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FROM THE JOURNALS

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A factorial trial of six interventions for the prevention of post operative nausea and vomiting

Apfel CC, Korttila K, Abdalla M et al (IMPACT investigators). *New England Journal of Medicine* 2004; 350; 2441-51

Patients often rate postoperative nausea and vomiting (PONV) as worse than postoperative pain. Untreated, about one third of patients will suffer postoperative nausea, vomiting or both. PONV often delays discharge from post anaesthesia care units and it is the leading cause of unexpected hospital admission after planned day case surgery.

High (at least 40%) risk of PONV is predicted by presence of 2 of the following risk factors:

- Female sex
- Non-smoker
- Previous PONV
- Previous motion sickness
- Anticipated requirement for postoperative opioid analgesic

In this trial 5199 patients who were at high risk of PONV were enrolled and randomised to receive 1 of 64 possible combinations of six prophylactive interventions. These interventions included ondansteron, dexamethasone, droperidol, propofol or a volatile anaesthetic, nitrogen or nitrous oxide and remifentanil or fentanyl. The primary outcome was nausea and vomiting within 24hrs of surgery, which was evaluated blindly.

Prophylaxis with each of ondansetron, dexamethasone or droperidol alone gave a relative risk reduction for PONV of 26 percent. Propofol reduced the risk (again relative risk reduction) by 19% and nitrogen (i.e. avoiding nitrous oxide) by 12%, thus the risk reduction achieved using total intravenous anaesthesia with propofol was similar to that seen for each of the antiemetics used alone.

In this study the antiemetic interventions employed were all similarly effective, so in a limited resource environment the least expensive should be used first.

- Prophylaxis is rarely warranted in low risk patients.
- Moderate risk patients may benefit from a single intervention.
- Multiple interventions should be reserved for high risk patients.

Manual displacement of the uterus during caesarean section
Kundra P, Khanna S, Habeebullah S and Ravishankar M. *Anaesthesia* 2007; 62: 460-65

Ninety ASA 1 and 2 women with term singleton pregnancies, scheduled for elective or emergency caesarean section under spinal anesthesia, were allocated to receive either manual displacement of the uterus or 15° left lateral tilt. Manual displacement was achieved by maximal leftward push applied by the right hand to the right upper border of the uterus to achieve a displacement of about 1.5 inches from the midline. Following subarachnoid block a median sensory level of T6 was observed in both groups.

The incidence of hypotension was significantly lower in the manual displacement group compared with the lateral tilt group (4.4% vs. 40%). The mean fall in systolic blood pressure was 29mmHg in the lateral tilt group compared with 20mmHg in the MD group.

The authors concluded that manual displacement effectively reduces the incidence of hypotension and ephedrine requirements when compared with left lateral tilt. This is an important finding for settings where access to vasopressor agents or intravenous fluids is unreliable.

Intra-abdominal pressure measurement: validation of intragastric pressure as a measure of intra-abdominal pressure
Turnbull D, Webber S, Hamnegard CH and Mills GH. *British Journal of Anaesthesia* 2007; 98: 628-34

Elevated intra-abdominal pressure and the adverse physiological effects that follow is termed abdominal compartment syndrome. This condition may present in critically ill patients following a variety of insults including sepsis, pancreatitis, retroperitoneal haemorrhage, bowel obstruction and trauma. Intra-abdominal pressures above 30mmHg may result in impaired organ perfusion. Persistent elevation causes bacterial translocation with subsequent multi-organ failure and death. Intravesical pressure measurement (measured via a catheter in the bladder) has been validated and remains the accepted estimate of intra-abdominal pressure for clinical use. Continuous pressure measurement kits are commercially available, however these are unlikely to be available in an environment with poor resources.

In this study 29 female subjects, scheduled for elective gynaecological laparoscopic surgery were recruited. Intra-abdominal pressure was measured via a 13mm laparoscopic trochar. Intra-gastric pressure was measured via an 80cm polyvinyl chloride balloon catheter inserted to a length of 60-70cm.

Measured intra-gastric pressure was always more positive than intra-abdominal pressure. Both showed linear correlation, with an estimated pressure difference between intra-gastric and intra-abdominal of ± 2.5mmHg.

The authors concluded that intra-gastric pressure, measured in this fashion, could be used for continuous intra-abdominal pressure measurement in normal individuals. Follow up studies in critical care patients are necessary to validate the accuracy of intra-gastric pressure measurement.

Which port in a storm? Use of suxamethonium without intravenous access for severe laryngospasm (editorial).
Walker RWM and Sutton RS. *Anaesthesia* 2007; 62: 757-59

This interesting editorial reviews past and present literature regarding the administration of suxamethonium via a route other than intravenous for the treatment of severe laryngospasm. The authors compare and contrast the efficacy of the intramuscular, intralingual and intraosseous routes.

In a previous editorial in 2001 it was suggested that there was no substitute for the intravenous route. This does not, however, offer a solution if intravenous access should fail in an emergency situation.

