The unsettled baby

Infant Crying

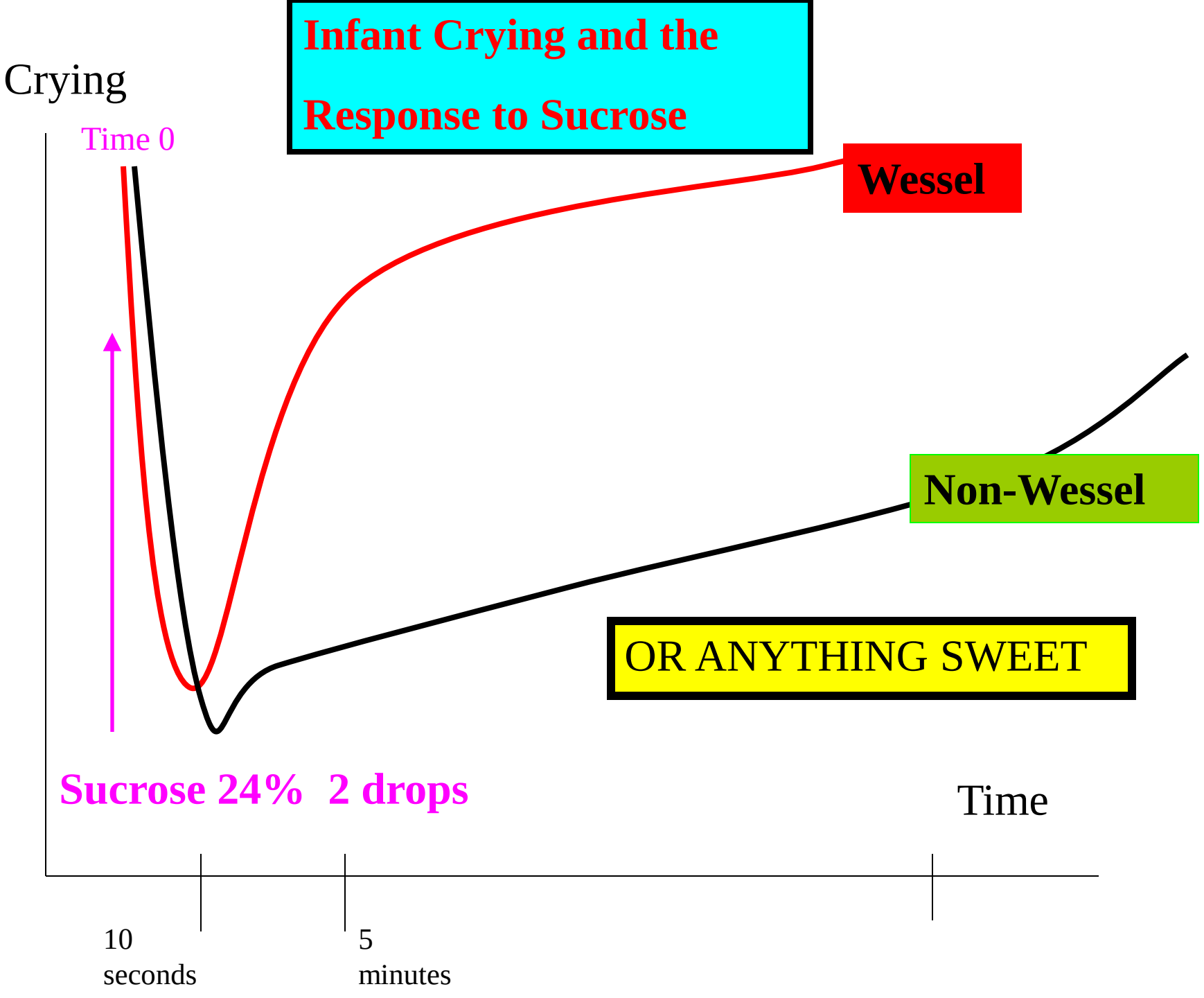
- Dr Morris Wessel, U.S. Paediatrician (in practice 1950-1993)
- Wessel's "criteria" (rule of 3's)
  - >3 hours per day
  - >3 times per week
  - for >3 weeks
- **"colic" prevalence of 4-20%**
- 1 in 6 families seek advice for excessive infant crying
- diary record - 3 groups (R. Barr)
  - "normal" - mean 1.75 hrs per day
  - parental c/o crying, **non-Wessel** - mean 2.0 hrs/day
  - **Wessel** - mean 4 hours/day

