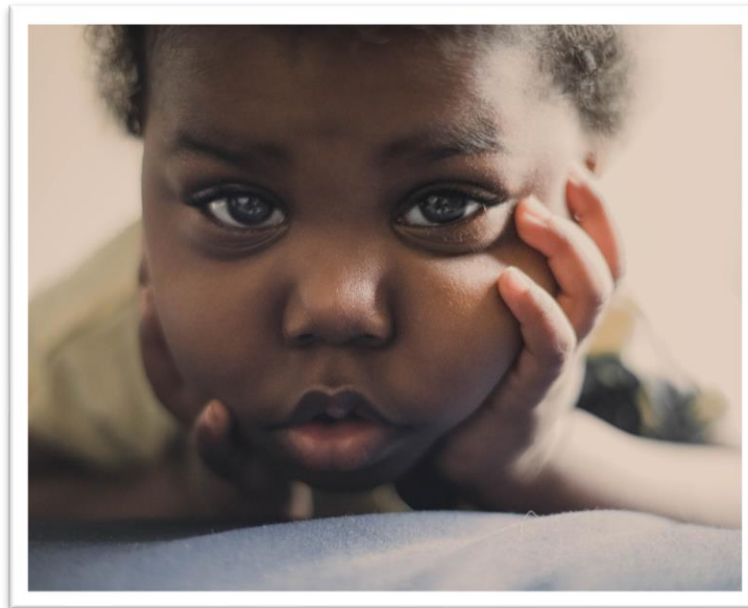


# The infant gut: A GPs guide to management of wind, cow's milk protein allergy, reflux and lactose

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*Author of The discontented little baby book: all you need to know about feeds, sleep and crying*



**Wind**

## Is baby Jason in pain from wind?

Breastfeeding mother presents with 7 week old JASON who

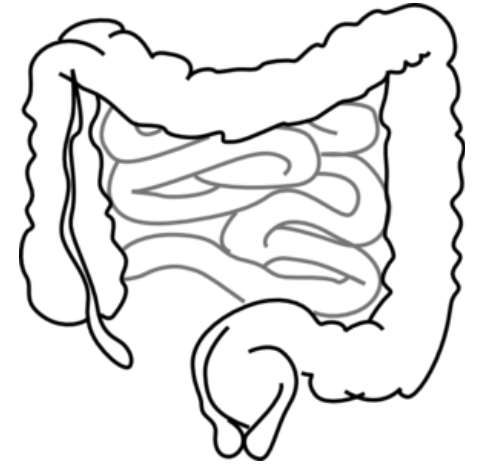
- Fusses and back-arches during breastfeeds
- Wakes frequently in night fussing and passing flatulence
- Won't settle to sleep easily



## The evidence: infant gut and dysbiosis

### Crying baby

- ↑inflammatory markers (calprotectin)<sup>1</sup>
  - No role for faecal calprotectin testing<sup>6,7</sup>
- ↓ diversity, ↓ stability of microbiota<sup>2,3,5</sup>
- ↑ gram negative bacteria (*Proteobacteria*)<sup>2,3</sup>
  - Perpetuate inflammation?
- ↓ *Actinobacteria Bifidobacterium* & *Firmicute Lactobacilli*<sup>5</sup>
  - Found in greater numbers in exclusively breastfed infants
- Gut microbiota 'signature' from first weeks<sup>4</sup>



<sup>1</sup>Rhoads JM, Fatheree NY, Norori J, Yuying L, Lucke JF, Tyson JE, et al. Altered fecal microflora and increased fecal calprotectin in infants with colic. *Journal of Pediatrics*. 2009;155:823-828.

<sup>2</sup>de Weerth C, Fuentes S, WM dV. Crying in infants: on the possible role of intestinal microbiota in the development of colic. *Gut Microbes*. 2013;9:5.

<sup>3</sup>Paarty A, Kalliomaki M, Endo A, Salminen S. Compositional development of Bifidobacterium and Lactobacillus microbiota is linked with crying and fussing in early infancy. *PLoS ONE*. 2012;7:e32495.

<sup>4</sup>De Weerth C, Fuentes S, Pulaert P, De Vos WM. Intestinal microbiota of infants with colic: development and specific signatures. *Pediatrics*. 2013;DOI: 10.1542/peds.2012-1449.