Intramuscular (IM) suxamethonium was first evaluated in the 1950's, when onset time was found to be predictable but consistently slower than the intravenous route. An IM dose of 3-4mg/kg slightly reduces onset time. Side effects related to intramuscular administration are rare and the authors

suggest that, where IV access is not available, the intramuscular route is the most favourable. It can be employed without leaving the airway, however one must have sufficient drug prepared beforehand to give the recommended dose of 4mg/kg.

The intralingual or submental route provides access to an extremely vascular muscle that retains blood flow to a greater extent when compared to skeletal muscle during times of reduced perfusion. A sublingual dose of 1.1mg/kg, gives an onset time of 75s (compared with 35s for intravenous and 210s for intramuscular), however there is a higher incidence of cardiac side effects. The submental route offers an alternative to this and enables the mask seal to be maintained. The benefits of the submental approach are marginal when compared to the intramuscular.

Despite the intraosseous route being widely accepted as a means of emergency circulatory access, administration of suxamethonium via this route is rarely reported. Two cases of rapid sequence induction in children in whom intraosseous access was established have been reported, with relaxation occurring 30-45s later, but to date there are no reports of its use in severe laryngospasm. Intraosseous access should be attainable within 60 seconds.

The authors conclude that in the absence of intravenous access any of the above routes may be considered as alternative means of suxamethonium administration. Choice of route may be dictated by personal experience and preference.

Successful use of pharyngeal pulse oximetry with the oropharyngeal airway in severely shocked patients
Yu H and Liu B. *Anaesthesia* 2007; 62: 734-6

One of the major drawbacks to standard oximeters is inaccuracy or inadequate signal and/or slow response from peripheral sites due to poor perfusion. The pharynx is highly perfused and lies in close proximity to the carotid artery, with relative preservation of blood flow in hypoperfusion states. Pharyngeal oximetry using the LMA and cuffed oropharyngeal airway (COPA), is possible with a side by side alignment of light emittor and sensor, rather than the opposing arrangement traditionally utilised in finger probes. This has previously been shown to be feasible and accurate in well-oxygenated anaesthetised patients.

The authors present two case reports, one patient with septic shock and one with haemorrhagic shock, where they used pharyngeal oximetry with the oropharyngeal airway (OPA) when conventional finger pulse oximetry had failed. In both cases a paediatric oximeter probe was attached to the superior surface of the OPA using adhesive tape, with care not to obstruct the optical components (see figure 1). Finger oximetry, pharyngeal oximetry and arterial blood gas analysis were compared at 30 minute intervals in both cases.

Pharyngeal oximetry gave a good waveform and oxygen saturation was 0-2% lower than the arterial samples, whereas the finger pulse oximetry was much lower or unobtainable.

The authors conclude that pharyngeal oximetry with an OPA is a simple, feasible and accurate method of assessing oxygen saturation in low perfusion states when finger/ear oximetry becomes unreliable or fails.

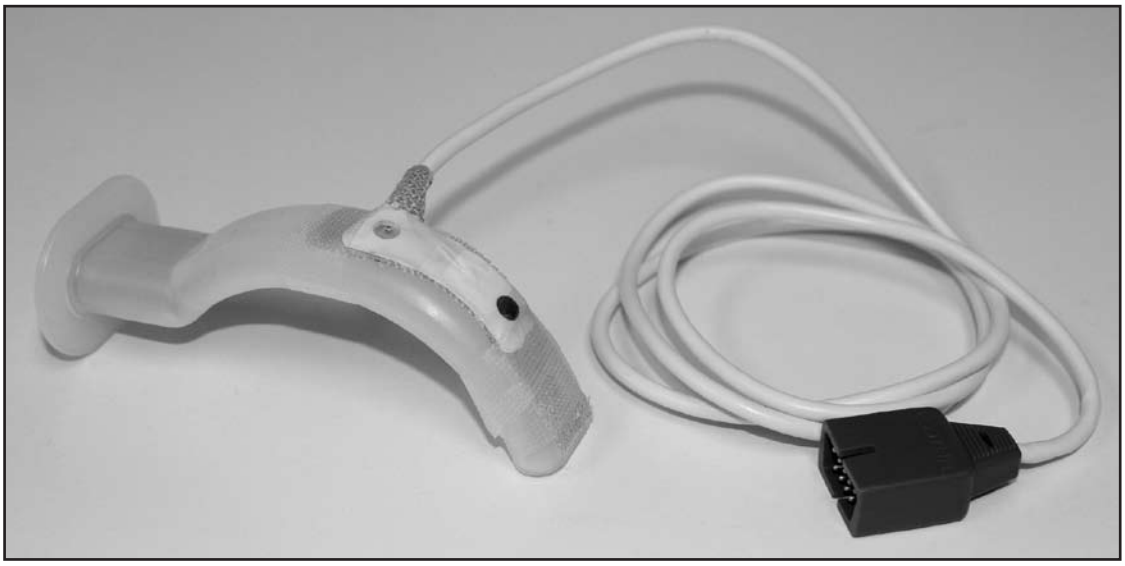

Figure 1: Pharyngeal pulse oximetry in shocked patients, using a paediatric pulse oximetry probe taped to an oropharyngeal (Guidel) airway.

