

# POST OPERATIVE ILEUS: WHEN ICARUS MEETS ERAS

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# Post operative ileus

- Definition.
  - *Postoperative ileus [POI] is a transient cessation of bowel motility after abdominal surgery. It is generally considered as a self-limiting process...*
  - *Although various clinical manifestations, including the absence of bowel sounds, flatus, and defecation, or intolerance of an oral diet, have been used to indicate postoperative bowel function, substantial variations exist in the definition and clinical endpoints of POI*

# Post operative ileus

- Common problem
  - Expensive
    - Additional 4.9 days to length of stay
- Little research.
- Some meta analysis.
  - 1524 papers
  - 1477 excluded
  - 57 Full text
  - 11 suitable for analysis

*Wu et al. Clinical endpoint, early detection, and differential diagnosis of postoperative ileus: a systematic review of the literature.*

*Eur Surg Res 2015;54(3-4):127-138.*

# Aetiology

- Multifactorial
- Loss of propulsive activity in gut
  - Small bowel <24 hours
  - Gastric 24-48 hours
  - Colonic 48-72 hours
- Exacerbating factors
  - Male > female
  - Obesity
  - Peripheral vascular disease
  - Electrolytes: ↓K<sup>+</sup>, Mg<sup>+</sup>, uraemia
  - Blood loss/transfusion
  - Emergency surgery
  - Stoma
  - Postoperative complications: pneumonia, intra-abdominal abscess

# Other conditions that mimic Ileus.

- Anastomotic leak
  - Small bowel obstruction
  - Internal herniation
  - Peritoneal haemorrhage
- 
- Diagnosis
    - CT
  - Getting the diagnosis correct is important:
    - Avoid surgery if POI
    - Intervene early if not POI

# Diagnosis & Treatment

## ■ Differential Diagnosis

- Perforation/sepsis, mechanical obstruction
- Clinical: nausea, vomiting, painless distension, delayed passage of flatus/stool
- Plain abdominal XR
- CT scan
  - 90-100% sensitivity in
  - distinguishing ileus/mechanical
  - obstruction
  - Identification of underlying cause



# Pathophysiology

- Association with inflammatory response
  - CRP
  - IL1, IL6, TNF alpha
  - Catabolism
- This also means:
  - An association with hypoalbuminaemia
  - Catabolic metabolism
  - An increased risk of nutritional problems.



# Summary of evidence-based recommendations

| Therapy                            | Improve GI recovery | Shorten length of stay |
|------------------------------------|---------------------|------------------------|
| ERP                                | Benefit             | Benefit                |
| Laparoscopic surgery               | Benefit             | Benefit                |
| Goal-directed fluid administration | Benefit             | Possible benefit       |
| Epidural analgesia                 | Possible benefit    | No benefit             |
| NSAIDs                             | Benefit             | No benefit             |
| Lidocaine                          | Benefit             | Possible benefit       |
| Chewing gum                        | Benefit             | Possible benefit       |
| Laxatives                          | Benefit             | No benefit             |
| Metoclopramide                     | No benefit          | No benefit             |
| Erythromycin                       | No benefit          | No benefit             |
| Naloxone                           | No benefit          | No benefit             |
| Methylnaltrexone                   | No benefit          | No benefit             |
| Alvimopan                          | Benefit             | Benefit                |

# Prevention

- Careful pre-operative preparation
- Enhanced recovery protocols
- Avoid handling during surgery
  - Laparoscopic surgery
- Treat sepsis

# Prevention

- Nasogastric intubation
- GI pacing
- Drugs
  - NSAIDS
  - Laxatives
  - Neostigmine
  - Prostaglandins E<sub>2</sub>, F<sub>2</sub>
  - Metaclopramide
  - Cisapride
  - Erythromycin
  - Octreotide



*Slide courtesy of Mr Richard Novell  
Royal Free, London*

# Careful postoperative care.

- Avoid NG tubes
- Early mobilisation
- Early enteral nutrition
- Reduce opiates
- Care over fluid replacement

# Medical Therapies

- Prokinetics
  - Domperidone
  - Metoclopramide
  - Erythromycin
- Cholinergics
- Novel opiates
- **None guarantee success.**



# Treatment

- Principally supportive
  - Treat sepsis
  - Careful fluids
    - Correct electrolytes
  - Post op analgesia
    - Reduce opiates
  - TPN

