Magill Medical Technology

SafeLM Sales Playbook v1.0

For Internal Use Only

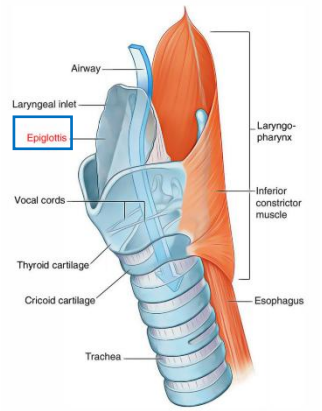
Magill Medical Technology Medical Team
1-13-2026

Contents

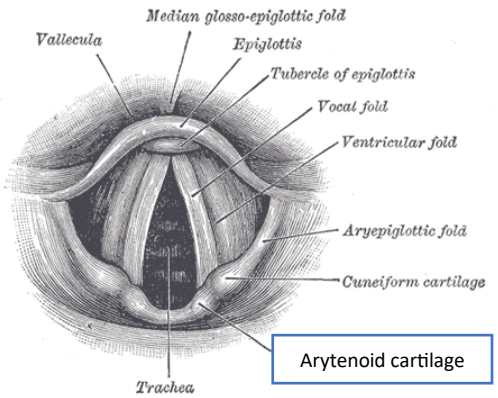
PART ONE

Ⅰ. AIRWAY ANATOMY

The Anatomy and Function of the Epiglottis



- **Anatomical Structure Characteristics：** The epiglottis is a flap of elastic cartilage is located between the base of the tongue and the entrance of the throat, shaped like a leaf, and covered with mucosa on the surface
- **Function:** Cover the throat entrance when swallowing to prevent food from entering the trachea, lift up to keep the airway open

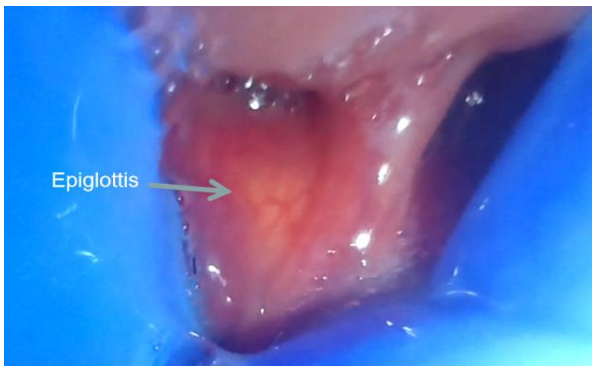


The Anatomy and Function of the Arytenoid

- **Anatomical Structure Characteristics：** A cartilage distributed in pairs at the posterior and upper part of the larynx, surrounding the glottis
- **Function:** Control the size of the glottic cleft and regulate the ventilation volume, one of the anatomical indicators for determining whether the laryngeal mask is placed correctly

The Anatomy and Function of the Glottis

- **Anatomical Structure Characteristics：** The glottis refers to the area composed of the vocal cords on both sides of the throat, which the starting point of the airway. Gas is exhaled from the lungs, passes through the lungs and trachea, and then reaches the larynx.
- **Function:** The impact of air flow causes the vocal cords to vibrate and produce sound. When swallowing, it can be tightly closed to prevent food from entering the lower respiratory tract. It keeps the airflow open when breathing.



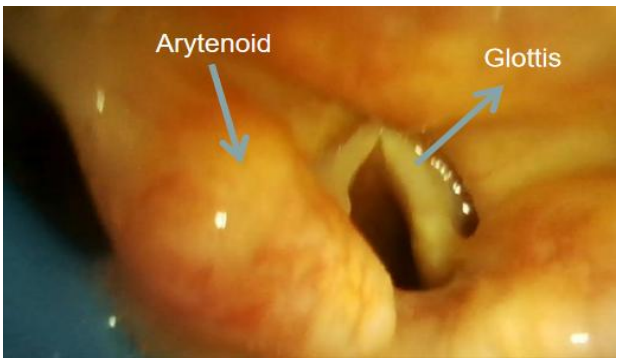
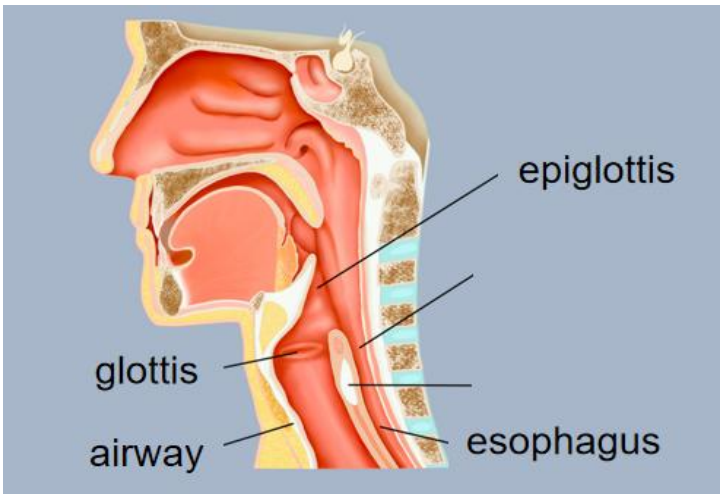


Figure 1. Real anatomical images of the Epiglottis, Arytenoid and Glottis under SafeLM

The Anatomy and Function of the Esophagus

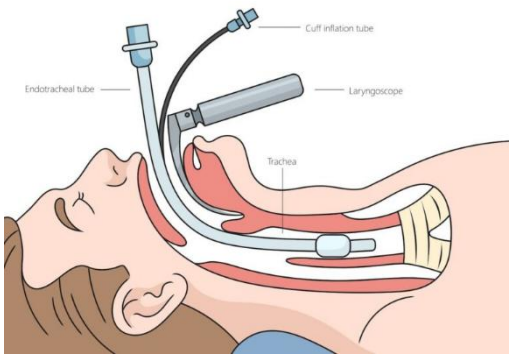


- **Anatomical Structure Characteristics：** The esophagus is a tube that connects the throat to the stomach. It is located in the neck and the back of the chest cavity, descending along the front of the spine and connecting to the stomach
- **Function:** Guide food from the throat to the stomach. The sphincter at the bottom of the esophagus prevents food from refluxing through the esophagus to the throat
- **The relative anatomical position relationship between the esophagus and the airway: The esophagus and the airway** both originate from the larynx and are in a closely adjacent anterior-posterior relationship at the neck. The trachea is located directly in front (anterior) of the esophagus. Air enters the trachea at the front through the larynx to lungs. Food enters the esophagus through the posterior esophageal entrance to stomach. The laryngeal entrance (epiglottis) closes during swallowing, guiding the food into the posterior esophagus and effectively preventing it from entering the anterior airway, otherwise known as aspiration.

Ⅱ. AIRWAY MANAGEMENT

Airway management refers to a series of clinical operations that ensure the patency of the patient's airway, maintain effective ventilation and oxygenation, and prevent aspiration through a series of preoperative evaluations, anesthesia techniques and interventional medical measures. The core lies in ensuring the supply of oxygen and the emission of carbon dioxide. Airway management is the primary link in maintaining life and is also associated with the highest and most common risks of anesthesia. Acute airway obstruction (blockage of the airway) can be fatal within minutes. For anesthetized or critically ill patients, effective airway management can prevent severe lung infections caused by aspiration. At the same time, it serves as the fundamental platform for implementing mechanical ventilation and advanced life support, running through all clinical scenarios such as emergency rescue, anesthesia, and intensive care. It directly determines the success or failure of rescue and the prognosis of patients. Air management is the core cornerstone of medical safety. **Laryngeal mask and endotracheal Intubation (ETT) are common airway management devices.**

Clinical Challenges with Using Endotracheal Intubation



- **Endotracheal Intubation** involves inserting a long, thin tube through the patient’s glottis and into the trachea using a laryngoscope. The insertion process is complex and muscle relaxants must be used. The patient may have a difficult intubation due to resistance of the laryngeal muscles or poor views of the glottis.
- The technical requirements are high and proficient intubation skills are required. It may cause airway

trauma (leading to sore throat, hoarseness) and contributes to slow postoperative recovery.

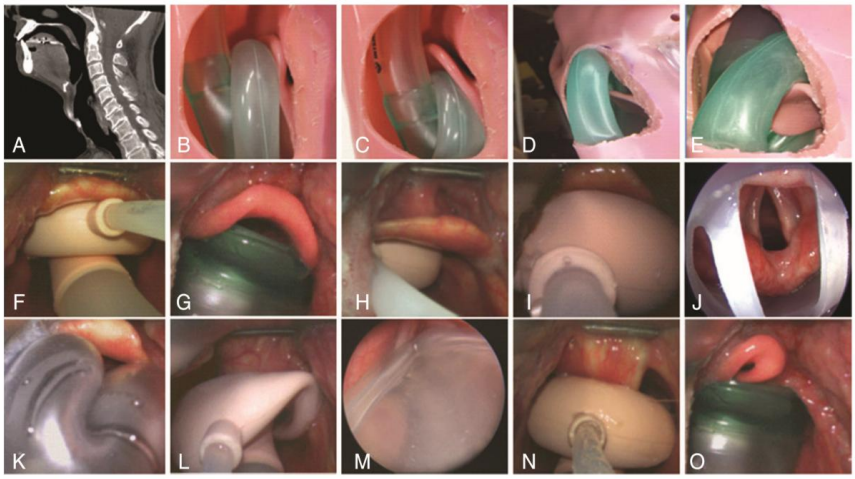
- Intubation may cause an increase in blood pressure and an accelerated heart rate. Extubation may cause laryngospasm (spasm of the larynx)

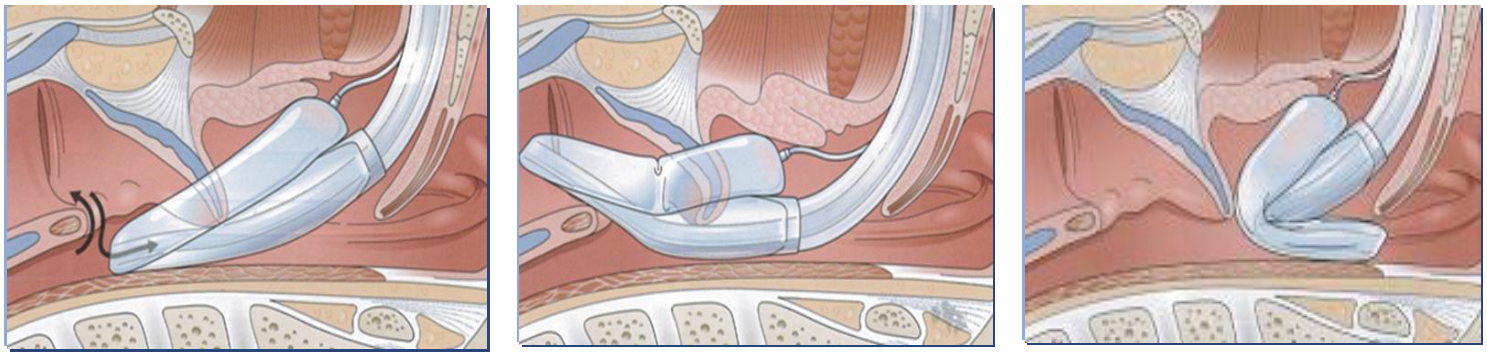
Clinical Benefits of Using a Laryngeal Mask Compared with ETT

- The laryngeal mask is simple, which can be directly inserted with a high success rate. No muscle relaxants are required for laryngeal mask insertion. It is suitable for patients with difficult airways.
- It does not touch the glottis and trachea, reducing the occurrence of postoperative sore throat and hoarseness, leading to a faster postoperative recovery.
- During the insertion and placement process, hemodynamic stability (stable blood pressure and heart rate) is maintained, making it suitable for elderly patients or those with cardiovascular disease

Clinical Challenges with Using a Laryngeal Mask

- Air leaking due to poor sealing
- Gastric regurgitation and aspiration
- Malposition occurs in 50%-80% laryngeal mask blind placement[1]





Insufficient Depth (15%) Glottic Placement (6%) Mask or tip fold over (3.4%)

Figure 2: Malposition of supraglottic airways

1. A. A. J. Van Zundert, Malpositioning of supraglottic airway devices: preventive and corrective strategies British Journal of Anesthesia 116 (5): 579 – 82 (2016)

Unique Benefits of SafeLM in Airway Management

- *Direct Visualization Eliminates Blindness*. SafeLM offers real-time video visualization of the glottic inlet and surrounding structures, removing the uncertainty and risk associated with blind insertion.
- *Significantly Reduces Incidence of Malposition*. Malposition rates for conventional LMAs are as high as 50–80% in some studies, often going undetected. With SafeLM, you can confirm and correct positioning visually, reducing misplacement and its consequences.
- *Consistently Higher Oropharyngeal Leak Pressures (OLP).* SafeLM achieves OLPs of 35–40 cm H_2O, outperforming standard LMAs (20–25 cm H_2O). This ensures superior seal integrity, especially under positive pressure ventilation or in high-risk surgical scenarios.
- *Enhanced First-Attempt Success*, especially in difficult airways. Visual guidance boosts first-pass success rates, minimizes multiple insertion attempts, and is particularly useful in limited mouth opening, abnormal airway anatomy, or restricted neck mobility.
- *Minimized Airway Trauma and Mucosal Injury*. Blind insertion risks epiglottic folding, soft tissue bruising, or arytenoid trauma. SafeLM's visual feedback reduces these risks, resulting in fewer post-op sore throats, hoarseness, or nerve injuries
- *Improved Safety in High-Intraabdominal Pressure Surgeries*. Surgeries like laparoscopy and steep Trendelenburg positions increase airway pressures. SafeLM maintains seal even in these cases, reducing conversion to endotracheal intubation.
- *Reduced Gastric Insufflation and Aspiration Risk*. A more effective seal around the glottis and prevention of malposition through video visualization helps prevent air from entering the stomach, reducing the risk of regurgitation and aspiration, especially in patients with GERD or full stomachs.

