24-hour Milk Production Profile

Why and how to use this valuable clinical tool



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Session outline



- What is a 24-hour milk production profile?
- Original use
- Breastfeeding evidencebased information
- Using as a clinical tool
 - Reasons to use
 - Case studies
- The process

What is a 24-hour milk production profile?



- Mother uses digital scale
 - accurate to 2g
- Weigh baby/milk
 - before and after breastfeeds
 - difference in weight, volume of feed, 1g=1mL
 - expresses and top up feeds
- Record
- Series of consecutive feeds
 - 24-hours

Recording paper or online

																pu
Daily Tim totals	Time	Weight (pre/post)						Time	Amou	Amount		Time	Amount		Wet 0 Dirty	
		Right pre	Right post	Amount	Left	Left post	Amount	Total	Righ	Right	Left	Total		EBM	Formula	

Originally used



A research tool

- Vital for generating evidence based research
- Validated as accurate_{Arthur 1987}
 - Measure 24-hour breastmilk
 production
- With before and after milk samples (1-5mL)
 - Breast storage capacity
 - Available milk
 - % of available milk removed







Breastfeeding evidence-based information

The normal breastfed baby

Normal Breastfeeding

Note: The individuality of each dyad must always be considered.

Breastfeeding	Average	Range
Infant age 7-14	615mL	485-745mL

Neville 1988

Breastfeeding 1-6 months	Average	Range
Number of breastfeeds	11	6-18
Duration of a breast feed	16	5-37
Duration session* (min)	33	12-67
Storage Capacity (mL)	179	74-382
% of milk removed (mL)	67	43-92
Fat content of milk (g/L)	41	22-62
24-hr Intake breastfeeding (mL)	798	478-1298

Session

Kent 2006

- Feeding from one breast.
- Feeding from two breasts if the baby commenced feeding from the second breast within 30 minutes of finishing feeding from the first breast.
- A cluster of feeds if the baby feeds again from the first breast within 30 minutes of finishing feeding from the second breast

- 30% always have unpaired breastfeeds
- 13% always have paired breastfeeds
- Mostly, sometimes have unpaired, sometimes have paired breastfeeds
- Individual breastfeeds can range from 0 -240mL



Kent JC et al., *Pediatrics*, **117**: e387 - e395, 2006

- 70% right produces more
- Storage capacity: mother's breast anatomy and infant's appetite
- Babies don't usually completely drain the breast each feed
 - Average 67% of the milk available in the breast
 - Once a day the breast is drained



Kent JC et al., Pediatrics, 117: e387 - e395, 2006

- Fat content: low full breast, high drained breast
 - The baby gets enough fat: many small feeds or few large feeds
- Most babies feed at night, even up to 6 months old
- A wide range in normal breastfeeding behaviour



- Average 11 breasts a day (range 6-18)
 - 8 sessions/day (4-13)
 - Amount from 1 breast 75mL (30-135mL)
 - 101mL session (54-234mL)
- Night feeds largest (20% total)
- Rate of milk synthesis relates to degree of fullness
- Time taken 12-67 min
 - Not related to volume
- Time to next feed not related to volume of previous feed



Kent JC et al., *Pediatrics*, **117**: e387 - e395, 2006

Clinical use

24-hour Milk Production Profile (not collecting milk samples)

The Normal Breastfeeding Relationship

- Provides a comfortable and satisfying nurturing experience for both the mother and her baby
- Enables optimal growth and development of baby
- Provides innate immune protection for the baby during the breastfeeding period
- Facilitates mutually beneficial physical, cognitive and emotional interaction for mother and baby

The Four Key Domains

Pain/Discomfort

 Provides a comfortable and satisfying nurturing experience for both the mother and her baby

Milk Supply

- Enables optimal growth and development of baby Baby's Health
- Provides innate immune protection for the baby during the breastfeeding period

Maternal Concerns

Facilitates mutually beneficial physical, cognitive and emotional interaction for mother and baby

- Diagnose
- Manage
- Monitor
- Reassure

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Information gained



- Frequency of feeds
- Duration of feeds
- Amount taken each feed (mL)
- Milk production each breast (mL)

Why use?