# Fluid replacement.

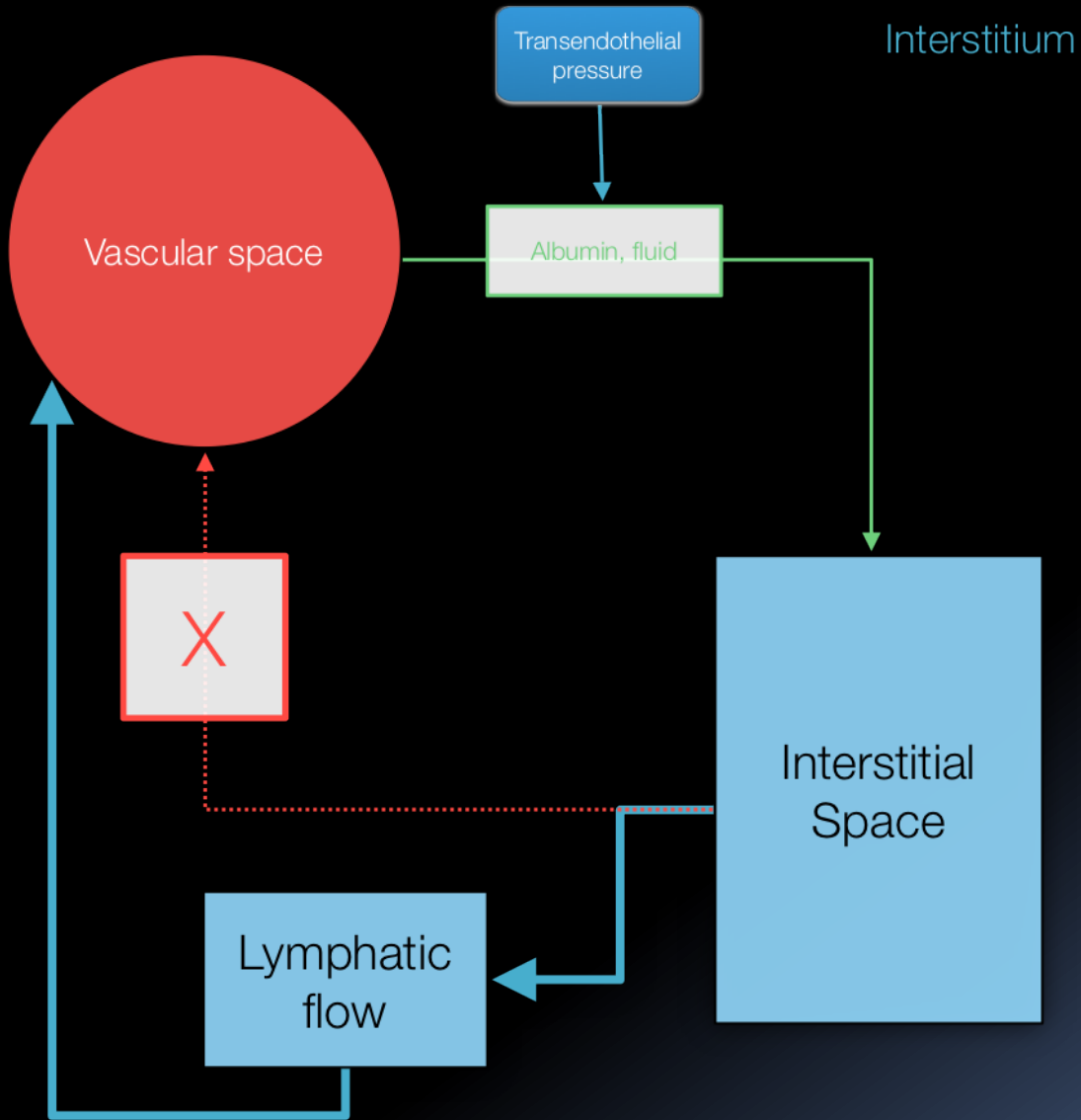
- Much debate:
- Crystalloid vs. Colloid
- 0.9% Saline vs. Balanced Fluids.
  - Difficult area to analyse.
- Nephrotoxicity of chloride.