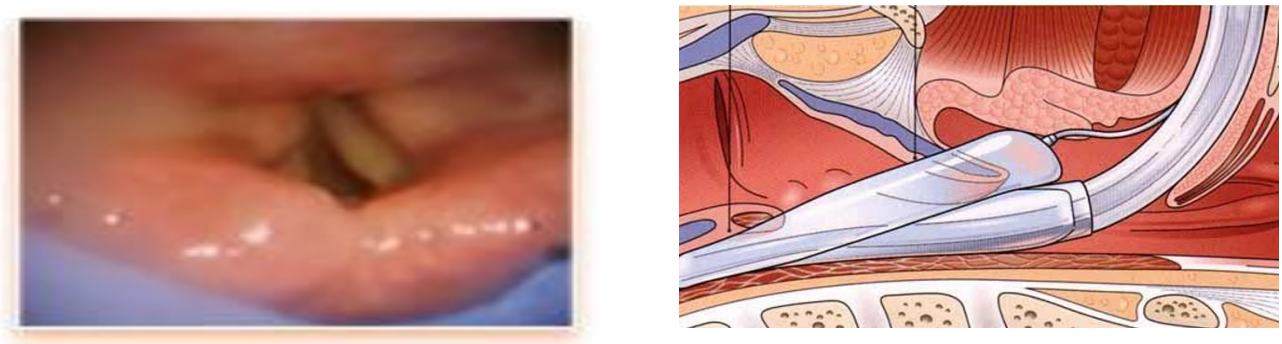


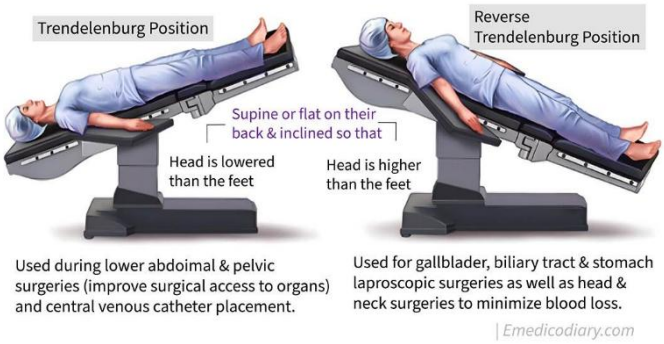
Figure 3. SafeLM accurately guide the placement position of the laryngeal mask.

Figure 4. SafeLM is suitable for laparoscopic surgery which have higher airway pressures

The Influence of Different Positions on Airway Management

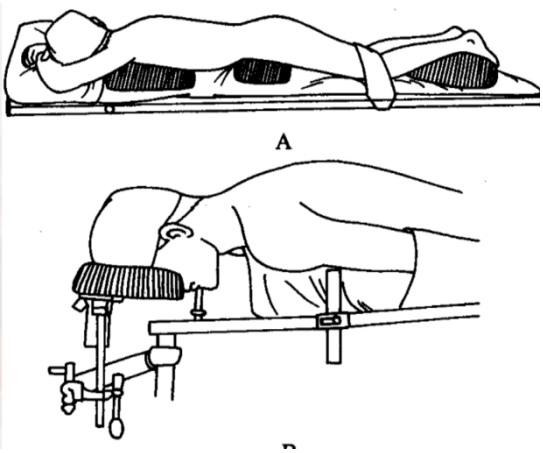
- **Lateral position:** Most anesthesiologists are accustomed to placing a laryngeal mask when the patient is in a supine position and then changing to a lateral position. The position of the laryngeal mask is prone to change when the position is placed. Use of a visual laryngeal mask can help to confirm laryngeal mask position after position change can ensure correct placement.

- **Lithotomy position:** Lithotomy position can increase the risk of reflux. This risk increases when intra-abdominal pressure rises. Clinical evidence shows that laryngeal mask anesthesia can also be safely and effectively used in lithotomy surgery.



- **Trendelenburg position:** Trendelenburg position may lead to the upward movement of abdominal contents, causing the diaphragm to rise, reducing functional residual volume and decreasing lung compliance, which may increase ventilation difficulties. At the same time, this position may promote gastric regurgitation and increase the risk of regurgitation and aspiration

- **Prone position:** In the prone position, the laryngeal mask is prone to displacement or disengagement due to gravity and pressure, resulting in a sharp decline in sealing efficiency and causing severe air leakage and insufficient ventilation. At the same time, the increase in intra-abdominal pressure significantly raises the risk of gastric regurgitation and aspiration. Therefore, laryngeal mask are usually regarded as a relative contraindication for prone ventilation.



Ⅲ. Annotation of key words for Anesthesia

Muscle Relaxants

- **Definition:** Muscle relaxants are a class of drugs that selectively act on N2 choline receptors on the endplate membranes of motor nerves, causing skeletal muscle relaxation by blocking the transmission of nerve impulses.
- **Function:** Muscle relaxants are mainly used to assist in general anesthesia to prevent the patient's muscles from moving during surgery, including the laryngeal muscles. They can help to reduce the depth of anesthesia and optimize surgical conditions, and are also used in scenarios such as mechanical ventilation. Muscle relaxants have no sedative, anesthetic or analgesic effects.
- **Side Effects：**

  1) **Allergic reactions:** Allergic reactions to muscle relaxants account for a relatively high proportion of perioperative allergic reactions, which incidence rate is 58/100,000.[1] Studies have reported 60%of perioperative anaphylaxis are caused by muscle relaxants.[2] Once perioperative anaphylaxis caused by muscle relaxants occurs, up to 20% of the patients experienced morbidity, including renal failure, cardiovascular complications, and neurological complications.[1]

  2) **Muscle relaxant residual effects**: Respiratory muscle weakness leading to hypoxemia (low oxygen) and hypercapnia (high carbon dioxide); muscle weakness in the throat; accumulation of secretions, obstruction of the upper respiratory tract, increasing the risk of reflux and aspiration; inability to cough, causing postoperative pulmonary complications.

  3) **Hemodynamic instability：** Bradycardia following succinylcholine[3]

Muscle Relaxant Antagonists

- **Definition :** Muscle relaxant antagonists are drugs used to reverse the effects of muscle relaxants after surgery or intensive care, helping to restore spontaneous breathing and muscle function.
- **Function:** Counteract the residual effects of muscle relaxants, accelerate postoperative recovery, and reduce the risk of respiratory depression (due to impact of muscle relaxants on the respiratory muscles that help us breathe)
- **Side Effects：**

  1) **Allergic reactions:** Hypersensitivity in response to *sugammadex* can occur, and its incidence rate is 0.33%.[1]

  2) **Muscle relaxant residual effect：** *Sugammadex* did not completely reverse the muscle relaxants, and muscle relaxation residual effects persisted after the operation, such as muscle weakness.

  3) **Hemodynamic instability：** Bradycardia is common side effects of *sugammadex.*

- **Cost:** Muscle relaxant antagonists can be expensive. The most commonly used drug, *Sugammadex*, can cost between USD100-200 per vial. Some countries may have generic versions which can be less expensive.

Reference Articles

.1. Pierre, d'Heudières,Cédric, Cirenei,Alexandre, Bourgeois et al. Mortality, morbidity, and impact on future anaesthesia after perioperative anaphylaxis related to neuromuscular blocking agents: an 11-year single-centre retrospective study.[J] .Br J Anaesth, 2025, 135: 1645-1653.

2. Charles, Tacquard,Julien, Serrier,Simon, Viville et al. Epidemiology of perioperative anaphylaxis in France in 2017-2018: the 11th GERAP survey.[J] .Br J Anaesth, 2024, 132: 1230-1237.

3. Kinjal M, Solanki,Tyler, Lipscomb,Efrain, Riveros Perez et al. Sudden Severe Bradycardia Induced by Propofol-Succinylcholine in a Healthy Adult Patient: A Case Report.[J] .Cureus, 2024, 16: e69207.

4. K C, Min,P, Bondiskey,V, Schulz et al. Hypersensitivity incidence after sugammadex administration in healthy subjects: a randomised controlled trial.[J] .Br J Anaesth, 2018, 121: 749-757.

Regurgitation and Aspiration

- **Definition:** The process in which substances in the stomach (gastric acid, bile, etc.) flow upward to the throat through the esophagus, and then due to the weakening or failure of airway protective reflexes (such as the contraction of the laryngeal sphincter and the closure of the glottis) during the patient's anesthesia, the stomach contents are inhaled into the trachea and lungs.
- **Result:** Acute respiratory tract obstruction, severe chemical pneumonia (Mendelsson syndrome), secondary bacterial pneumonia and acute respiratory distress syndrome.

Oropharyngeal Leak Pressures (OLP)

- **Definition:** OLP refers to the critical pressure value (usually expressed in cm H_2O) at which the pressure in the airway reaches the point where gas leaks from the edge of the laryngeal mask under mechanical ventilation conditions after the laryngeal mask is placed.
- **Clinical significance:** OLP reflects the sealing property between the laryngeal mask and the anatomical structure of the larynx, and is the core parameter for evaluating the performance of the laryngeal mask

OLP range	Clinical Significance
OLP > 20 cm H_2O	Good sealing, suitable for laparoscopic surgery
OLP 15-20 cm H_2O	Suitable for most short surgeries, spontaneous breathing or low-pressure ventilation
OLP < 15 cm H_2O	Insufficient sealing, adjusted the position or the size of laryngeal mask

Cuff pressure

- **Definition:** The cuff pressure of the laryngeal mask refers to the internal pressure inside the mask cuff required to maintain contact between the mask and the laryngeal mucosa to form an effective seal.

- **Clinical significance**: Ensure effective ventilation and sealing to prevent gas leakage; Reduce the risk of postoperative complications caused by compression of the pharyngeal mucosa, such as postoperative sore throat. Cuff pressure that is too high can cause laryngeal ischemia (insufficient blood flow to the mucosa of the larynx).

Check-in Questions

1. What is the leaf-shaped flap of elastic cartilage that sits above the glottic opening known as?
    a. Subglottis
    b. Epiglottis
    c. Glottis
    d. Arytenoid cartilage

2. What are 3 benefits of using a laryngeal mask as compared to endotracheal intubation?
    a. Easier and faster insertion
    b. Hemodynamic stability
    c. Visualization with direct laryngoscope
    d. Reduced occurrence of post-operative sore throat and hoarseness

3. What is the risk of malposition in laryngeal mask blind placement according to Van Zundert's paper in the BJA 2016?
    a. 10-30%
    b. 30-50%
    c. 50-80%
    d. 80-100%

PART TWO

I . Type of Surgery

Laparoscopic Surgery

Airway management in laparoscopic surgery requires careful planning because pneumoperitoneum (introduction of CO2 gas into the abdomen) increases intra-abdominal pressure, which can elevate airway pressures and reduce lung compliance. Most anaesthetists prefer endotracheal intubation to maintain oxygenation and prevent aspiration. Patient positioning, such as Trendelenburg (head down feet up position), can further compromise respiratory mechanics and increase the risk of airway oedema.