Low milk supply

- not knowing self reported reason stop breastfeeding. Li 2008
- Health professionals
 - supply accurate breastfeeding information. Hegney 2008
- Mothers and lactation consultants
 - cannot accurately estimate milk intake by observation. Meier 1998



Breastfeeding problems

- Commonly: Problem orientated response:
- Wait and see
- Weight drops
- Bilirubin levels rise
- Mother insists

Time sensitive intervention: Prevention is better than cure

- Doesn't further compromise the baby
- Helps ensure optimal milk supply

Provides accurate clinical information for the LC



- A true assessment of intake from the breast
- A true assessment of maternal milk supply

If appropriate:

- Volume expressed
- Intake of EBM/formula

And its easy to perform

4 key breastfeeding elements

- Maternal concerns
- Milk supply
- Baby
- Pain/discomfort

Maternal Concerns



- Anxious, poor past experience
- "Difficult feeder" baby pulling off and refusing to feed – in fact a quick feed

Diagnosing – milk supply or baby



- Teasing out origin of problem
 - Infant difficulty eg: tongue tie, large nipples
 - Maternal difficulty
 eg: low/over supply
 - Low supply
 - Oversupply

Management – milk supply



- Nipple shield (friend or foe)
 - Is feed more effective with or without
- Supplementary Nursing System
 - Stimulating supply or is pump better
- Supplementary top ups
 - Saves on over topping up < breastmilk intake

Management – transition/pain



- Transition to full breastfeeding
 - Determine effective feeds/ dropping express sessions
 - Middle of the night feeds
- Nipple pain
 - Reduce breastfeeding time for maternal comfort

Monitoring



- Galactagogue use
 - Before commencing
 - Again when medicated
 - Also weaning down off
- Nipple shield use
 - Start trying feeds without to assess the effectiveness of feeds
- "slow to start" baby
 - Jaundice, difficult birth, unexplained ineffective feeder

Examples

Maternal concerns



Case Presentation: Worried mother, thought her baby was not feeding enough times a day: unusual pattern



Milk supply/baby



Case Presentation:

- Healthy term boy
- Presented day 16
 - "fussing" at feeds
 - Extended time between feeds
 - Giving EBM
 - Worried "nipple confusion"
 - Previously successfully breastfed

Assessment



- 143g below birthweight
- Oral cavity appeared normal
- Mother no pain
- Breastfeed
 - Appeared non nutritive sucking
- Test weigh R 8mL, L 4mL
- Post feed express 60mL
 - EBM fed via teat (suction required)

24-hour milk production profile	
No. of breastfeeds, 11 (6-18)	14
Duration of breastfeeding, min 16 (5-37)	
left	12
right	14
Average volume of a breastfeed, mL 75 (30-135)	
left	4
right	10
Total breastfeed, mL/24h 798 (478-1298)	78
Total expressed and bottle fed, mL	272
Total intake, mL	350

24 Hr Feeds Chart



24 hour Milk Production Profile Interpretation



- Poor milk transfer by infant
- Diminished maternal milk supply
- Ongoing plan
- Continue expressing 6-8/ day
- Top up after breastfeeds
- Domperidone 20mg/8 hourly
Over following 2 weeks



- Milk supply dramatically improved
- Infant weight gain (382g/ week)
- ? infant transfer problem
- Perform 2nd 24-hour milk production profile
 - Reassess milk production
 - Infant transfer rate

24-hour milk production profile			
Infant age, weeks	2.5	6	
No. of breastfeeds, 11 (6-18)	14	12	
Duration of breastfeeding, min 16 (5-37)			
left	12	6	
right	14	9	
Average volume of a breastfeed, mL 75 (30-135)			
left	4	7	
right	10	23	
Total breastfeed, mL/24h 798 (478-1298)	78	190	
Total expressed and bottle fed, mL	272	1064	
Total intake, mL	350	1254	

2nd 24-hour Milk Production Profile



- Maternal milk supply recovered
- Infant 24 hour intake
 - Confirmed infant related "problem"
- Mother ready to give up breastfeeding (bottle expressed milk)
- Where to from here?

Tongue tie



- Congenital developmental variant
- Sublingual frenulum, short, thick or tight
- Limits tongue mobility
- Sometimes no abnormality seen
- 1-10% incidence

24-hour milk production profile			
Infant age, weeks	2.5	6	7.5
No. of breastfeeds, 11 (6-18)	14	12	14
Duration of breastfeeding, min 16 (5-37)			
left	12	6	12
right	14	9	19
Average volume of a breastfeed, mL 75 (30-135)			
left	4	7	26
right	10	23	80
Total breastfeed, mL/24h 798 (478-1298)	78	190	810
Total expressed and bottle fed, mL	272	1064	78
Total intake, mL	350	1254	888





