Feeding & growth issues in infancy

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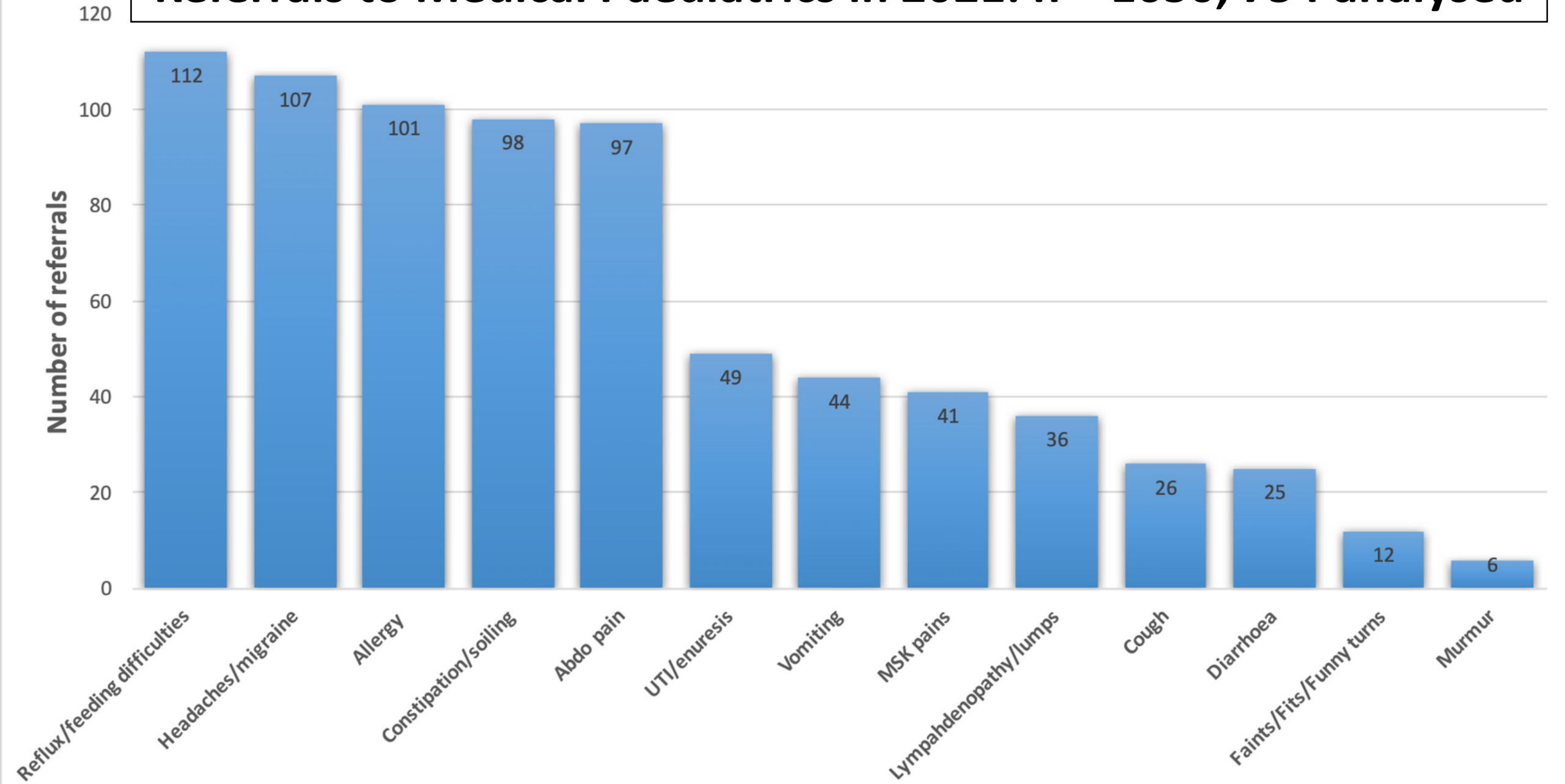
Royal Hospital for Children & Young People, Edinburgh

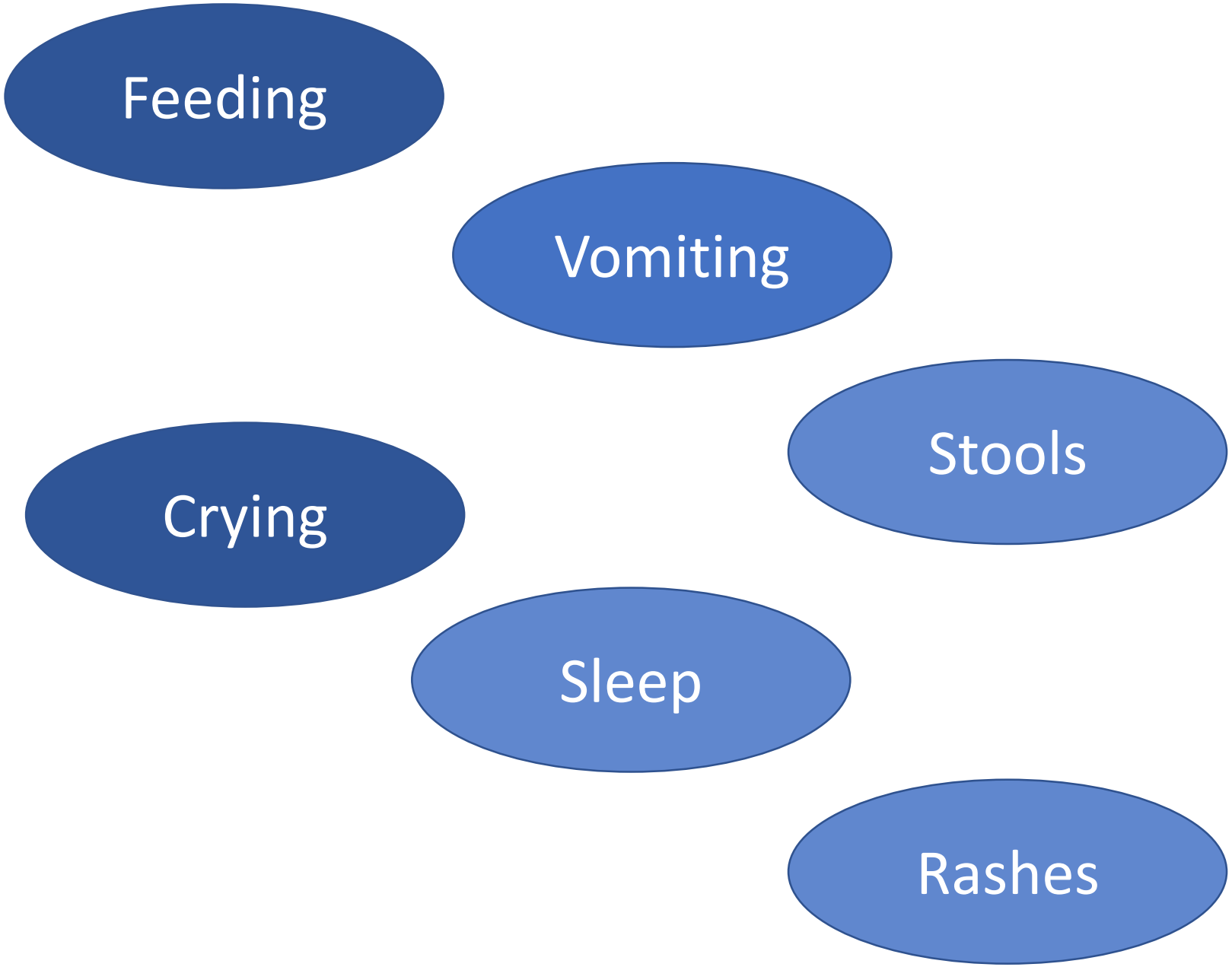
Referrals to Medical Paediatrics in 2021: n = 1650, 754 analysed