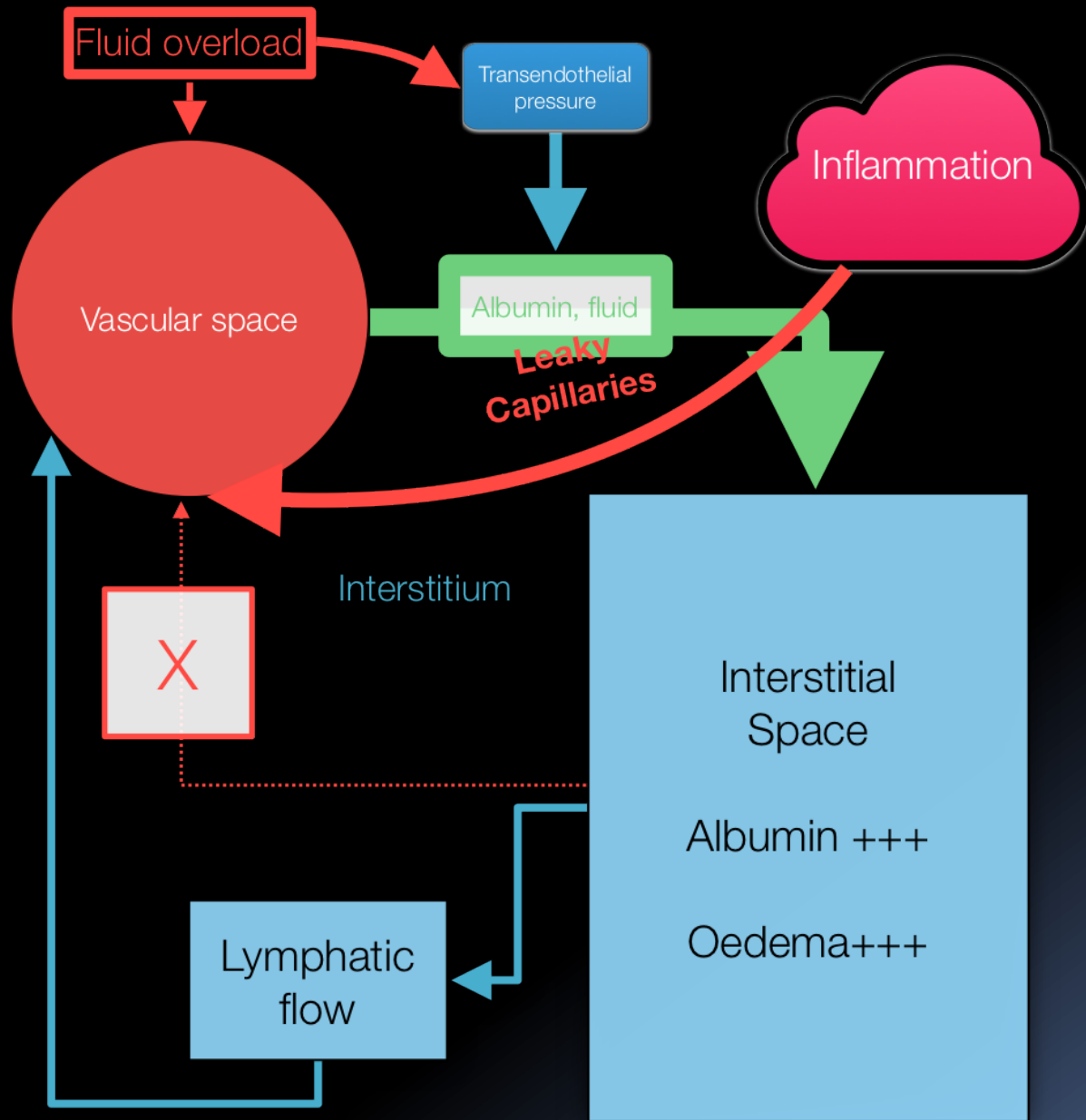


# Daily requirements

- In “normal” humans:
  - Water:  $25 - 35 \text{ ml kg}^{-1} \text{ day}^{-1}$
  - $\text{Na}^+$ ,  $\text{K}^+$ :  $1 \text{ mmol kg}^{-1} \text{ day}^{-1}$
  - Fluid balance:  $1.75 - 2.75 \text{ litres day}^{-1}$
- 1 litre of N-saline is  $154 \text{ mmol l}^{-1} \text{ Na}^+$
- In sepsis and trauma, colloids should be more effective than they appear to be.

