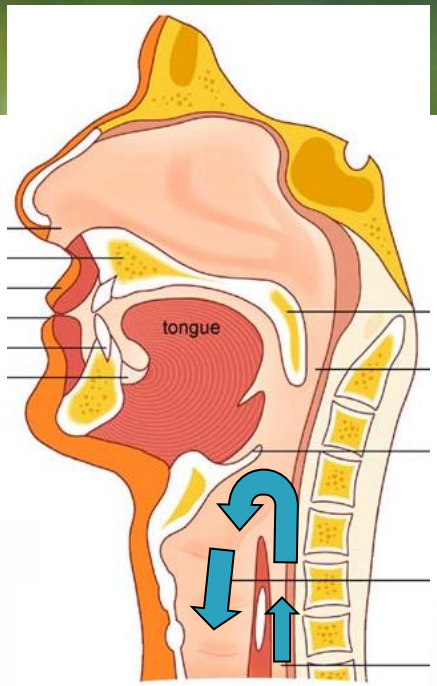
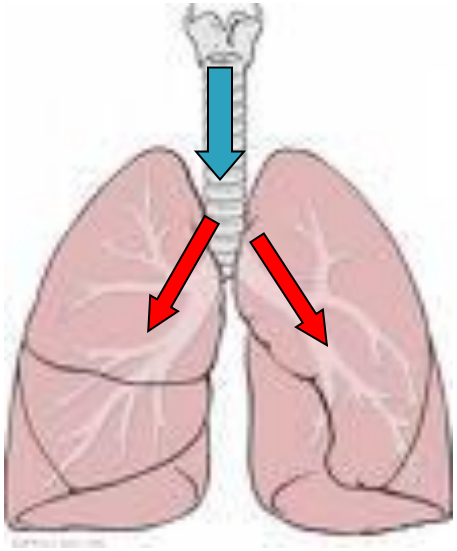
Dietary intake, physical activity and posture effects on non-invasive measures of reflux

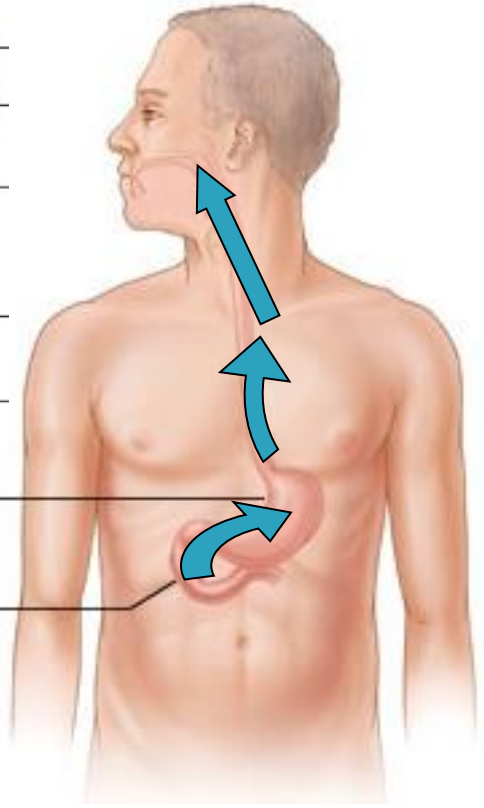
Dr. Iain Brownlee
iain.brownlee@ncl.ac.uk