Infant Crying

- All 3 groups had 6-7 bouts of crying per day
- The **Wessel** group cried for longer (35v17 min)
  - non-responsive to soothing
  - cry “as if in pain”
  - arching back
  - passing wind both ends
  - legs pulled up

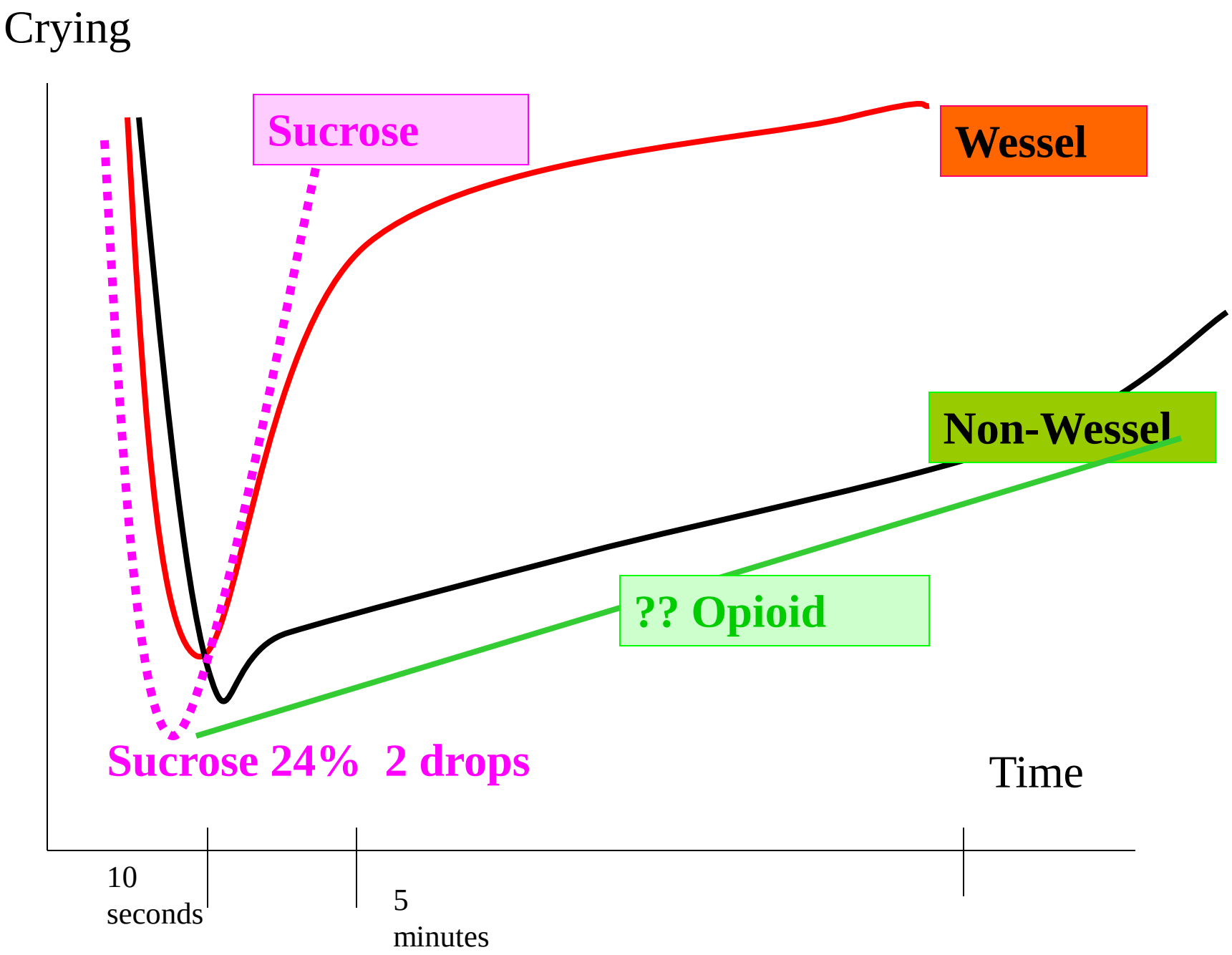
Pain Concatenation
Facial Appearance when crying