Overview

- Normal babies
- Gastro-oesophageal reflux
- Cows' milk protein allergy
- Faltering growth in infants & children

What is normal…… and what's not?



Normal feeding in the first 6 months of life

Breast feeding

- On demand
- Frequent
- Day and night
- Little pattern

Formula feeding

- 150 ml/kg/day after day 5 until weaning
- 3 - 4 hourly
- Day and night
- More regular / routine

Complementary feeding / weaning

- From around 6 months of age
- Not before 17 weeks
- Pureed / mashed / chopped + finger foods
- Early introduction of allergens including peanuts (peanut butter) < 1yr
- Avoid adding salt and honey under 1 year

LEAP STUDY

EAT study

The NEW ENGLAND JOURNAL of MEDICINE
2015 & 16

BDA The Association of UK Dietitians

sacn
Scientific Advisory Committee on Nutrition

Milk through the years

- Breast milk / formula under 1 year
- Full fat cow's milk after 1 year, can be used in food after 6 mths
- Semi-skimmed milk after 2 years

Quantities:

- 0 - 6 mths: 150mls/kg/day
- 6 – 12 mths: Gradually reducing to
- 1 – 8 years: 400mls / day

- **Too much milk can cause constipation & iron deficiency anaemia**

Vomiting

- Common in babies

- Differential diagnosis:
  - Over-feeding
  - GOR
  - CMPA
  - Infection: sepsis / UTI / gastroenteritis ….
  - Pyloric stenosis
  - Malrotation / volvulus / obstruction / intussusception
  - Necrotising enterocolitis…..

Red flag symptoms and signs

GI

- Frequent projectile vomiting
- Bile-stained
- Haematemesis
- Blood in stools
- Abdominal distension, tenderness, mass
- Chronic diarrhoea

Systemic

- Unwell
- Fever
- Dysuria
- Bulging fontanelle
- Increasing OFC
- Lethargy / irritability

When not to worry

- Well baby
- Milky
- Effortless
- Un-distressed
- Normal growth

- Volume?
- Projectile?

Advice for **WELL** vomiting babies

- Check feed volumes if bottle-fed
  - Reduce if excessive
- Check growth
  - If normal, relax
- Ask about distress
  - If none, encourage parents to be more relaxed
  - If distressed, likely to be reflux
- If unwell, consider need for referral to ED

Bowel habit in babies and children - frequency

Age (months)	Mean no. of stools / day	3rd – 97th centile
1	3	0.6 - 5.7
6	2	0.7 – 3.5
18	1.8	0.8 – 3.2
30	1.5	0.7 – 2.9

BMJ Journals

ADC Education & Practice edition

Best practice and fifteen-minute consultations

Fifteen-minute consultation on the healthy child: Bowel habit in infants and children

Joely Clarke [1], Mark Peter Tighe [2]

The Shades of Baby Poo – A Rough Guide

Meconium can be very dark green or black

Breastfed baby poo might be a mustard yellow

Formula-fed baby poo might be this sort of colour

Green poo isn't usually anything to worry about

Brown is a common poo colour for babies on solids

Red might be harmless, but get it checked out in case it's blood

Black poo (after the first five days) could also be a sign of blood, so let your doctor know

White or very pale poo is rare, but may be a sign of liver disease, so call your doctor

Note: The colour of baby poo can vary a lot. This chart is not suitable for diagnosing your baby's health. Always check in with your doctor or health visitor if you have any concerns.

Stools: breastfed babies – VERY VARIABLE

- Colour - yellow / brown / green
- Frequency
  - 10 a day
  - Once every 10 days
- Consistency:
  - Runny
- Un-distressed baby, normal growth, no concerns

Stools: formula-fed babies

- Firmer consistency
- Brown / yellow / green
- 2-3 per day during first year

What are we NOT worried about

- Green stools
- Mucus
- Stools after every feed

- **IN A BABY WHO IS WELL AND GROWING NORMALLY**

What are we worried about?

- Blood in stools
- Significant distress
- Hard stools
- Watery stools
- Poor growth

Dyschezia

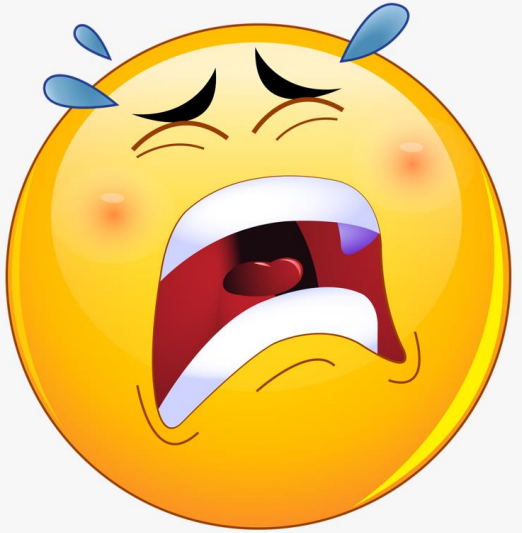
- Straining/ distress while passing normal stools
- First 9 months

- Failure to coordinate increased intra-abdominal pressure with relaxation of pelvic floor