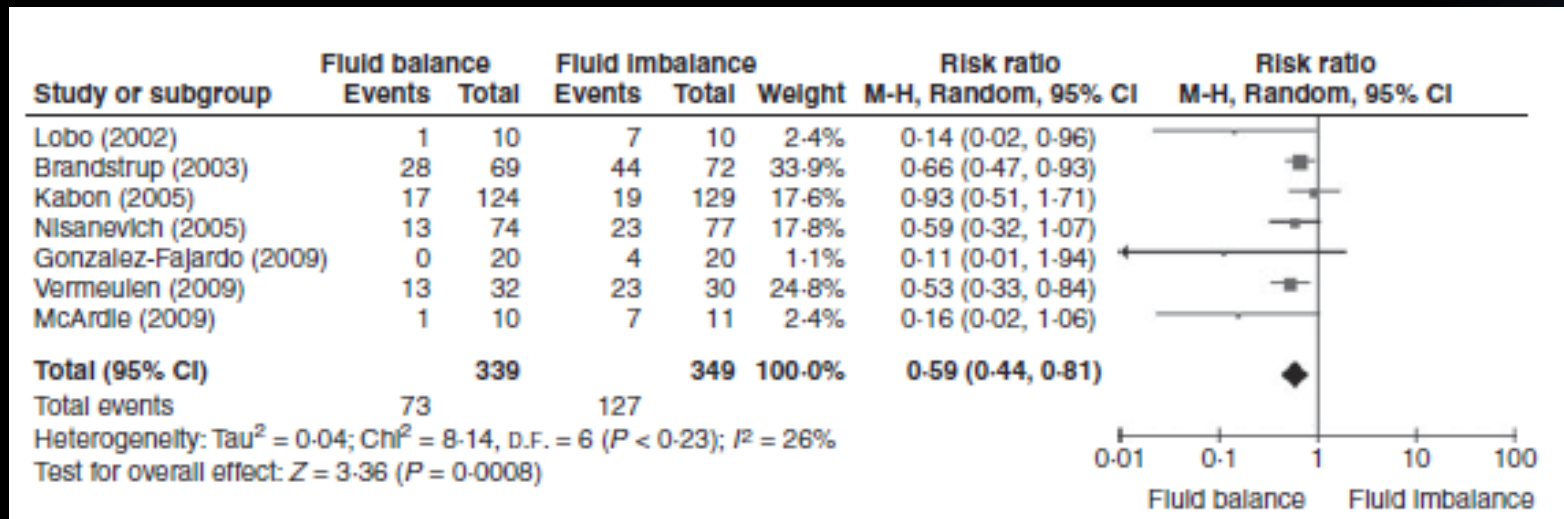






# Fluid balance vs. Fluid Imbalance

- All complications:
  - Fluid balance vs. Imbalance

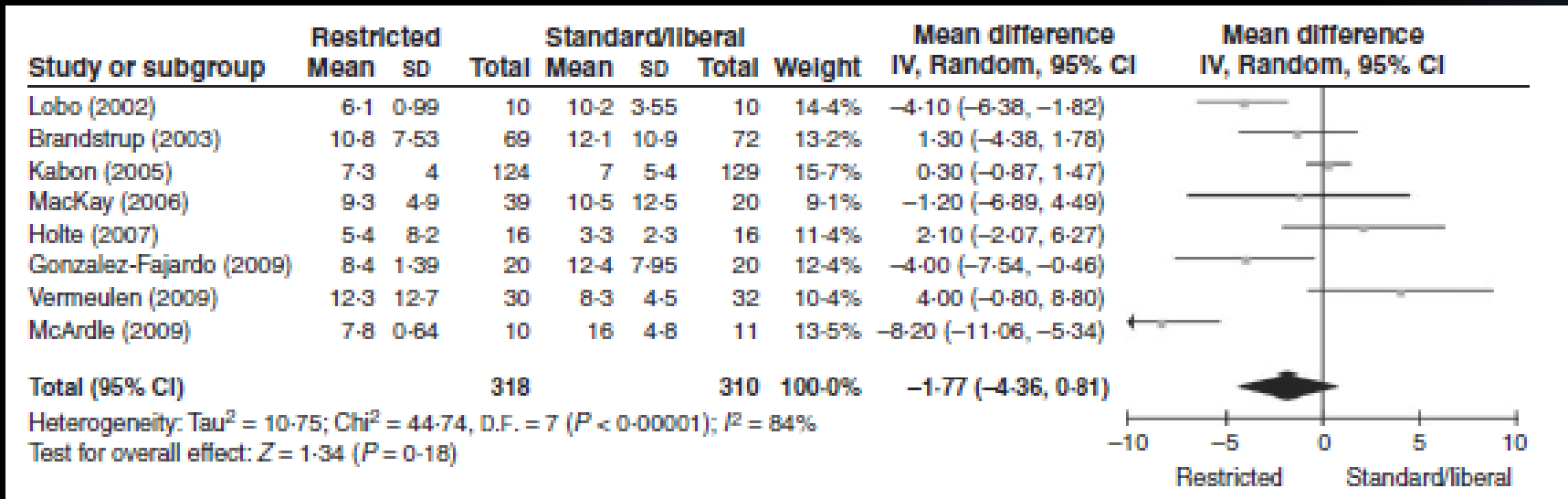


Varadhan K.K., Lobo DN. A meta-analysis of randomised controlled trials of intravenous fluid therapy in major elective open abdominal surgery: Getting the balance right.

Proc Nutr Soc 2010;69(4):488-498.

