



Neonatal stomach volume and physiology suggest feeding at 1-hour intervals

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His diverse background explains his broader public health approach to supporting and promoting the global dissemination of maternal-infant skin-to-skin contact. He also researches with the University of Cape Town, developing a brain monitor that will read the autonomic nervous system.

Viewpoint Article

Neonatal stomach volume and physiology suggest feeding at 1-h intervals

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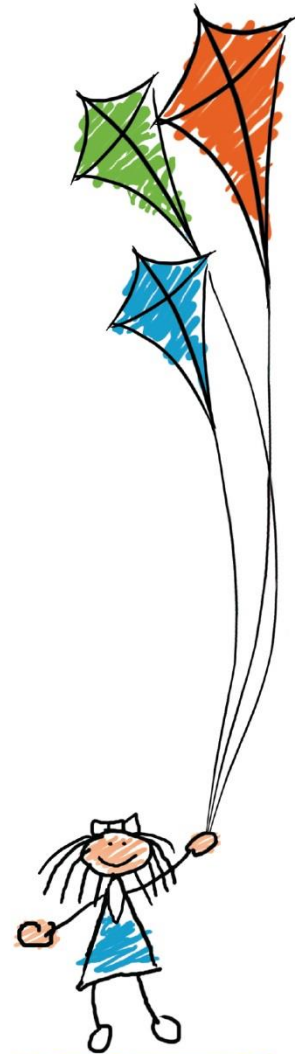
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Issue



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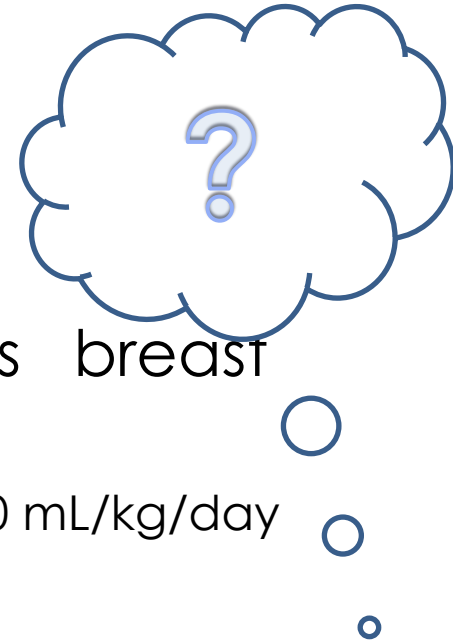
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What we know...

Newborns and infants' ideal nutrition is breast milk and the ideal method suckling.
How to calculate the volume -150 to 160 mL/kg/day



What we are reasonable certain about...

How to calculate the volume -150 to 160 mL/kg/day

WHO says...it is 'not possible to provide additional recommendations due to insufficient evidence'

Edmond KT, Bahl R. *Optimal feeding of low-birth-weight infants: technical review*. Geneva, Switzerland: WHO, 2006.



What we do not know...

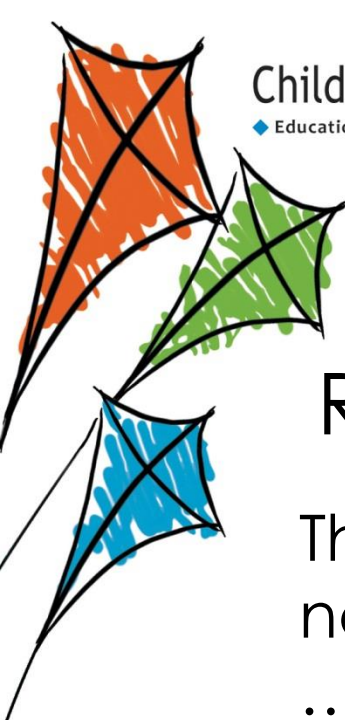
How frequently the infant requires the feed

**So the researcher starts
with what we do know...
anatomy and physiology:
the structure and function
of the stomach as a
repository**



See link for a diagram:

<http://www.uofmchildrenshospital.org/HealthLibrary/Article/88591>



Rationale:

There is insufficient evidence on optimal neonatal feeding intervals
.... and there are a wide range of practices.

There is no available evidence on feeding frequency. **Feeding frequency is however an inverse function of stomach capacity**

The stomach capacity could determine feeding frequency.





Methodology:

A literature search was conducted utilising CINAHL, PubMed and clinician colleagues' references for studies reporting volumes or dimensions of stomach capacity before or after birth. Six articles were found.

Author included articles that examined pre and postnatal - gastric capacity, volume and dimensions



Findings:

See table 1 of the journal article for the table summarising studies





Conclusions:

20ml volume capacity → 160ml per day =
20ml per hour

The newborn's broader context – feeding and
sleeping

Sleep cycling is vital for brain development
AND
normal sleep cycle in newborns is 1 hour





Conclusions:

Oxytocin – the hormone that establishes secure attachment

AND

A single milk ejection reflex following oxytocin release produces ...

A constant 20 to 30 ml of breast milk!



Conclusion:

Larger feeding volumes at longer intervals may therefore be stressful and the consequences

- spitting up
- reflux
- hypoglycaemia.

Really?

Outcomes for low birthweight infants could possibly be improved if stress from overfeeding was avoided while supporting the development of normal gastrointestinal physiology.

Cycles between feeding and sleeping at 1-h intervals likely meet the evolutionary expectations of human neonates

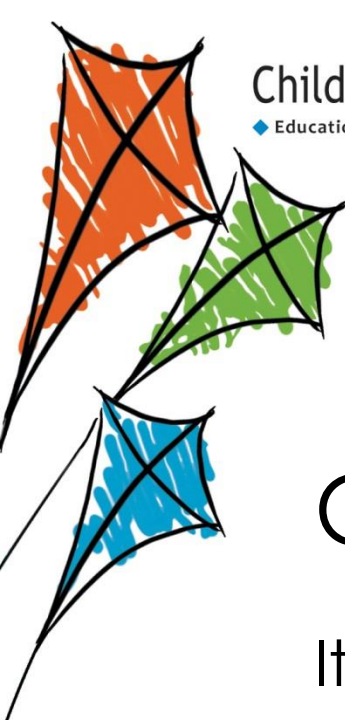


Changing our perspectives

“Medical culture behaves as if the brain and the gut are disconnected.”

The autonomic and enteric nervous systems regulate the gut, and the main sensory inputs are olfactory and tactile, ideally provided in skin-to-skin contact.





Changing our perspectives

It is usually assumed that the anatomy and physiology of newborns is immature, but given the right context even the preterm gut behaves competently.



Implications for practice:

Newborn feeding frequency should be approximately hourly, but adjusted to the actual sleep cycle with associated enteric cephalic phase which averages one hourly.

This has implications for, two very common feeding related problems
reflux and hypoglycemia

It may even address early epigenetic programming of obesity.

While such frequent feedings may seem too much work, closer scrutiny shows it results in a major time saving





FINAL Conclusion:

A stomach capacity of 20 mL translates to a feeding interval of approximately 1 hour for a term neonate.

This corresponds to the gastric emptying time for human milk, as well as the normal neonatal sleep cycle.