Clinical Benefits of Using a Laryngeal Mask in Laparoscopic Surgery

- Shortened operating room time (anesthesia induction time and extubation time), supporting improved operating room efficiency, for a relatively short surgery (usually <2h)
- Reduced airway trauma for less post-operative complications (sore throat, bleeding, pain)
- Shortened patient recovery period, improve patient comfort
- Supports faster patient turnover and improved hospital efficiency

Barriers to Using a Laryngeal Mask in Laparoscopic Surgery

- Risk of malposition, leading to air leak, gastric insufflation and regurgitation → aspiration
- Need for higher Oropharyngeal Leak Pressure (OLP) due to pneumoperitoneum and potentially Trendelenberg
- Trendelenberg increases the risk of regurgitation and aspiration
- Some laparoscopic surgeries >2h

Unique Benefits of SafeLM in Laparoscopic Surgery

- Ensure correct mask position to reduce aspiration risk and air leak
- Support high OLP (35-40cm H2O) because of high fit between laryngeal mask and larynx, first generation masks at 25-30cm H2O. Second generation masks can be 25-35cm H2O, if position is correct. With SafeLM, they can confirm the position and therefore ensure a high OLP.
- Continuous monitoring throughout the surgery for regurgitation/secretions with increased aspiration risk, even for longer surgeries >2h

Reference Articles

Title	Journal	Citation
Supraglottic Airway Devices (SADs) and Laparoscopic Surgery	Anaesthesia Patient Safety Foundation (2023)	Schwartz S, Peng YG. Supraglottic airway devices (SADs) and laparoscopic surgery. APSF Newsletter. 2023;38:18–19.
Comparison between supraglottic airway devices and endotracheal tubes in patients undergoing laparoscopic surgery	Medicine (2016)	Park, Sun Kyung MD, PhDa; Ko, Geum MDb; Choi, Geun Joo MD, PhDc; Ahn, Eun Jin MD, PhDd; Kang, Hyun MD, PhD, MPHc,*. Comparison between supraglottic airway devices and endotracheal tubes in patients undergoing laparoscopic surgery: A systematic review and meta-analysis. Medicine 95(33):p e4598, August 2016. | DOI: 10.1097/MD.0000000000004598

SafeLM Experience

Figure 1. 7h complicated gynaecological laparoscopic surgery in Trendelenberg position in Warsaw, Poland. No aspiration or laryngeal edema noted.

Check-In Questions

1) What are the current barriers to using a laryngeal mask for laparoscopic surgery? (Select 3)
    a. Risk of malposition leading to gastric insufflation and risk of aspiration
    b. Risk of malposition due to many surgeries being performed in lateral position
    c. Need for higher oropharyngeal leak pressure (OLP) in the event of Trendelenberg
    d. Need for higher OLP due to pneumoperitoneum

2) What are the clinical benefits of using a laryngeal mask in laparoscopic surgery? (Select 3)
    a. Improves OT efficiency, reducing anesthesia induction and extubation time
    b. Medical literature supports findings of reduced post-operative complications like sore throat, bleeding and pain with laryngeal mask use
    c. Supports faster patient turnover, reducing hospital stay duration
    d. Allows continuous bronchoscope access

3) Which key features of SafeLM can support the use of a laryngeal mask specifically for laparoscopic surgery? (Select 3)
    a. Supports OLP 25-30cm H2O due to accurate mask position
    b. Supports OLP 35-40cm H2O due to accurate mask position
    c. Ensure correct position to reduce aspiration risk and air leak
    d. Continuous monitoring with deviation alarm for regurgitation or displacement

ORTHOPAEDIC SURGERY

Airway management in orthopedic surgery often requires special attention due to patient positioning and the potential for prolonged procedures. In the lateral position, securing the airway can be more challenging because access to the patient's head and neck is limited once draping and positioning are complete.

Clinical Benefits of Using a Laryngeal Mask in Orthopedic Surgery

- Faster patient recovery, improved patient comfort
- Reduced airway trauma and hemodynamic stress (elderly, obese and cardiac patients)
- Fewer pulmonary complications (important for reduced mobility post-operative)
- Shortened operating room time (the anaesthesia induction time and extubation time) for improved operating room efficiency

Barriers to Using a Laryngeal Mask in Orthopedic Surgery

- Positioning needs (lateral, prone) can compromise airway access
- Positive pressure ventilation requirement in patients with reduced pulmonary compliance or obesity
- Longer procedure duration >2h

Unique Benefits of SafeLM in Orthopedic Surgery

- Ensure correct mask position to reduce aspiration risk and air leak, especially in lateral position or even prone position. Mask can be placed supine, with video monitoring of the airway during or after repositioning to ensure correct placement.
- Supports high OLP (35-40cm H2O), first generation masks at 25-30cm H2O. Second generation masks can be 25-35cm H2O, if position is correct. With SafeLM, they can confirm the position and therefore ensure a high OLP.
- Continuous monitoring throughout the surgery for regurgitation/secretions for longer procedures

- Anesthesiologist also use SafeLM to switch to intubation for longer procedures

Reference Articles

Title	Journal	Citation
Use of a view-adjustable video laryngeal mask versus endotracheal intubation for airway management during anesthesia for arthroscopic surgery: a randomized trial	Annals of Medicine (2025)	Geng, C.-J., Su, G.-L., Deng, Y., Cong, Z.-K., Feng, D.-D., Zhang, S.-Y., Cao, H.-L., & Zeng, H. (2025). *Use of view-adjustable video laryngeal mask versus endotracheal intubation for airway management during anaesthesia for arthroscopic surgery: A randomized trial*. Department of Anesthesia, Peking University Third Hospital, China; Shanxi Provincial People's Hospital, China.

SafeLM Experience

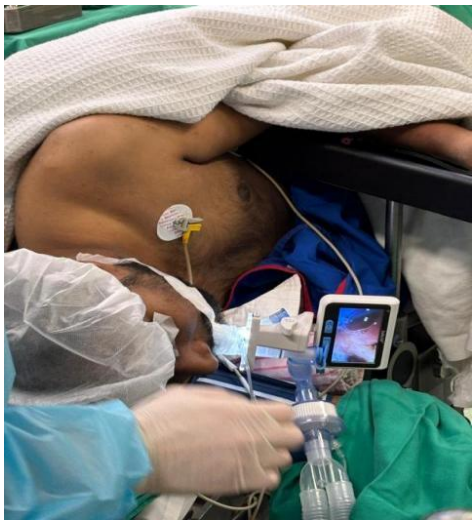


Figure 5. Lateral position surgery with SafeLM in Hospital Shah Alam, Kuala Lumpur, Malaysia. SafeLM inserted supine, and patient repositioned. Videoscope inserted after repositioning to check placement.

Check-in Questions

1) What are the barriers to using a laryngeal mask in orthopedic surgery? (Select 2)
    a. Many shoulder surgery patients are unfasted, increasing the risk of regurgitation
    b. Trendelenberg position increases the risk of aspiration
    c. More likely to have lateral or prone position which can displace a laryngeal mask
    d. Orthopedic surgery duration can be unpredictable, many >2h

2) Which key features of SafeLM can specifically support orthopedic surgeries? (Select 2)
    a. Ensure correct mask placement in lateral or prone position
    b. Discover laryngospasm which is common with bronchoscope manipulation

c. Continuously monitor mask position even in lateral or prone position surgery
d. Supports the use of bronchial blockers under visual guidance

3) True/False: There is a clinical paper published in 2025 from China comparing SafeLM to ETT in arthroscopic shoulder surgery.

4) When discussing the use of SafeLM in orthopedic surgery with physicians, which factor is the most convincing reason for them to use SafeLM?
   a. Reduced airway trauma
   b. Shortened operative time
   c. Hemodynamic stability
   d. Suitable for patients undergoing long procedures or procedures with unpredictable duration

PEDIATRIC SURGERY

In pediatric anaesthesia, the laryngeal mask offers easier insertion, less hemodynamic disturbance, and fewer postoperative complications compared to the endotracheal tube (ETT). However, ETT provides superior airway protection compared to traditional laryngeal masks and is often preferred in longer surgeries or when aspiration risk is high. Airway management in children is more difficult as they are more prone to airway mucosal injury and laryngospasm.

Clinical Benefits of Using a Laryngeal Mask in Pediatric Surgery

- Shortened operating room time (anaesthesia induction time and extubation time) to improved operating room efficiency, faster patient recovery and shorter hospital stay
- Reduced airway trauma for reduced mucosal injury and laryngospasm
- Avoid using muscle relaxant and muscle relaxant antagonists, adverse reactions of muscle relaxant(allergic pulmonary edema, postoperative atelectasis)

Barriers to Using a Laryngeal Mask in Pediatric Surgery

- Reduced aspiration protection for children with GERD/GORD, emergency cases (unfasted)
- May not provide an adequate seal in patients with restrictive lung disease/other pulmonary disease
- Surgeon positioning requirements (lateral, prone)
- Longer or more complex surgeries require reliable airway control, higher risk of dislodgement

Unique Benefits of SafeLM in Pediatric Surgery

- Visualization enhances the success rate on first -pass insertion, reducing laryngospasm risk
- Visualization avoids injury to soft tissues in the throat caused by repeated adjustment, reducing adverse airway events such as pain and bleeding in the larynx after surgery, shortening the recovery period and potentially hospital stay duration
- Ensure correct mask position to reduce aspiration risk and air leak
- Support high OLP (35-40cm H2O), reducing the need for ETT and *potentially* reduce the use of muscle relaxant
- Continuous monitoring throughout the surgery for regurgitation/secretions

Reference Articles

Title	Journal	Citation
Use of a view-adjustable video laryngeal mask versus endotracheal intubation for airway management during anesthesia for arthroscopic surgery: a randomized trial	Annals of Medicine (2025)	Geng, C.-J., Su, G.-L., Deng, Y., Cong, Z.-K., Feng, D.-D., Zhang, S.-Y., Cao, H.-L., & Zeng, H. (2025). *Use of view-adjustable video laryngeal mask versus endotracheal intubation for airway management during anaesthesia for arthroscopic surgery: A randomized trial*. Department of Anesthesia, Peking University Third Hospital, China; Shanxi Provincial People's Hospital, China.

SafeLM Experience

Figure 6. Use of SafeLM in pediatric surgeries in Warsaw Medical University, Warsaw, Poland

Check-in Questions

1) Which of the following pediatric surgeries can be clinical indications for SafeLM?
    a. Inguinal hernia repair
    b. Internal fixation of tibial plate
    c. Difficult airway ETT tube exchange
    d. Adenoidectomy

2) True/False. Magill Medical produces size 1 and size 1.5 laryngeal masks.

3) How can SafeLM support reduced airway trauma for pediatric surgery? (Select 2)
    a. Increased success in first-pass insertion (reduce repeated attempts and laryngospasm risk)
    b. Integrated local anaesthetic spray port to reduce sensation
    c. Reduced need for repeated adjustments in the event of air leak
    d. Used together with muscle relaxant to prevent children from moving during procedure

4) Why are laryngeal masks generally preferred in pediatric surgeries? (Select 3)
    a. Faster patient recovery and shorter hospital stay
    b. Avoid using muscle relaxants and muscle relaxant antagonists due to common allergic/side effects
    c. Reduce airway trauma to prevent mucosal injury and laryngospasm
    d. To encourage increased use of muscle relaxants

5) What are the key features of SafeLM that can support laryngeal mask use in pediatric surgery? (Select 3)
    a. Intubation function through SafeLM as a rescue airway
    b. Continuous monitoring throughout the surgery for improved patient safety
    c. Improve first-pass success, reducing airway trauma
    d. Avoids need for repeated adjustment, reducing laryngospasm risk

BRONCHOSCOPY

Bronchoscopy is a minimally invasive procedure that allows doctors to directly view and sometimes treat the airways and lungs using a thin, flexible camera called a bronchoscope. The laryngeal mask is increasingly used in bronchoscopy as it provides a secure airway while allowing flexible scope access. It offers better oxygenation and ventilation to prevent hypoxemia (low oxygen) rather than simple nasal cannula, particularly during advanced or prolonged procedure, because bronchoscopy can be challenging as there is a shared airway for ventilation and endoscopy. The laryngeal mask has become the common airway device for bronchoscopy.

