Overview of Supraglottic Airways

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Simplified classification: Based upon sealing site

- Peri-laryngeal sealing
  - Simple – e.g LMA, i-gel, iLMA
    - Extended e.g. LMA supreme
  - Directional e.g. ProSeal
- Base of tongue sealing
  - With oesophageal cuffs e.g. Combitube, LT, SLT.
  - Without oesophageal cuff e.g. CobraPLA™
  - SLIPA™

Aspiration protection mechanisms:

- Obstruction
  - Lower in oesophagus more effective than at entrance.
  - inflatable more effective than fixed volume
  - Combitube, LTS > ProSeal, LMA > igel, SLIPA
- Drainage
  - Effectiveness is dependent upon effective obstruction mechanism
  - Combitube, LTS > ProSeal > igel
- Storage
  - Effectiveness dependent upon storage capacity – independent of obstruction effect
  - SLIPA™ > Combitube, LTS > ProSeal, LMA, igel

Access to the trachea:

<table>
<thead>
<tr>
<th>Good</th>
<th>Fairly good</th>
<th>Poor</th>
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<tbody>
<tr>
<td>iLMA</td>
<td>ProSeal</td>
<td>Combitube</td>
</tr>
<tr>
<td>Air Q</td>
<td>LMA supreme</td>
<td>LT, LTS</td>
</tr>
<tr>
<td>LMA, igel</td>
<td>Cobra</td>
<td>SLIPA™</td>
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Strategy to achieve adequate ventilation when there is limited seal pressure

- Pressure support ventilation
- Pressure controlled ventilation
- Choice of optimal I:E ratio is 1:1
Avoiding complications in use of SLAs with particular reference to SLIPA™ safety features.

**Trauma to the airway**
- Wrong insertion techniques in relation to different SLA designs
  - Combitube – better to use laryngoscope.
  - Repositioning of pharyngeal cuff inflation airways.
- Opposing insertion techniques of LMA and SLIPA

**Aspiration protection mechanisms**
- Obstruction; Drainage tubes; Storage – effectiveness?

**Storage for aspiration protection**

Results of aspiration model lung with LMA (♦), ProSeal with drainage tube obstructed (×), ProSeal with 30 ml sec$^{-1}$ (■) and 15 ml sec$^{-1}$ ( ) and SLIPA (Δ) airway.

**Neuropraxias mechanisms**
- Hypoglossal nerve: is 1 mm from tip of hyoid bone.
- Recurrent laryngeal nerve at entrance to oesophagus
- Lingual nerve

Preventive strategies (more relevant to design than clinical application):
- Use smaller sizes (?practicality as there is already a limited seal pressure)
- Avoid high cuff inflation pressure with indiscriminate constant pressure
- Avoid local pressure at vulnerable sites

**Future improvements if SLAs are to advance:**
- Higher seal pressures
  - Limited by gastro-esophageal insufflation with higher seal pressures
  - Neuropraxia risk increases with high cuff pressures
- Epiglottic downfolding
  - Affects airflow and tracheal tube access
- Improved comfort and tolerance for application in the ICU?
- Suitability for wider application of instrumentation