# Restricted vs. Unrestricted Fluids.

- Length of stay:
  - Restricted vs. Standard / Liberal

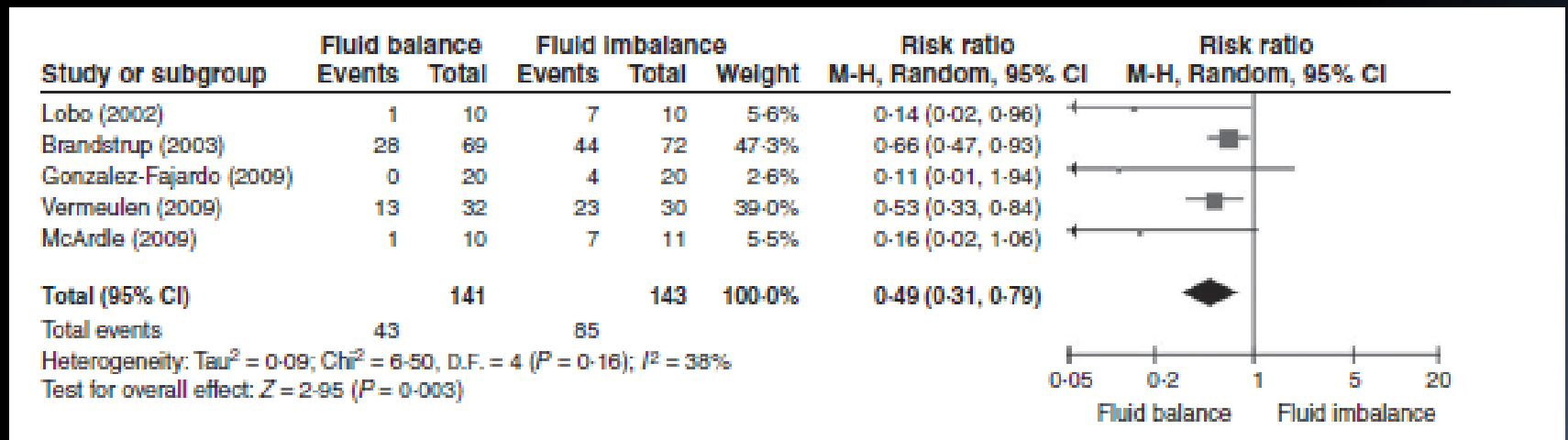


Varadhan K.K., Lobo DN. A meta-analysis of randomised controlled trials of intravenous fluid therapy in major elective open abdominal surgery: Getting the balance right.

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# Saline based regimens

- All complications:
  - Fluid balance vs. Imbalance



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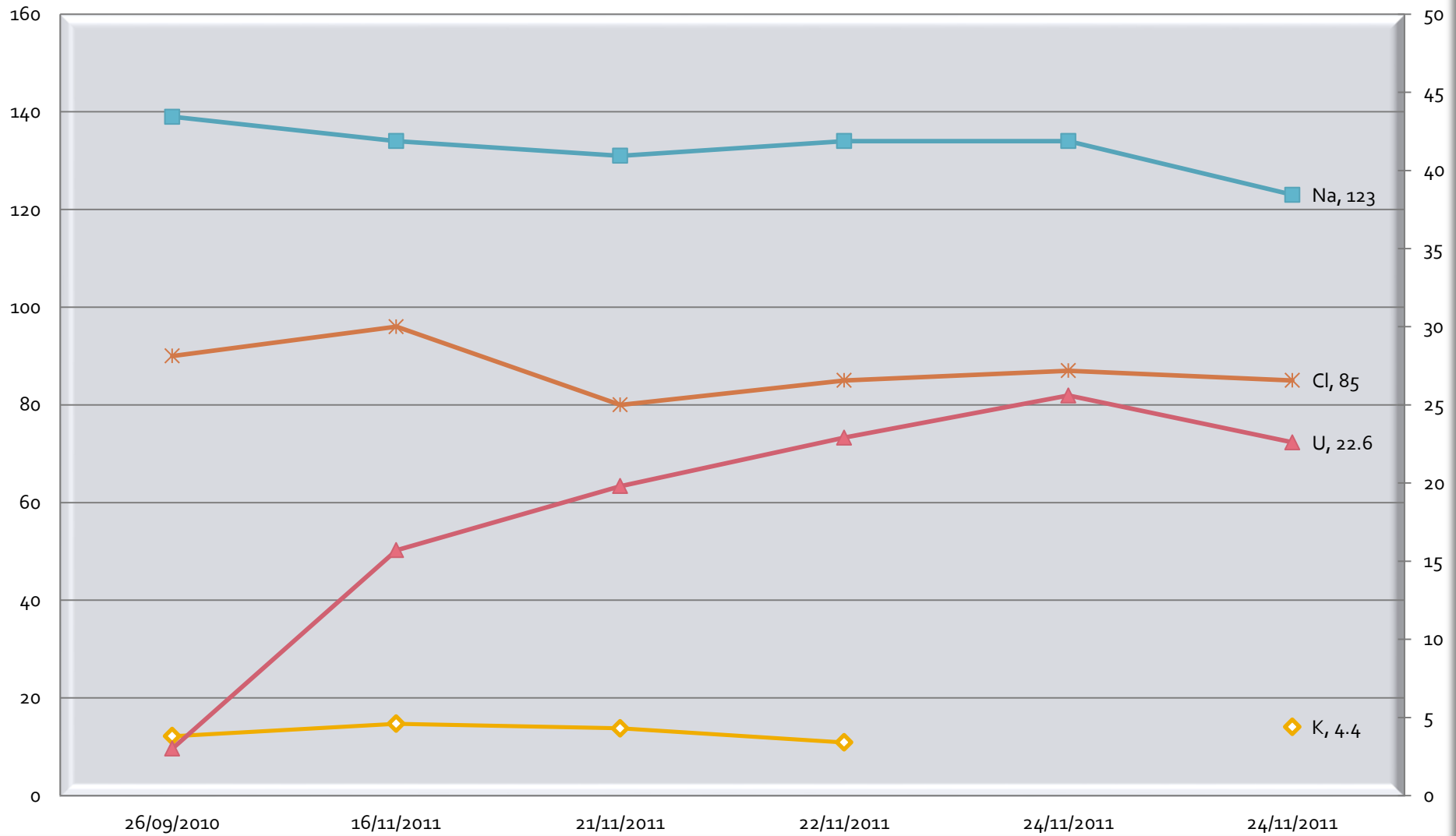
Proc Nutr Soc 2010;69(4):488-498.