- Face: (first described by Charles Darwin)
  - square mouth
  - eyes squeezed
  - brow bulge
  - nasolabial furrowing
- Scoring system reproducible
- **Wessel** more facial change than **non-W**

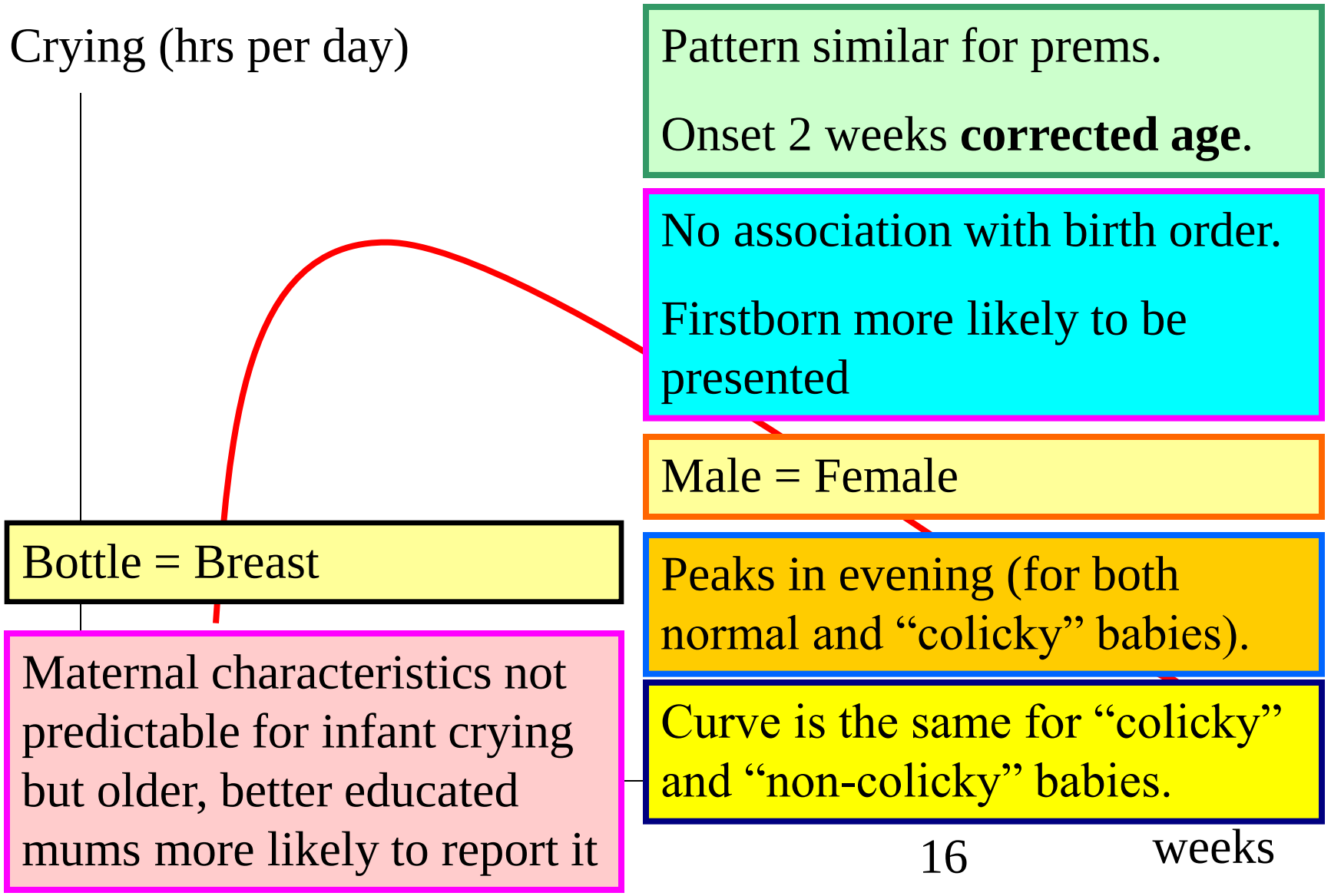

Infant Crying and the
Response to Sucrose
Crying
Time 0
Wessel
Non-Wessel
OR ANYTHING SWEET
Sucrose 24% 2 drops
Time
10
seconds
5
minutes