Clinical Benefits of Using a Laryngeal Mask in Bronchoscopy

- Improved oxygenation during operation, reducing risk of hypoxemia (low oxygen)
- Allows continuous bronchoscope access, which is convenient for endoscopists to operate
- Support mechanical ventilation when anaesthetists inject muscle relaxant in patients with repeated cough

Barriers to Using a Laryngeal Mask in Bronchoscopy

- The success rate of the first-pass insertion of a laryngeal mask is low due to blind insertion
- Bronchoscopy can alter the position of the laryngeal mask, increasing risk of air leak or hypoventilation,
- If laryngospasm happens due to bronchoscope repeatedly stimulate the glottis, anaesthetists can only determine the occurrence of laryngospasm based on experience

Unique Benefits of SafeLM in Bronchoscopy

- Ensure correct mask position, improving the success rate of the first-pass insertion of a laryngeal mask to reduce aspiration risk and air leak, preventing hypoxemia
- Continuous monitoring can help anaesthetists to adjust laryngeal mask position during the operation. It no need to stop the endoscopist's operation to remove the bronchoscope, which improve the efficiency of the endoscopy room
- Discover laryngospam through SafeLM screen
- TRI-2 connector with Y-adaptor design seals the entrance of the bronchoscope

Figure 7. Bronchoscopy TRI-2 connector

Figure 8. Bronchoscope through TRI-2

Figure 9. EBUS in Hacetteppe University Hospital, Turkey

Check-in Questions

1) What are the key features of SafeLM in bronchoscopy? (Select 3)
    a. Continuous monitoring can help anaesthetists adjust laryngeal mask position during procedure if displacement occurs, which is common with bronchoscope manipulation
    b. Ensures correct position of mask of patient is repositioned to lateral position
    c. Assess whether hypoxia is due to laryngospasm or bronchoscope intervention
    d. TRI-2 connector seals bronchoscope entrance

UROLOGY LATERAL POSITION

In addition to lower urethral surgery such as transurethral approach, urinary surgery also includes upper urethral surgery such as kidney and adrenal gland surgery. In clinical practice, the lateral position is usually adopted for surgeries on the upper urinary tract. Airway management in urology lateral surgery can be challenging. In the lateral position, securing the airway can be more challenging because access to the patient's head and neck is limited once draping and positioning are complete.

Clinical Benefits of Using a Laryngeal Mask in Urology Lateral Position

- Faster patient recovery, improved patient comfort
- Reduced airway trauma and hemodynamic stress (elderly, obese and cardiac patients)
- Fewer pulmonary complications (important for reduced mobility post-operative)
- Hemodynamic stress (elderly, obese and cardiac patients), reduce the occurrence of adverse vascular events (hypertension, tachycardia) during the perioperative period

Barriers to Using a Laryngeal Mask in Urology Lateral Position

- Lateral positioning can compromise airway access, increase the risk of air leakage due to displacement of the laryngeal mask
- Positive pressure ventilation requirement in patients with reduced pulmonary compliance or obesity
- Longer procedure duration >2h

Unique Benefits of SafeLM in Urology Lateral Position

- Ensure correct mask position to reduce aspiration risk and air leak, especially in lateral position or even prone position. Mask can be placed supine, with video monitoring of the airway during or after repositioning to ensure correct placement.
- Support high OLP (35-40cm H2O), first generation masks at 25-30cm H2O
- Continuous monitoring throughout the surgery for regurgitation/secretions for longer procedures
- Suitable for longer surgeries（＞2h）/unpredictable surgery which the patient needs to be converted to laparotomy, and thus the operation needs to be prolonged, this situation arises.

Reference Articles

Title	Journal	Citation
Second-generation supraglottic airway in laparoscopic donor nephrectomy	Scientific reports (2023)	Ja Eun, Lee,Ha Yeon, Kim,Kyo Won, Lee et al. Second-generation supraglottic airway in laparoscopic donor nephrectomy.[J] .Sci Rep, 2023, 13: 8406.

Check-in Question

1) Which one of the following urological surgeries is performed in the lateral position?
    a. Partial nephrectomy
    b. Bladder repair
    c. Lower urinary tract reconstruction
    d. Prostatectomy

2) What is the main challenge of using a laryngeal mask in lateral position?
    a. Gastric acid aspiration is more like in lateral position than supine

b. Lateral position surgeries tend to be longer (>2h)
c. Lateral position can compromise airway access, increasing risk of air leak
d. Laryngospasm is more likely in lateral position surgery

TUBELESS THORACIC SURGERY

Tubeless thoracic surgery refers to thoracic anesthesia performed without an endotracheal tube, allowing patients to maintain spontaneous breathing. In tubeless thoracic surgery, patients also receive thoracic paravertebral block (TPVB) and vagus nerve block. The double-lumen tube (DLT) is traditionally the first-line gold standard airway management tool for general anesthesia thoracic surgery. It has a thick diameter, which can stimulate sympathetic nerves and lead to hemodynamic instability. With tubeless anesthesia, the DLT is replaced by a SGA with ultrasound guided nerve block. Tubeless anesthesia can lower perioperative stress responses and reduce postoperative complications, which will accelerate the postoperative recovery of patients, shorten hospital stay duration, and convert some elective surgery patients who may need to be hospitalized for observation into day surgery patients.

Clinical Benefits of Using a Laryngeal Mask in Tubeless Thoracic Anesthesia

- Facilitates spontaneous ventilation, avoiding need for the double-lumen tube and therefore mechanical ventilation injuries or airway trauma.
- Reduced hemodynamic stress (elderly, obese and cardiac patients), reduces the occurrence of adverse vascular events (hypertension, tachycardia) during the perioperative period.
- Avoid adverse reactions of muscle relaxant, and save the cost of muscle relaxants and muscle relaxant antagonists
- Shortens the operating room time (the anesthesia induction time and extubation time) to improve operative room efficiency. Faster patient recovery and shorter hospital stay

Barriers to Using a Laryngeal Mask in Tubeless Thoracic Anesthesia

- Complex anesthesia techniques to maintain stable oxygenation
- Blind insertion can increase airway pain/bleeding post-operatively
- Air leakage, regurgitation and aspiration when changing to a lateral position
- Difficulty switching to bronchial blockers or single lumen tube (SLT) when converting to thoracotomy or discontinuing tubeless anesthesia
- Laryngospasm

Unique Benefits of SafeLM in Tubeless Thoracic Anesthesia

- Visualization enhances the first-pass success rate on insertion, reducing airway trauma
- Intelligent airway monitoring function which can automatically identify and alarm in the event of aspiration/significant secretions
- If hypoxemia is detected, SafeLM can help detect whether the cause is laryngospasm, prompting the anaesthetist to increase the depth of anaesthesia or muscle relaxants
- If the patient has extensive pleural adhesions and needs to be converted to a thoracotomy, SafeLM can guide the bronchial blockers (BB) to the glottis under visual guidance
- SafeLM can support conversion of laryngeal mask to SLT + BB or LMA + BB, without bronchoscopy

Reference Article

Title	Journal	Citation
可视喉罩联合支气管封堵器在胸腔镜肺叶部分切除术中的应用 “Application of visual laryngeal mask airway combined with bronchial blocker in thoracoscopic partial lobectomy.”	腹 腔 镜 外 科 杂 志 Journal of Laparoscopic Surgery (2022)	Wang, G., Ma, X., Du, S., & others. (n.d.). *Application of visual laryngeal mask combined with bronchial occluder in thoracoscopic partial lobectomy*. School of Anaesthesiology, Weifang Medical University; Graduate Training Base of Linyi People’s Hospital, Jinzhou Medical University; Department of Anesthesiology, Linyi People’s Hospital.

SafeLM Experience

Figure 10. Tubeless surgery with SafeLM + BB in Hong Kong

Check-in Questions

1) Which of the following are benefits of SafeLM in non-intubated thoracic surgery? (Select 3)
    a. the laryngeal mask is less likely to become displaced during position changes
    b. Continuous observation helps prevent reflux and aspiration
    c. Assists double-lumen tube (DLT) placement into the glottis during conversion to mechanical ventilation
    d. Hemodynamic stability

2) True/False: There is a clinical paper published in 2022 from China using SafeLM in tubeless thoracic surgery.

HYSTEROSCOPY

Hysteroscopy is a minimally invasive procedure that uses a thin, lighted telescope to examine or treat the inside of the uterus. It allows diagnosis and management of conditions such as abnormal bleeding, polyps, fibroids, or intrauterine adhesions with reduced recovery time compared to open surgery.

Some hospitals may use TIVA (total intravenous anaesthesia) for hysteroscopy cases, and others may opt for NA (neuraxial anaesthesia). TIVA involves using intravenous agents to induce and maintain unconsciousness without inhaled anesthetics, allowing precise control of depth and rapid recovery. Neuraxial anesthesia, including spinal or epidural blocks, provides targeted sensory and motor blockade while preserving consciousness and reducing systemic drug exposure. The choice between the two depends on surgical requirements, patient comorbidities, and the need for airway control or hemodynamic stability.

Clinical Benefits of Using a Laryngeal Mask in Hysteroscopy

- Hysteroscopy procedures are usually short (~1-2 hours), laryngeal masks can provide secure ventilation under sedation.
- Use of a nasal cannula is usually insufficient in hysteroscopy. It does not provide airway protection or controlled ventilation, so generally suitable only for patients with low aspiration risk and stable respiratory function.
- Reduce the need for muscle relaxant and muscle relaxant antagonists,

Barriers to Using a Laryngeal Mask in Hysteroscopy

- Some procedures run longer than expected, or have an unpredictable duration, in which case anaesthetists will opt for endotracheal intubation as it is believed to be more secure

Unique Benefits of SafeLM in Hysteroscopy

- Continuous monitoring supports the use of a laryngeal mask for controlled ventilation even during procedures with longer or unexpected duration
- Decreases the need for muscle relaxants and deep anaesthesia, supporting faster recovery and improved patient comfort.
- SafeLM can help detect whether the cause is laryngospasm, prompting the anaesthetist to increase the depth of anaesthesia or muscle relaxants

SafeLM Experience

Figure 11. SafeLM use in hysteroscopy in China

NEUROSURGERY

Clinical Benefits of Using a Laryngeal Mask in Neurosurgery

- Reduced hemodynamic stress compared with endotracheal intubation, helping limit spikes in blood pressure and intracranial pressure during airway manipulation.
- Less coughing and bucking on emergence, which may decrease abrupt increases in intracranial pressure and improve surgical conditions.
- Avoidance of muscle relaxants and muscle relaxant antagonists in selected cases, allowing earlier neurological assessment postoperatively.

Barriers to Using a Laryngeal Mask in Neurosurgery

- Limited airway protection against aspiration, particularly concerning in patients with impaired consciousness, reflux, or prolonged procedures.
- Reduced suitability for long surgeries, prone positioning, or cases requiring tight control of ventilation and carbon dioxide levels.
- Risk of displacement once the head is fixed or draped, making airway access difficult intraoperatively.
- Preference for endotracheal tubes in many neurosurgical settings due to their reliability, familiarity, and ability to ensure controlled ventilation and airway security.

Unique Benefits of SafeLM in Neurosurgery

- Enables atraumatic, well-controlled airway placement with continuous visualization, reducing airway manipulation and cervical movement—important in patients with unstable spines or elevated ICP risk.
- Supports hemodynamic stability by avoiding direct laryngoscopy, thereby minimizing sympathetic surges that could increase intracranial pressure or cerebral blood flow.
- Facilitates rapid emergence and neurological assessment by reducing anesthetic depth, opioid requirements, and residual neuromuscular blockade.
- Supports a guided Bailey maneuver

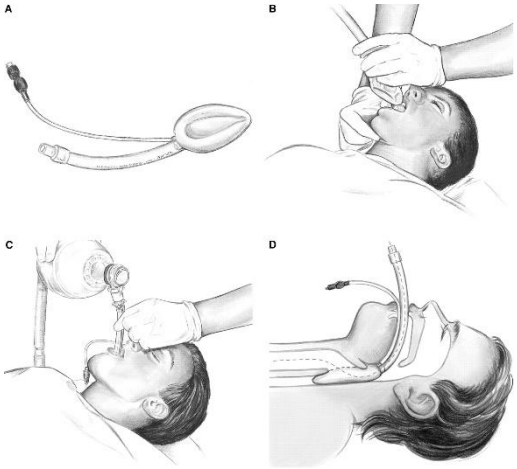


Figure 12. Bailey Maneuver. The Bailey maneuver is an airway exchange technique in which a laryngeal mask airway (LMA) is inserted behind an endotracheal tube before extubation, allowing the tube to be removed while maintaining airway control. The LMA provides a smooth transition during emergence, reducing coughing, bucking, and hemodynamic stress. It is particularly useful in patients where airway re-instrumentation or sympathetic stimulation should be minimized.