Milk supply management





Case Presentation

Really wanted to BF, antenatal visit, anxious

Low supply with first baby: could only produce $\frac{1}{2}$ baby's needs Plan:

Early intervention and rigorous expressing regime to stimulate good milk supply. First 2 weeks important

24-hour milk production profile		
Infant age	14 days	
No. of breastfeeds, 11 (6-18)	16	
Duration of breastfeeding, min 16 (5-37)		
left and right	11	
Average volume of a breastfeed, mL 75 (30-135)		
left	26	
right	33	
Total breastfeed, mL/24h 614mL (485-675)	474	
Total expressed and bottle fed, mL	170 EBM 30 formula	
Total intake, mL	674	
Total milk produced breastfeeding and expressing	634	

24 Hr Feeds Chart



24-hour milk production profile			
Infant age	2 weeks	4 weeks	
No. of breastfeeds, 11 (6-18)	16	14	
Duration of breastfeeding, min 16 (5-37)			
left and right	11	18 L&R	
Average volume of a breastfeed, mL 75 (30-135)			
left	26	99 L&R	
right	33		
Total breastfeed, mL/24h 614mL (485-675)	474	696	798 (478-1298)
Total expressed and bottle fed, mL	170 EBM 30 formula	-	
Total intake, mL	674	696	
Total milk produced breastfeeding and expressing	634	696	





Maternal concern, milk supply and baby



Case presentation

- Week 3 baby had lost weight
- Mo. stated *NO* confidence Plan
- Firstly feed baby and build supply
- 24-hour milk production profile to assess
- Rebuild confidence

24-hour milk production profile		
Infant age	3 weeks	
No. of breastfeeds, 11 (6-18)	14	
Duration of breastfeeding, min 16 (5-37)		
left and right	10 &16	
Average volume of a breastfeed, mL 75 (30-135)		
left	5	
right	25	
Total breastfeed, mL/24h 614mL (485-675)	206	
Total expressed and bottle fed, mL	212 EBM 174 formula	
Total intake, mL	592	
Total milk produced breastfeeding and expressing	452	

24 Hr Feeds Chart



24-hour milk production profile					
Infant age	3 weeks	5	6 weeks		
No. of breastfeeds, 11 (6-18)	14 .	Mum	n not convin	ced	
Duration of breastfeeding, min 16 (5-37)	•	frenotomy would help Continued like this for		d help his for several	
left and right	10 &1	week	(S		
Average volume of a breastfeed, mL 75 (30-135)					
left	5		8		
right	25		36		
Total breastfeed, mL/24h 614mL (485-675)	206		340	798 (478-1298)	
Total expressed and bottle fed, mL	212EBN 174 forr	1 mula	192		
Total intake, mL	592		532		
Total milk produced breastfeeding and expressing	452		962		

24 Hr Feeds Chart



- At 8 weeks had frenotomy - some improvement
- Mo. Requested 2nd frenotomy
 - She was now convinced it would make a difference
- 2 weeks later full breastfeeding



24-hour milk production profile			
Infant age	3 weeks	6 weeks	10 weeks
No. of breastfeeds, 11 (6-18)	14	15	19
Duration of breastfeeding, min 16 (5-37)			
left and right	10 &16	12 & 15	
Average volume of a breastfeed, mL 75 (30-135)			
left	5	8	54
right	25	36	39
Total breastfeed, mL/24h 798 (478-1298)	206	340	878
Total expressed and bottle fed, mL	212 EBM 174 formula	192	0
Total intake, mL	592	532	878
Total milk produced breastfeeding and expressing	452	962	878





Milk supply management



Case presentation

- Baby not gaining weight
- No expressing

Plan

- Commence expressing
- Double expressing, old equipment
- Then improved pump system

24-hour milk production profile		
No. of breastfeeds, 11 (6-18)	12	
Duration of breastfeeding, min 16 (5-37)		
left	16	
right	23	
Average volume of a breastfeed, mL 75 (30-135)		
left	54	
right	36	
Total breastfeed, mL/24h 798 (478-1298)	536	
Total expressed and bottle fed, mL	60 EBM 290	
Total intake, mL	886	
Total Milk produced by breasts	540	

24-hour milk production profile		
No. of breastfeeds, 11 (6-18)	12	20
Duration of breastfeeding, min 16 (5-37)		
left	16	13
right	23	18
Average volume of a breastfeed, mL 75 (30-135)		
left	54	25
right	36	38
Total breastfeed, mL/24h 798 (478-1298)	536	634
Total expressed and bottle fed, mL	60 EBM 290 Form	100 EBM
Total intake, mL	886	834
Total Milk produced by breasts	540	708



Case presentation

- 6 week old baby at times would not breastfeed unless using a nipple shield
- Mother was concerned had only read "bad press" re nipple shield.