Background

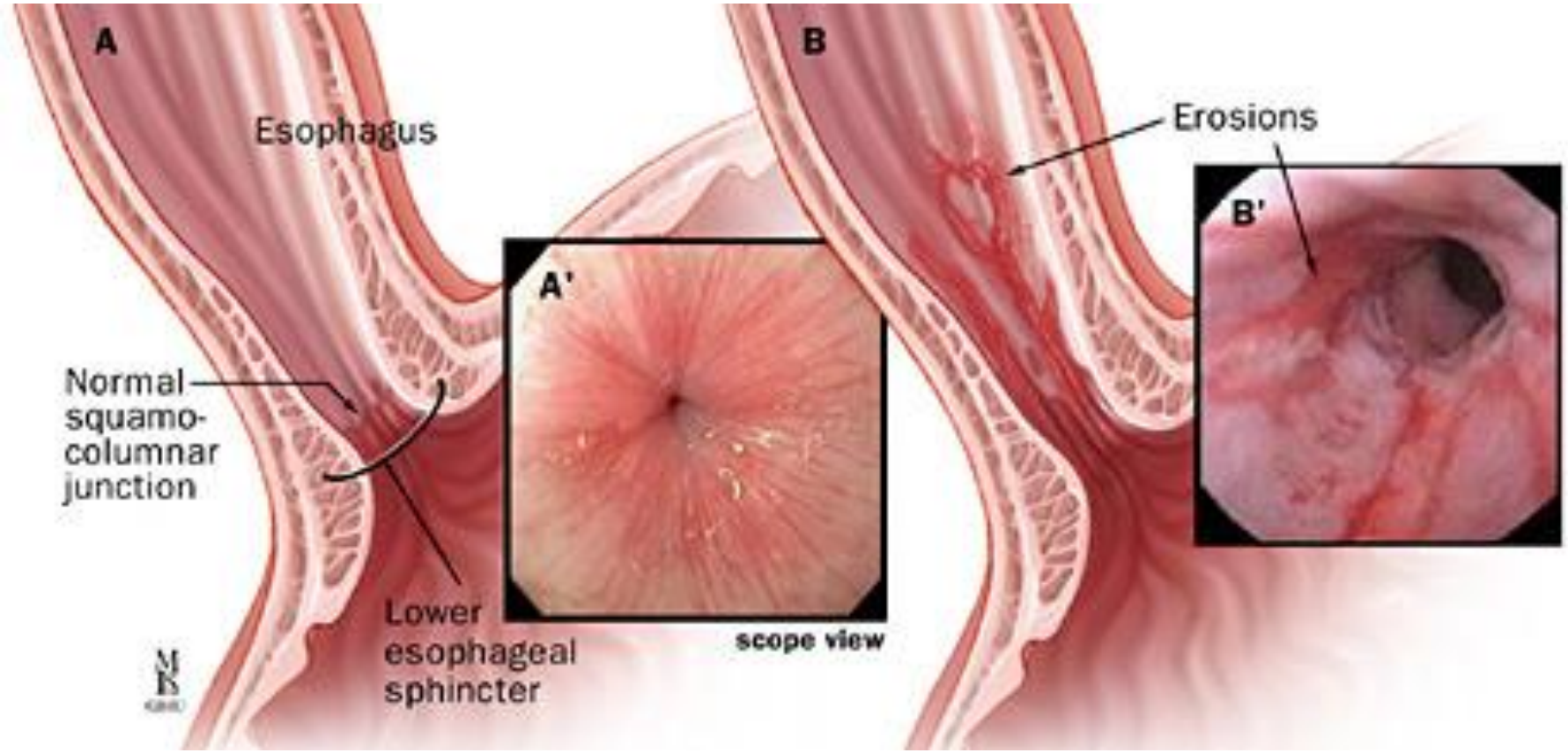
Gastric reflux







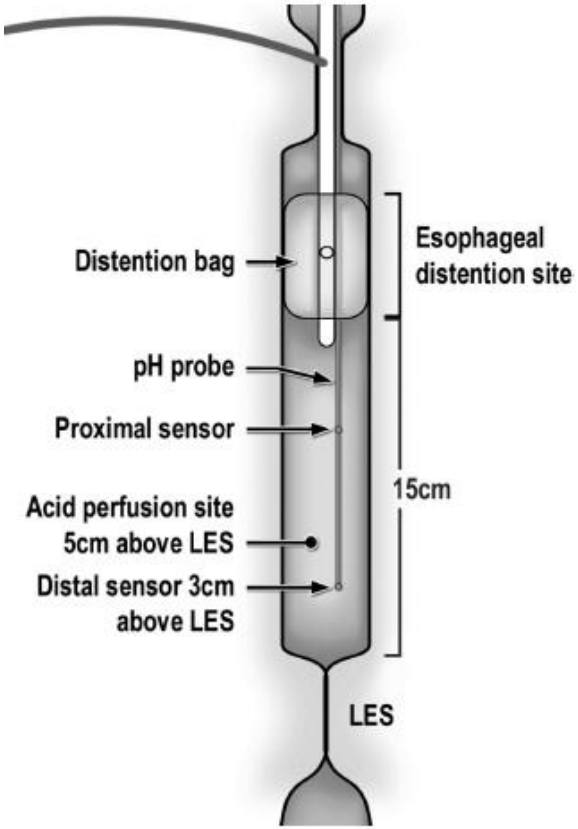
Erosive oesophagitis

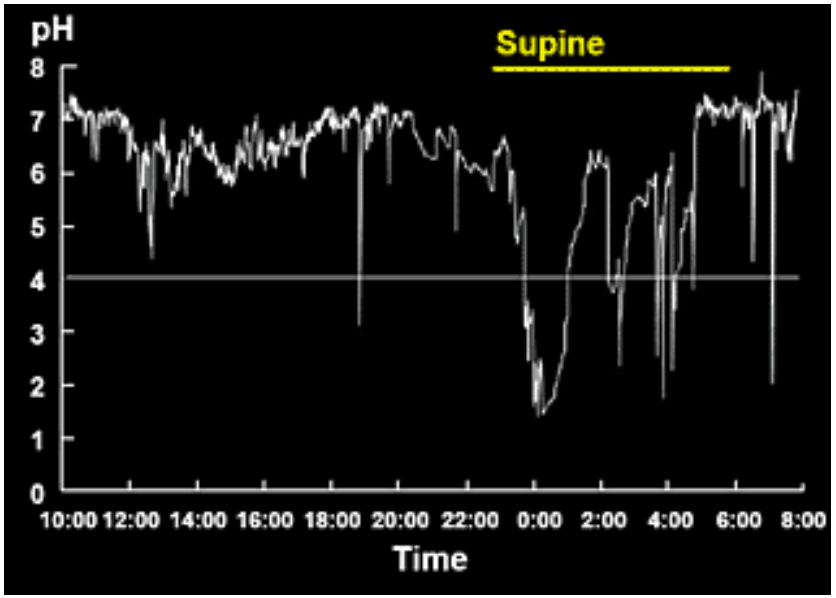