EYE (OPHTHALMIC) SURGERY

Airway management in ophthalmology requires minimizing patient movement and coughing to protect delicate ocular structures. Because many procedures are performed under local or monitored anesthesia care, maintaining spontaneous ventilation and ensuring patient cooperation are critical. General anesthesia in eye surgery is reserved for patients who cannot tolerate local techniques, ensuring immobility, airway control, and optimal surgical conditions.

Clinical Benefits of Using a Laryngeal Mask in Eye Surgery

- Provides a secure airway with minimal hemodynamic response, reducing coughing or movement that could compromise delicate ocular procedures on insertion and removal
- Reduced airway trauma, improved recovery quality, faster patient recovery and shorter hospital stay
- Most ophthalmic procedures are short, laryngeal mask use supports faster turnover and improved efficiency
- Lower risk of coughing on extubation compared to ETT, preventing rise in intra-ocular pressure

Barriers to Using a Laryngeal Mask in Eye Surgery

- Aspiration risk, especially in longer surgeries
- Anticipated need for higher airway pressures

Unique Benefits of SafeLM in Eye Surgery

- Video guidance ensures a smoother insertion, minimizing patient movement and hemodynamic fluctuations which impact ocular structures and pressures
- Reduced airway trauma and complications for faster recovery
- Continuous monitoring throughout the surgery for regurgitation/secretions
- Supports easier extubation compared to ETT, less coughing
- Reducing unnecessary intubations, drug use and complications to improve operating room efficiency, for more cases per day

Reference Articles

Title	Journal	Citation
Use of the laryngeal mask airway during ophthalmic surgery results in stable circulation and few complications; A Prospective Audit	Washington University Audit, Acta Anaesthesiologica Scandinavica	Ateş, Y., Alanoğlu, Z., & Uysalel, A. (2008). Use of the laryngeal mask airway during ophthalmic surgery results in stable circulation and few complications: A prospective audit. Acta Anaesthesiologica Scandinavica, 42(1), 112–115.

Check-In Question

1) What are the key features of SafeLM that specifically support ophthalmic surgery? (Select 3)
    a. SafeLM PVC cuff is softer and less stimulating for the patient
    b. SafeLM silicone cuff is softer and less stimulating for the patient
    c. Video guidance ensures smoother insertion, minimizing sympathetic stimulation which can affect eye structures
    d. Supports easier extubation, reducing likelihood of coughing

Ear Nose and Throat Surgery

Clinical Benefits of Using a Laryngeal Mask in ENT

- Reduced hemodynamic stress compared with endotracheal intubation,
- Less coughing when the depth of anesthesia for the patient is too shallow or the muscle relaxation effect is insufficient
- Hemodynamic stress (elderly, obese and cardiac patients), reduce the occurrence of adverse vascular events (hypertension, tachycardia) during the perioperative period.

Barriers to Using a Laryngeal Mask in ENT

- The placement of the laryngeal mask by the anesthesiologist can be inaccurate, which can lead to the possibility of the mask falling off during the operation, resulting in air leakage and the risk of aspiration.
- Reduced suitability for long surgeries, prone positioning, or cases requiring tight control of ventilation and carbon dioxide levels.
- Lateral head movement like in ear surgery can displace the mask, increasing risk of air leak

Unique Benefits of SafeLM in ENT

- Support high OLP (35-40cm H2O) because of high fit between laryngeal mask and larynx
- Continuously monitor the airway to prevent the blood flowing in the throat from entering the airway, and maintain correct positioning even with head movement
- Quickly convert to ETT without interfering with the surgery

Ⅱ.Type of Surgery/Type of Patient

Longer Surgeries/Unpredictable Surgery Duration

- There is no clinical evidence that limits the use of a laryngeal mask to a surgery less than 2 hours. This common “2 hour” rule is set due the risks of malposition of a laryngeal mask, that can often lead to aspiration or air leak for longer surgeries.
- Without video guidance to correctly place the mask, and continuous monitoring with a deviation alarm, anesthetists can feel confidence in using SafeLM for surgeries longer than 2 hours.
- Our current record (as of December 2025) is *a 7 hour laparoscopic surgery in Warsaw, Poland* in October 2025. This was a gynaecological procedure performed in Trendelenberg position, planned for 3 hours but complicated by the need for bowel resection. 7 hours later, there was no aspiration or laryngeal edema reported.

Overweight/Obese Patients

Concern	SafeLM Feature
Overweight/obese patients are often at risk of gastro-esophageal reflux disease (GORD). Accurate placement is required to prevent regurgitation and aspiration.	With video visualization, anaesthetists can feel confident to use SafeLM in this group of patients. Early detection can prompt the need for a Ryles tube to be inserted.
Overweight/obese patients often have reduced lung compliance due to a heavier chest wall/higher intra-abdominal pressure.	The SafeLM silicone cuff supports an OLP of 35-40cm H2O, supporting higher ventilation pressures.

Patients with Cardiovascular Disease

- E.g hypertension, history of myocardial infarction (MI) cerebrovascular accident (CVA), coronary artery disease (CAD), coronary stents, valve dysfunction, cardiac ischemia, implanted pacemaker, heart failure
- ETT insertion with laryngoscopy can provoke significant sympathetic stress, which may cause transient hypertension, tachycardia and increased myocardial oxygen demand, leading to ischemia, arrhythmias or heart failure exacerbation
- Positive-pressure ventilation through an ETT can reduce venous return and cardiac output, particularly in patients with impaired ventricular function, increasing the risk of hemodynamic instability
- Laryngeal masks offer gentler insertion with less sympathetic response, promoting a more stable heart rate and blood pressure during induction and emergence.
- Laryngeal masks are often limited due to aspiration risk, which can be mitigated with video monitoring.

ASA III or ASA IV patients

ASA anesthesia commonly refers to the **American Society of Anesthesiologists (ASA) Physical Status Classification System**, which is used to assess and communicate a patient's preoperative health before anesthesia. It categorizes patients from **ASA I (healthy)** to **ASA VI (brain-dead organ donor)**, with higher classes indicating greater systemic disease and perioperative risk. The system helps guide anesthetic planning, risk stratification, and informed consent, but it does not predict surgical difficulty or outcomes on its own.

Table 1. ASA Physical Status Classifications and Examples

ASA PS Classification	Definition	Examples
ASA I	A normal healthy patient	Healthy, nonsmoking, no or minimal alcohol use
ASA II	A patient with mild systemic disease	Mild diseases only without substantive functional limitations. Examples include (but not limited to): current smoker, social alcohol drinker, pregnancy, obesity (30 < BMI < 40), well-controlled DM/HTN, mild lung disease
ASA III	A patient with severe systemic disease	Substantive functional limitations; one or more moderate to severe diseases. Examples include (but not limited to): poorly controlled DM or HTN, COPD, morbid obesity (BMI ≥40), active hepatitis, alcohol dependence or abuse, implanted pacemaker, moderate reduction of ejection fraction, ESRD undergoing regularly scheduled dialysis, premature infant PCA <60 wk, history (>3 mo) of MI, CVA, TIA or CAD/stents
ASA IV	A patient with severe systemic disease that is a constant threat to life	Examples include (but not limited to): recent (<3 mo) MI, CVA, TIA or CAD/stents; ongoing cardiac ischemia or severe valve dysfunction; severe reduction of ejection fraction; sepsis; DIC; ARD; or ESRD not undergoing regularly scheduled dialysis
ASA V	A moribund patient who is not expected to survive without the operation	Examples include (but not limited to): ruptured abdominal/thoracic aneurysm, massive trauma, intracranial bleed with mass effect, ischemic bowel in the face of significant cardiac pathology or multiple organ/system dysfunction
ASA VI	A declared brain-dead patient whose organs are being removed for donor purposes	

ARD, acid reflux disease; **ASA,** American Society of Anesthesiologists; **BMI,** body mass index; **CAD,** coronary artery disease; **COPD,** chronic obstructive pulmonary disease; **CVA,** cerebral vascular accident; **DIC,** disseminated intravascular coagulation; **DM,** diabetes mellitus, **ESRD,** end-stage renal disease; **HTN,** hypertension; **MI,** myocardial infarction; **PCA,** postconceptual age; **PS,** physical status; **TIA,** transient ischemic attack

Figure 13. ASA Physical Status Classifications and Examples

- In general, an ETT is used for ASA III/IV patients due to increased aspiration risk or cardiovascular instability
- Video guided insertion and monitoring can support a more secure airway in these high-risk patients

Difficult Airway

In a difficult airway, securing oxygenation and ventilation is the primary goal. ETT remains the gold standard for definitive airway control but may be challenging to place and physiologically stressful, particularly in high-risk patients. **Laryngeal masks** play a crucial role as rescue or primary devices in selected cases, offering rapid airway establishment with less manipulation and **serving as a bridge to intubation** or definitive airway management when needed.

Ⅲ. Clinical Benefits

Patient Safety

- Improved visualization enables accurate placement and confirmation of optimal positioning, reducing failed insertions and airway trauma.
- Continuous real-time monitoring allows early detection of malposition, obstruction, or regurgitation, supporting timely correction and safer ventilation. This also makes it suitable for various surgical positions such as lateral, Trendelenberg, and prone position surgeries
- Enhanced seal and ventilation efficiency improve oxygenation and may reduce aspiration risk, particularly in patients with difficult airways or obesity.
- Reduced cervical spine, dental and airway damage caused by intubation
- Avoid intracranial pressure elevation caused by coughing and choking during extubation

Reduction of Airway Complications

- Decreases airway trauma by avoiding blind insertion and excessive manipulation
- This can reduce the incidence of post-operative sore throat, hoarseness and dysphagia (difficulty swallowing)
- Enables early detection and correction of displacement, lowering the incidence of desaturation and airway obstruction.
- May reduce regurgitation and aspiration risk through improved alignment and controlled placement compared with traditional LMAs
- Visually assisted intubation can support difficult airway management and intra-operative intubation functions

Hemodynamic Stability

Hemodynamic stability during airway management refers to minimizing changes in heart rate and blood pressure while securing the airway. Hemodynamic stress is the cardiovascular response, such as increased heart rate and blood pressure, triggered by airway manipulation or surgical stimuli. This is especially beneficial in patients with cardiovascular disease, helping maintain stable cardiac output and perfusion throughout anesthesia.

- Devices like a video laryngeal mask reduce sympathetic stimulation compared with direct laryngoscopy and tracheal intubation, lowering the risk of tachycardia (high heart rate), hypertension (high blood pressure), or myocardial stress.
- Requires less airway manipulation, lowering the risk of myocardial stress in patients with cardiovascular disease.
- Provides smooth insertion and secure ventilation, maintaining stable oxygenation and perfusion throughout anesthesia.

Reduction in Use of Muscle Relaxants

- Lower anesthetic and opioid requirements: Efficient airway placement and maintenance can reduce depth of anesthesia needs, contributing to faster emergence and less postoperative nausea, vomiting, and opioid use.
- Adequate airway seal and ventilation can be achieved under lighter planes of anesthesia, reducing reliance on muscle relaxants.
- Avoidance of tracheal intubation decreases the need for paralysis to suppress airway reflexes and patient movement.
- Reduced muscle relaxant use supports faster recovery of spontaneous breathing and neuromuscular function postoperatively.

