CRITICAL CARE

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Elective report

Elective dates: 07/05/13 - 07/06/13
Elective supervisors: Professor Hinds/Professor Watson
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My elective in critical care was split between the ITUs at St Bartholomew's and Homerton University Hospitals.

My objectives included the following:

1. Describe the case mix you encountered on your elective and discuss how and why this was or was not what you expected.

- The case mix was extremely different at both of the ITUs I spent time at. The ITU at Barts was mainly occupied by patients who were recovering from cardiac surgeries like valve replacements and coronary artery bypass grafts. Additionally, cases from general theatres or high-risk patients from other parts of the hospital would occasionaly stay on the unit e.g. a patient who had undergone a bilateral adrenalectomy, or a patient with a gynaecological malignancy.
- At Homerton University Hospital, the ITU was comparable to a district general hospital: overdoses, diabetic ketoacidosis, head injuries and out of hospital cardiac arrests.
- I was surprised by how specialist the ITU at Barts was, but expected the wide range of conditions I encountered during my time at Homerton.

2. Describe the pattern of health provision and contrast this with other European countries and the USA.

- At the time of writing, health provision in the UK is by the NHS and is free at the point of delivery.
- In France, healthcare is provided using a national health insurance system. The government refunds between 70 and 100% of healthcare costs.
- The USA provides healthcare via a private insurance model. It therefore does not guarantee access to healthcare for its population.
- Interestingly, the USA spends more than any other country on healthcare per capita, yet has the lowest life expectancy when compared to equivalent countries. Conversely, France provides close to the best healthcare in the world according to the World Health Organisation. If the NHS as it is will cease to be a viable option, perhaps a system similar to that used in France should be tried.

3. What was the most difficult case you dealt with and how would you do things differently in future?

- The most emotionally difficult case I dealt with was a patient who had ischaemic colitis and remained on the unit for over 50 days. The patient was obviously depressed because they were having near-constant diarrhoea complicated by decreased anal tone and subsequent excoriation around the anus. When the patient's NG feed was stopped and the diarrhoea ceased, the improvement in the patient's mood was huge. Therefore sometimes, in order to keep a patient motivated and thus increase their chances of recovery, divergent thinking may be required. For really ill patients, much thought must be placed into overcoming the barriers to their recovery. Inadequate solutions (where a better solution could exist) should not be tolerated.

4. How has this placement impacted on your personal/professional development goals? Reflect on a case that has changed how you will practice medicine in the future.

- This placement has added to my interest in Critical Care Medicine. I feel that it is likely I will apply for ACCS (Anaesthesia) or ACCS (Intensive Care Medicine) should such an option exist when I am applying. I feel that critical care marries the practical aspects of anaesthesia with the physiological understanding and complexity of acute medicine and both of these qualities appeal to me.
  I feel every case I was a part of has changed how I will practice medicine in the future because of the approach I have developed as a result of seeing how the critical care team assessed patients. Assessing each of a patient's systems individually means that one won't miss anything out and will 'cover all the bases' when crafting a management plan.

Over the course of the 5 weeks I wrote 2 reports, one about acute kidney injury (AKI) and the other regarding lactate. Furthermore, I produced a presentation on a case of acute respiratory distress syndrome (ARDS), with the slides included on the following pages. Other learning objectives are listed below.

1. To increase personal understanding of the pharmacology associated with agents commonly used in critical care.

- I read about induction agents and focused on propofol due to its prevalence in both anaesthesia and critical care.

2. To revisit the pathophysiology of common critical illnesses

- I specifically investigated AKI, sepsis and ARDS.

3. To understand the evidence base behind key management protocols

- I looked at the evidence behind protocols for AKI, sepsis, ARDS and chylothorax.

4. To appreciate the importance of the multidisciplinary care provided to critically ill patients

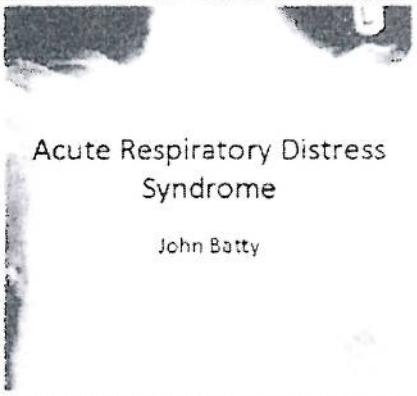
- The ITU nurses look after the patient 24 hours a day and are integral to the functioning of the ITU. The outreach team try and prevent admissions to ITU, or help expediate admissions if required. Physiotherapists help to wean patients off ventilators and try and reduce the incidence of, or overcome, critical care polyneuromyopathy. Radiographers work to image patients for many reasons, including diagnostic X-rays or images that confirm the correct placement of lines. Dieticians provide advice on feeding patients using TPN or NG feeds. Porters help transfer patients to the CT scanner and to wards. Other clinicians assess patients using specialist knowledge. Intensivists help correct and maintain the physiology of the patients and construct management plans to aid recovery.