"Silent" reflux

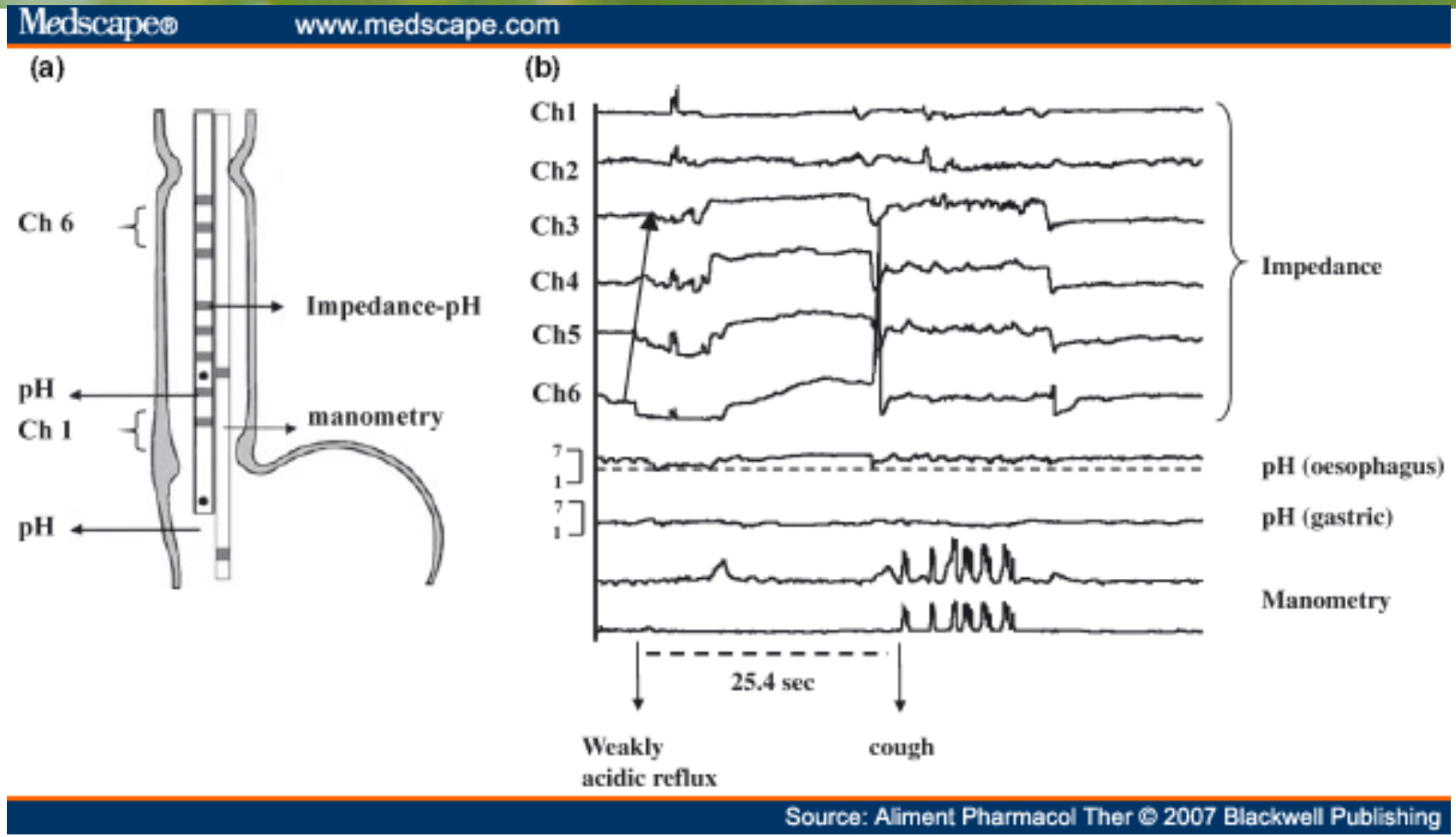
- = Clinically silent
  - No pain in oesophagus
  - No oesophageal presentation
- Reflux can reach other areas from the oesophagus (extra-oesophageal reflux)
- Gastric juice most likely to damage:
  - unprotected areas
  - areas where it stays

