Normal Weight Gain/Weight Loss in the first 6 weeks

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Objectives

At the end of this session you should be able to

- Describe key issues from a case scenario regarding weight loss in the neonatal period
- Gain knowledge about newborn physiology and behaviours that affect weight gain and weight loss
- Discuss the assessment of the breastfeeding dyad to determine cause(s) of weight loss in newborn
- Provide an overview of hypernatraemic dehydration in breastfed infants
- Identify appropriate actions that can be taken to address weight loss issues in a timely manner.

Case scenario

- Mrs A 40 years old; primigravida.
- 5 scans - normal growth found.
- Weight, urine and BP all within normal limits
- Heavy smoker; using Aropax.
- Term - Long latent phase of labour; Ms A anxious and reporting severe contractions. Given Pethidine and later Panadol.
- Obstetric consultation: CTG – reassuring; ultrasound – sufficient liquor

Case scenario continued/…

- Later that night contractions more severe
- Decelerations noted on CTG trace
- Obstetrician recommended caesarean section

Case scenario continued/…

- Baby born by caesarean at 1.45 am; oral and nasal suction performed, given facial oxygen.
- Apgars 7 and 10.
- Temperature 36.8 °C, heart rate 100bpm, respirations 50 bpm
- Weight 2735 gms (6 lbs)
- Full examination; no abnormalities detected

Case scenario continued/…

- Day 0 - No skin to skin contact or breastfeeding until 5.30am – few sucks; colostrum 1ml by syringe.
- Vital signs normal
- 11.30 am breastfed well after bath
- Next recorded feed – 10.42 pm – fed for 20 minutes on one breast only. Temperature 36.8 °C
- Day 1- Fed at 3.45am – well from both breasts, sucking and swallowing noted. Thereafter fed at 7am, 9am, 10.45am and 12 noon. Good sucking and swallowing.
- Fed again 1.20pm, 2.15pm. Unsettled later that afternoon

Case scenario continued/…

- Poor feeding that afternoon.
- Given 3ml EBM by syringe at 8.30pm; large bowel motion.
- 9.15 pm fed for 15 minutes from one breast.11.30pm – attempt to breastfeed noted in clinical records.
- 2.45 unsuccessful breastfeed attempt; baby woken and given 5ml EBM at 4.45am (Day 2)
- 8am baby woke for feed but went back to sleep and would not rouse for feed.
- 8.30am 4ml EBM by syringe; baby sleepy, clammy.
- What would you do at this stage?
- Blood sugar recorded as Lo; temperature 36.1 °C

Case scenario continued/…

- Baby fed 13ml EBM via NG tube, physician consult undertaken.
- BSL – 1.4 mmol/L
- What is the normal blood sugar range?
- 2.5 – 3 mmol/L
- 17ml EBM via nasogastric tube – condition improved.
- Baby had a seizure at 10.05am.
- BSL 1.4mmol/L; 20 ml formula given at 10.14am.
- Temperature 36.7 °C.

Case scenario continued/…

- 10.40am Temp; 37.9°C, HR 165bpm, respirations 39bpm, “dusky episode”
- IV fluids commenced; antibiotics; oxygen; unstable blood sugar, seizures, apneic episodes - transferred hospital with NNU.
- Significant neurological problems.

Normal newborn physiology and behaviour?

- Continuous flow to Intermittent feeding
- Study of normal newborn behaviour by Stephanie Benson (2001) in Australia:
  - Feed frequently in first 24 hours then sleep for 6-8 hours
  - Feed well after birth then have a 6-8 hour sleep, then feed frequently
  - Unpredictable
  - No formula top-ups needed
- How will you know if this is not a normal full term newborn baby?

Physiology and behaviour continued...

- **Stomach size:** 15-30 ml depending on weight of baby at birth (Stables & Rankin, 2005).
- At birth, stomach noncompliant and does not relax easily.
- Over next 3 days, reduction in gastric tone and increase in compliance (Zangen, et al, 2001).
- Small volumes of milk, regurgitate excess.

Physiology and behaviour continued...

- **Physiologic and anatomical stomach** capacity approximate each other around 4 days of age (Scammon & Doyle, 1920).
- **Hungry sooner** if breastfed than formula fed:
  - Gastric half-emptying time for formula is 65 minutes (range 27-98 min)
  - Gastric half-emptying time for breastmilk is 47 minutes (range 16-86 minutes) (Van Den Driessche, et al, 1999).
  - Gastric emptying individual for each baby;
  - may relate to bioactive peptides in breastmilk e.g.leptin, ghrelin and obestatin (associated with energy intake and expenditure) (Khan, et al, 2013) – further investigation needed.