<sup>5</sup>Dubois NE, Gregory KE. Characterizing the intestinal microbiome in infantile colic: findings based on an integrative review of the literature. *Biological Research for Nursing*. 2016;18:307-315.

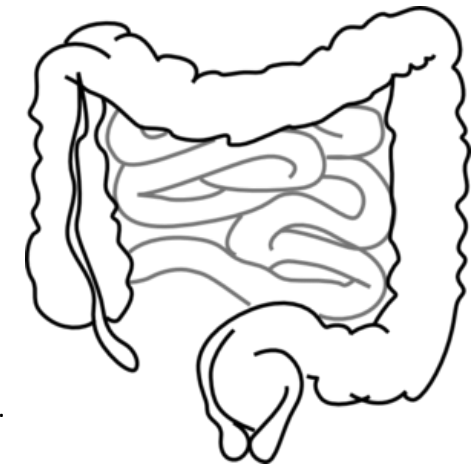
<sup>6,7</sup>Xiong et al 2021;<sup>7</sup>Roca et al 2021

## The evidence: infant gut and dysbiosis

Gut microbiota composition changed by

- Crying
  - ↑SNS/HPA arousal (chronic)<sup>1</sup>
- Feed problems
  - Consistently high dose of lactose load breastmilk
  - Formula
- Medications: antibiotics, antacids<sup>2,3</sup>

**NOT JASON**



<sup>1</sup> Rhee SH, Pothoulakis C, Mayer EA. Principles and clinical implications of the brain-gut-enteric microbiota axis. *Nature Reviews Gastroenterology and Hepatology* 2009;6:306-314.

<sup>2</sup> Jackson MA, Goodrich JK, Maxan M-E, Freedberg DE, Abams JA, Poole AC, et al. Proton pump inhibitors alter the composition of the gut microbiota. *BMJ*. 2016;65:749-756.

<sup>3</sup> Clooney AG, Bernstein CN, Leslie WD, Vagianos K, Sargent M, Laserna-Mendieta EJ, et al. A comparison of the gut microbiome between long-term users and non-users of proton pump inhibitors. *Alimentary Pharmacological Therapies*. 2016;43:doi:10.1111/apt.13568.



## The evidence: infant gut and dysbiosis

Belief that changes in gut microbiome  
→ inflammation → pain is too simplistic

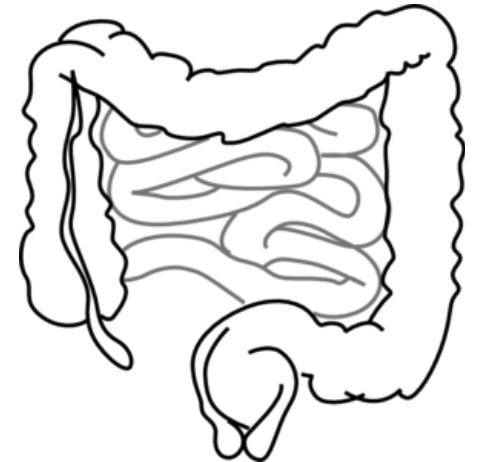
Not evidence-based: multiple assumptions

Gut microbiome dynamic and highly variable:

