

SASA 2014

Annual Congress of the South African Society of Anaesthesiologists,

Sun City, March 14-19 2014

Ross's Rough Notes

Please note that these notes are taken during the lectures at high speed and thus are neither complete nor comprehensive. I try to get the gist of the messages, and the bits that I find most valuable. There are almost certainly errors and they should be attributed to me and not the speakers. Please feel free to share the link if you find them useful.

Refresher Course, Day 1

Confined Space Intubation – Ross Hofmeyr, University of Cape Town

- My talk is available online at www.wildmedic.co.za/presentations A review article on the subject is in press, and I'll post the link when it is available.

Evidence-based Anaesthesia – John Carlisle, NHS

- Combining research with clinical experience, in the framework of the patient's context.
- Find it -> Interpret it -> Communicate it
- Asking the question: **PICO** - Population, Intervention, Comparison, Outcome
- You'd need to read 95 papers a day just to keep up with randomised controlled trials published across the medical literature.
- "Best" evidence depends on the type of question
- Systematic reviews are based on a formal system; meta-analysis pools the actual numbers of the individual trials
- Cochrane publish the protocol for the review before it is begun
- Beware confusing relative risk and odds ratios

Cardiopulmonary Interaction – Justiaan Swanevelder, University of Cape Town

- We cannot influence cardiac or respiratory function independently.
- Ventricular interdependence is well describe but underappreciated.
- Pressure-volume loops are an effective way to understand the relationships
- The left side of the heart can tolerate increases in afterload, but the right ventricular fails rapidly if pressures are increased quickly.
- As long as the pulmonary pressures/resistance stays low, the patient can survive well with a single ventricle
- Hypoxic pulmonary vasoconstriction increases pulmonary vascular resistance, but despite the 'wonder drugs' there is little we can do once the right ventricle is failing

- Increased airway pressures and volume (see Pinsky et al Am Rev Resp Dis 1992;146:681-7):
 - Decreased preload on left and right sides
 - Increased afterload on RV; decreased compliance on LV
 - Reduced RV contractility; variable effects on RV
 - Compression of heart in the cardiac fossa
- PEEP has variable effects
- Numerous clinical examples with echocardiography provided

Anaesthesia for Space Travellers – Johan van der Walt, University of Cape Town

- Brief review of the history of the space race – the governments of the world are taking a back seat, and private enterprise is now running in the lead
- Virgin Galactic plans to have paid low earth orbit flights departing soon
- We are inevitably going to see an increase in space travellers needing anaesthesia, either on their return, or later in orbit
- Risks to our physiology are still somewhat unknown and exploration is continuous
- Greatest risk to astronauts on extended missions is still trauma
- Zero gravity makes out endothelium more vulnerable to stress.
 - ANP, NO and Mg are decreased, with impaired angiogenesis.
 - Decreased diurnal blood pressure variation with progressive hypertension
 - Mg physiology impaired, influencing >300 enzymatic processes
 - Decreased EPO levels leading to anaemia
- Autonomic dysfunction with orthostatic hypotension
 - Cephalad fluid shift with subsequent volume constriction
 - Syndrome of inadequate sympathetic response
 - Alteration in alpha-receptor distribution -> down-regulated in space
 - Baroreceptor reflexes which are altered/decreased
 - Neuraxial anaesthesia could be a problem just after return
- Cardiac atrophy caused by microgravity environments
- Decrease in CVP due to cephalad shift of fluid, causing diuresis
- Plasma volume reduction = Class 1 ATLS haemorrhage before any bleeding has even occurred!
- Potential airway and ventilation difficulties
- Increased half-lives and bioavailability of drugs due to physiological changes
- Many potential causes of trauma in space...
- Fluids in bags and vials will separate and form foam
- Could suspended animation be the future paradigm in space (and on Earth)?

Myocardial Injury after Noncardiac Surgery - Bruce Bickard

- Landmark paper published recently – Anaesthesiology 2014;120(3)564-578 (Paper seems to be free access at the moment)
- 85% of patients suffering perioperative cardiac injury are asymptomatic (and thus missed)
- VISION study undergo – 40000 patients >45yrs requiring non-cardiac surgery with a night in hospital. Sufficient power reached after 15000 patients!

