight gain, respiratory stability with no apnoea and the maintenance of temperature in an open care cot\(^2\,^3\).

The relatively low dependency of this period has lead to the introduction of home gavage feeding programmes where motivated and confident parents can take their babies home prior to the establishment of full sucking feeds\(^4\,-\,^8\).

So while the literature describing the outcomes of these programmes is limited and there have been no randomised controlled trials yet published, evaluation of these programmes has been described and their safety demonstrated\(^4\,^6\,-\,^9\). These programmes utilise skilled neonatal nurses, who closely monitor infant developmental progress and provide support for the parents while keeping the infant within the family unit in the home environment. Successful implementation of a Home Gavage Feeding Program will therefore be dependent on effective discharge preparation, support and guidance by the registered nurses in special care, the lactation specialists and Newborn Family Support Team (NFST). Effective communication and collaboration with medicine and allied health will also be vital to the successful transition of these infants into the community.

Potential benefits of such a model of care include:

- **Shortening prolonged family separation** Initially parental stress is elevated as discharge nears, especially when consideration is being given to discharge of the infant still on intra gastric feeds\(^5\). It is anticipated that an immediate benefit for parents will be increased time with their infant. Daily travelling time to and from the hospital will be eliminated, while the cost and anxiety associated with inadequate parking facilities should be significantly reduced. In addition the emotional burden of prolonged infant parental separation will be shortened and parent satisfaction improved\(^6\,^8\,^10\).

- **Decreased risk of infection** Örtenstrand et al\(^7\) demonstrated a lower incidence of respiratory infections in the group of infants discharged early, compared with those who remained in hospital until establishment of full sucking feeds (\(p=0.6\)).

- **Reduced length of stay** Studies have consistently shown an average reduction in the hospital stay of about 10 days\(^4\,^6\,^7\). Thus the strategy is cost saving and will have the added advantage of reducing level 2 bed block in our nursery. Sturm\(^6\) calculated savings based on a hospital in the US. In this study, all those enrolled (143) were born less than 37 weeks gestation, 52 were sent home gavage feeding and 91 were discharged home from hospital on full sucking feeds. Infants on the home gavage feeding programme went home an average eight days earlier than the infants discharged on oral feeds. In total the 52 infants on the home gavage programme spent 645 less days in hospital compared with the 91 infants discharged on full sucking feeds. This represented an average saving of $US 12,428 per infant.

- **Low readmission rates** Re admission rates of infants discharged on home gavage programmes were consistent between studies and were not a result of complications related to gavage feeding. Sturm\(^6\) reported 10 readmissions, of which none were directly related to gavage feeding within the first two months of discharge from the NICU. Four infants required elective surgery and six were respiratory related issues including reflux, RSV infection and apnoea. Örtenstrand et al\(^7\) reported
nine re-admissions within duration of domiciliary care, and none were directly related to gavage feeding. While Barrett & Kecskes did not comment on the re admission rates of infants on their programme, no increased complications or adverse events were reported in infants receiving gavage feedings at home. Bissell & Miall were consistent in reporting no adverse outcomes and in addition reported no re admissions to hospital for feeding related difficulties in their cohort of 40 infants.

Breast Feeding rates: It is important to note that although Örtenstrand et al. found no statistical difference in the duration of breastfeeding between infants discharged using standard discharge protocols (7.5 months) and infants in the early discharge programme (6.3 months), there is clearly a difference. A recent case control study by Meerlo-Habing and colleagues, demonstrated improved rates of exclusive breast feeding in the early discharge with tube feeding group (34% or 17/50 infants) compared with the control group (26% or 20/78 infants) at 4 months after discharge (p=0.04). At six months, results were similar to Örtenstrand et al. in that the relative risk of ceasing breastfeeding in the early discharge compared with the control group when adjusted for smoking, gestational age and birth weight was 0.67 (0.43-1.05, p=0.06). Both studies strongly emphasised the need to follow up infants on these early support programmes with skilled nurse specialists.

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The Canberra Hospital has had a home gavage early discharge program for five years. Their as yet unpublished audit demonstrates similar results to that in the literature and we are very grateful to them for sharing their experience and guidelines with us.

Practice Guidelines

Inclusion Criteria: Families considered appropriate for the home gavage feeding programme should be identified by the team leaders in SCN (58894 / 58897) and the NFST (56436/ 56435). The family situation should then be discussed with the relevant neonatologist and social worker and if in agreement the family can then be approached. The following criteria should be met:

- This protocol is aimed at well preterm infants. However, these guidelines may be utilised to facilitate discharge of the complex preterm / term infant when considered appropriate by the neonatal team.
- Families who live within the NFST home visiting area.
- Infants who are physically well, haemo-dynamically stable and no longer require cardio-respiratory or SpO2% monitoring.
- Infants who are taking at least half their daily requirement as sucking feeds. If breast feeding those feeds should be at least code 5 or 6 and supply should be adequate to meet their infants nutritional needs see Breast feeding protocols.
- The infant should be discharged into a safe environment where there is no history of substance abuse, or domestic violence.
- There should be adequate and safe parking facilities for NFST.
- The family must have access to a 24 hour telephone service.
- Parents who are agreeable and are assessed as able to safely perform intra gastric feeding for their baby
- Consistent weight gain within the lower end of the target range of 10-15 grams/kg/day.