- Unable to define eubiosis
- Unable to define dysbiosis

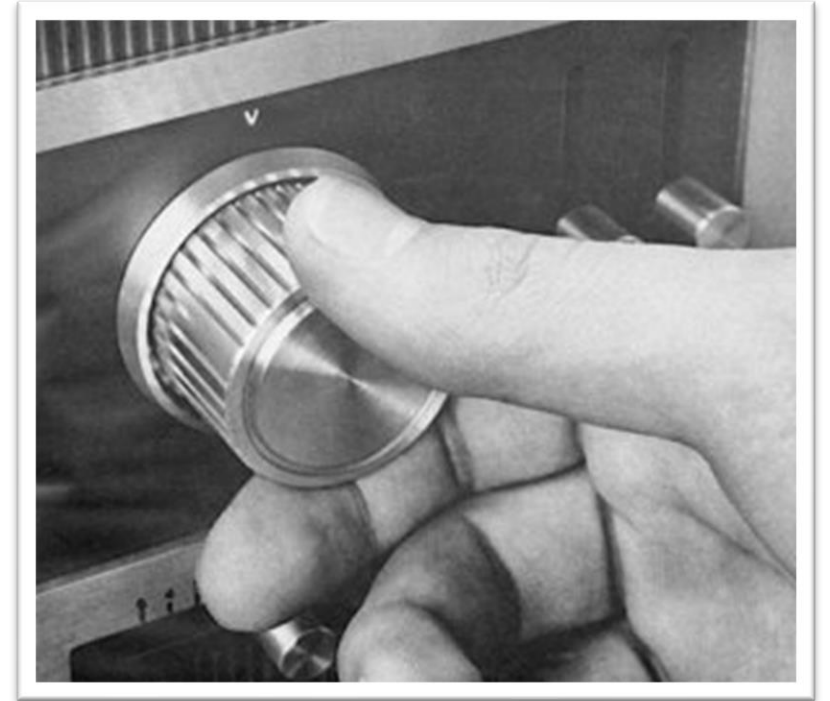


**NOT JASON**



## What to say to Jason's mother

- Dial on sympathetic nervous system turned up during feeds
- Gut is second brain
- Activates when baby dials up
- Gut event (flatulence, reflux) is in response to dialing up



Neuroprotective Developmental Care (NDC or 'the Possums programs')

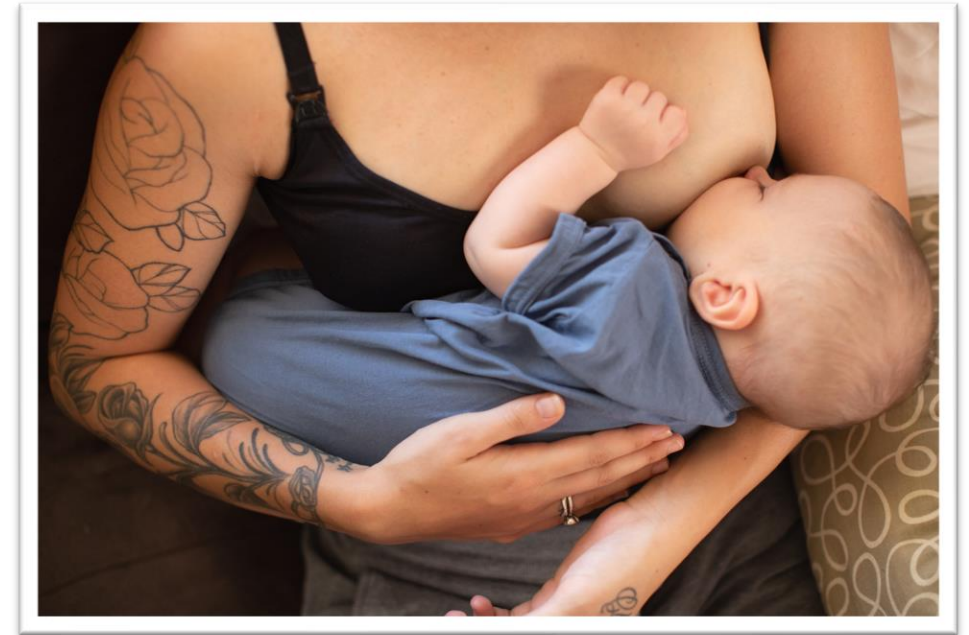
## What to do to help Jason and his mother

### Breastfeeding assessment

- Positional instability → fit and hold intervention (gestalt method)
- Conditioned dialing up → never coerce, cease when feeds dialed up, offer frequently and flexibly without pressure

### Disrupted circadian clock

- Possums sleep intervention<sup>1-5</sup>



Neuroprotective Developmental Care (NDC or ‘the Possums programs’)<sup>6</sup>

<sup>1</sup>Douglas & Whittingham 2014; <sup>2</sup>Douglas 2018; <sup>3</sup>Ball et al 2018; <sup>4</sup>Ball et al 2020; <sup>5</sup>Whittingham et al 2020; <sup>6</sup>Crawford et al 2022



**Allergy**

## Is baby Jason in pain from allergy?

Breastfeeding mother presents with 7 week old JASON who

- Fusses and back-arches during breastfeeds
- Wakes frequently in night fussing and passing flatulence
- Won't settle to sleep easily
- Green stools and mucous in stools



## The evidence: CMA IgE mediated<sup>1</sup>

Skin rashes – urticaria, eczema  
Allergic rhinitis  
Reactive airways



**NOT JASON**

<sup>1</sup>Burris et al 2020



## The evidence: CMA non-IgE mediated

CMA non-IgE mediated<sup>1,2</sup>

- Food protein-induced enterocolitis syndrome (FPIES)
- Food protein-induced allergic proctocolitis (FPIAP)
  - Blood in stool - haematochezia