Infant Crying

- Studies in rats show a similar pattern of response to 24% sucrose to the non-W babies (prolonged response)
- This prolonged response can be blocked by naloxone
- The prolonged response is absent in methadone dependent human infants
- Suggests that there is a release of endogenous opioids to cause prolonged soothing response


Crying
Sucrose
Wessel
Non-Wessel
?? Opioid
Sucrose 24% 2 drops
Time
10
seconds
5
minutes

Patterns of Crying



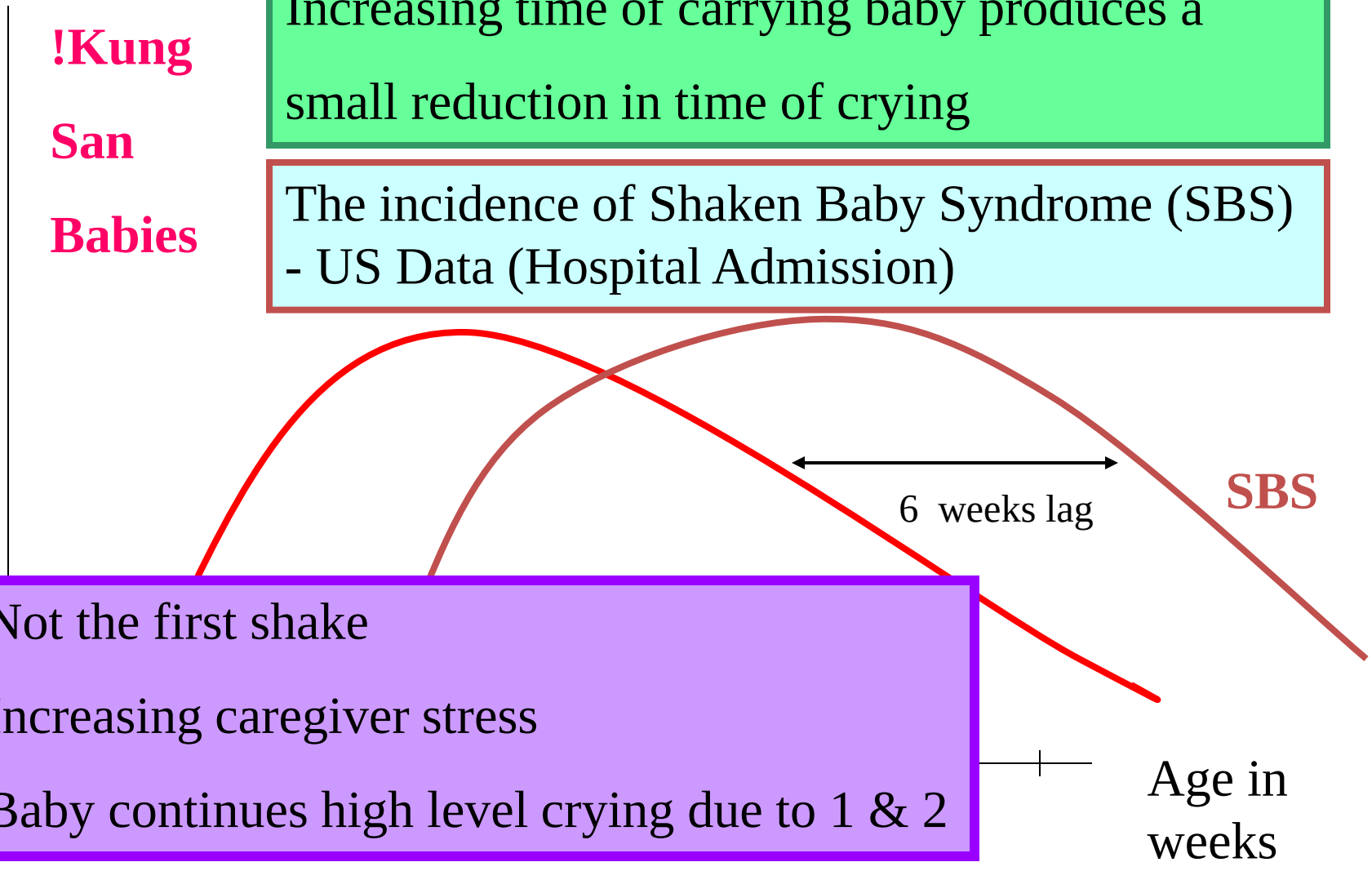
The !Kung San People

- Gatherer/Hunter tribal group (this study in Botswana)
- Hypothesis - the crying pattern of infants is innate and will be similar irrespective of child-rearing practices
- !Kung San infants:
  - carried in sling by mother (held upright)
  - almost constantly suckled
  - responded to immediately

Several other studies (including Brazelton 1962, Hunziker 1986, St James-Roberts 1994) all show similar pattern.

Increasing time of carrying baby produces a small reduction in time of crying

The incidence of Shaken Baby Syndrome (SBS) - US Data (Hospital Admission)



1. Not the first shake
2. Increasing caregiver stress
3. Baby continues high level crying due to 1 & 2

Conclusions

- There is evidence that “colicky” babies are different but very rare to find medical cause for excessive crying
- **It possibly relates to poor recruitment of an “opioid driven” soothing process**
  - **failure/inadequate production of endogenous opioids**
  - **end-organ receptor problem**
- **Pro-active advice**

Outcomes

- The babies do fine
- 10 yr f/u of 103 infants IC found increased risk of recurrent abdo pain, allergic conditions , sleep disorder and behavioural disorders
- Large cohort 983 infants with 9.3% IC did not confirm any assoc'n with any atopy or infant feeding
- Parental problems are very common
  - poor self esteem, attachment problems, feel inadequate as parents

P - Peak pattern