Reflux measurement

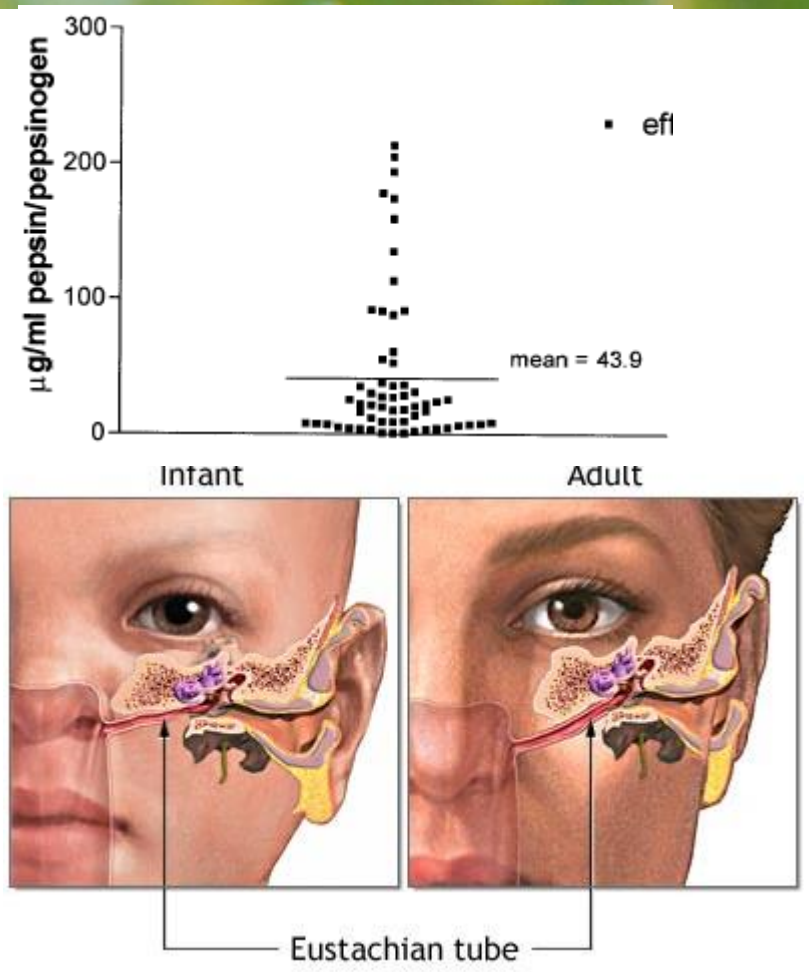


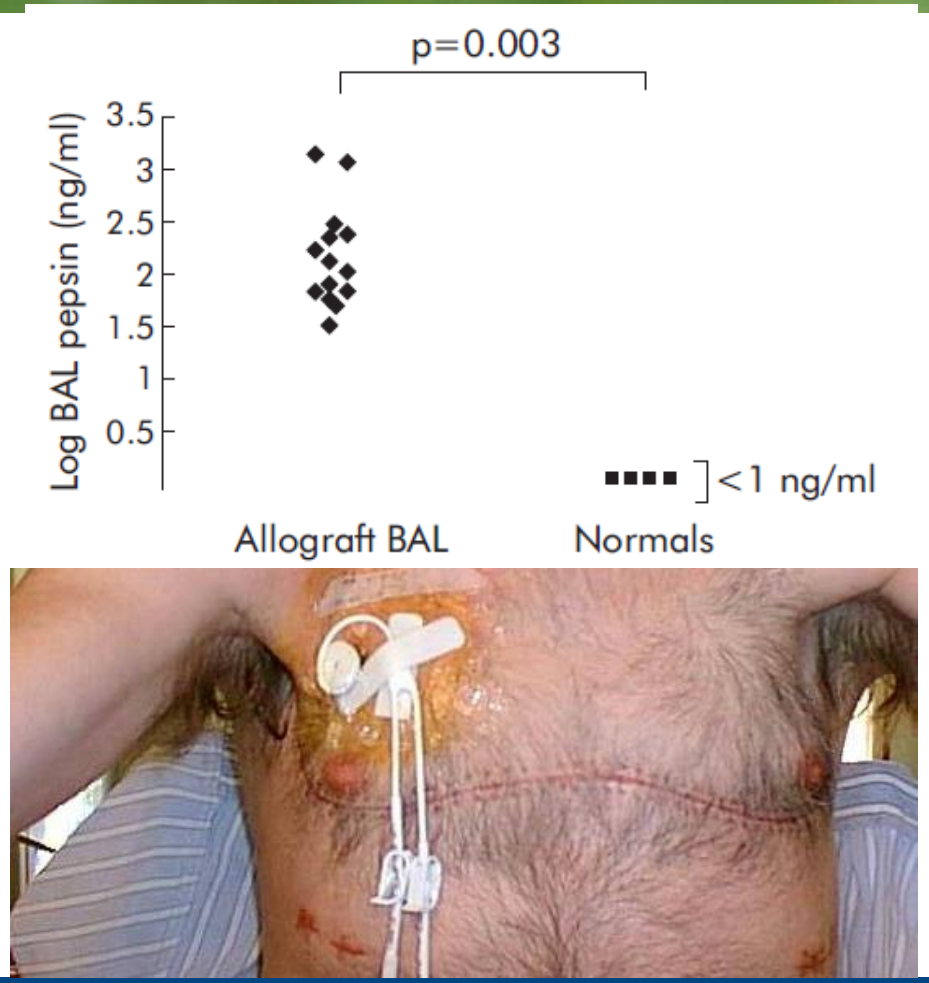


Reflux measurement



Reflux measurement





Reflux treatment

1. Lifestyle
2. Pharmacological
3. Surgical

Lifestyle factors

- Dietary intake
  - Spicy foods?
  - Acidic foods?
  - Fatty foods?
  - Alcohol?
- Sleep
  - Sleep on left hand side
  - Put bricks under your bed
- Physical activity
  - Reduced and moderate intensity?

