Death from pulmonary aspiration continues to remain a risk, albeit small, for the population requiring surgery. Rates of death from pulmonary aspiration, taken from computerised medical records from the 70's and 80's in the USA are of the order of 1:40,000-50,000 procedures. However, several cases seen recently by the VSCC involve aspiration at induction of anaesthetic or postoperatively.

Historically the approach to risk reduction of pulmonary aspiration in surgical patients has been ad hoc, due in large part to the lack of strong evidence related to interventions employed to reduce pulmonary aspiration. There have been few randomised studies in this area, due in large part to ethical considerations with such trials.

Clinical practice guidelines

These guidelines will focus on recommendations shown to be worth implementing in the surgical patient identified as being at higher risk of pulmonary aspiration. Unfortunately approximately 50% of pulmonary aspirations occur in patients without an identifiable risk factor.

Risk factors are listed and available interventions are examined. An approach to anaesthesia in the higher risk patient is presented in the form of an algorithm.

1. Recognition of the patient at risk

Risk factors

Some common associations

Extremes of age, emergency procedures, the time of night (1800-0600 hrs), upper gastro-intestinal procedures, Caesarean section and obesity. Specific anaesthetic associations include the difficult airway and repeated instrumentation of the upper airway.

Specific conditions associated with increased risk of aspiration

- Pharynx, e.g. pharyngeal pouch
- Oesophagus, e.g. achalasia, gastro-oesophageal reflux disease
- Stomach, e.g. outflow obstruction due to disease or surgical
- Intervention, e.g. laparoscopic gastric banding, pyloric stenosis
- Jejunum and colon, e.g. malignant obstruction

General measures that can be employed in risk reduction

There are general measures that may be of assistance in reducing aspiration risk. Some of these measures may involve other specialities therefore early consultation if possible, will be required.

Tailored fasting regime.

Patients with a pharyngeal pouch for example, will require both a dietary alteration and mechanical measures to assist with emptying pouch prior to surgery.

Neuraxial anaesthesia

There is good evidence to show that neuraxial anaesthesia in an appropriate setting can reduce the risk of pulmonary aspiration. If a patient is medicated with anticoagulants these will need to be ceased at a suitable interval prior to anaesthesia

Antacid medication

Proton pump inhibitors or H2 blockers should be continued prior to surgery. If aspiration occurs the resulting injury depends on both pH and bile salts in the aspirate.

Position of patient

VSCC Guidelines / Practice Statements are intended to provide some broad statements of principle to facilitate the improvement and safety of surgical practice. They are not legally binding, nor do they provide a comprehensive analysis of every situation.
Obtunded patients should be nursed in the lateral position and transported to the operating room in a similar position. There is evidence to show that patients with a naso-gastric tube are best nursed supine in a semi-recumbent position.

**Insertion of a nasogastric tube**
The insertion of a nasogastric tube prior to anaesthesia should always be considered in a patient with significant gastric distension. The correct placement of a naso-gastric tube should be confirmed and its effectiveness assessed by a reduction in gastric volume. In some centres this is done using radiological techniques. There will be some patients, those with an impaired conscious state, in whom pre-operative insertion of a nasogastric tube is relatively contraindicated.

**The post-operative period**
It is important to remember that higher risk patients may continue to be higher risk in the post-operative period. Data shows that around 25% of aspirations occur in the post-operative period.

2. **Algorithm outlining specific management decisions for the patient requiring anaesthesia, at higher risk of pulmonary aspiration***

![Algorithm Image]

Key:  
DI Difficult intubation  
DMV Difficult mask ventilation  
NGT Nasogastric tube  
OGT Orogastric tube  
RSII Rapid sequence induction and intubation

*Chart reproduced with kind permission of Dr M Ramez Salem, Department of Anesthesiology, Advocate Illinois Masonic Medical Center, 836 West Wellington Ave, Chicago, Il 60657

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3. Advice highlights for surgeons.

- **Awake intubation** is an option for the higher risk patient, as noted from the above chart. It is an option that has been used very successfully in North America to prevent aspiration. Implementation of an appropriate anaesthetic technique is critical in many specific situations where aspiration is a potential complication. It is difficult to be dogmatic about the management of every patient at higher risk of aspiration. As always the tenet holds, every case should be managed on its merits.

- **Early anaesthetic consultation** allows time for the implementation of an appropriate strategy, and is important to minimise aspiration risk.

- **Early anaesthetic consultation and time for correction of coagulation abnormalities** may allow the use of regional anaesthesia.

- **An anaesthetist of adequate level of experience** should manage high risk patients.

- **Cricoid pressure during rapid sequence induction (RSI)** must be certain to ensure the compression is adequate and sufficiently maintained until the airway is secured.

- **Allow an increased fasting interval** where time permits. This is helpful for the patient without gastro-intestinal pathology or who has slow emptying of the gut, e.g. pharyngeal pouch.

- **Techniques to reduce gastro-intestinal tract fluid volume** may also include:
  
  - Pharmacological reduction of gastric acidity,

  - Mechanical - naso-gastric tube (note: although evidence supporting its efficacy is debated, non-use of a naso-gastric tube was associated with several poor outcomes seen recently by the VSCC)

4. Lateral Thinking:

Nursing an obtunded patient in lateral position prior to surgical intervention is important in preventing pre-operative aspiration. Nursing patients in the lateral position while they recover from anaesthesia and post-operatively is also important in minimising post-operative aspiration.

Reference:

VCCAMM Statement on Rapid Sequence Induction of Anaesthesia

VSCC Approved: August 2014

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