5. To be familiar with the ethical considerations associated with end of life care

- There are many ethical considerations to do with end of life care and I feel that the 5 weeks I have spent on ITU has shed some light on this vast issue that takes many years to get to grips with. If I have difficulty in the future with such issues, I think it important to speak with the patient if they are able, speak with the next of kin and speak to colleagues to arrive at a decision that benefits the patient in a way that the medical team are comfortable with. This is easier said than done, but with careful consideration and effective communication a mutually.agreeable situation should be achieved.

6. To be able to recognize the critically ill patient

- Due to my time spent with the outreach nurse and the time on the unit, recognizing critically ill patients has become easier. Extreme shortness of breath, changes in skin pallor and different postures are some indications of a critically ill patient.



Acute Respiratory Distress Syndrome

John Batty

Background

- Mr AD
- 51 M
- Worked in Laboratory at Royal Free Hospital
- Gout -> colchicine PRN
- Smoker: 4/day for 30 years = 6 pack year Hx
- Spouse visa – divorced from wife in Dec 2012 – she had initiated proceedings to get this overturned

Pre-admission

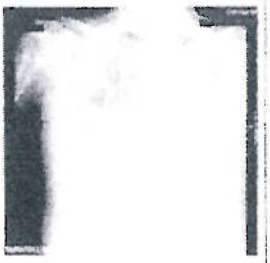
- January: Cough, SoB & weight loss
- February
  - Chest clinic: Impression – bilateral pleural effusions ? TB/malignancy
  - CT report confirmed pleural effusions. Abdominal changes ?peritoneal carcinomatosis or malignant peritoneal mesothelioma
- March
  - Pleural tap fluid: exudate, awaiting TB culture. Referred to surgeons for biopsy
  - Listed for a diagnostic laparoscopy

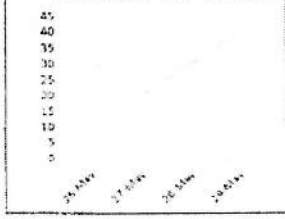
Post-admission

- 22/3 Admitted for a diagnostic laparoscopy of the omentum/ peritoneum as a day case.
- Kept in overnight for increasing abdominal pain
- Haematemesis overnight
- 24/3 O/E: Systolic BP 60s peritonism.
- ABG: pH 7.29 HCO$_3$ 17
  PaCO$_2$ 4.6 BE -9
  PaO$_2$ 13.7 Lactate 5.7
- Exploratory laparotomy
  - Perforated small bowel -> resected -> end to end anastomosis
  - Faecal contamination
- ITU post operatively

Natural history

- 25/3: ↓air entry at the bases
- 26/3: ↓air entry at the bases
- 27/3: ↓ basal crepitations
- 28/3: ↓ basal crepitations + transmitted sounds in the mid zones
- 29/3: Improved transmitted sounds





ARDS - definition

- "... A type of acute diffuse, inflammatory lung injury, leading to increased pulmonary vascular permeability, increased lung weight and loss of aerated lung tissue.
- The clinical hallmarks are hypoxaemia and bilateral radiographic opacities, associated with increased venous admixture, increased physiological dead space, and decreased lung compliance." [1]
- Primary vs. secondary

ARDS – Berlin classification

- Mortality: 20%, 41% and 52% respectively

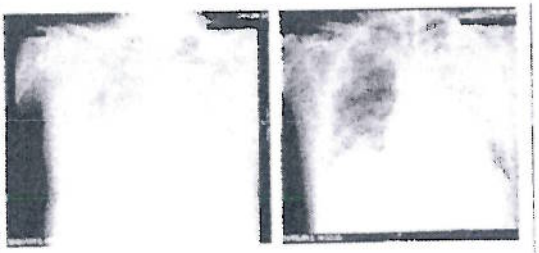
ARDS – Ventilatory Mx

- Low tidal volumes (6 mL/kg)
- Plateau pressures of ≤ 30 cmH_2O
- PEEP (+titration)
- Recruitment manoeuvres [2]
- High frequency oscillatory ventilation [3-4]
- Permissive hypercapnia [5]

ARDS – adjunctive therapies

- Prone positioning in severe ARDS confers significant survival benefit [6-7]
- Conservative fluid balance [2]
- iNO transient benefit but may be harmful [8]
- ECMO (specialist centre beneficial) [9-12]
- Neuromuscular blockade beneficial [11,13-14]

Resolution of ARDS in Mr AD



Currently

- CT scan: multiple intra-abdominal collections
- Results of biopsy: likely TB
- 3 x operations to remove collections, change dressing and close abdominal wound

Summary

- Worrying condition with high mortality
- Primary or secondary
- Management strategies involve ventilatory and adjunctive measures