

Breastfeeding the premature infant in a high tech NICU environment The Swedish experience



Kerstin Hedberg Nyqvist, RN, PhD, Associate Professor
Department of Women's and Children's Health
Uppsala University, Uppsala, Sweden

University Hospital, Uppsala, Sweden



Preterm infants: Breastfeeding rates

Compared to healthy term infants:

Nearly the same at discharge...but shorter duration.

LBW infants born at a 27-40 weeks

Discharge with breast milk feeding:

93 % (close to national breastfeeding statistics):

- 74 % fully
- 19 % partly

95 % of these infants: fed directly at the breast

Comparison: LBW group - term control group

Breastfeeding at: 2 months CA: 82 % vs. 92 %
 4 months: 63 % vs. 83 %
 6 months: 36 % vs. 65 %

Very preterm infants: 2 months CA: 79 %
 4 months: 62 %
 6 months: 45 %
 9 months: 22 %
 12 months: 12 %

Explanations of breastfeeding outcome

Socio-economic factors - not size or neonatal illness

Common misconceptions that must be eradicated

“Preterm infants:

- are unable to coordinate sucking, swallowing and breathing until 32-34 weeks,
- show inefficient, dysfunctional sucking,
- need oral motor stimulation to achieve oral motor functioning (massage in/around mouth, finger sucking),
- assessment must be made before introduction of oral/breast feeding (registration of sucking pressure)”

Where did these ideas come from?

- Most studies of development of sucking capacity made during bottle-feeding
Results wrongly inferred on breastfeeding.
- Breastfeeding counselling based on incorrect ideas about infant competence
- Feeding routines not adapted to facilitate breastfeeding
Start of oral feeding delayed.
= Self-fulfilling prophecy!

Feeding guidelines must be based on evidence

Development of preterm infants' oral-motor competence

- Preterm Infant Breastfeeding Behavior Scale, PIBBS)
- Test-weighing

71 mothers - infants born at 26-35 weeks:

4,300 PIBBS records.

Criteria for initiation:

- weaned from ventilator/CPAP,
- no severe instability (not GA, PMA, age, test...)
from 27 weeks

No restrictions in frequency or duration of breastfeeding sessions.

Early oral motor competence

28 weeks

Obvious rooting

Efficient areolar grasp (latch)

Staying fixed at breast for

≥ 15 min.



31 weeks

Repeated swallowing



32 weeks

Repeated long bursts (≥ 10 sucks)

Very long bursts (≥ 30 sucks)



Breastfeeding outcome

*Attainment of nutritive sucking (≥ 5 ml): From 30 w,
Exclusive breastfeeding: From 33 w.*

Breastfeeding at discharge:

Exclusive	80 %
Partial	<u>14 %</u>
Total	94 %

Milk intake per feed: Highly variable – frequent small or less frequent very large volumes

Mature sucking pattern not needed for exclusive breastfeeding!

Early development of breastfeeding behavior in infants GA <32 w

15 singletons

GA md (range):

29 (26 - 31)

6 ventilator: 1- 45 days

13 CPAP: 1- 18 days

Oxygen: 1- 90 days



Milestones in feeding progress

Event	n	PMA (w) Md (range)
Initiation of breastfeeding	15	31 (29 – 33)
Introduction of cup feeding	15	33 (31 – 36)
Transition to total daily volume	14	34 (32 – 36)
Early discharge	15	35 (33 – 39)
Formal discharge	15	36 (33 – 39)

Breastfeeding at discharge

Attainment of full breastfeeding (n = 12)

PMA (weeks + days): 35 + 5 (**32 + 4** – 38 + 5)

Breastfeeding at early discharge:

12 fully, 2 partially

Breastfeeding at formal discharge

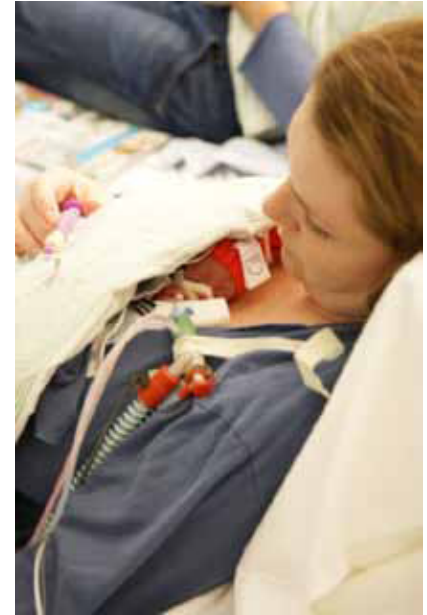
10 fully, 4 partially (cup or bottle)

Feeding practices

Long delays of introduction and slow advancement of enteral feeding are common.