Volume of milk production and intake (Adapted from RCOM, 2002)

Time postpartum	Av. Volume/day	Av Volume /feed	Notes
Day 1 (0-24 hrs)	37 ml (7-123ml)	7ml	Matches physiologic capacity
Day 2 (24-48 hrs)	84 ml (44-335ml)	14ml	
Day 3 (48-72 hrs)	408ml (98-775ml)	38ml	Lactogenesis II (secretory activation) occurs in this time period
Day 4 (72-96 hrs)	625ml(378-876ml)	58ml	Delayed lactogenesis results in decreased volume

Physiology and behaviour continued...

- **Weight loss** after birth; on average 5-7% of birth weight in breastfed babies.
- Loss may be increased in breastfed babies if mother had epidural and/or IV fluids.
- Average weight loss in first day of life 226g (epidural) vs 142g (non epidural) (Dahlenburg, Burnell & Braybrook, 1980)
- IV fluids in labour (6.17%) vs 4.07% (no IV fluids in labour (Merry & Montgomery, 2000); recent studies by Noel-Weiss et al, 2011 and Chantry et al (2011) – intrapartum fluid intake, fetal volume expansion and loss after birth
- Associated with caesarean section without labour (Preer, et al, 2012) – previously unreported risk factor.? mechanism involved.

Physiology and behaviour continued...

- **Urine output**
  - 6-44ml of urine in bladder at birth.
  - 99% of babies void by 48 hours of age
  - High levels of ADH lead to low urinary output in first day of life
  - Noel-Weiss et al (2011) study - most infants corrected fluid status by 24 hrs of age
  - Normal output 2-6 times per day in first 28 hours
  - 5-25 times thereafter
  - Increase occurs with lactogenesis II/secretory activation (Blackburn, 2003;Walker, 2006).

Normal growth in breastfed babies

- Weight and length slower than formula fed babies; COH doesn't differ (Dewey, 1998).
- Studies to support average weight increase include Agostini, et al, 1999; Marques, et al, 2004; WHO 2006 growth charts.
- Average daily weight gain decreases after 3 months of age in breastfed babies.
- Birth weight doubled by 4 months and tripled by 12 months of age

Average daily weight gain

Age	Grams
0-3 months	26-31 gms
3-6 months	17-18 gms
6-9 months	12-13 gms
9-12 months	9 gms

A useful leaflet

- Weigh often in first 2 weeks
- Thereafter less frequently ok
- Weights measured over a lon

likely to show true weight chan

- Look more closely if excessive

or slow gain or unusual pattern

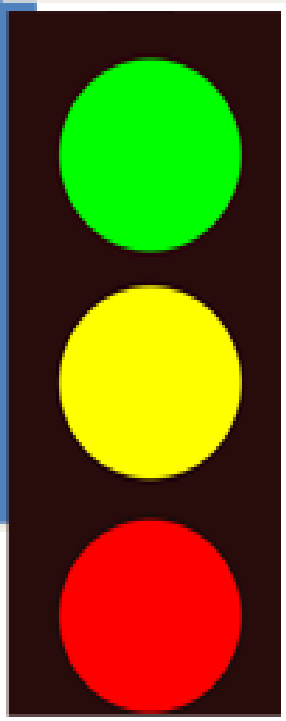
crosses 2 centile lines

Weighing in the neonatal period.

“Babies should be weighed at 5 and 10 days as part of the assessment of feeding, and thereafter as needed. Recent research has shown that early weighing does not discourage breastfeeding mothers from feeding their babies and may help identify problems in a timely manner.”

Ministry of Health, 2010

WEIGHT LOSS PARAMETERS



- 7% - physiological
- 10% - may be OK but needs assessment and follow-up
- 12 -15% Feed! Consult. U&E's
- 15 - 20% Admission, U&E's, hypernatraemia

Guidelines for Consultation with Obstetric and Related Medical Services (Referral Guidelines)

- According to the Guidelines for consultation with obstetric and related medical services:

Growth and feeding			
8013	Sustained feeding difficulties in a newborn not related to gestational age		Consultation
8014	Dehydration or › 10% weight loss since birth		Consultation

Consultation	The process by which, in communication with the woman, an LMC seeks an assessment, opinion and advice about the woman and/or her baby from another primary care provider or a secondary/tertiary care specialist, by way of a referral. A consultation may or may not result in transfer of clinical responsibility. Consultations may involve the woman and/or baby being seen by the other practitioner; however, a discussion between practitioners is often appropriate on its own. Consultations can take place in person, by telephone, or by other means as appropriate in the situation.