- *"However, when the fluid regimens were reclassified and patients were grouped into those who were managed in a state of fluid 'balance' or 'imbalance', it was clear that those who were in a state of fluid balance had 59% fewer complications and a 3.4 d shorter length of hospital stay than those who were in a state of fluid imbalance."*

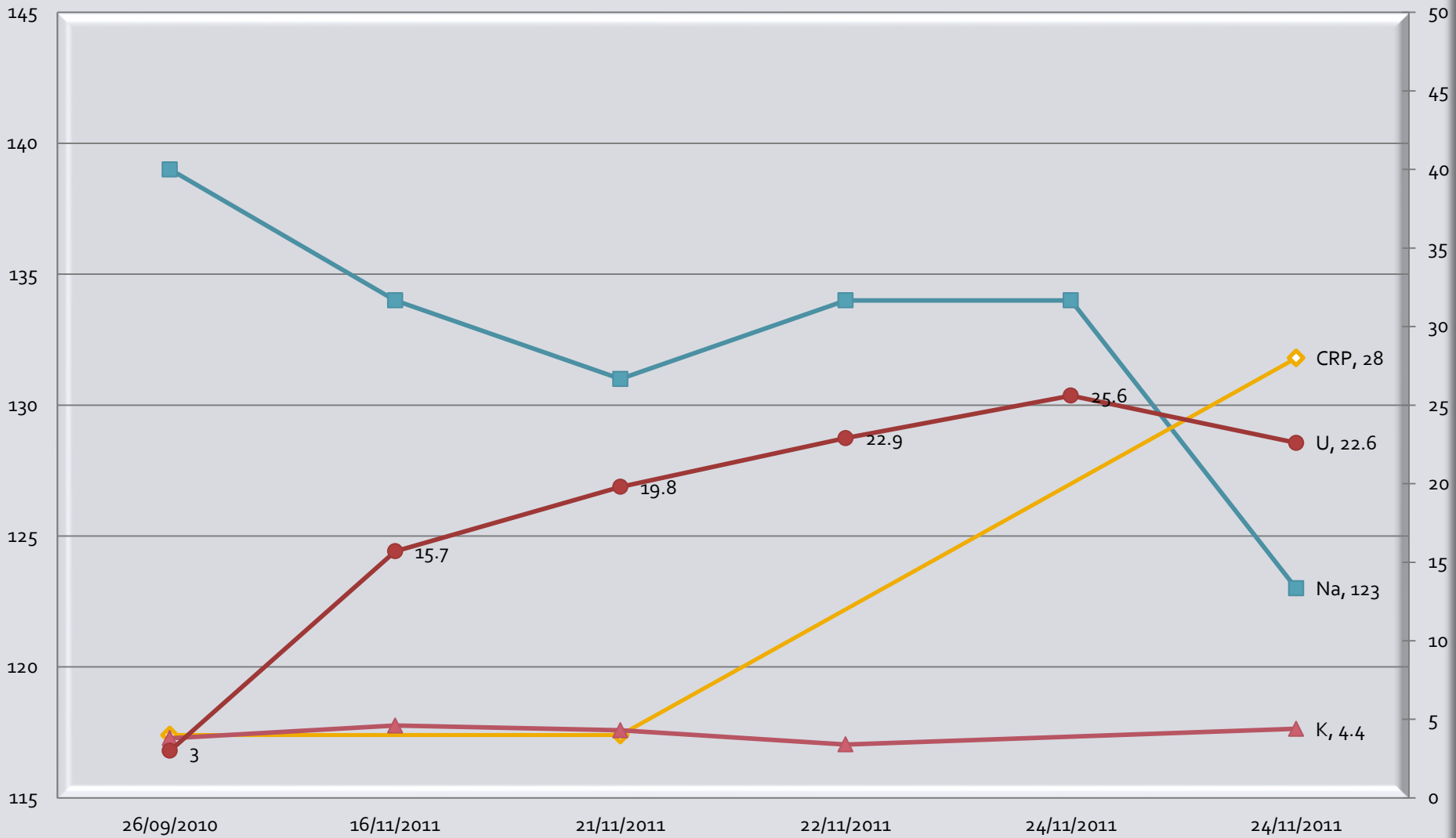
# Nutrition

- Low Albumin carries a poor prognosis.
- Albumin is a marker of inflammation not nutrition.
- The acute inflammatory response is associated with catabolism.