- Simultaneous abdominal & gluteal contractions make stooling difficult

- Will resolve spontaneously

Crying



- Many reasons
- Physical: hungry, wet / dirty, tired, wanting comfort
- No obvious reason, difficult to settle
- Very distressing for parents

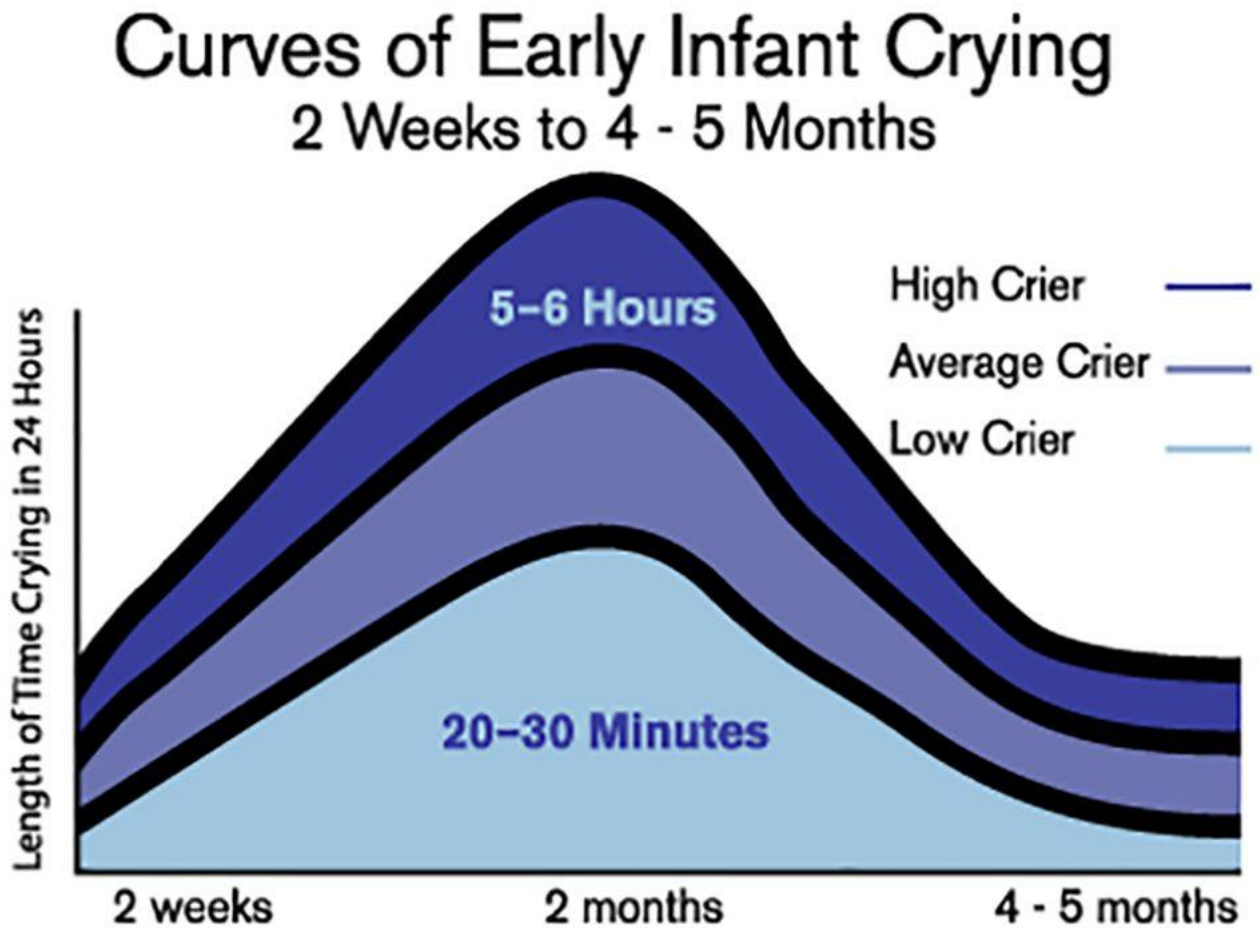
- Often increases around 2 weeks, peaks 2 months
- After 5 months, crying is more purposeful

- **Important not to over-medicalise eg diagnose reflux, CMPA etc**

ICON

www.iconcope.org

* I – Infant crying is normal
* C –Comforting methods can help
* O – It's OK to walk away
* N – Never, ever shake a baby



RCGP Royal College of General Practitioners

Sleep

Fifteen-minute consultation on problems in the healthy child: sleep

Age (years)	Hours of sleep
1	14
3	12
5	11
7	10.5
9	10
11	9.5
13	9.25

Turnbull JR, Farquhar M.
Arch Dis Child Educ Pract Ed 2016;101:175–180

Normal infant sleep

Age	Sleep (hours)
Newborn	18
3-4 mths	16
6-9 mths	14

- Short sleep cycles
- Frequent waking
- 60% of babies sleep for 6 hours by 6 months, 70% by 1 year
- Beware sleep consultants

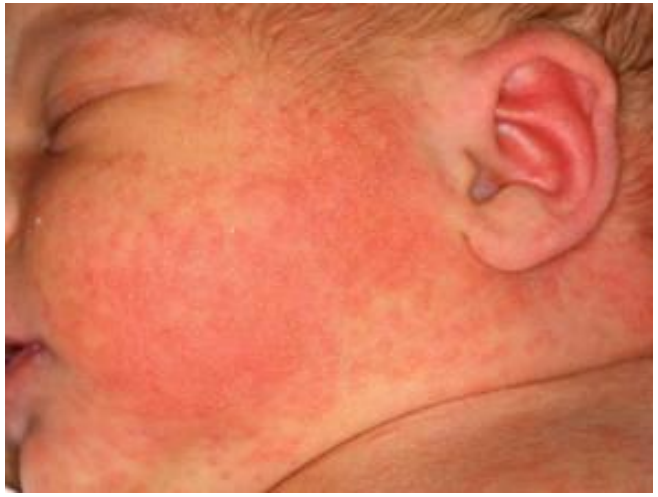
Sleep advice

- Encourage self-soothing
  - No props (breast / bottle / dummy / TV / music...)
- Consider where baby / child sleeps