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CRICOS Provider Code: 00125G

Delivery Ground FIr (Goods Receival), Bayliss Building, Entry No. 4, Fairway, Nedlands

CG-S 24-h Milk Profile - 06 March 2011

		Population	
		Average	Range
Number of Breastfeeds			
Left	8		
Right	7	11	6 - 18
Total	15		
Average Breastfeed (ml)			
Left	40	76	20 125
Right	41	75	30 - 135
Average Breastfeed Duration (min)			
Left	16		
Right	17	16	5 - 37
24-h Production (mL)			
Left	378		
Right	311	798	478 - 1298
Total	689		
24-h Milk Intake Breastfeeding (mL)			
Left	320		
Right	286		
Total	606	798	478 - 1298
Total Milk Intake - Breastfeeding an	d Supplementary Feeds (mL)		606
Total Milk Produced by Breasts - Br (mL)	eastfeeding and Expressions		606

24-hour Breastfeeds



Notes on nipple shield use:

Left breast 4 feeds without the nipple shield total: 214 mL Left breast 5 feeds with the nipple shield total: <u>172 mL</u> Right breast 7 feeds with the nipple shield total: <u>286 mL</u>

Biggest feeds in 24 hours 66mL: 2 with the nipple shield, 1 without

Summary: if your baby is more comfortable using the shield at feeds there appears to be no reason to not use it as she can get good quantities of milk when using it.

As you can see by your results she is getting a good total volume of milk with lots of frequent feeds.

Baby/ milk supply monitoring

- Seen by LC, who suggested expressing and topping up: mo. wanted 2nd opinion
 - She felt baby should just BF
 - PH anxiety
 - Felt stressed after LC visit

- No tongue tie
- No other reason found
- "slow to start" baby
- I agreed with 1st LC
- Hired double pump
- Hired scales

24-hour milk production profile		
Infant age	2.5 weeks	
No. of breastfeeds, 11 (6-18)	15	
Duration of breastfeeding, min 16 (5-37)	30	
left and right		
Average volume of a breastfeed, mL 75 (30-135)		
left	4	
right	27	
Total breastfeed, mL/24h 798 (478-1298)	244	
EBM top up, mL	412	
Total intake, mL	656	
Total milk produced breastfeeding and expressing	676	

- 1st 24 hour milk production mo.
 - Evidence 1st LC good advice



24-hour milk production profile			
Infant age	2.5 weeks	4.5 weeks	
No. of breastfeeds, 11 (6-18)	15	11	
Duration of breastfeeding, min 16 (5-37)	30	20	
left and right			
Average volume of a breastfeed, mL 75 (30-135)			
left	4	21	
right	27	49	
Total breastfeed, mL/24h 798 (478-1298)	244	398	
EBM top up, mL	412	259	
Total intake, mL	656	657	
Total milk produced breastfeeding and expressing	676	840	

- 1st 24 hour milk production mo.
 - Evidence 1st LC good advice
 - 2nd 24 hour showed good progress



24-hour milk production profile			
Infant age	2.5 weeks	4.5 weeks	7 weeks
No. of breastfeeds, 11 (6-18)	15	11	10
Duration of breastfeeding, min 16 (5-37)	30	20	28
left and right			
Average volume of a breastfeed, mL 75 (30-135)			
left	4	21	38
right	27	49	66
Total breastfeed, mL/24h 798 (478-1298)	244	398	520
EBM top up, mL	412	259	0
Total intake, mL	656	657	520
Total milk produced breastfeeding and expressing	676	840	520

- 1st 24 hour milk production mo.
 - Evidence 1st LC good advice
 - 2nd 24 hour showed good progress
 - 3rd confirmed baby now effective





2.5 weeks

4.5 weeks

7 weeks

24-hour

Milk Production Profile - maternal confidence

Breastmilk Production: perception & measurement.

Conclusion

- Objective measurement of breastmilk production did not undermine the confidence of mothers who were already confident.
- When mothers who initially lacked confidence received objective evidence of their normality they gained confidence and would continue to breastfeed.