U - Unpredictability

R - Resistance to soothing

P - Pain in face

L - Long

E - Evening

C R Y I N G !!!

COLIC IS SOMETHING THAT INFANTS DO -

NOT SOMETHING THEY HAVE

Management

- Feeding
  - Conflicting evidence that a hypoallergenic or cow milk free diet helpful
  - Possible benefit if breast feeding mothers on low allergen diet

  Pediatrics 2005 Nov

  RCT low allergen mat diet in exclusively BF infants with colic. Exclude CM, eggs, peanuts, tree nuts, wheat, soy, fish.

  107 infants mean age 5.7 weeks (2.9-8.6)

  Outcome at 7 days of change in crying over previous 48 hr

  More responders in the low allergen group (74% vs 37%) with an av reduction in crying of 21%

Management

- Medication
  - Simethicone, thickener, antacids and herbal remedies such as chamomile, licorice or fennel show no convincing benefit
- Alternative therapies
  - No evidence that acupressure, cranial osteopathy or amber beads of any effect

Management

- Best strategy
  - Describe the natural history
  - Reassurance that the infant is healthy
  - Parents doing the right thing
  - Social support, “time out” for parents

Prognosis

Does my baby have Reflux?

- Gastroesophageal reflux (GER)
  - “The retrograde passage of gastric contents into the esophagus”
- GER disease (GERD)
  - “symptoms or complications of GER”

Pathophysiology

- Baseline lower esophageal sphincter (LES) pressures are normal in infants
- GER manifests when there are frequent LES relaxations
- GER promoted by
  - Liquid diet
  - Relatively smaller gastric volume
  - Supine/ slumped positioning

Prevalence

- GER common in the first year life
- 85% infants vomit during the first week of life
- 60-70% infants vomit during at least one feed/ 24hr by age 3-4/12
- Symptoms GER abate without treatment in 60% by 6/12
  - When start on solids and sitting more upright
- Resolution in 90% by10/12

“Physiological vs Pathological?”