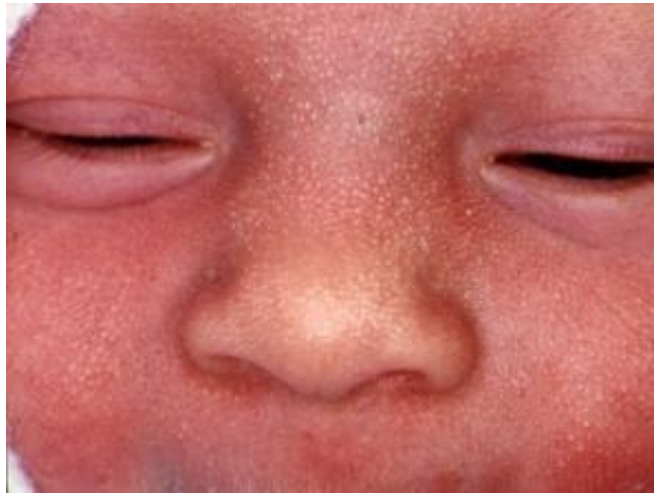
Older children:

- No TV in bedroom
- No screens for 1 hour before bed
- No caffeine / cut down sugar
- Consistent bedtime routine
- **Insufficient sleep has significant consequences for mental & physical health**

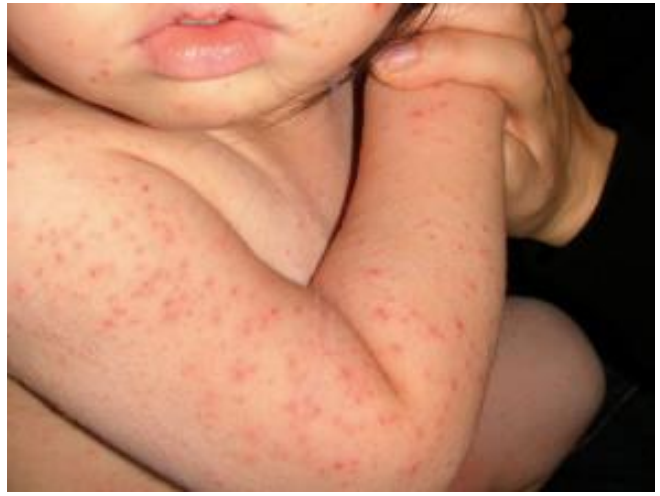
Skin: babies get lots of rashes, they are not all allergy!