- This constitutes a 'new' diagnosis – MINS (Myocardial Injury after Noncardiac Surgery). Involves cardiac myocardial ischaemic injury, but not necessarily infarction.
- Outcomes are the same for patients with a peak TnT ≥ 0.03 , regardless of the presence or absence of symptoms (remember 85% asymptomatic).
- Myocardial morbidity is high – predicted 30-day cardiac mortality of 10%; composite mortality of ~20%
- So, should we monitor postoperative troponins?
 - Missed diagnosis (Asymptomatic)
 - 30-day risk of mortality
 - 3rd universal definition of MI
 - Potential for simple therapy
- Surveillance monitoring may prove cost-effective
- VISION signal has been shown in a number of prospective cohorts
- Rx includes statin, aspirin, ECG

Thermoregulation in Anaesthesia – Dan Sessler, Dept Outcomes Research, Cleveland Clinic

- Body temperature is tightly regulated within a tight range
- Three important regulatory responses are sweating, vasoconstriction or vasodilation and shivering
- The shivering threshold is a full degree below vasoconstriction
- Anaesthesia impairs thermoregulation, delaying response temperature changes. Decrease is non-linear with increasing concentration of IV anaesthetics and linear with volatiles.
- Temperature drop under anaesthesia is well documented and consists of three phases:
 - Initial rapid core drop (1-1.5°C) – internal core to peripheral redistribution (loss of vasoconstriction causes movement of heat from the core to the usually cooler periphery)
 - Slower linear decrease – heat loss to the environment exceeds production
 - Plateaux – patient becomes sufficiently cold (~34°C) to vasoconstrict again
- Neuraxial anaesthesia causes...
 - A central inhibition of thermoregulatory control (much like general anaesthesia). Magnitude is smaller, but cause is unknown.
 - Peripheral loss of regulatory mechanisms (due to neural control of sweating, vasoconstriction and shivering)
- Monitoring sites for accurate core temperature: Nasopharynx, oesophagus, tympanic thermocouple. No good: Anything infrared (too inaccurate); rectal (too slow).
- Consequences of hypothermia:
 - Each degree of hypothermia increases blood loss by 20%
 - Increased surgical site infection
 - Prolonged hospitalisation
 - Decreased drug metabolism
 - Enzyme dysfunction
 - Patient discomfort
- How do you keep people warm?
 - Thermal insulators (plastic sheets, surgical drapes, paper towels) – a single layer makes a 30% difference (trapping an insulating air layer against the patient)

- More layers does not work better
- Forced-air warmers work, work well, and are safe
- Warming fluids doesn't help to warm patients much, but it does definitely prevent heat loss. One unit of cold blood or one litre of room-temperature fluid cool the core by 0.25°C

Never trust a drug pronounced three different ways, or: Drug Errors in Anaesthesia - Rob Raw, Iowa

- Discovered vs. undiscovered
- Wrong drug, wrong dose, wrong label, wrong use, wrong solvent, wrong patient, wrong time, wrong...
- Many stories shared...all true and all scary ☹
- Communication: Verbally verify the action – Speak the drug
- RTARTS – Read The Ampoule, Read The Syringe
- Save the ampoules until the end
- We must collect data on drug errors – and this information must be protected/indemnified to protect the process from legal attacks.
- Drop-down lists are a frequent source of error on electronic administration/charting systems
- Regional anaesthesia additive errors are very serious but quite uncommon
- See: Cooper 2013 in Anaesthesia Clinics
- Also see: Llewellyn 2009 AIC (SA article about interns)

Paediatric Anaesthetic Emergencies – Jenny Thomas, Red Cross War Memorial Children's Hospital, Cape Town

- Emergency = serious, unexpected and often dangerous situation requiring immediate action
- Errors and emergencies happen to everyone, and do not imply a fault
- Crisis in practice: relying on intuition without knowledge leads to poorer outcomes. Learned and practiced algorithms produce a standardised response when a catastrophe occurs.
- “To err is human, to forgive, divine”
- Recognise as early as possible. Listen to your suspicions.
- Reduce distractions
- Adverse events should all be reported and recorded for learning purposes – ‘free lessons’
- SAJAA still publishes case reports – use this forum!
- At RXH, the burns theatre has the highest incidence of anaesthesia-related critical incidents
- Numerous cases presented.
- Severe hyperkalaemia is a consequence of both malignant hyperthermia and anaesthesia-induced rhabdomyolysis. Resuscitation may be prolonged and may require bypass/ECMO to maintain circulation while potassium is being removed.
- Ped Anaes Sept 2013 – entire issue on paediatric muscle disorders
- RXH perioperative workup protocol for muscle biopsy is working well and is available for dissemination/use at other centres.