- Determined by
  - Number and severity of episodes
  - Symptoms
  - complications

History in child with suspected GERD

- Feeding history
  - Amount and frequency
  - Type
  - Positioning/ burping
- Pattern of vomiting
  - Frequency and amount
  - Forceful
  - Painful
  - Blood/ bile warning signs

- Family hx
  - GI, allergy, metabolic
- Social hx
  - Stress, supports
- Past Medical hx
  - Prematurity, growth, surgery

Examination

- Growth
  - Plot wgt, length, head circ
- Skin for eczema if assoc'd CMPI
- Abdo for distension
- Hernias
- Neurological impairment

Symptoms associated with GER

- Crying/ irritability associated with feeding or spilling and not in the pattern of IC
- Reduced appetite
- Sleep disturbance
- Poor growth
- Apparent life-threatening event (ALTE)
  - Apnoea, pallor/ cyanosis, floppy
- Apnoea/ bradycardia
- Sandifer syndrome (posturing with opisthotonus)

Respiratory symptoms

- Known association between GER and respiratory illness
- Reflex apnoea in young infants with acid in lower esophagus
- Activation respiratory receptors associated with airway hyperresponsiveness
- Wheeze
- Stridor/ hoarseness
- Chronic cough
  - Microaspiration (common in neurologically impaired children)

WARNINGS

- Bilious vomits (green)
  - Need to exclude bowel obstruction/ malrotation
- Projectile vomit
  - Pyloric stenosis, raised IOP
- Haematemesis
  - Mallory weiss tear, ulceration, esophagitis
- Altered bowel habit with the vomiting
  - Allergy, malabsorption
- Abdo distension
  - Obstruction, malabsorption
- Onset vomiting after 6/12

complications

- Reflux esophagitis
  - Ulceration
  - Bleeding
  - Stricture formation
- Barrett's esophagus when goblet cell metaplasia assoc'd with increased risk adenocarcinoma
- Eosinophilic esophagagitis
  - Symptoms persist beyond 1 yr, dysphagia, eosinophils on biopsy
  - Treated with low allergenic diet/ fluticasone