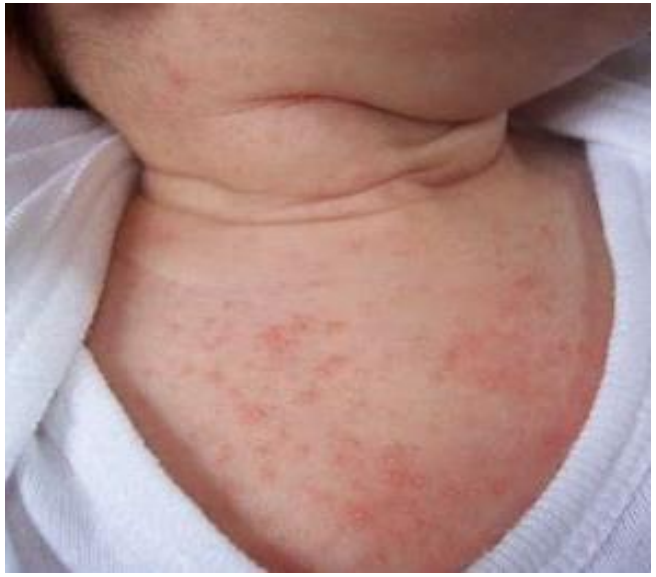
Erythema toxicum

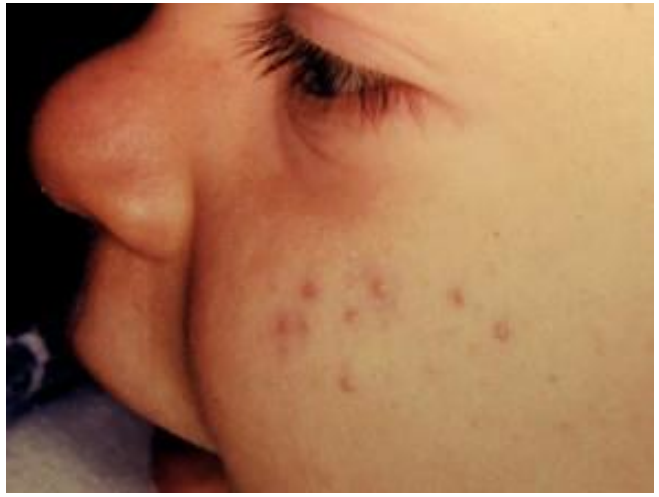


Milia

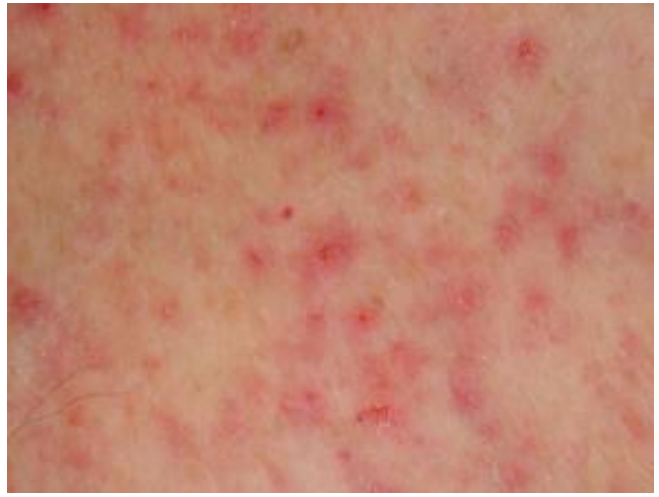


Viral rash





Baby acne



Heat rash

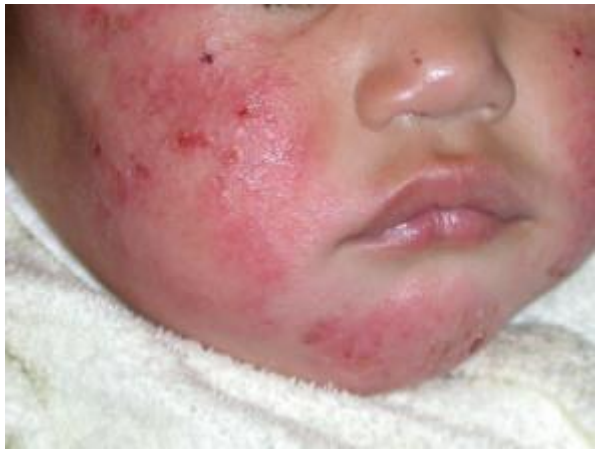
DermNet NZ
All about the skin

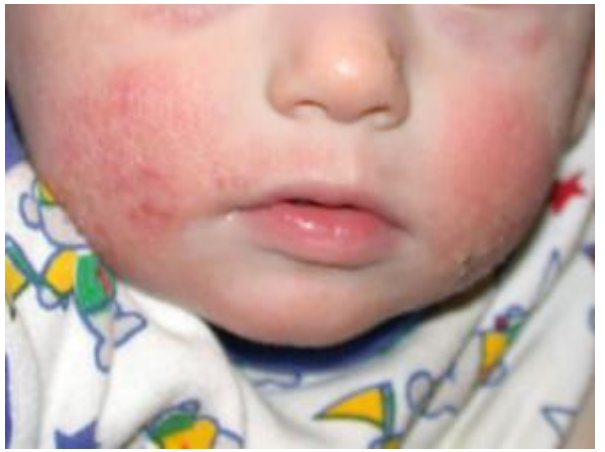
Infantile eczema

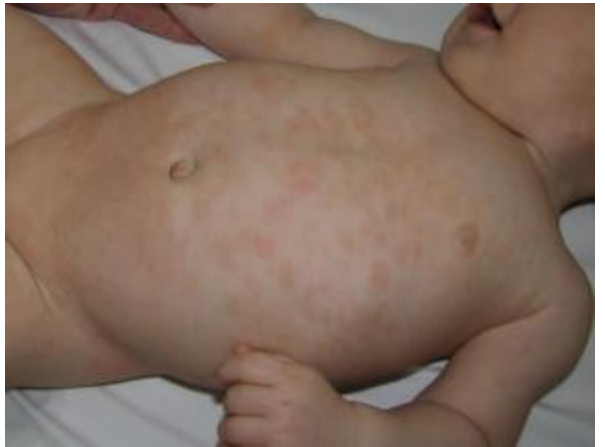
- Very common – up to 20% of infants

- **Most eczema is NOT food-related**
- Optimise topical treatment and most will improve
- It will flare up intermittently

- Emollients
- Steroids
- Avoid commercial bath / skin products
- www.eczema.org







RefHelp

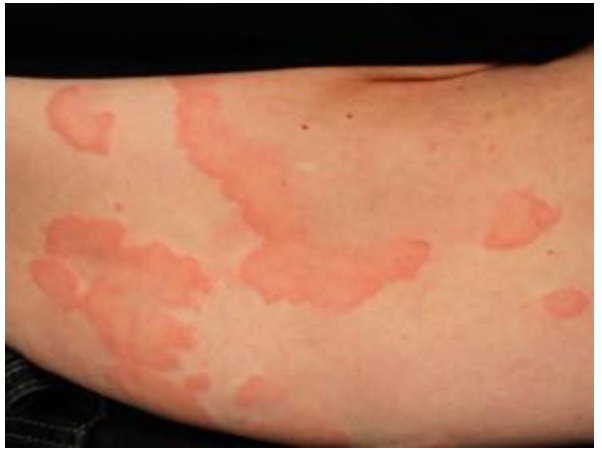
Eczema, Atopic (Paediatric)

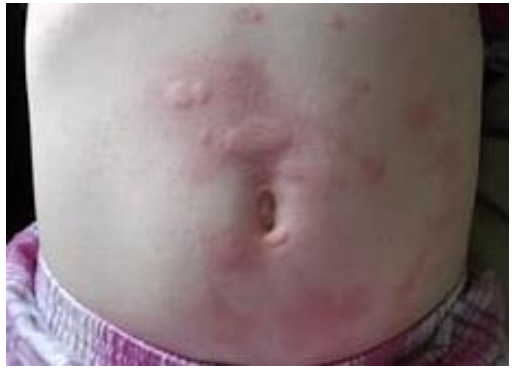
Urticaria

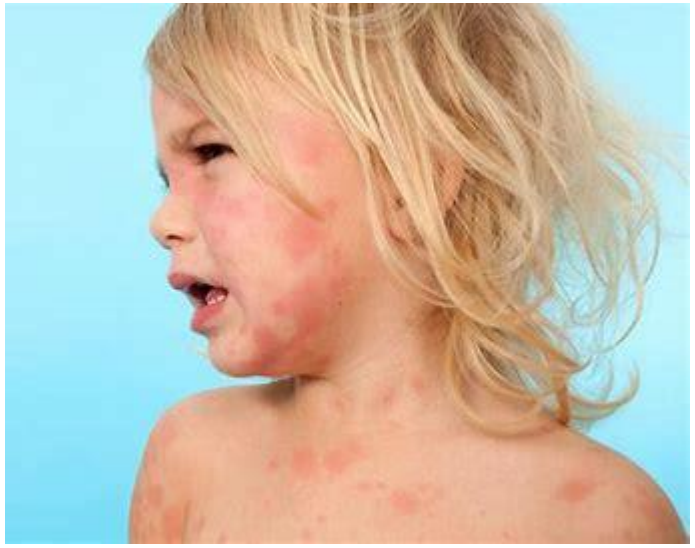
- Common – 20% lifetime risk
- Few mins – 24 hours

- Lots of causes
  - Infections: viral & bacterial
  - Allergy
  - Heat / cold / exercise
  - Idiopathic