Enhanced Patient Recovery (ERAS)

Enhanced Recovery After Surgery (ERAS) is a multimodal, evidence-based perioperative care pathway designed to reduce surgical stress, maintain physiological function, and accelerate recovery. It integrates optimized anesthesia, analgesia, nutrition, and early mobilization to improve outcomes, shorten hospital stay, and reduce complications. The use of a video laryngeal mask can support ERAS with -

- Reduced airway trauma: SafeLM allows precise placement with less manipulation than endotracheal intubation, decreasing sore throat, hoarseness, and airway inflammation, which supports earlier mobilization and comfort.
- Improved hemodynamic stability: Avoidance of direct laryngoscopy and tracheal intubation reduces sympathetic stimulation, helping maintain cardiovascular stability—an important ERAS goal, especially in high-risk patients.
- Lower anesthetic and opioid requirements: Efficient airway placement and maintenance can reduce depth of anesthesia needs, contributing to faster emergence and less postoperative nausea, vomiting, and opioid use.
- Preservation of pulmonary function: Better alignment and continuous visual confirmation of airway position support effective ventilation, reducing atelectasis and postoperative respiratory complications.
- Faster recovery and discharge readiness: Improved airway safety, reduced complications, and smoother emergence align with ERAS principles of early oral intake, mobilization, and shorter hospital stay.

IV. Economic Benefits

Improving Work Efficiency

- Increases the first-pass success rate, reducing the time needed to secure the patient's airway
- Supports surgeries that do not require muscle relaxants, reducing the time needed to prepare/administer muscle relaxants and their antagonists, and the time needed for the drugs to take effect
- Faster and easier extubation which can be done by a nurse/junior doctor
- Guided repositioning if air leak or regurgitation is detected

Shorten hospital stay

- Decreasing sore throat, hoarseness, and airway inflammation, reduce postoperative pain Improve the quality of patients' recovery.
- Minimal cardiovascular and airway irritation, and the patient's vital signs fluctuate minimally, enabling them to meet the discharge criteria more quickly.
- Combined with tubeless thoracic anesthesia can alleviate the perioperative stress response of patients and shorten the hospital stay

Check-in Questions

1) True/False. There is strong clinical evidence that proves a laryngeal mask cannot be used in surgeries longer than 2 hours.

2) Anesthetist A tells you that many of his/her patients are obese. Overweight/obese patients are often at risk of gastro-esophageal reflux, increasing their risk for aspiration. How can you address this concern? (Select 2)
    a. Agree they should use an ETT for full aspiration protection
    b. Show them the deviation alarm which will sound when there is displacement or regurgitation
    c. Explain that it is impossible for patients to aspirate with SafeLM
    d. Explain that with video visualization, they can feel confident that the mask seal is secure over the glottis, and any aspiration can be visualized and managed accordingly.

3) Which of these patient groups can benefit from a laryngeal mask over ETT due to the improved hemodynamic stability with laryngeal mask? (Select 2)
    a. Eye surgery patients
    b. Neurosurgery patients
    c. Unfasted patients
    d. Female patients <40 years old

4) Which surgeries can be performed with a laryngeal mask airway (LMA) without muscle relaxants?
    a. Hysteroscopic surgery
    b. Laparoscopic surgery
    c. Bronchoscopic treatment
    d. Orthopedic surgery

5) What is the ASA Classification used for? (Select 1)
    a. Determine patient's pre-operative health before anesthesia.
    b. Determine the patient's post-operative health after anesthesia.
    c. Determine the type of anesthesia used for the surgery
    d. Determine the patient's life expectancy

6) How can SafeLM reduce the need for muscle relaxants?
    a. Visualization of the stomach through the gastric channel
    b. Preserve pulmonary function
    c. Reduce regurgitation of gastric contents
    d. Reduce the need for endotracheal intubation, which requires paralysis to suppress airway reflexes

7) Which of the following statements best describes enhanced recovery after surgery (ERAS)? Select 1.
    a. The pain relief medication protocol for post-operative use
    b. A peri-operative care pathway designed to reduce surgical stress, maintain physiological function, and accelerate recovery.
    c. How to turn all surgeries into day case surgeries
    d. A manual on how to discharge patients from hospital within 10 days

8) Select 3 ways in which a video laryngeal mask can support ERAS.
    a. Reduced airway trauma for less post-operative sore throat or hoarseness
    b. Improved hemodynamic stability maintains cardiovascular stability
    c. Lower anaesthetic and opioid requirements as compared to ETT
    d. Ensure all cases are day case surgeries

9) How can SafeLM help to improve work efficiency?
    a. Supports surgeries that do not require muscle relaxant, reducing time needed to prepare/administer muscle relaxants and their antagonists, and the time needed for the drugs to take effect
    b. Faster and easier extubation that can be performed by a nurse/junior doctor
    c. Supports intubation for difficult airways
    d. Guided repositioning if air leak or regurgitation is detected

V. Competitor Review

First and Second Generation Laryngeal Masks

Features	2nd Generation Mask	3rd Generation mask (SafeLM)
Video	No	Yes, HD video with recording and photo function
Market Players	100+ manufacturers	Only Magill Medical with adjustable camera angle
Price and Margin	Less expensive due to competition	Considered expensive due to additional features and functions. Stable price due to unique benefits and lack of true competition.
Advanced Indications	Uncommon to use for long surgery/laparoscopic surgery etc due to lack of confirmation of placement	Surgery >2h, laparoscopic surgery, overweight, difficult airway, continuous airway monitoring, bronchoscope, airway suction, pre-hospital
Market Size	50-80% General anaesthesia cases	20-30% general anaesthesia cases (remaining for ETT)
KOL Support	Minimal	Increasing support for a new technology

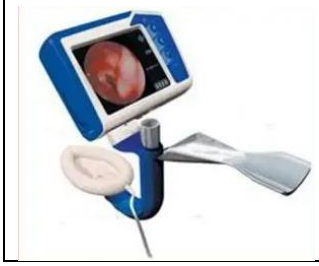
First and Second Generation Laryngeal Masks

Device (Gen)	Manufacturer(s)	Key Selling Points / Features	Notes
LMA Classic (1st Gen)	Teleflex (originally LMA International) 	• Simple design, widely used • Inflatable cuff creating seal around larynx • Good for routine elective procedures	Classic first-generation supraglottic airway; simple, inexpensive design.
LMA Unique / Unique EVO (1st Gen)	Teleflex 	• Fixed curve, intubation-friendly • Single use, cost-effective • Cuff Pilot™ pressure indicator (EVO version)	Basic first-generation with innovations for cuff management.

Flexible LMA (1st Gen)	Various (shared design across brands) 	• Flexible reinforced tube • Useful in ENT/dental surgeries where tube position flexibility is needed	Classic LMA derivative with longer, flexible tube.
LMA ProSeal (2nd Gen)	Teleflex 	• Improved oropharyngeal seal pressure • Gastric drain tube reduces aspiration risk • Better for positive pressure ventilation	Second-generation with ability to vent gastric contents and higher seal pressures. OLP same as SafeLM *if placed correctly.*
LMA Supreme (2nd Gen)	Teleflex 	• Single-use, anatomically curved • Dual seal with gastric access • Integrated bite block & fixation	Combines easy insertion with gastric access and safety improvements. Many anaesthetists like this device.
i-gel Supraglottic Airway (2nd Gen)	Intersurgical Ltd 	• Non-inflatable gel-like cuff (thermoplastic elastomer) • Rapid insertion with minimal tissue compression • Transparent tube for easier secretion visualization	Second-generation with ergonomic shape to conform to airway anatomy. Van Zundert's BJA paper (2016) shows that i-gel does not always conform to airway anatomy.
AuraGain (2nd Gen)	Ambu 	• Gastric access channel • Can act as conduit for intubation • Designed for easy insertion and secure seal	(Marketed as advanced SAD with multifunction use; widespread adoption noted.)

OTHER 'THIRD GENERATION' LARYNGEAL MASKS

NAME	MANUFACTURER	NOTES
SaCoVLM	UE Medical (Zhejiang, China)	• Non-adjustable videoscope • Single use item

		
C-Trach 	Teleflex	• Non-adjustable videoscope • Previous article demonstrates poor (30%) visualization with C-trach

LARYNGEAL MASKS VS ENDOTRACHEAL INTUBATION (ETT)

FEATURE	ENDOTRACHEAL TUBE	SUPRAGLOTTIC AIRWAY DEVICE
Insertion	Requires laryngoscopy, more technically demanding	Easier and faster insertion
Skills required	Required more skills and experience	Easier for less experienced personnel
Airway/dental trauma	Higher risk due to use of laryngoscope blade	Lower risk
Drug- cost	Required Muscle relaxants and their antagonists are usually expensive.	Muscle relaxant , reversal agents and Optional often not required.
Drug- related complications	Higher incidence	Lower incidence due to less muscle relaxant/antagonist required. Reduced anaesthetic requirements for airway tolerarnce
Post-operative complications like sore throat, hoarseness, difficulty swallowing	Common	Less common
Hemodynamic stability	Can cause rise in heart rate/blood pressure due to sympathetic nerve stimulation	Less nerve stimulation, improved hemodynamic stability at induction and emergence
OT efficiency	Takes a longer time to insert depending on experience. Requires muscle relaxant preparation and administration	Faster insertion, saving time

Check-in Question

1) Anesthetist B tells you that they have tried the video laryngeal mask system before, and did not find it helpful. You know that you have not yet introduced SafeLM to them. How can you approach the situation?
    a. Tell them that's impossible as there are no other third generation laryngeal masks in the market except SafeLM
    b. Acknowledge that there are other video laryngeal mask systems in the market like SaCoVLM and C-Trach. The visualization was likely poor as they do not have the adjustable view angle, which increases the glottic exposure for more airway anatomies.
    c. Acknowledge that there are other third generation laryngeal masks, but they are all more expensive than SafeLM
    d. Agree that video laryngeal masks are not helpful and walk away.

VI. Common Questions about SafeLM

1. **I've used LMAs for over a decade with no issues; why do I need video now?**

Answer:

Experienced hands can often place LMAs correctly by feel and ventilation response alone. But SafeLM isn't about replacing good technique.

- Perfect insertion doesn't guarantee ideal anatomical positioning
- Studies show up to 80% of LMAs are malpositioned even with good ventilation (e.g. epiglottis folded, partial glottic obstruction).
- You already insert laryngeal masks well, now SafeLM simply lets you see what you're already doing.

The difference is that SafeLM lets you:

- Confirm the cuff isn't folded, too high, or partially obstructed
- Avoid silent malposition (even with good capnography)
- Visually check you're not compressing the arytenoids or folding the epiglottis
- You can now visually verify in 5 seconds what you've always inferred from feel and that makes your routine work more precise, not more complex.

Blind insertion LMA often limits the use of a laryngeal mask. You may feel comfortable inserting an LMA for short procedures <2h, patient in supine position and no pneumoperitoneum.

- Having a video function gives you confidence to use a laryngeal mask for additional case types such as laparoscopic surgery, even in Trendelenberg position, or surgeries >2h

2. **If ventilation is working, why does it matter if I can't see the glottis?**

Answer:

Because "working" and "optimal" aren't always the same.

You may still be:

- Compressing the arytenoids (risking post-op hoarseness)
- Getting only partial seal, increasing O2/air flow demand
- Causing high-pressure leaks, even if tidal volumes look okay

With SafeLM, if the glottis is visible and the view is central, you know:

- Cuff is correctly seated
- You won't have to fiddle mid-case
- You've reduced the risk of mucosal injury and leak

3. **Is it really worth the cost per case?**

Answer:

Yes, when you factor in:

- Fewer failed insertions
- Less repositioning or device exchange
- Better cuff seal, meaning more efficient ventilation
- Less chance of post-op sore throat or trauma
- Reduced need for muscle relaxant/antagonist
- Ability to reduce anaesthetic time (insertion, removal, muscle relaxant preparation and administration, antagonist preparation and administration) improves OT efficiency, saving up to 20minutes per case.

Additionally,

- In cases like laparoscopy, obese patients, or long surgeries, the cost of minor complications adds up.
- Plus, if you ever need to intubate through it, you already have visual access; and this keeps SafeLM being a foolproof device.

4. **Is there strong evidence that SafeLM reduces complications or improves outcomes?**

Answer:

Clinical studies on third-gen video LMAs are emerging, but early data shows:

- Improved first-attempt success in difficult airway settings
- Reduced pharyngeal trauma due to better control during insertion
- Fewer malpositions and better teaching outcomes
- Improved hemodynamic stability, especially significant in cardiac patients

We're seeing it follow the same path as video laryngoscopy; starting with improved visualization, then evolving into standard practice as outcome data accumulates.