*Celiac disease*

*Cow's milk-induced iron deficiency anaemia*

**NOT JASON<sup>1,2</sup>**



<sup>1</sup>Bergmann et al 2014; <sup>2</sup>Munblit et al 2020

## Evidence: food protein induced enteropathy syndrome FPIES<sup>1</sup>

- Predominantly formula-fed babies
- Very rarely breastfed but can occur
  - React on direct feeding of food only
- Diarrhoea within 24 hours



### Acute FPIES

- Vomiting 1- 4 hours after feed
- Pallor
- Clammy
- Sweaty
- Hypotonia
- Lethargy
- Hypovolemia +/- shock
- Diarrhoea

**NOT JASON<sup>1,2</sup>**

<sup>1</sup>Nowak-Wgrzyn et al 2019

### Chronic FPIES

- Intermittent vomiting
- Frequent diarrhoea
- Abdominal distension
- Pallor
- Hypotonia
- Lethargy
- Dehydration
- Hypovolemia +/- shock

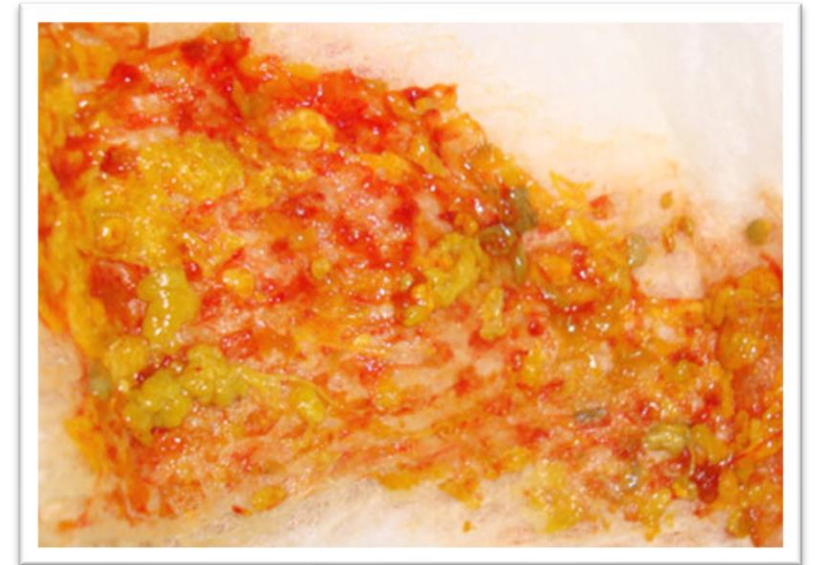
## Evidence: food protein induced allergic proctocolitis FPIAP

Not associated with vomiting, diarrhoea or failure to thrive<sup>1</sup>

If formula fed use → extensively hydrolysed formula

Breastfeeding

- Observe for a month if mild hematochezia<sup>2</sup>
- If persists or if mod-severe commence maternal cow's milk elimination diet



**NOT JASON<sup>1,2</sup>**

<sup>1</sup>Abrams et al 2021; <sup>2</sup>Micheli et al 2018

## The evidence: overdiagnosis of infant allergy<sup>1,2</sup>

- CMA may cause oesophagitis (GORD) but takes time to develop (relevant to older infants and children)
- CMA is the only allergy linked with cry-fuss problems in first 16 weeks
- Unnecessary maternal elimination diets increase risk of infant allergy<sup>3,4</sup>