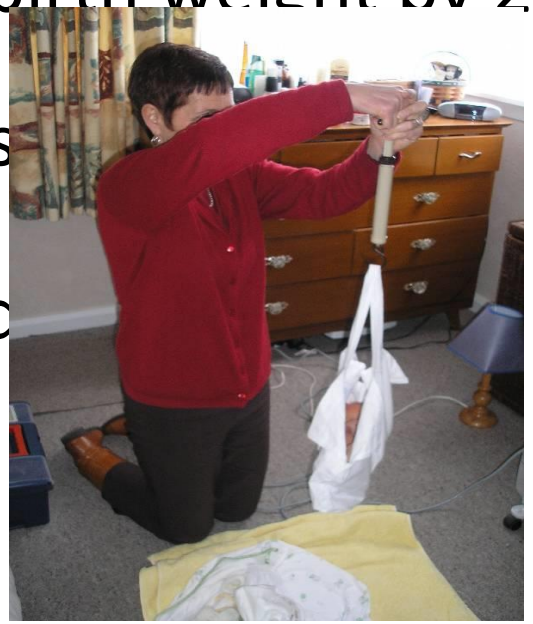
Abnormal weight loss

- What is abnormal?
- Hypernatraemic dehydration in breastfed infants.
  - What is it?
  - How is it identified?
  - When is it commonly identified?
  - What are the consequences for the baby?
  - What is the treatment?
- What can we do to ensure **prevention** of this condition?

Abnormal weight loss

- >7-10% must make us look further (Noel-Weiss, Courant & Woodend, 2008) **!!**
- **Should we use birthweight or 24 hour weight as baseline?**
- Also if failure to surpass birth weight by 2 weeks of age;
- Assess often in early days
- NZ-WHO growth charts

Information for parents and Caregivers (MoH, Aug 2010)



Check on the A-B-Cs

- **A – ACCESS** to the breast
- **B - BREASTMILK TRANSFER**
- **C - COMFORT**

How should this loss be addressed?

- Assess the 3 B's

Breast e.g.

- Growth at puberty, and pregnancy
- Milk production, when does milk normally come in? Colostrum expression and storage.
- Nipples
- Breast surgery
- Medical conditions, e.g.

pituitary adenoma, diabetes

- Severe haemorrhage

Baby

- **Oral cavity** – tongue, jaw, lips, cheeks, palate, nasal cavity.
- **Reflexes**, swallowing (12 weeks gestation); sucking (24 weeks gestation); gag (26 weeks gestation); rooting (from 32 weeks but strongest at 40 weeks).
- **Wet and dirty nappies**

Baby continued/…

- **Cranial nerves** e.g. glossopharyngeal (motor pathway for swallowing and gag reflex) and vagus nerve (sensory info from palate, pharynx).
- **Muscle Tone**, e.g. baby with Down Syndrome

Additional problems to consider

- **Jaundice** – immature liver; poor glycogen stores, low levels of albumin; pathological causes, e.g. galactosaemia, biliary atresia
- **Sleepy** baby with poor feeding
- **Hypothermia**
- **Hypoglycaemia** – affects wakefulness; ability to feed effectively; brain growth and function – neurological damage.
  - Who requires blood sugar level checks?
  - Ketone bodies as energy for baby's brain
- Think **metabolic** problems – phenylketonuria (1 in 13500-19000), galactosemia (1 in 60000)

Both

- Positioning and attachment
- Suck-Swallow-Breathe
- Milk transfer
- Woman's attitude and stress levels.

- **Assessment tools** e.g.
- IBFAT (infant breastfeeding assessment tool)

Action

- **Increase** milk supply
- **Manage** large supply
- **Check** on result of Neonatal Metabolic Screening Test
- **Document a plan**
- **Evaluate** plan, and **adjust** as needed
- **Consult** with specialist e.g. paediatrician, speech-language therapist, cranio-osteopath, physician, gynaecologist, lactation consultant
- **Refer**

