



## Background

- Medically complex/ premature neonates may have difficulties with suck/ swallow coordination (Lau, 2016)
- Poor early feeding experiences can impact on time in hospital and increased parental stress, and may contribute to chronic feeding problems (Park et al., 2016; Jadcherla et al., 2016)
- Reducing flow rate is one way to support improved suck-swallow-breath coordination (Pados et al., 2019)
- International studies have found significant variability in teat flow within and across brands (Pados et al., 2019; Bell & Harding, 2019)

## Methods

### Decision-making regarding teat inclusion via departmental consensus

15 of each teat and bottle type posted to the US for testing on original equipment

### Teats and bottles tested on US equipment (Figure 1)

- Applied suction pressure of 230mmHg with a suction rate of 108 cycles/ minute using a breast pump
- Equal hydrostatic pressure was maintained inside each bottle
- Suction applied for 1 minute and weight on the scale afterwards was converted to grams using formula density (0.97mL/gram)



### Statistical testing conducted

- Compared flow rates across AND within different slow/ extra-slow brands
- Completed cluster analysis to group teats according to flow rate

## Results

- 27 different teat types were tested (n=405 total tests conducted)
- Significant variability observed across different slow and extra-slow flow brands (p<0.01)
- Five clusters found (see Figure 2), where 1=slowest group and 5=fastest group
- Variable flow rates also observed for the same type of teat (8 low variability, 13 medium variability, 6 high variability)

## Assessing the flow rate of different bottles and teats: An Australian context

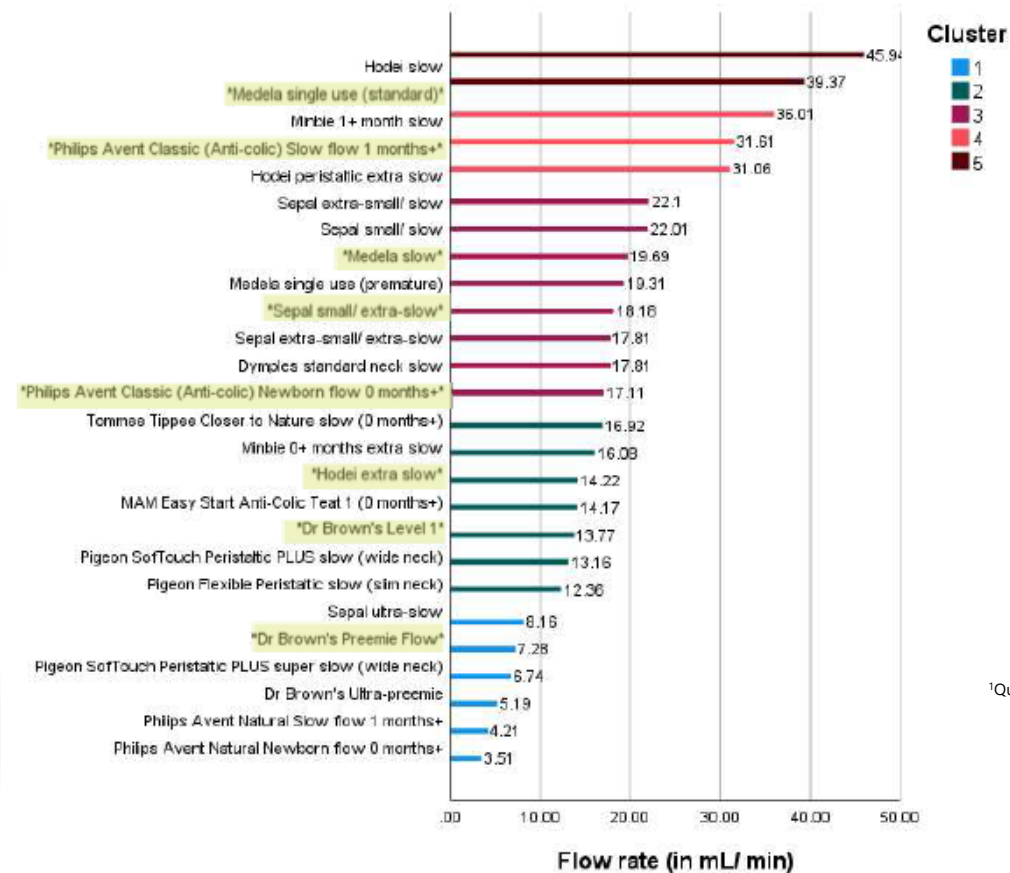


Figure 2. Teat brand and type clustered according to flow rate. Teats marked with an asterisk\* were found to have low variability (coefficient of variation <0.1)

## The clinical implications of this research?

- Not all teats labelled as slow or extra slow flow at the same rate
- Understanding which teats are consistent and slower flowing may be beneficial in supporting safer and more efficient feeding for fragile patients

*Disclaimer: We are a breastfeeding-friendly hospital and promote and encourage breastfeeding wherever possible. The Queensland Children's Hospital does not endorse any particular teat brand or type.*

Bell, N., & Harding, C. (2019). An investigation of the flow rates of disposable bottle teats used to feed preterm and medically fragile infants in neonatal units across the UK in comparison with flow rates of commercially available bottle teats. *Speech, Language and Hearing*, 22(4), 227-235.  
Jadcherla, S.R., Wang, M., Vijayapal, A.S. & Leuthner, S.R. (2010). Impact of prematurity and co-morbidities on feeding milestones in neonates: a retrospective study. *Journal of Perinatology*, 30(3), 201-208.  
Lau, C. (2016). Development of infant oral feeding skills: what do we know? *American Journal of Clinical Nutrition*, 103(2), 616-621.  
Pados, B.F., Park, J., & Dodrill, P. (2019). Know the flow: Milk flow rates from bottle teats used in the hospital and after discharge. *Advances in Neonatal Care*, 19(1), 32-41. doi: 10.1097/ANC.0000000000000538  
Park, J., Thoyre, S., Estrem, H., Pados, B.F., Knaff, G.J. & Brandon, D. (2016). Mothers' psychological distress and feeding of their preterm infants. *American Journal of Maternity and Child Nursing*, 41(4):221-9.

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