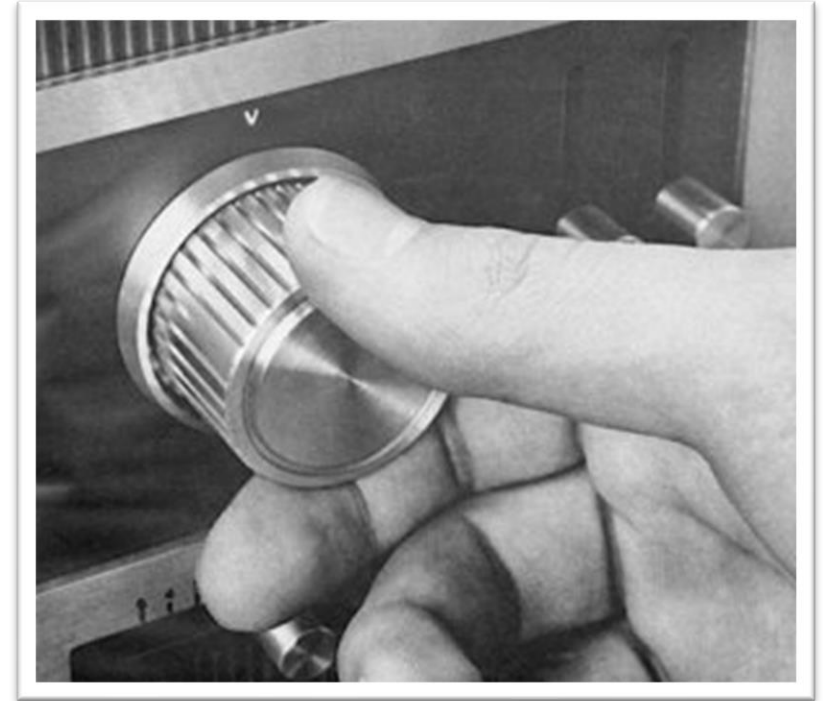
**NOT JASON<sup>1,2</sup>**

<sup>1</sup>Bergmann et al 2014; <sup>2</sup>Munblit et al 2020; <sup>3</sup>Muraro A et al 2014; <sup>4</sup>Aerodiakonou et al 2016



## What to say to Jason's mother

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Neuroprotective Developmental Care (NDC or 'the Possums programs')



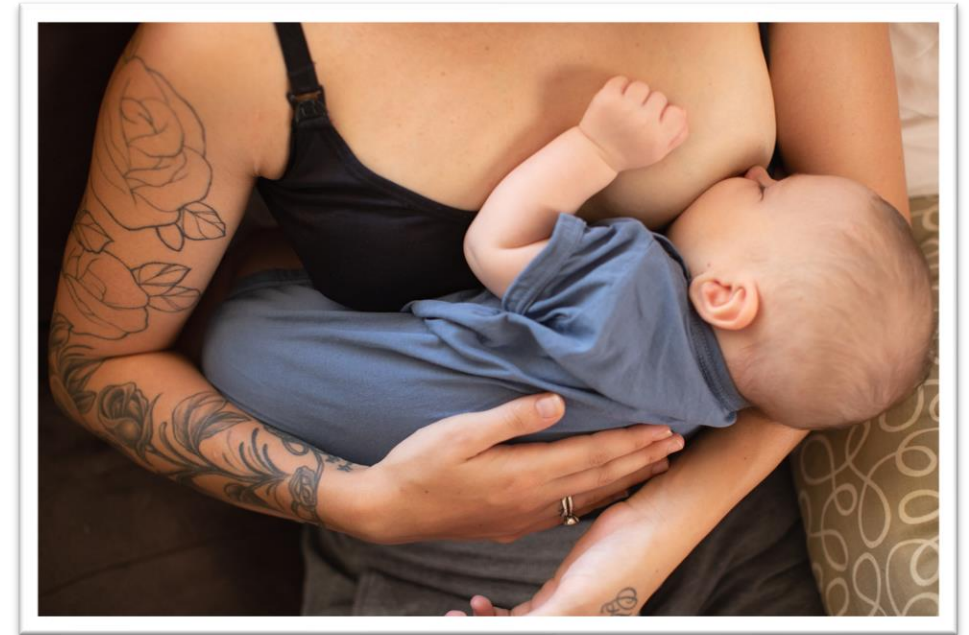
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### Disrupted circadian clock

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**Reflux**

## Is Jason in pain from reflux?

Breastfeeding + formula feeding woman c/o her 7-week-old baby:

- Pukes frequently especially after feeds
- Seems to be choking and gagging with 'silent reflux' whenever she puts him down
- Cries in pain when she puts him down to sleep
- Only settles if she holds him upright
- Not gaining weight adequately



## The evidence: infant reflux and proton pump inhibitors

Proton pump inhibitors e.g. omeprazole

- Does not improve unsettled baby behaviour<sup>2,3</sup>

Omeprazole side-effects

- Infections (respiratory and gastrointestinal)<sup>4</sup>
- Allergy<sup>5</sup>
- Bone fracture (dose dependent)<sup>6</sup>
- Asthma<sup>7</sup>