Pre Discharge Education:

The responsibility for coordinating discharge planning, family education and preparation would be primarily with NFST in collaboration with the registered nurses in special care. This would include:

- Provision of a Gavage Pack and Safety Guidelines (parent and RN signatures required)
- Basic newborn resuscitation for parents will be demonstrated by the NFST. The parents would also be encouraged, as is current practice to attend a first aid course specific to resuscitation / first aid needs of a baby in their first year of life. The course should be conducted by an accredited group in the community such as St Johns Ambulance or Red Cross.
- Confirmation of the naso-gastric tube position using ph strips and intra gastric feeding to be demonstrated by NFST or designated registered nurse (after instruction from NFST) to ensure consistency of information and safe technique.
- The family to perform at least five feeds under the supervision of NFST or a designated registered
The insertion and fixing of a naso-gastric tube will be demonstrated to the parents by NFST or a designated registered nurse to reinforce the safety around correct tube insertion and position (refer - RPA Newborn Care Enteral Feed Practice Guideline). Some parents who are willing and demonstrate competence may be subsequently assessed to insert an intra gastric tubes at home.

NFST page and contact details are issued and explained (132 222 & page 15929) as is current practice.

Written instructions and diagrams relating to intra gastric tube feeding and / or insertion will be given to the parents by NFST.

Written instructions about the milk volume and other relevant information for example, preparation and dilution of Human Milk Fortifier® (HMF Nutricia), addition of polyjoule (Nutricia) and when to give the infant a top up feed.

Feed volume will be recalculated by NFST once baby is discharged home.

Parents are advised at what rate to administer the feed for example over 20 minutes during their supervised instruction before discharge.

Parents to be reassured that increase in feed volumes / calories will be calculated by NFST according to weight gain.

SIDS positioning reinforced by all the neonatal team and NFST.

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**Discharge Planning:**

**Nutrition:**

- The infant should have a steady weight gain and may or may not still require HMF® (Nutricia) or other calorie additive after discharge home.
- Consideration should be given to the use of a post discharge formula in those infants born before 30 weeks gestation who are feeding on a low birth weight formula close to discharge. Transition to this formula should be implemented 2-3 days prior to discharge.\(^\text{13}\)

**Documentation and Appointments:**

- Document expected date of discharge - document same on Newborn Care Discharge Risk I/D 630807
- Complete all usual discharge planning requirements - document same on Newborn Care Discharge Risk I/D 630807
- Document discharge examination and additional instructions in the infants Personal Health Record (Blue Book)
- Enter infant details on the NFST database and clearly document education
- Discuss safety and the home environment and any special needs for their infant - document same on Newborn Care Discharge Risk I/D 630807
- Reinforce car safety and SIDS guidelines document same on Newborn Care Discharge Risk I/D 630807
- Discharge teaching checklist can assist in such an assessment.
- NFST to notify community health services and family GP about impending discharge document same on Newborn Care Discharge Risk I/D 630807
- Team leader SCN to organise 4-6 weeks post discharge appointment with consultant neonatologist as is current practice document same on Newborn Care Discharge Risk I/D 630807
- Reassure parents the infant can be reviewed by the neonatologist earlier if NFST have concerns

**NFST visits:**

- Prior to discharge NFST will develop a care plan with parents that agrees on timing and frequency of visits, volume and type / route of feeds, strategy for tube accidental dislodgement and observation of an intra gastric feed by parents in the home.
- NFST will contact and home visit the day following discharge and then upon on a needs basis negotiated with family.
NG tube displacement: *Written instructions are given to parents should accidental dislodgement of the intra gastric tube occur. Routine advice would be:*

- If the intra gastric tube falls out during the day, the parents should page NFST for assistance, guidance and replacement of tube.
- If the tube falls out overnight:
  - If baby has had a full feed (intra gastric / sucking) prior to dislodgement of the tube, and will next feed will take or is due for a sucking feed and the family is not anxious, NFST can be contacted in the morning to supervise replacement / replace tube.
  - If the tube has fallen out earlier in the evening, the family will most likely need to give a couple of feeds overnight. If the parents are assessed to insert a tube, they can replace the intra gastric tube. Otherwise, the parent will need to bring the infant to RPA Newborn Care after first paging NFST, who will liaise with the RN in charge of the SCN to reinsert the tube for the parents.

*Evaluation of Protocol change:*

NFST & CNC will audit the gavage feeding programme over a 12 month period from time of implementation.

**References:**


12. NSW Health: Nasogastric feeding tubes for infants and children reducing the incidence of misplacement associated with administration *Safety Notice 007/09*