Uppsala NICU: Enteral feeding

- introduced by 2 hours after birth / immediately after emergency procedures
- skin-to-skin
- breast/pacifier sucking during/after feeding.



Parents begin tube feeding ASAP (day 0 or 1)

→ support the parental role.

Proactive feeding regimen

Volumes increased rapidly:

Day 0: 65 ml/kg/day  day 10: 170 ml/kg/day

SGA infants: 100- 150 -200 ml/kg/d day 0-1-2.

This proactive feeding regimen: no long term effects on growth.

Funkquist et al. 2007; Funkquist et al. 2010

Proactive feeding regimen

Effects contrary to expectations

- Preterm AGA infants:
Size at birth explained growth up to 18 months
- Infants with higher standard deviation scores
(**not small infants!**) for weight, length and HC
at birth:
Higher risk of inadequate growth in hospital

Months with exclusive breastfeeding correlated negatively with length.

Cup feeding: 1st priority as alternative oral feeding method



Introduction from 29 weeks

When:

Infant awake after breastfeeding

In mother's absence



*Bottle = exception:
mother will not
breastfeed exclusively,
or refuses cup*



Regulated feeding → demand breastfeeding

Regulated feeding: Fixed volumes + intervals

Uppsala: All infants x 12 (imitate breastfeeding/often)

Semi-demand (unregulated) breastfeeding

Mother offers infant the breast often
day and night + supplementation
(cup, tube) when needed



Demand breastfeeding = Based on infant's signals

From term age – brain maturation

Tube to breast: Mother decides strategy

- A. Test weighing = supplementation reduced based on infant's actual competence
- B. Supplementation reduced step by step
- C. Schedule for reduction av supplementation (for X days ahead)

Daily (or every 2-3:e days) weight



Controversy about test weighing

No: Duty, focus on nutrition → stress, failure, shame

Yes: Mother perceives as support AND enjoys breastfeeding (breastfeeding = relationship, bonding, love)

Test-weigh or not? SGA infants

NICU A: Test-weighing, B "clinical indices"

Exclusive breastfeeding at discharge

A: 97 % - B: 98 %

NS

PMA at full breastfeeding

A: 35.9 (32.6-38.0) < B: 36.4 (34.3-38.9) p.010



PMA at discharge:

A: 36.7 (33.6-38.6) < B: 37.1 (34.6-39.3) p .005



Conclusions: Both strategies possible.

Likely earlier attainment of full breastfeeding and earlier discharge with test weighing.

Factors that support breastfeeding in the NICU

Guidance to mothers according to the Newborn Individualized Developmental Care and Assessment Program (NIDCAP)




Sensitive mother-infant interaction when breastfeeding a preterm infant.

Trustful mother - NICU staff relationship



Kangaroo Mother Care

Swedish VPT dyads
with more time in
KMC/day  longer
breastfeeding duration.



Breastfeeding and early discharge

Criteria

- No apnea/illness
- Some oral intake,
- Prepared parents (incl. CPR)
- From about 34 weeks

Parents perform infant's care,
Home visits or telephone rounds
"Open door policy"

Benefits for breastfeeding:

Reduces conflict between wanting to go home and establishment of breastfeeding



Challenge to breastfeeding

Mothers' modern life style

- Find demand feeding/lack of control - tiresome
- Want time of one's own
- Prefer scheduled feeding
- Belief: babies “predictable” - feed 4-hourly, stop nursing during the night after 3-4 months.

Goal: Help mothers understand:

Wide variations between infants in nursing pattern also after discharge in:

Number of sessions per day, intervals, duration per session, total sucking time per 24 hours

Thank you for your attention



Uppsala NICU feeding policy: GA <28 w

Age (days)	ml/kg/day
0	70 - 80
1	80 - 90
2	90 - 100
3	100 - 110
4	110 - 120
5	120 - 130
6	130 - 140
7	140 - 150
8	150 - 160
≥ 9	160 - 170

First meal:

Within 1-2 hours after birth

Rapid weight loss, hypoglycemia, infant hungry: Increase faster

If inadequate growth with 170 ml/kg:

Increase to ~ **230** ml/kg

Feed - semi-reclining (skin-to-skin)

- ideally skin-to-skin
- slowly

(GER: Very uncommon)

Prescribed gradual reduction of supplementation

Day	PMA (w)	Weight	Breast milk	Feeding
0	28 + 0	1533	0 x 4 6 x 1 10 x 7	Partial parenteral nutrition
7	29	1416	18 x 12	PPN discontinued
14	30	1570	24 x 12	Breastfeeding
16				Breastfed x 6
21	31	1728		Breast x 7 Tube x 11
28	32	1858	+ 150 ml	
29			+ 120 ml	
30			+ 100 ml	
31-32			+ 75ml	
33				Breast only
35	33	1994		Breast x 12-13