5. **We already use i-gel or LMA ProSeal - why should we switch if they're proven and cost-effective?**

Answer:

i-gel and ProSeal are excellent second-generation LMAs, and SafeLM isn't here to replace them blindly. But SafeLM brings a new layer of control, visibility, and precision that second-gen LMAs simply can't offer without visual confirmation.

- Here's the key difference:
- With i-gel or ProSeal, you're still inserting blindly and relying on indirect signs ; i.e chest rise, capnography, and guesswork on position.

With SafeLM, you can:

- See the glottis in real time during placement
- Confirm optimal cuff position under vision (no arytenoid pressure, no epiglottic folding)
- Immediately correct malposition, reducing leaks and adjustments
- Ensure a better seal with lower peak pressures
- Use the video channel if you ever need to intubate; no need to switch devices

In daily practice, that means:

- Continuous monitoring of the airway for longer or more risky surgeries, such as those with repositioning, or laparoscopy.
- Visualizing the airway gives you confidence that the mask is placed correctly during the entire surgery

- Early detection of regurgitation and aspiration for timely intervention

6. **Won't this slow me down during routine induction/ start of anaesthesia?**

Answer:

Actually, it speeds you up overall because:

- You get instant visual confirmation (no need to wait for capno tracing to "decide")
- You avoid repositioning or re-securing later
- On day-to-day lists with back-to-back LMAs, it gives you consistency and peace of mind
- Reduces the need for muscle relaxants (preparation time adds up)

Initial insertions may take 10 seconds longer as you adjust to visual guidance; but after 3–4 cases, it's as fast or faster, especially since you rarely need to reposition.

7. **This sounds great for training and marketing but what's the actual benefit for my daily elective list?**

Answer:

Here's what SafeLM gives you in routine, elective practice:

- One-look confirmation that LMA is seated perfectly
- Better seal → less adjustment mid-case
- Fewer leaks, especially in head-down or laparoscopic positions
- Ability to use a laryngeal mask for procedures that previously they didn't feel confident to use a laryngeal mask for such as laparoscopy, Trendelenberg, lateral position surgery, surgeries >2h

APPENDIX

---- NOT FITS + KIND OF FITS ++ APPROPRIATE +++ VERY FITS

	Type of Surgery And Type of Patient	Basic SGA	Laparoscopic	Orthopaedic	Pediatric	Bronchoscopy（Respiratory）	Urology lateral position	Thoracic Surgery（tubeless）	Hysteroscopy（Gynecology）	Neurosurgery	Eye Surgery	ENT	Longer /Unpredictable Surgery Duration	Over weight	Cardiovascular Disease	ASA III /ASA IV	Difficult Airway
	Monthly volume																
Benefits	Save surgical time,enhance the efficiency of operating room	++	++	++	++	+++	+	++	++	++	++	++	++	++	++	++	-----
	Accurately placed, unlikely to shift position	++	++	++	+++	+++	+++	+++	++	+++	+++	+++	+++	+++	++	++	+++
	Fit in lateral position, head-down foot-up position	++	+++	+++	+++	----	+++	+++	----	----	----	+++	-----	-----	-----	-----	-----
	Longer /Unpredictable Surgery Duration	++	+++	+++	++	++	+++	+++	+++	++	+++	++	-----	++	++	++	+++
	High sealing pressure，prevent air leakage caused by high airway pressure	+	+++	+	+++	+	+	----	----	----	+	+	-----	-----	+++	-----	----
	Reduce cervical spine, dental, airway damage caused by intubation	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	----

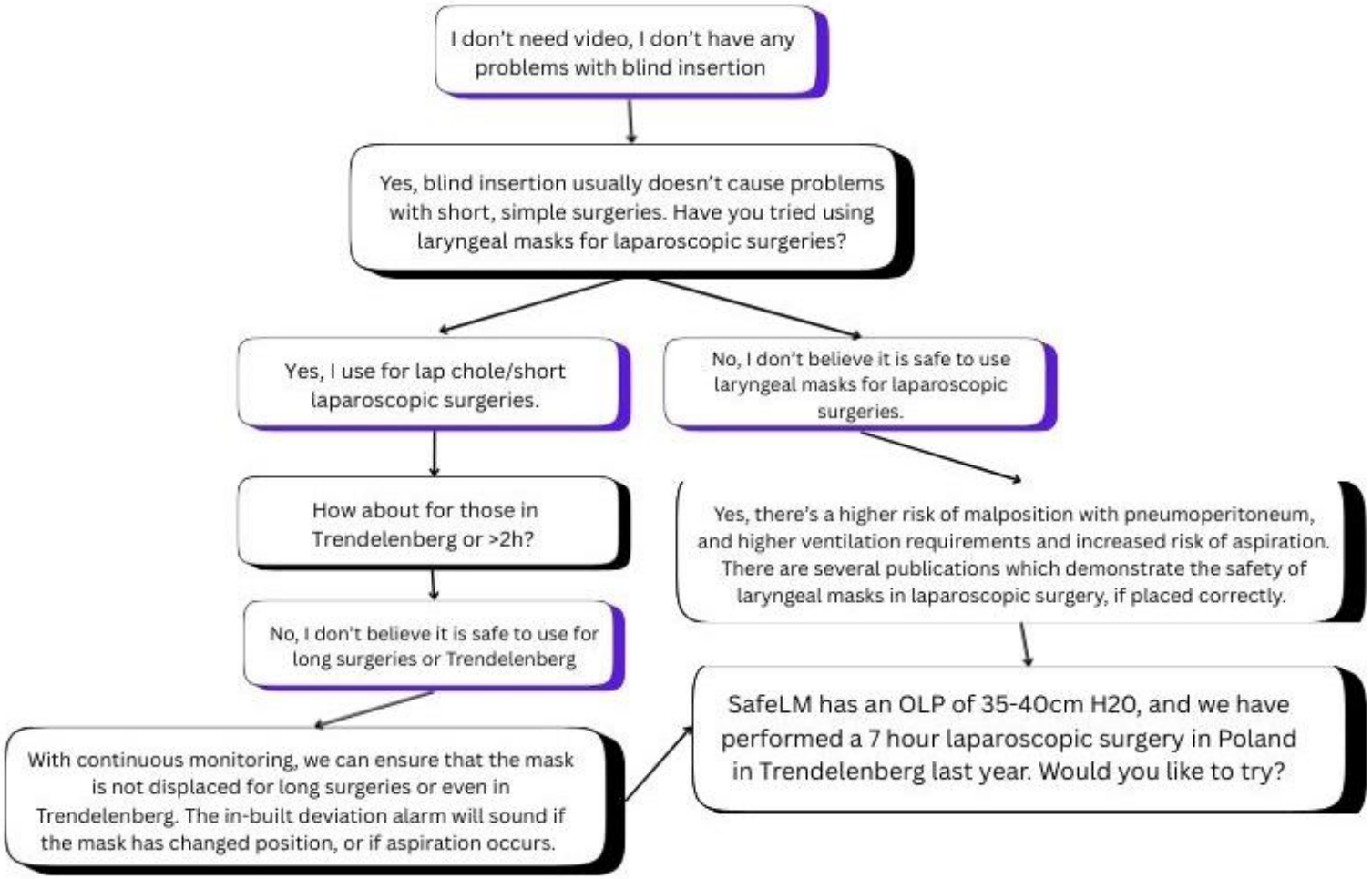
Continued Table

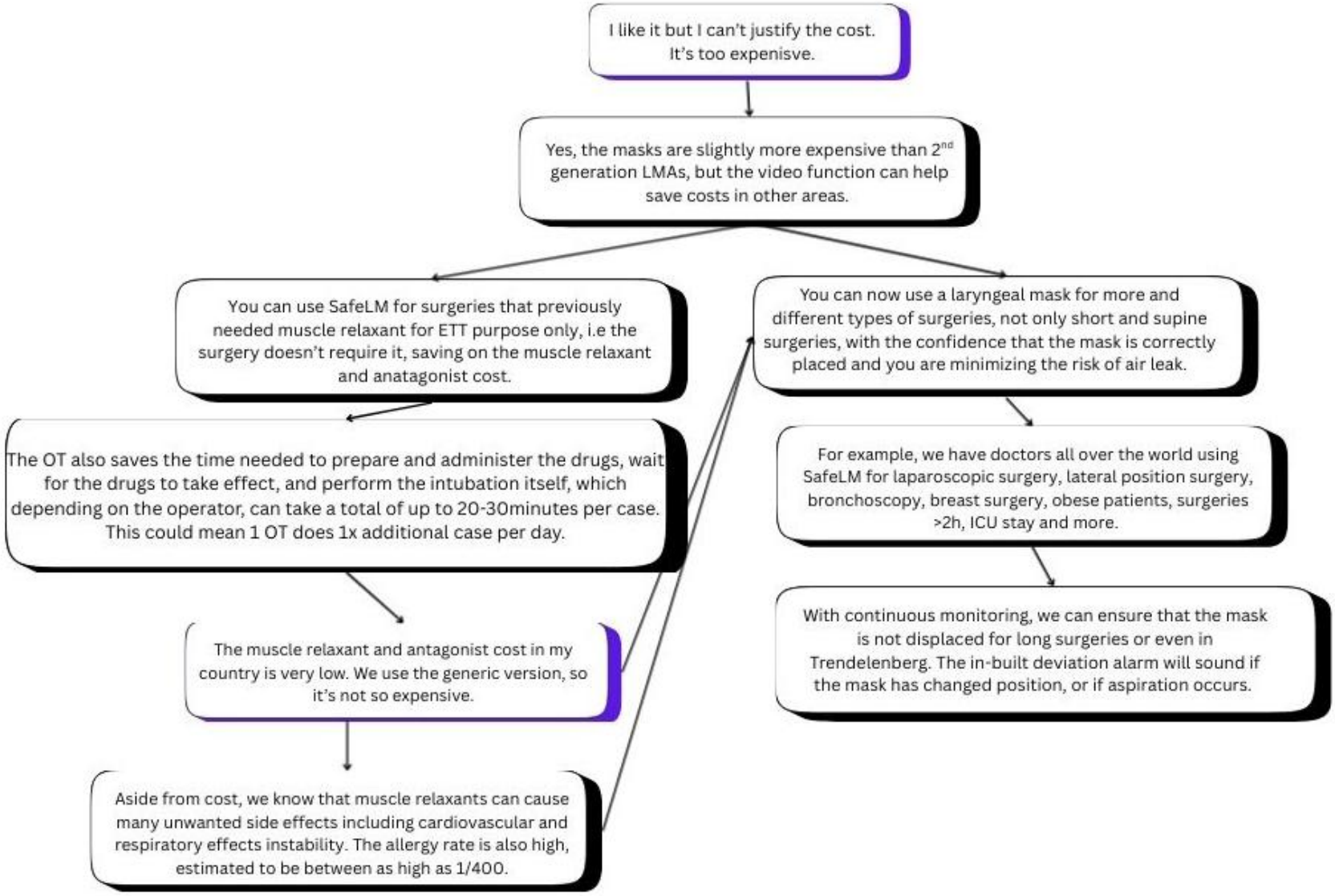
	Type of Surgery And Type of Patient	Basic SGA	Laparoscopic	Orthopaedic	Pediatric	Bronchoscopy (Respiratory)	Urology lateral position	Thoracic Surgery (tubeless)	Hysteroscopy (Gynecology)	Neurosurgery	Eye Surgery	ENT	Longer /Unpredictable Surgery Duration	Over weight	Cardiovascular Disease	ASA III /ASA IV	Difficult Airway
Benefits	Avoid using muscle relaxants/antagonists to prevent side effects	++	+	+	++	----	----	+++	+++	----	----	-----	-----	-----	-----	-----	-----
	Hemodynamic stability	++	++	++	++	++	++	++	++	+++	+++	+++	++	++	+++	++	----
	Continuously monitor the airway to prevent aspiration	++	+++	++	+++	----	+++	+++	++	++	++	+++	+++	+++	++	++	----
	Intubation function	+	+	+	----	----	+	+++	----	+++	+++	+++	++	++	+	++	+++
	Avoid intracranial pressure elevation caused by choking during extubation	----	----	----	----	-----	----	----	----	+++	+++	+++	------	-----	+++	-----	-----
	Reduce postoperative complications	++	++	++	+++	++	++	++	++	++	++	++	++	++	++	++	++
	Shorten the hospital stay	----	----	----	+	----	---	+++	----	----	----	----	----	----	----	----	----

Continued Table

	Type of Surgery And Type of Patient	Basic SGA	Laparoscopic	Orthopaedic	Pediatric	Bronchoscopy （Respirator）	Urology lateral position	Thoracic	Surgery （tubeless）	Hysteroscopy （Gynecology）	Neurosurgery	Eye Surgery	ENT	Longer /Unpredictable Surgery Duration	Over weight	Cardiovascular Disease	ASA III /ASA IV	Difficult Airway
Anesthesiologist's feedback (agree, disagree, unsure)	Dr.																	
	Dr.																	
	Dr.																	
	Dr.																	
	Dr.																	
	Dr.																	
	Dr.																	
	Dr.																	
	Dr.																	
	Dr.																	