Koufman JA (2010) Annals of Otology. Rhinology & Laryngology **120**

Study design

Aims

- Test saliva samples for the presence of pepsin in healthy individuals in relation to:
  - Dietary intake
  - Physical activity
  - Posture (before and after sleep)

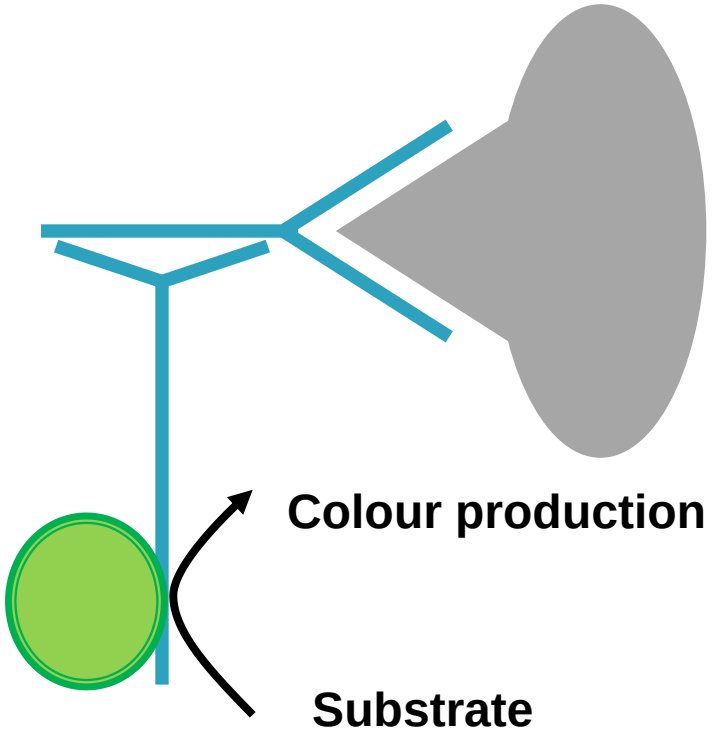
Saliva sampling

- Collect over 7 days before & after
  - Meals
  - Physical activity
  - Sleep
- Samples collected in 30 ml screwtop tubes
  - Citrate as preservative
  - Ziplock bags to seal
- c.1 ml of saliva collected