Breastmilk as first milk

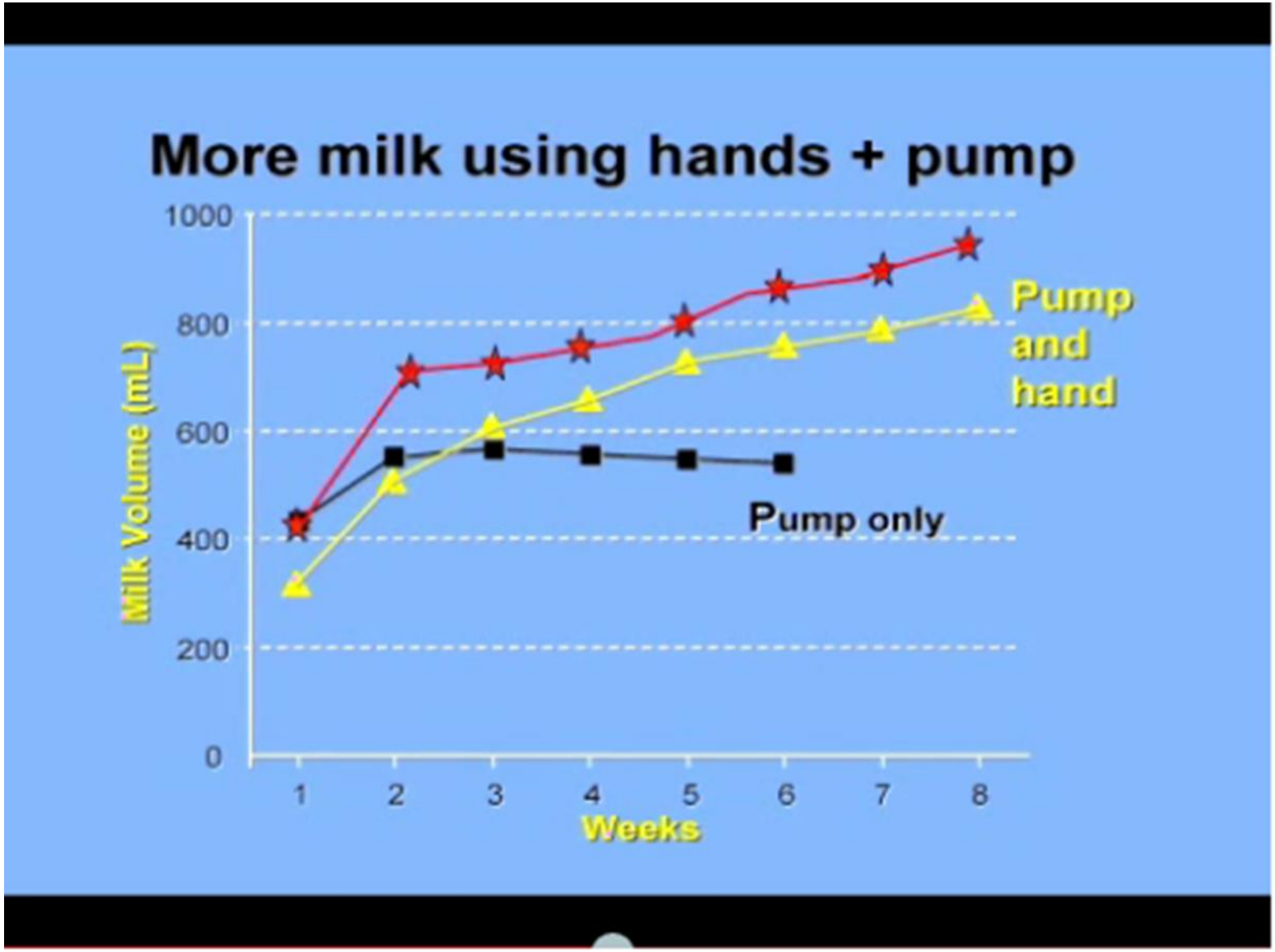
- Antenatal colostrum expression and storage

Australian Multicentre RCT research with women with diabetes in pregnancy (DAME (diabetes and antenatal milk expression –Forster, Jacobs, Amir et al)

- Getting mums to express early and often

Longer is not necessarily better (power pumping)
Increase milk supply by pumping and hand expression (Dr Morton, Stanford university)

http://newborns.stanford.edu/Breastfeeding/MaxProduction.html



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The Well Fed Baby Checklist

*To know that breastfeeding is going well, answer these questions when the baby is **5 - 7 days old.***

1. Is the baby having **several bowel movements in 24 hours** that are mustard yellow with curds in them? ("poop you can scoop", not just a smear)	Y	N
2. Is the baby **wetting 5 - 7 diapers in 24 hours**?	Y	N
3. Do the **breasts feel full before feeding** and **softer after feeding**?	Y	N
4. If the mother had initial **nipple soreness**, is this **resolved**?	Y	N

5. Do you **hear swallowing** when the baby is breastfeeding?	Y	N
6. Is the baby **eating at least 8 times in 24 hours**?	Y	N
7. Does the baby seem **satisfied after a feeding**?	Y	N
8. Is there a **lack of sore, tender, or red and firm areas** in either breast?	Y	N
9. Has the baby started **gaining 1/2 - 1 ounce per day**?	Y	N

If you have answered NO to any of these questions, there may be some problems with feeding. Have the parents call their pediatrician and/or a Lactation Consultant.

Summary

- Take note of risk factors from pregnancy, labour and birth history
- Undertake a full assessment of mother, baby and breastfeeding
- Frequent assessments needed in the early postpartum period
- Listen to the mother's concerns
- Teach the mother, father and significant others the indicators of a well fed baby
- Consult and refer (primary-primary, primary-

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