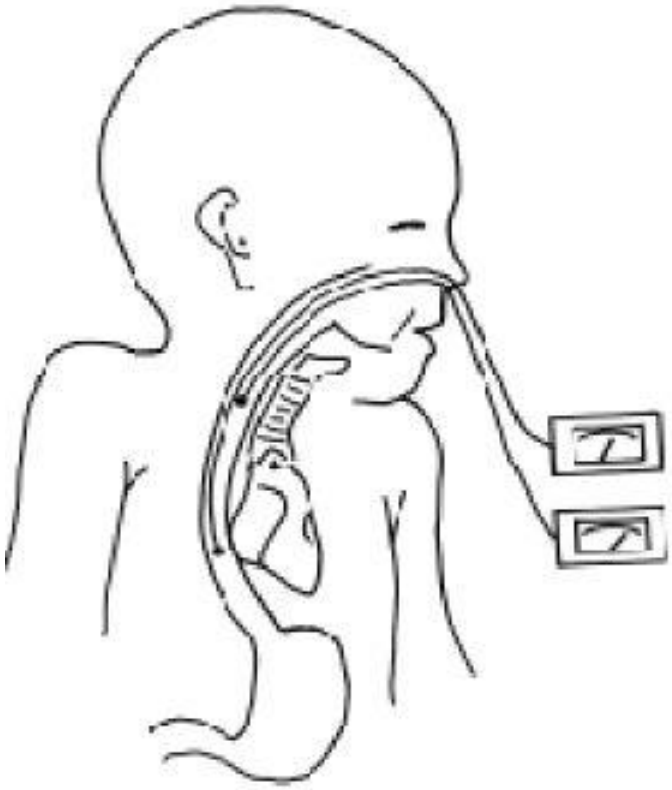
Investigations

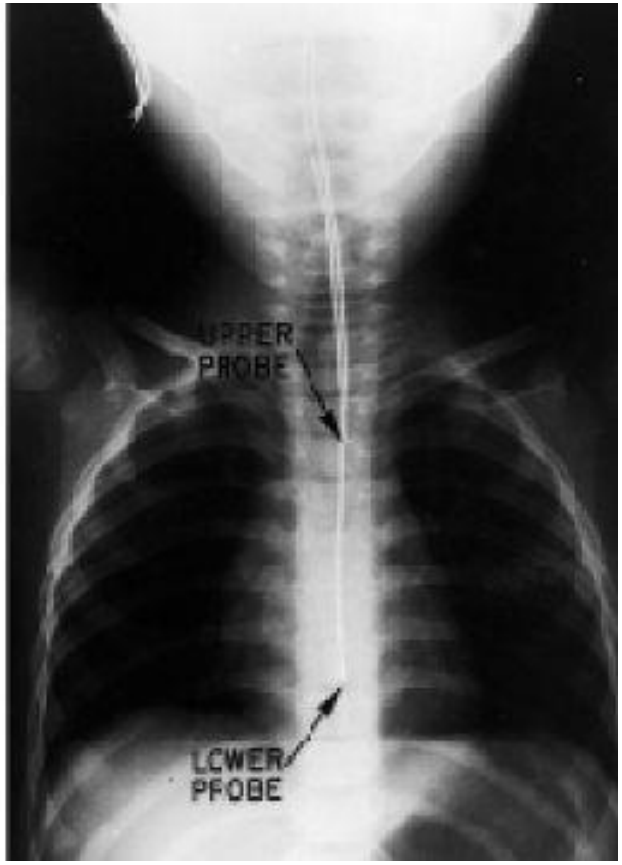
- Investigations only indicated by history or examination findings. Not routine, particularly if growing well

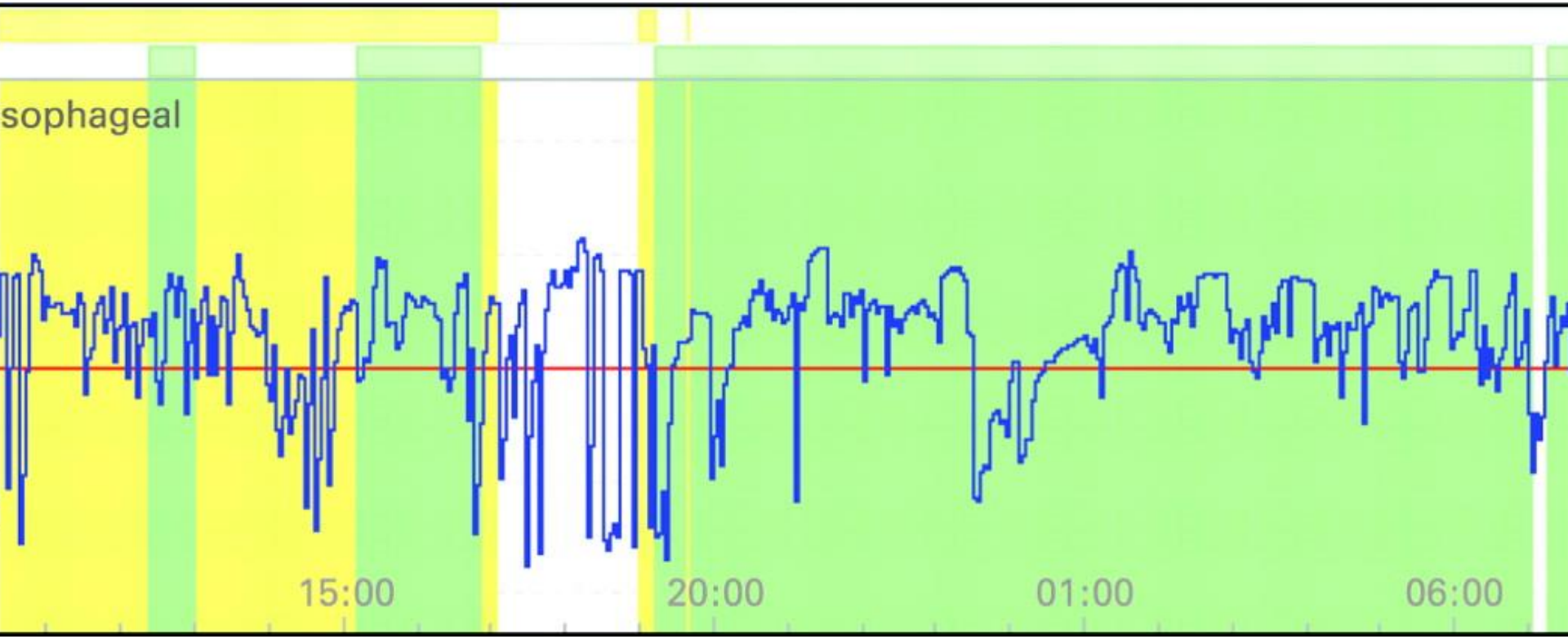
- If not growing well
  - Bloods, urine, stool