**WON'T HELP JASON**



<sup>1</sup>Orenstein& Hassall 2007;<sup>2</sup>Gieruszczak-Bialek et al 2015;<sup>3</sup>Kolodziej et al 2021;<sup>4</sup>Freedberg et al 2015;<sup>5</sup>Mitre et al 2018;<sup>6</sup>Malchodi et al 2019;<sup>7</sup>Wang et al 2021

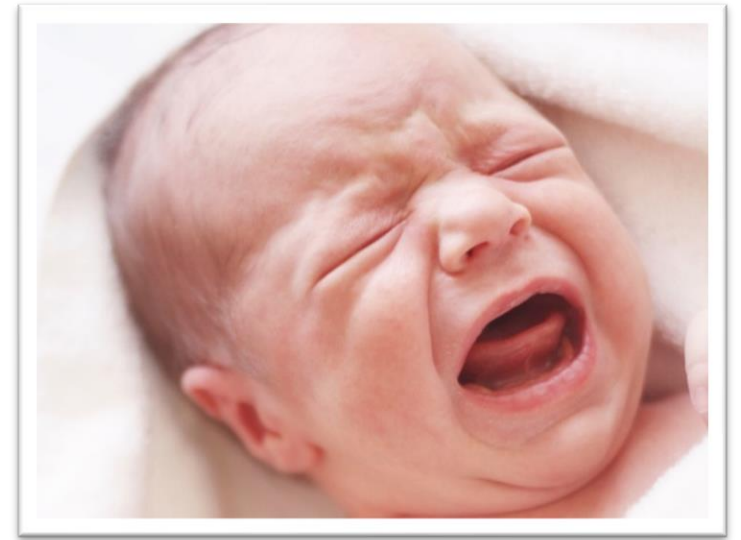


## What to say to Jason's mother

### Reassure

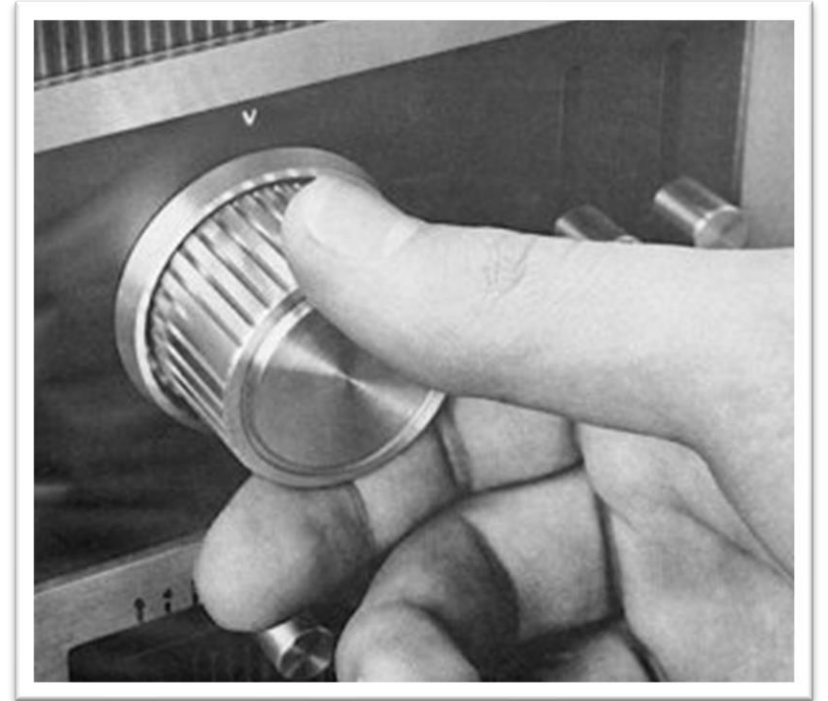
- Refluxate is close to pH neutral for 2 hrs post-feeds
- Not noxious, does not cause pain<sup>1</sup>
- Normal, peaks at 4 months
- Exclude pyloric stenosis, CMPI, gastroenteritis