Inflation with air via a facepiece for facilitating insertion of a nasogastric tube: a prospective, randomised, double-blind study
Gupta D, Agarwal A et al. *Anaesthesia* 2007; 62: 127-30

Nasogastric tube insertion in an anaesthetised patient is often straightforward, but at times can be time-consuming, frustrating and difficult. Many techniques to improve the reported success rate (66-68% on first attempt) have been described, and to date neck flexion would appear to be the most successful intervention. However, no technique is universally accepted. Techniques involving lateral and forward flexion of the head and neck may be unsafe in some circumstances. Interventions involving bougies or introducers may cause soft tissue trauma. Endoscopic techniques require expertise and expensive equipment that may not be available.

This paper describes a prospective, randomised study exploring the hypothesis that creation of positive pressure in the oropharynx, (by means of a facemask attached to a self inflating bag) facilitates insertion of a nasogastric tube.

160 consecutive adult patients were recruited and randomised into two groups. All were ASA status 1-2 and scheduled for elective surgery where nasogastric intubation would be required. Patients with anticipated difficult airways, morbid obesity, full stomach, nasal deformity, thyroid disease or history of abnormal bleeding were excluded. Anaesthesia was standardised, and all patients were paralysed and intubated with a tracheal tube.

In the study group, two positive pressure breaths (500-600ml) were delivered over 1-2s each, by means of a facemask attached to a self-inflating bag. This immediately preceded attempted passage of a nasogastric tube, previously placed as far as the oropharynx. In the control group, placement of the tube was attempted with the head in neutral position without inflation. A successful attempt was defined as smooth insertion of the tube without the need to pull it back. A blinded observer confirmed correct placement of the tube.

A success rate of 96% (75/78) was observed in the inflation group compared to 68% (54/80) in the non-inflation group ($p<0.001$).

Fibreoptic endoscopy in a selection of patients confirmed that generation of positive pressure (approx 25mmHg from the self inflating bag) was sufficient to cause opening of the upper oesophageal sphincter.

The authors conclude that facemask inflation is a successful intervention to facilitate insertion of a nasogastric tube, when performed immediately preceding an attempt. No particular expertise or expense is involved, the technique is simple and non-traumatic, and may be suitable to use in cervical trauma.

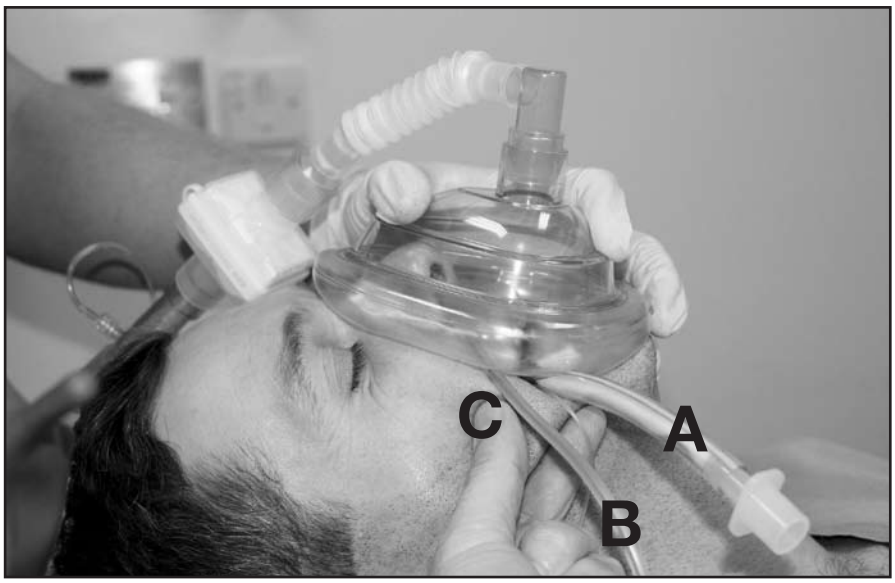

Figure 2: Air inflation via a facemask to facilitate nasogastric tube insertion.

*(**Editor's note:** I have tried this twice and it has been successful on both occasions. Note that patients should be anaesthetised and intubated (reducing the risk that any soiling of the airway will lead to aspiration into the lungs). It can be a technical challenge to obtain a seal with the facemask around the endotracheal (A) and nasogastric (B) tubes. This was more effective using an assistant to manipulate the patient's facial tissues to minimise the leak (C).*

Guidelines for the Management of Severe Local Anaesthetic Toxicity
The Association of Anaesthetists of Great Britain & Ireland 2007

The AAGBI has recently published guidelines for the management of local anaesthetic toxicity, incorporating the use of lipid emulsion ('Intralipid') as an infusion. These are available as a PDF file that can be accessed by the link: http://www.aagbi.org/publications/guidelines/docs/latoxicity07.pdf