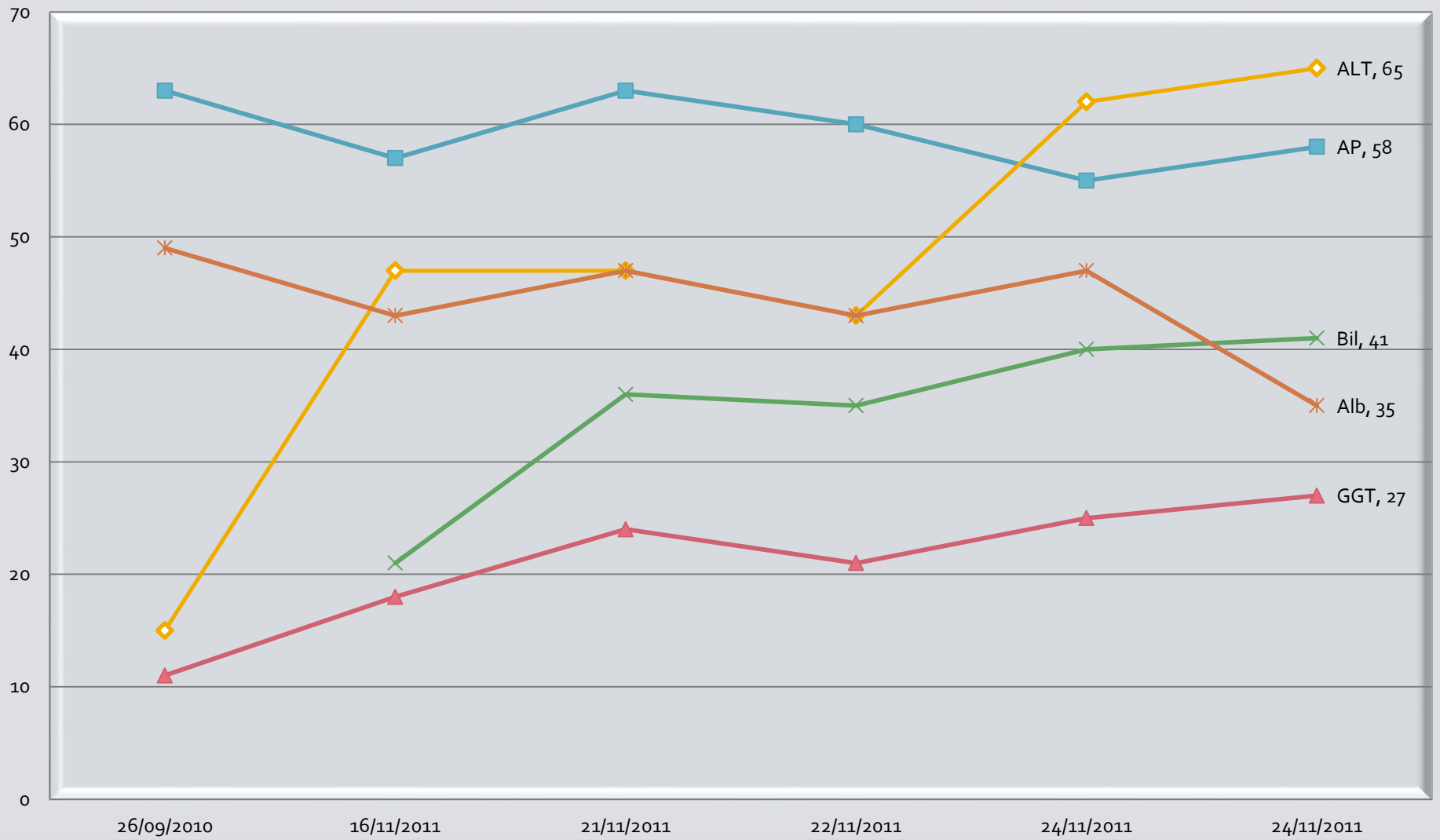
# U & Es



# U & Es + CRP



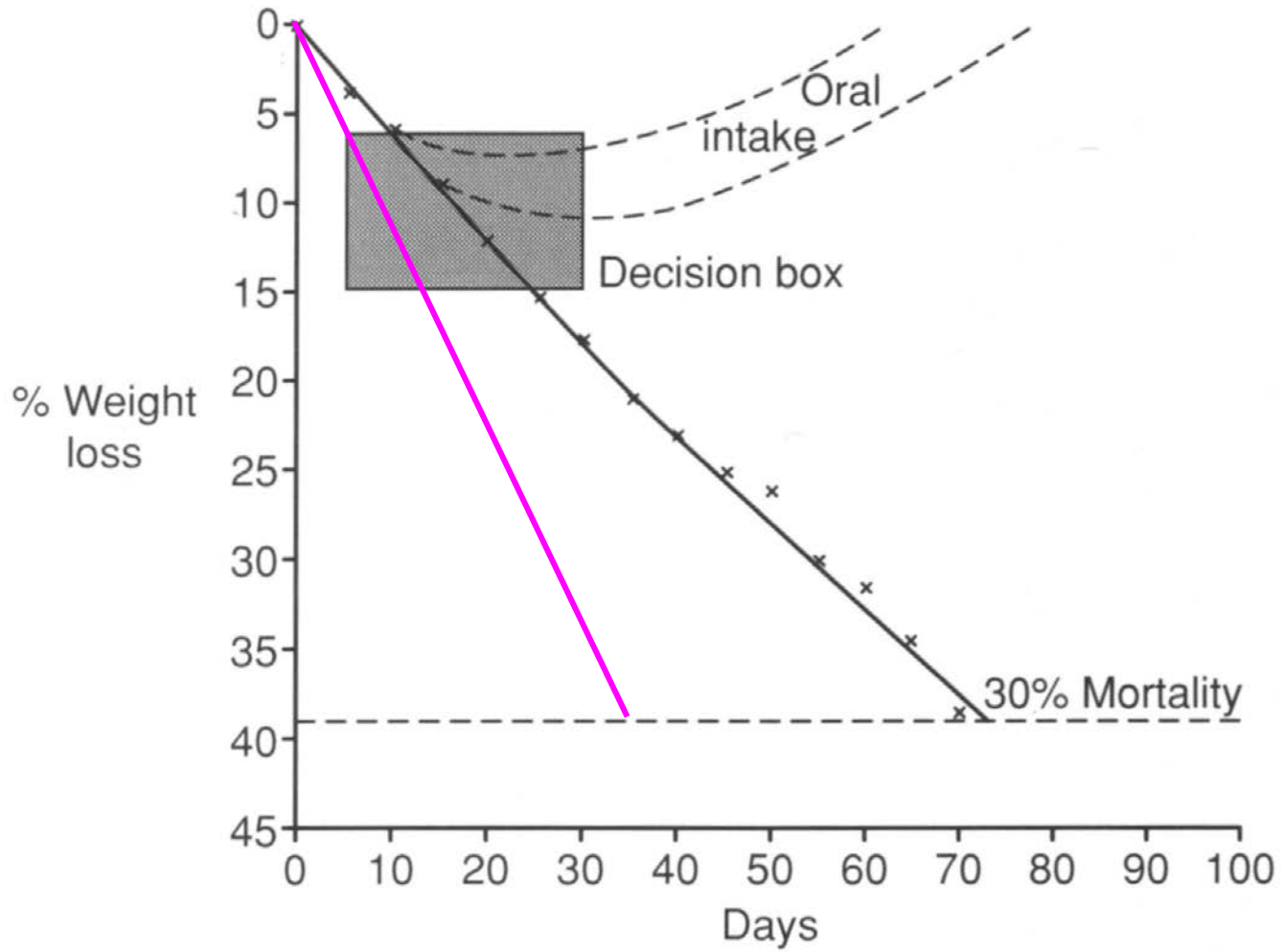
# LFTs + Alb



# Malnutrition and Albumin.

- Patients with uncomplicated anorexia nervosa usually have a normal CRP and albumin.
  - Remain normal up to a few hours before death.





# Post operative Ileus.

- Is by definition a failure to regain oral intake.
- Is by definition a form of intestinal failure:
  - Usually Type 1
  - May sometimes extend into Type 2
- Nutritional failure is often hidden.
  - Oedema
  - “Adult Kwashiokor”

# Post operative Ileus.

- Early nutritional support:
  - Buys time
  - Can reduce the speed of decline in nutritional status
  - Has beneficial effects separate from weight gain:
    - Improved muscle strength
    - Improved psychological well being
    - Better wound healing
- Has to be prescribed effectively:
  - Avoid hyperglycaemia
  - Avoid fluid overload.

# Summary

- In most circumstances POI is predictable and preventable.
- Its association with the acute inflammatory response means that it is often part of a more complex picture.
- Careful fluid balance and early nutritional intervention are important.

- *About suffering they were never wrong,  
The old Masters: how well they understood  
Its human position: how it takes place  
While someone else is eating or opening a window or just  
walking dully along;*
- *W H Auden, Musee des Beaux Arts.*