No need to burp or hold upright after feeds



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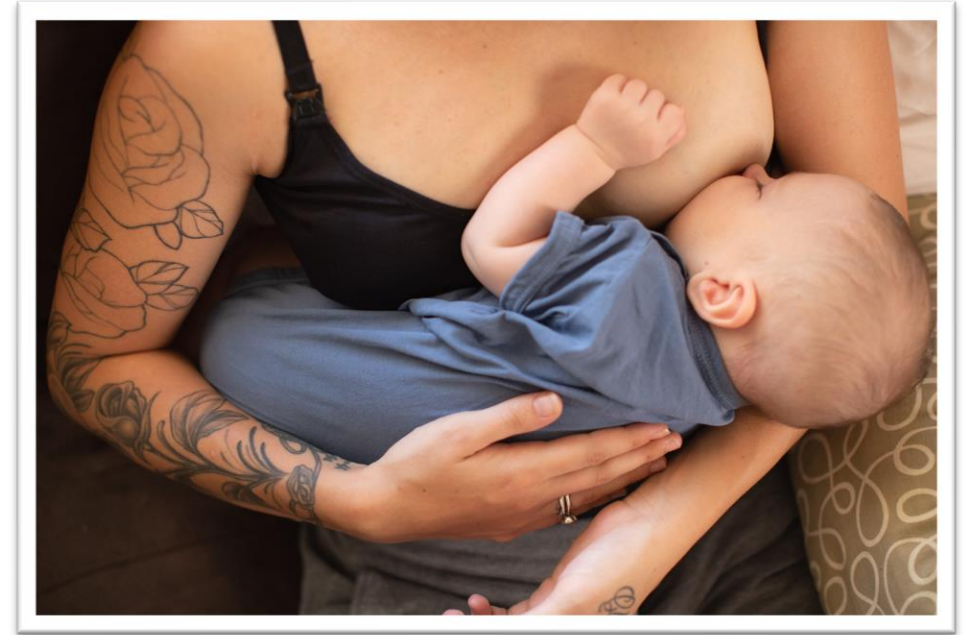
## What to do to help Jason and his mother

Breastfeeding assessment

- Eliminate positional instability
- Fit and hold intervention (gestalt method)

Frequent flexible feeds

Reassurance re normal infant behaviour  
e.g. cries when puts down



'Scripts' from Neuroprotective Developmental Care (NDC or 'the Possums programs')

## Lactose intolerance



## Is baby Jason in pain from lactose intolerance?

Breastfeeding mother presents with 7 week old JASON who

- Fusses and back-arches during breastfeeds
- Cries a lot
- Wakes frequently in night fussing and passing flatulence
- Won't settle to sleep easily
- Green stool and mucous in stool
- Frothy explosive stools
- Gaining weight and climbing above percentile line of birth



## The evidence: infant lactose intolerance

- Congenital lactase deficiency
  - Extremely rare
- Primary lactose intolerance
  - > 3 years of age
  - <10% N Europe, 95% in parts of Africa and Asia
- Secondary lactose intolerance
  - Post-gastroenteritis or from true non-IgE allergy
    - Lactose-free formula if formula-fed
    - No change if breastfeeding
- **Functional lactose intolerance in breastfed baby: JASON**



Lactase not indicated for Jason

## What to say to Jason's mother

Breastfeeding management problem

- No problem with Jason's gut enzymes
- No problem with mother's milk

Return Jason to one breast over a period of time

Avoid causing

- Mastitis
- Undersupply




Neuroprotective Developmental Care (NDC or 'the Possums programs')



Making sense of baby's crying

medicalrepublish.com.au/making-sense-babys-crying-fussing/19208

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## Making sense of baby's crying and fussing

Parents trying to cope with problem crying in babies are faced with a barrage of conflicting and confusing advice, much of which lacks a sound evidence base

By Dr Pamela Douglas, 20 February 2019

[f](#) [t](#) [v](#)

*IN THIS SECOND ARTICLE OF OUR THREE-PART SERIES ON CRYING BABIES, WE EXPLORE THE IMPACT OF INTERPRETATIVE BIASES ON EXISTING EVIDENCE CONCERNING THE GUT AND INFANT CRY-FUSS BEHAVIOURS, AND OFFER A NEUROBIOLOGICAL EXPLANATORY MODEL. WE ALSO OFFER INTEGRATED, EVIDENCE-BASED MANAGEMENT STRATEGIES FOR THE BABY WHO CRIES AND FUSSES WHEN FEEDING.*

The following signs are commonly inappropriately medicalised in crying babies:

1. Difficulty coming on the breast, back-arching, pulling off, and fussing at the breast, caused by positional instability and breast tissue drag;
2. Excessive flatus, frequent explosive frothy stool, tympanic abdomen and frequent feeding in a breastfed baby, caused by functional lactose overload;