- History is important



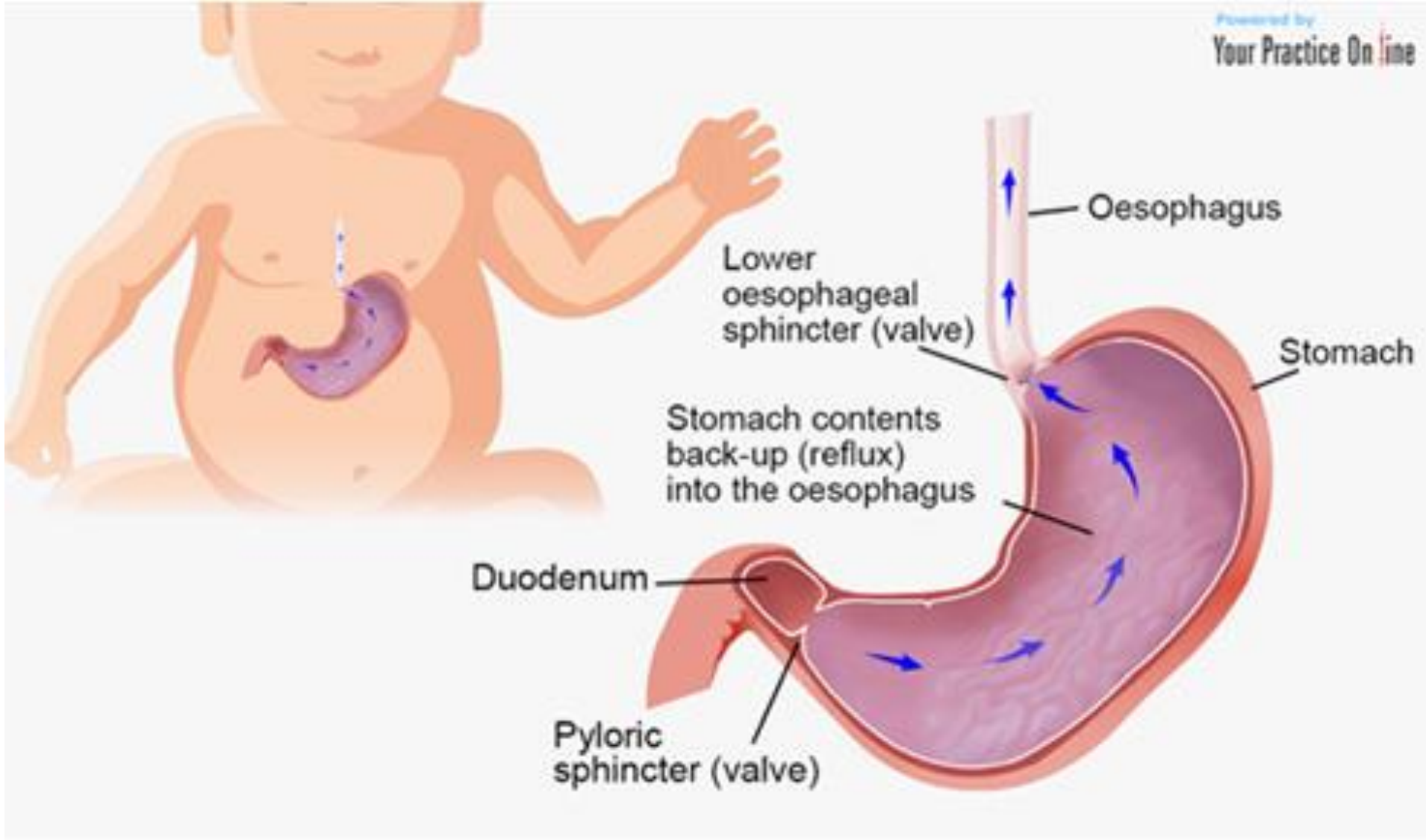




Let’s take a breather…..any questions?

Vancouver, Canada

Gastro-oesophageal reflux

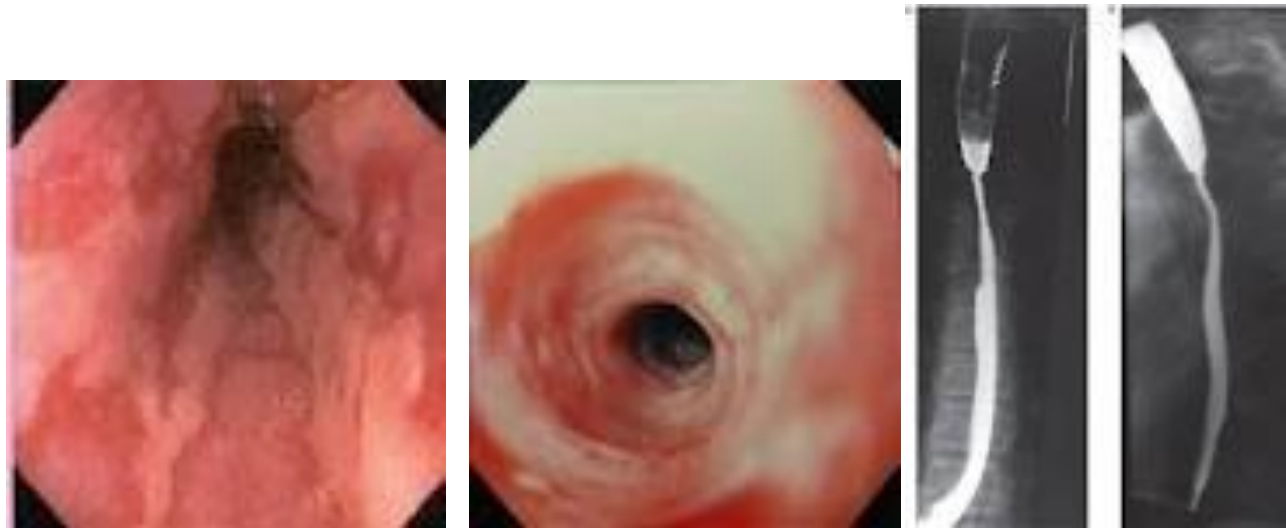


GOR vs GORD

- GOR = Effortless passage of gastric contents into oesophagus with or without vomiting.

  NORMAL PHYSIOLOGICAL PROCESS

- GORD = GOR causing troublesome symptoms and/or complications
  - Faltering growth
  - Erosive oesophagitis
  - Strictures
  - Respiratory complications



GOR = Reflux = Physiological

- 1/2 babies at 4/12
- Resolution: 60% by 6/12
  90% by 1 year (not if associated neurodisability)
- No investigations or treatment required in most cases
- Management – advice & reassurance
  (medications)

NICE
National Institute for Health and Care Excellence

Reflux – Advice for parents

- Explanation of condition
- Common problem
- May be frequent (5% > 6 episodes/day)
- Reassurance it will get better with time
- **If baby is undistressed & growing, no Ix or Rx req'd**

Reflux management - Breastfed infants

- Breastfeeding assessment
- Advice re positioning
- Early weaning (after 17 weeks)
- Marked distress – consider medications
- Re-assess after 4 weeks
- **Mum to continue unrestricted diet**

Reflux management – Formula-fed infants

- Reduce feed volumes if excessive
- Trial of smaller volume feeds more often
- Trial of anti-reflux formula
- Early weaning (after 17 weeks)
- Reassess after 4 weeks

NHS

Living with Reflux
Raising awareness of Gastro-oesophageal Reflux

Reflux medications: feed thickeners

- With normal formula / expressed breast milk
- Not to be used with pre-thickened formula
- Difficult to administer to exclusively breast-fed babies
- Should reduce vomiting

- **Gaviscon** - **constipation is almost universal, so start slowly**
  - eg 1-2 sachets per day, increasing to maximum of 6 sachets / day
  - If effective but constipated, add Lactulose