- Imaging
  - Video swallow if concerns about choking, resp symptoms
  - Barium swallow follow thru to look at anatomy, stomach outlet
    - Not sensitive/ specific for dx GER

- Esophygeal pH probe
  - Probe inserted into distal esophagus and continuously measures pH over a 12-24 hr period
  - Quantifies number and duration of periods of acid reflux into lower esophagus and whether GER associated with symptoms/ events i.e apnoea, desaturation
  - Mean upper limit in infants
    - 75 daily reflux events
    - 10 episodes of >5 min
    - Reflux index (% of time pH<4) 12%
  - Important to confirm diagnosis if considering other diagnosis and prior to considering surgery




PROBE
LOWER
PROBE


sophageal
15:00
20:00
01:00
06:00

Intraluminal esophageal electrical impedence (EEI)

- Some GER may not be acidic i.e after a milk feed so may not be picked up on pH probe
- This measures retrograde flow in the esophagus
- Can pick up very brief reflux episodes

Treatment

- In most cases, reassurance only required
- Conservative measures
  - Upright positioning
  - Thickener/ AR formula
  - Small frequent feeds
- If symptoms sugest cow milk protein intolerance (spilling assoc'd with altered bowel habit, rash, poor growth) change to a hypoallergenic formula
  - Peptijunior (peptides)
  - Neocate (amino acid)

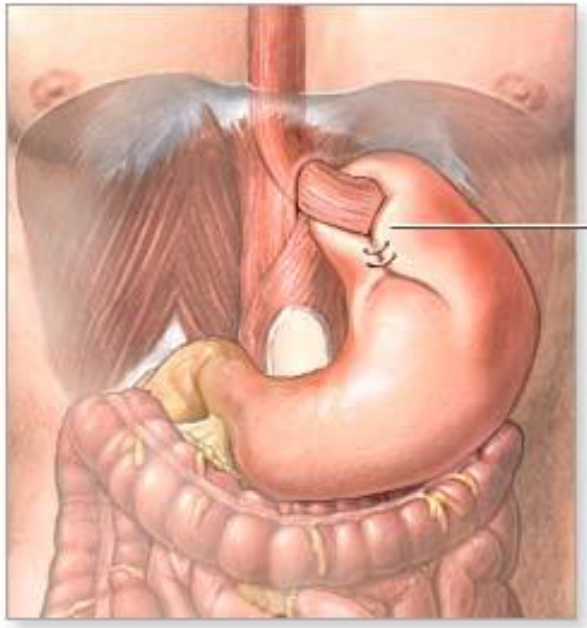
Treatment

- Antacids to neutalize the acid reflux
  - Mylanta (Aluminium/ magnesium hydroxide, simethicone)
  - Gaviscon (sodium/ magnesium alginate)

- If symptoms suggest GERD start medication to reduce stomach acid production
  - H2 receptor blockers (ranitidine/ zantac)
  - Proton pump inhibitor (omeprazole/ losec)

Treatment

- If remain symptomatic trial
  - Prokinetic agents to speed gastric emptying
    - Erythromycin
    - Domperidone
    - Cisipride nolonger available
    - Metoclopramide (maxolon) limited by s/e
- Surgical treatment considered if
  - ALTE, apnoeaic episodes
  - Neurologically impaired infants at risk of aspiration
  - Persisting symptoms and unable to wean off medication



A.D.A.M.

Treatment

- Nissen fundoplication
  - Stomach is wrapped around the lower esophagus
  - May have a gastrostomy if long term tube feeds anticipated or for risk of aspiration
  - Can be associated with difficulty swallowing some solids and alteration of gastric emptying