Kent 2010

The process



- Set scale on flat, level firm surface.
- Have a paper and pen ready to write down weights (or log on to website)
- Check the bubble in the level gauge, adjust scale feet if necessary






 Optional, place a soft cloth on the scales and press the tare button



 Press the weight lock button so that weight locks and can be put into memory



 Place baby on the scale, hovering your hand over baby may help to steady a restless baby



- When the scale beeps press the memory button so the weight is recorded
- Record on data sheet (or enter data on-line)

Breastfeed





- After breastfeeding place baby back on the scale
 - not changing any clothing, wraps etc
- Wait for the scale to beep with the new weight
- Press weight gain button
- Write down weight and weight gain (or enter data on-line)

On-line data entry, calculation and report for 24-h milk profile

Email

Jacqueline.Kent@uwa.edu.au

 With mother's name, email address, sex and date of birth of infant

Procedure

- 1. Mother is emailed user ID and password and web address
- 2. Mother logs in, consents to participation in nominated study (currently 'Evidence for improvement in milk production by breastfeeding mothers)
- 3. Mother enters weight of baby before and after breastfeed or supplementary feed, and each expression, for 24 hours
- 4. Mother clicks on 'Mark as completed' and admin is notified
- 5. Admin checks entered data and clicks 'Submit and calculate'
- 6. Admin emails results to mother and requesting LC

Enter your readings

Add Feed

Submitted

Add new feed data:

Please do not click any link, or leave this page while filling in the data. If you leave this page before clicking the "SUBMIT" button, you will loose your data

Note: The data for before and after feed needs to be submitted together.

	Date ?	Time(hh:mm) ?	B/E/\$	L/R ?	Weight ?	Comments(Optional)		
Before Feed ? After Feed ?	06/02/201	16 \$ 00 \$	 Breastfeed Expressed Supplementary 	● L ○ R	3500			
	06/02/201	16 ‡ 10 ‡			3550			
	Submit							



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CRICCS Provider Cude: 001395

S.No.	Date and Time	B/A	Feed Type	L/R	E/F	Weight	Weight Gain	% Cream	Comments
1	07:57 Wed 28th Jan 15	в		L		4260			
2	08:15 Wed 28th Jan 15	A	в	L		4308	48		
3	08:19 Wed 28th Jan 15	B	в	R		4308			
4	08:28 Wed 28th Jan 15	A		R		4314	•		
5	09.53 Wed 28th Jan 15	8		R		4260	5.0		
6	10:15 Wed 28th Jan 15	A		R		4318			
7	10:13 Wed 28th Jan 15	в		L		4318	26		
8	10:35 Wed 28th Jan 15	Α		L		4344	26		
9	12:10 Wed 28th Jan 15	8	в	L		4250	64		
10	12:31 Wed 28th Jan 15	A		L		4314			
11	12:38 Wed 28th Jan 15	в		R		4306			
12	12:50 Wed 28th Jan 15	A	в	R		4320	14		
	13:07 Wed 28th Jan 15	в	q		E	4292	30		
	13:20 Wed 28th Jan 15	Α	5		E	4322	35		
13	13:40 Wed 28th Jan 15	в	-	R		4264			
14	13:50 Wed 28th Jan 15	Α	в	R		4278	14		
15	14:55 Wed 28th Jan 15	B		L		4252	24		
16	15:08 Wed 28th Jan 15	Α		L		4288	30		
17	15:11 Wed 28th Jan 15	в		R		4272			
10	15:20 Wed 28th Jan 15	A	в	R		4294	~~~		
19	18:19 Wed 28th Jan 15	B		L		4276			
20	18:35 Wed 28th Jan 15	Α	D	L		4340	04		
21	18:41 Wed 28th Jan 15	в		R		4314	20		
22	18:52 Wed 28th Jan 15	A	0	R		4340	20		
23	19:05 Wed 28th Jan 15	в		L		0			
	19:23 Wed 28th Jan		E				40		

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Population

Results for Mother ID : 15010

15010 - 24-h Milk Profile - 28 January 2015

Average Range Number of Breastfeeds Left 6 7 11 6 - 18 Right Total 13 Average Breastfeed (ml) 44 Left 75 30 - 135 30 Right Average Breastfeed Duration (min) Left 17 16 5 - 37Right 13 24-h Milk Intake Breastfeeding (mL) 262 Left Right 208 Total 470 798 478 - 1298 Expressed (mL) Left 272 Right 240 Total 512 Supplementary Feeds (mL) EBM (mL) 192 Formula (mL) 0 Total Milk Intake - Breastfeeding and Supplementary Feeds (mL) 662 Total Milk Produced by Breasts - Breastfeeding and Expressions 982 (mL)





Thank you

Questions?