- **Carobel** – OTC

Reflux medications: Proton pump inhibitors

- Useful for babies with distress, unlikely to reduce vomiting
- **Omeprazole** – difficult to administer
- **Esomeprazole** – easier to administer, more expensive
- Minimum 2 week trial
- Prescribe decent dose for weight
  - Eg Omeprazole for 5kg baby
  - BNFC: 700 mcg/kg od, max 3mg/kg or 20mg
  - Prescribe 10mg od, can increase to 15mg if not effective

Other reflux medications

- Ranitidine – no longer used
- Domperidone – used rarely as pro-kinetic, need ECG

Key messages:

- **Ideally one change at a time**
- **Minimum trial 2 weeks**
- **Generally avoid Gaviscon for breastfed babies**

Severe reflux

- Marked distress
- Oral aversion
- Poor growth

- Advice and explanation
- Reassurance it will improve
- **Feed thickeners + Esomeprazole**
- Weight after 1 - 2 weeks
- Reassess after 4 weeks
- HV support
- Urgent referral to Paediatrics

Early weaning: 17 – 26 weeks

- Healthy babies: wean between 5 & 6 months when ready

- Refluxy babies: consider weaning from 4 months

- Mainly milk-based solids eg baby rice / porridge
- Ensure calorie intake is not compromised
- Not aiming to have large dietary repertoire

- Go slowly – if not ready, wait before trying again

Cows’ milk protein allergy

CMPA - types

- **Type 1 hypersensitivity: IgE-mediated: immediate**
  - Rare
  - Urticaria, vomiting, facial swelling etc
- **Type 4 hypersensitivity: non-IgE mediated: delayed**
  - More common, still rare
  - Non-specific symptoms
- **It is <u>not</u> lactose intolerance**

Lactose intolerance / lactase deficiency

- Primary: ‘hypolactasia’
  - Genetically programmed decline in lactase
  - Increasing incidence with age, rare in early childhood
  - Varied incidence with ethnicity

- **Secondary: usually to gastroenteritis**
  - Temporary
  - Use lactose-free products for 6 weeks

- Congenital lactase deficiency
  - Very rare
  - Severe diarrhoea & faltering growth

FIRST STEPS NUTRITION TRUST

RefHelp

IgE-mediated CMPA

- Usually seen on introduction of formula
- Mum to continue normal diet if breastfeeding

- Treat as per allergic reaction

- Wean baby dairy-free

- Refer to medical paediatrics and dietetics

Non-IgE mediated CMPA

- Considerable overlap of symptoms of reflux / normal babies
  - Irritability / ‘colic’ / ‘wind’
  - Vomiting
  - Loose stools (+/- blood)
  - Eczema
  - Atopic FHx

- Usually on introduction of cow’s milk formula
- Can manifest in breastfed babies but RARE
- **Frequently over-diagnosed**
- ALLERGY TESTING IS NOT HELPFUL

Non-IgE CMPA - diagnosis

- No tests

- Failed trial of anti-reflux meds, suggestive history, consider 4 week trial of Rx
  - hydrolysed formula
  - maternal dairy-free diet if breastfeeding

- **RE-CHALLENGE after 4-6 weeks**

CMPA management – breastfed babies

- Rare (<1%)
- Frequently (over) diagnosed
- Mum to exclude dairy from diet
- Needs calcium & vitamin D supplements – please prescribe
- Refer to dietician

Breast milk remains gold standard of therapy in CMPA

CMPA Management – Formula-fed babies

2 types of hypoallergenic formula

- **Extensively hydrolysed formula (EHF)**

  Eg Aptamil Pepti & SMA Althera, Nutramigen, Pregestamil, Similac

- **Amino acid formula (AAF)**
  - Eg Neocate, Elecare, SMA Alfamino, Nutramigen PurAmino

- **90% tolerate EHF. AAF 2-3 x more expensive**
- Choice:

BNFC

NICE National Institute for Health and Care Excellence

Choose Amino acid formula if:

1. Symptoms do not resolve on EHF
2. Severe complex GI food allergies: EoE and FPIES
3. Multiple food allergies
4. Severe atopic eczema
5. Symptoms while breastfeeding on a maternal milk-free diet & req top-ups
6. History of anaphylaxis
7. Faltering growth

(Meyer et al., 2018)

Diagnostic test: Re-challenge after exclusion

- Exclusion for 4 weeks

- Breast-fed: re-introduce milk to maternal diet
- Formula-fed: re-introduce normal formula

- No reaction – continue normal diet
- Reaction – continue milk exclusion, wean dairy-free

CMPA Management: Milk-free weaning

- **Avoid all milk and milk-containing products**

- **< 6/12: hydrolysed formula in cooking / cereals**
- **> 6/12: Ca-fortified plant-based milks can be used in foods**

- Avoid:
  - milk products from other mammals eg sheep, goat
  - soya formula < 6/12
  - rice milk < 5 years

- **Milk re-introduction at 1 year using milk ladder**
- **Discontinue formula prescription at 12/13months old**

Check the food labels

CMPA - Referrals

- **Dietetic referral is essential**
  - Appropriate education / meeting reqmts / prevent deficiencies
  - Ensure formula discontinued at 12 months
  - NHS LOTHIAN Dietetic-led service

- **Paediatric referral**
  - if faltering growth / other concerns

Restricting maternal diets in breastfed babies

- Avoid as much as possible
- Slippery slope – often one restriction leads to multiple
- Dubious cause and effect
- Small amount of allergenic proteins transferred in breast milk
- Potentially dangerous complications for mother and baby
    - Anxiety, depression, weight loss, nutritional deficiencies, early bf cessation

Delphi Consensus Study, 2022

Increasing concern re over-diagnosis of CMPA

- Interpretation of normal baby behaviours as symptoms
- Over-use of hydrolysed formulas at high cost
- Undermining of breastfeeding
- Unnecessary restriction of infant & maternal diets

unicef
UNITED KINGDOM
THE BABY FRIENDLY INITIATIVE

Vincent, R. et al. 2021. Frequency of guideline-defined cow's milk allergy symptoms in infants: Secondary analysis of EAT trial data. DOI: 10.1111/cea.14060

Boyle, RJ, Shamji, MH. Allergy societies and the formula industry. *Clin Exp Allergy*. 2021; 51: 1260–1261. https://doi.org/10.1111/cea.14017

Munblit D, Perkin MR, Palmer DJ, Allen KJ, Boyle RJ. Assessment of Evidence About Common Infant Symptoms and Cow's Milk Allergy. *JAMA Pediatr.* 2020;174(6):599–608. doi:10.1001/jamapediatrics.2020.0153