www.rdbiomed.com

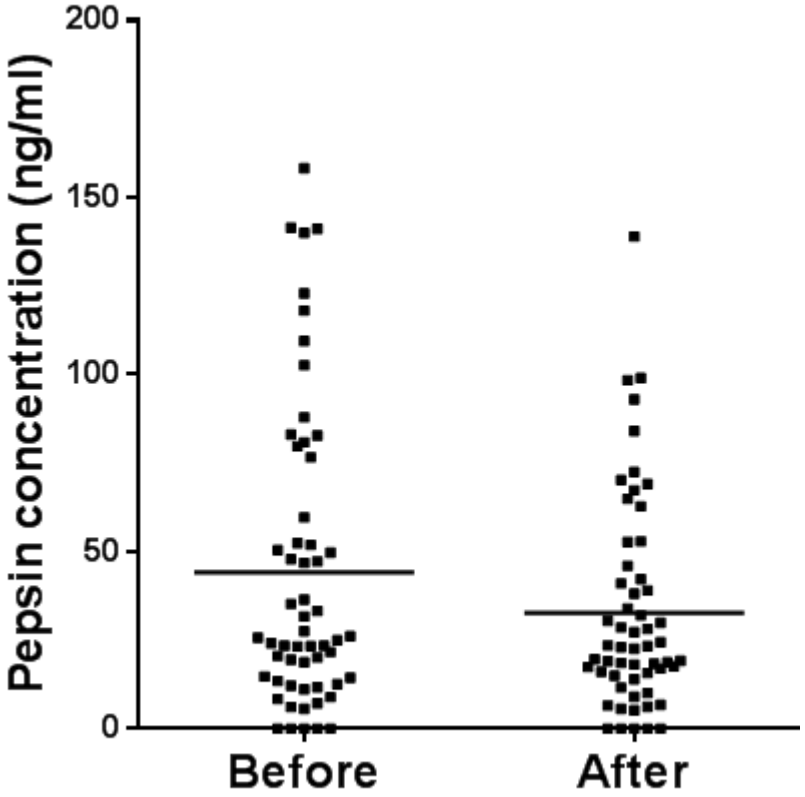
Sample handling and analysis

- Sample centrifuged
  - Remove cellular debris
  - Remove particulate matter
- Supernatant tested for pepsin
  - Indirect ELISA
  - 96-well plates

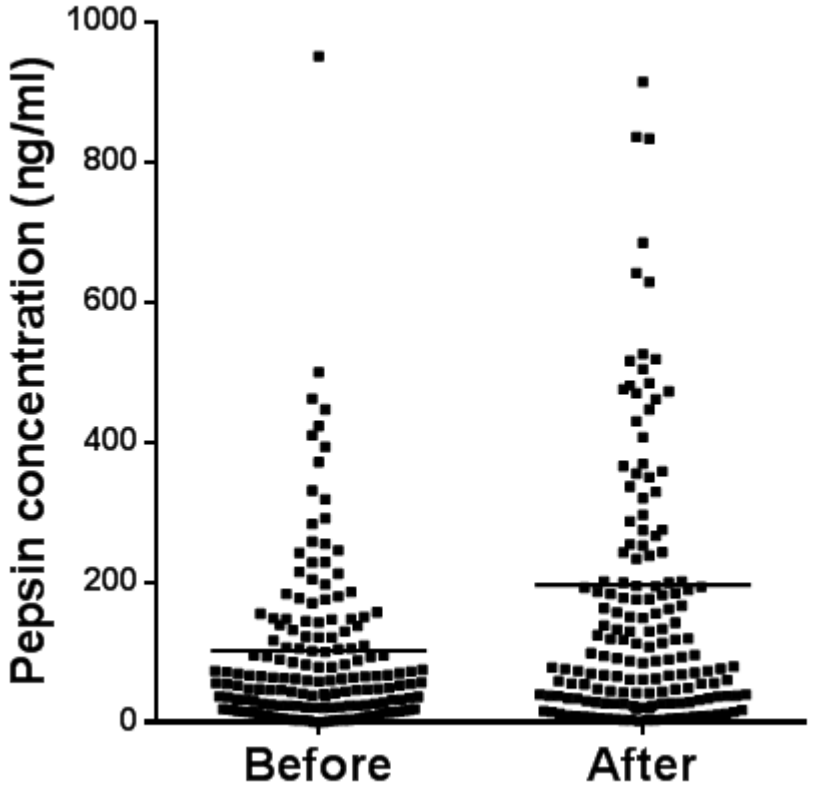


Major findings and discussion

Meal intake



Sleep



Summary

- $[pepsin]_{saliva}$ was significantly higher pre-meal than post-meal ($P = 0.037$)
  - Possible effect of cephalic phase of digestion?
- $[pepsin]_{saliva}$ occur was significantly higher post-sleep than pre-sleep ($P < 0.001$)
  - Recumbant posture likely to drive reflux events
  - Consideration of reduced saliva production also necessary
- No impact of physical activity bouts on $[pepsin]_{saliva}$
  - Low physical activity intensity noted in participants

Interpretation

- Detectable $[pepsin]_{saliva}$ occur frequently at sampling times assessed here
- Diet, physical activity and posture are all likely to affect circadian reflux occurrence
- Consideration of “abnormal” measures not possible from current findings
- Further “challenge” studies warranted