Guidelines

BSACI
Improving Allergy Care
through education, training and research

The British Society for Allergy and Clinical Immunology

NICE National Institute for Health and Care Excellence

Cow's milk allergy in children

Last revised in August 2021

RefHelp

Feeding Difficulties in Infants Under 6 Months

Infant feeding difficulties are some of the most common causes of referrals to general paediatrics. At RHCYP, general paediatricians and dieticians work closely together in the management of infants with feeding difficulties. For dietetic issues, the **Paediatric Dietetic page on RefHelp** has lots of information about referrals to their service, as well as useful resources and advice for specific dietary issues. Of note, **all infants started on a cow's milk free diet should be supported by a dietitian.**

Flowchart 1: How to approach infant feeding difficulties

NHS Lothian

Detailed history including allergy history if suspected CMPA

Full examination including:
Weight
Height
Head circumference
Heart
Abdomen
Male genitalia

Red flags
Faltering growth *(see section below)*
Developmental delay
Severe symptoms
Bilious or bloody vomit*
Pale stools

Red flags
Faltering growth *(see section below)*
Developmental delay
Atopic eczema
Hernia
Unwell*
Dehydrated*
Lethargic*
Bulging fontanelle*

Refer urgently to general paediatrics
(or other speciality/*RHCYP ED as appropriate)

Common diagnoses to consider

Normal	Gaining weight well, settled, no red flags
Over-feeding	Unsettled after feeds, vomiting
Colic	Excessive crying (usually in late afternoon or evening), otherwise well
GOR(D)	Upper GI symptoms (posseting milk after feeds), happier upright
CMPA	Atopic rashes, vomiting, blood in stool, unsettled, faltering growth (if severe), atopic family history
Lactose intolerance	Lower GI symptoms (diarrhoea, bloating, gassiness), recent gastroenteritis, no atopy
Pyloric stenosis	Upper abdominal lump, projectile vomiting, dehydration
Faltering growth	1. Fall across 1 or more centile (if birthweight <9th centile) 2. Fall across 2 or more centiles (if birthweight 9th-91st centiles) 3. Fall across 3 or more centiles (if birthweight >91st centile) 4. Current weight <2nd centile for age, whatever the birthweight.

Growth

Determinants of normal growth

- Birthweight: maternal health during pregnancy & placental function
- Infancy: nutrition
- Childhood: nutrition, hormones and genetic potential

Normal growth patterns

- Most babies grow roughly along a centile line

- Regression to the mean: large and small babies are likely to get closer to 50th centile over first few months of life

ADC Education & Practice edition

A picture is worth a thousand words

C J Kistin, H Bauchner

BMJ

CLINICAL REVIEW

Weight faltering and failure to thrive in infancy and early childhood

Brian Shields *paediatric specialty registrar*[1], Ian Wacogne *consultant paediatrician*[1], Charlotte M Wright *professor of community child health/consultant paediatrician*[2]

Faltering growth: NICE definitions

- Fall across 1 or more weight centile spaces, if BW < 9th centile
- Fall across 2 or more weight centile spaces, if BW b/w 9th & 91st c
- Fall across 3 or more weight centile spaces, if BW > 91st centile
- When current weight is < 2nd centile, whatever the birthweight

NICE National Institute for Health and Care Excellence

Aetiology of faltering growth

- Inadequate nutritional intake is the commonest cause

- <5% cases have underlying condition / disease

- Malabsorption
- Excessive energy requirements
- Child protection issues

History

- Dietary history:
  - Current foods
  - Current feeding pattern
  - Amount & type of fluid intake
  - Mealtime environment
- Systems review
- PMH / DH / SH / FH

Examination

- Thorough!

Investigations

- Rarely required in primary care
- 1st line: FBC, U&Es, LFTs, coeliac screen, TFTs, urine MC&S, metabolic screen
- 2nd line: sweat test, immunoglobulins .....
- Timing depends on age & severity

Faltering Growth: Dietary management < 6 mths

Breastfed babies

- Feed on demand (from both breasts)
- Day and night
- Mum to optimise own nutrition: vit D, calcium, calories and protein. Breastfeeding and diet - NHS (www.nhs.uk)
- Consider EBM / formula top-ups

Formula-fed

- Check volumes: 150ml/kg up to 200ml/kg (monitor vomiting)
- Introduce high calorie specialist formula (under dietetic supervision)

Dietary management > 6 months

- Fry / roast in oil
- Fortify foods with butter, cream, cheese
- Calorie-dense foods eg avocado, nut butters, chocolate spread
- Full-fat dairy products
- Work towards 3 meals + 2 snacks (> 9months)
- Desserts after lunch & dinner
- (Dietary supplements under dietetic supervision)

NHS

Nutritional advice for underweight children

Overweight / obesity

Scottish Paediatric Endocrine Group National Managed Clinical Network

RefHelp

GUIDELINES
Click to Open Guidelines

SEARCH
Click to Search this Site

Home | Educational | News & Events | WaitingTimes | About Us

NHS National Services Scotland

You are in: Home > Weight Management

Weight Management

Services

We are a specialist service which supports families in Lothian to make changes to their lifestyle to become healthier and more active.

Our multi-disciplinary team consists of Dietitians, Clinical Psychologists and Exercise Specialists. We also work with our community leisure partners and health coaches – all with expert skills in advancing nutrition, physical activity and behavioural changes.

To find out more about the range of programmes we currently offer and other healthy lifestyle resources, please visit our NHS Lothian webpage – Child

- Who to refer:
- Age 2 - 18 yrs
- BMI > 91st centile
- Family ready to make changes

Websites for parents

Parent Club

FIRST STEPS NUTRITION TRUST

AllergyUK

raisingchildren.net.au
the australian parenting website

Living with Reflux
Raising awareness of Gastro-oesophageal Reflux

Healthier Together
Improving the health of children and young people in Dorset, Hampshire and the Isle of Wight

NHS

Resources for professionals

RefHelp

BMJ Journals

ADC Education & Practice edition

CYANS

Children and Young People's Allergy Network Scotland

NICE National Institute for Health and Care Excellence

FIRST STEPS NUTRITION TRUST

Take home messages

- Care not to over-medicalise normal baby behaviours
- Care with attributing symptoms to foods (especially milk)
- Reflux is much more likely than CMPA: incidence 50% vs 2% (at most)
  - Beware over-diagnosis of CMPA
- Ensure good trials of GOR Rx prior to changing, ideally one at a time

Thank you!
Any questions?