✓ AGRE E × DISAGREE ? UNSURE


I don't need video, I don't have any problems with blind insertion
Yes, blind insertion usually doesn't cause problems with short, simple surgeries. Have you tried using laryngeal masks for laparoscopic surgeries?
Yes, I use for lap chole/short laparoscopic surgeries.
No, I don't believe it is safe to use laryngeal masks for laparoscopic surgeries.
How about for those in Trendelenberg or >2h?
Yes, there's a higher risk of malposition with pneumoperitoneum, and higher ventilation requirements and increased risk of aspiration. There are several publications which demonstrate the safety of laryngeal masks in laparoscopic surgery, if placed correctly.
No, I don't believe it is safe to use for long surgeries or Trendelenberg
SafeLM has an OLP of 35-40cm H20, and we have performed a 7 hour laparoscopic surgery in Poland in Trendelenberg last year. Would you like to try?
With continuous monitoring, we can ensure that the mask is not displaced for long surgeries or even in Trendelenberg. The in-built deviation alarm will sound if the mask has changed position, or if aspiration occurs.


I like it but I can't justify the cost. It's too expenisve.
Yes, the masks are slightly more expensive than 2nd generation LMAs, but the video function can help save costs in other areas.
You can use SafeLM for surgeries that previously needed muscle relaxant for ETT purpose only, i.e the surgery doesn't require it, saving on the muscle relaxant and anatagonist cost.
The OT also saves the time needed to prepare and administer the drugs, wait for the drugs to take effect, and perform the intubation itself, which depending on the operator, can take a total of up to 20-30minutes per case. This could mean 1 OT does 1x additional case per day.
The muscle relaxant and antagonist cost in my country is very low. We use the generic version, so it's not so expensive.
Aside from cost, we know that muscle relaxants can cause many unwanted side effects including cardiovascular and respiratory effects instability. The allergy rate is also high, estimated to be between as high as 1/400.
You can now use a laryngeal mask for more and different types of surgeries, not only short and supine surgeries, with the confidence that the mask is correctly placed and you are minimizing the risk of air leak.
For example, we have doctors all over the world using SafeLM for laparoscopic surgery, lateral position surgery, bronchoscopy, breast surgery, obese patients, surgeries >2h, ICU stay and more.
With continuous monitoring, we can ensure that the mask is not displaced for long surgeries or even in Trendelenberg. The in-built deviation alarm will sound if the mask has changed position, or if aspiration occurs.

Check in Questions and Answers

Part One

4. What is the leaf-shaped flap of elastic cartilage that sits above the glottic opening known as?
    a. Subglottis
    b. Epiglottis
    c. Glottis
    d. Arytenoid cartilage

    Answer: B

5. What are 3 benefits of using a laryngeal mask as compared to endotracheal intubation?
    a. Easier and faster insertion
    b. Hemodynamic stability
    c. Visualization with direct laryngoscope
    d. Reduced occurrence of post-operative sore throat and hoarseness

    Answer: A, B, D

6. What is the risk of malposition in laryngeal mask blind placement according to Van Zundert's paper in the BJA 2016?
    a. 10-30%
    b. 30-50%
    c. 50-80%
    d. 80-100%

    Answer: C

Laparoscopic Surgery

5) What are the current barriers to using a laryngeal mask for laparoscopic surgery? (Select 3)
    a. Risk of malposition leading to gastric insufflation and risk of aspiration
    b. Risk of malposition due to many surgeries being performed in lateral position
    c. Need for higher oropharyngeal leak pressure (OLP) in the event of Trendelenberg
    d. Need for higher OLP due to pneumoperitoneum

Answer: **A, C, D**. Most laparoscopic surgeries are performed with the patient supine (flat on their back), in head down feet up position (Trendelenberg) or head up and feet down position (Reverse Trendelenberg), not lateral position.

6) What are the clinical benefits of using a laryngeal mask in laparoscopic surgery? (Select 3)
    a. Improves OT efficiency, reducing anesthesia induction and extubation time
    b. Medical literature supports findings of reduced post-operative complications like sore throat, bleeding and pain with laryngeal mask use
    c. Supports faster patient turnover, reducing hospital stay duration
    d. Allows continuous bronchoscope access

Answer: **A, B, C**. Bronchoscopes are not generally used during a laparoscopic surgery.

7) Which key features of SafeLM can support the use of a laryngeal mask specifically for laparoscopic surgery? (Select 3)
    a. Supports OLP 25-30cm H2O due to accurate mask position
    b. Supports OLP 35-40cm H2O due to accurate mask position
    c. Ensure correct position to reduce aspiration risk and air leak
    d. Continuous monitoring with deviation alarm for regurgitation or displacement

Answer: B, C, D. The silicone cuff and *confirmation of correct placement* means that the SafeLM can withstand higher ventilation pressures before it begins to leak.

Orthopedic Surgery

4) What are the barriers to using a laryngeal mask in orthopedic surgery? (Select 2)
    a. Many shoulder surgery patients are unfasted, increasing the risk of regurgitation
    b. Trendelenberg position increases the risk of aspiration
    c. More likely to have lateral or prone position which can displace a laryngeal mask
    d. Orthopedic surgery duration can be unpredictable, many >2h

Answer: C, D. Most orthopedic surgery patients are elective, meaning that they have prepared and fasted (not eaten) the night before their surgery. Trendelenberg position is normally performed for abdominal surgery, not orthopedic.

5) Which key features of SafeLM can specifically support orthopedic surgeries? (Select 2)
    a. Ensure correct mask placement in lateral or prone position
    b. Discover laryngospasm which is common with bronchoscope manipulation
    c. Continuously monitor mask position even in lateral or prone position surgery
    d. Supports the use of bronchial blockers under visual guidance

Answer: A, C. Bronchoscopes are not routinely used in orthopedic surgeries. Bronchial blockers are not routinely used in orthopedic surgeries, but in thoracic (chest) surgeries to isolate a lung.

6) True/False: There is a clinical paper published in 2025 from China comparing SafeLM to ETT in arthroscopic shoulder surgery.

Answer: True.

8) When discussing the use of SafeLM in orthopedic surgery with physicians, which factor is the most convincing reason for them to use SafeLM?
    a. Reduced airway trauma
    b. Shortened operative time
    c. Hemodynamic stability
    d. Suitable for patients undergoing long procedures or procedures with unpredictable duration

Answer: D. Many ortho surgeries are long, or have unpredictable duration.

Pediatric Surgery

6) Which of the following pediatric surgeries can be clinical indications for SafeLM?
    a. Inguinal hernia repair
    b. Internal fixation of tibial plate
    c. Difficult airway ETT tube exchange
    d. Adenoidectomy

Answer: A, B, D. Size 2 and 2.5 masks do not support intubation because the airway channel is too narrow.

7) True/False. Magill Medical produces size 1 and size 1.5 laryngeal masks.

Answer: False. The smallest mask size produced by Magill Medical is size 2, due to the small size of the mask and limitation of video channel size.

8) How can SafeLM support reduced airway trauma for pediatric surgery? (Select 2)
    a. Increased success in first-pass insertion (reduce repeated attempts and laryngospasm risk)
    b. Integrated local anaesthetic spray port to reduce sensation
    c. Reduced need for repeated adjustments in the event of air leak
    d. Used together with muscle relaxant to prevent children from moving during procedure

Answer: A, C. Video supports guided insertion, placement and reposition to limit manoeuvres.

9) Why are laryngeal masks generally preferred in pediatric surgeries? (Select 3)
    a. Faster patient recovery and shorter hospital stay
    b. Avoid using muscle relaxants and muscle relaxant antagonists due to common allergic/side effects
    c. Reduce airway trauma to prevent mucosal injury and laryngospasm
    d. To encourage increased use of muscle relaxants

Answer: A, B, C. Most anesthetists prefer not to use muscle relaxants due to side effects and costs, if possible.

10) What are the key features of SafeLM that can support laryngeal mask use in pediatric surgery? (Select 3)
    a. Intubation function through SafeLM as a rescue airway
    b. Continuous monitoring throughout the surgery for improved patient safety
    c. Improve first-pass success, reducing airway trauma
    d. Avoids need for repeated adjustment, reducing laryngospasm risk

Answer: B, C, D. Size 2 and size 2.5 (pediatric) do not support intubation as the airway channel is too narrow. If the anesthetist wishes to intubate for pediatrics through SafeLM, they need to use a bougie through the airway channel, and remove SafeLM before inserting the ETT over the bougie.

Bronchoscopy

2) What are the key features of SafeLM in bronchoscopy? (Select 3)
    a. Continuous monitoring can help anaesthetists adjust laryngeal mask position during procedure if displacement occurs,

which is common with bronchoscope manipulation
   b. Ensures correct position of mask of patient is repositioned to lateral position
   c. Assess whether hypoxia is due to laryngospasm or bronchoscope intervention
   d. TRI-2 connector seals bronchoscope entrance

Answer: A, C, D. In bronchoscopy, most patients are supine (on their back) with their head elevated.

Urology Lateral Position

3) Which one of the following urological surgeries is performed in the lateral position?
   a. Partial nephrectomy
   b. Bladder repair
   c. Lower urinary tract reconstruction
   d. Prostatectomy

   Answer: A. A partial nephrectomy is indicated when the patient has renal tumor (s) as it provides direct access to the kidney. Other urological surgeries performed in lateral position include: adrenalectomy (removal of adrenal tumors) and ureterolithotomy (for large ureteral stones)

4) What is the main challenge of using a laryngeal mask in lateral position?
   a. Gastric acid aspiration is more like in lateral position than supine
   b. Lateral position surgeries tend to be longer (>2h)
   c. Lateral position can compromise airway access, increasing risk of air leak
   d. Laryngospasm is more likely in lateral position surgery

- **Answer: C.** Lateral positioning can compromise airway access, increase the risk of air leakage due to displacement of the laryngeal mask

Tubeless Thoracic Surgery

3) Which of the following are benefits of SafeLM in non-intubated thoracic surgery? (Select 3)
   a. the laryngeal mask is less likely to become displaced during position changes
   b. Continuous observation helps prevent reflux and aspiration
   c. Assists double-lumen tube (DLT) placement into the glottis during conversion to mechanical ventilation
   d. Hemodynamic stability

   Answer: A, B, D. The DLT is too large in diameter to be inserted through SafeLM, only a single lumen tube (SLT) and bronchial blocker (BB) can be inserted.

4) True/False: There is a clinical paper published in 2022 from China using SafeLM in tubeless thoracic surgery.

   Answer: True.

Ophthalmic Surgery

2) What are the key features of SafeLM that specifically support ophthalmic surgery? (Select 3)
   a. SafeLM PVC cuff is softer and less stimulating for the patient
   b. SafeLM silicone cuff is softer and less stimulating for the patient
   c. Video guidance ensures smoother insertion, minimizing sympathetic stimulation which can affect eye structures
   d. Supports easier extubation, reducing likelihood of coughing

Answer: B, C, D. SafeLM mask cuff is made from silicone, the main stem is made from PVC, which is tougher/more sturdy compared to silicone. Irritation of the sympathetic nerves in the airway can cause a rise in intra-ocular (eye) pressure.

Type of Surgery/Patient

10) True/False. There is strong clinical evidence that proves a laryngeal mask cannot be used in surgeries longer than 2 hours.

Answer: False. There is no clinical evidence to show that laryngeal masks cannot be used for surgeries longer than 2 hours. This common misconception is due to the risk of malposition and air leak/other complications if SGA position cannot be confirmed.

11) Anesthetist A tells you that many of his/her patients are obese. Overweight/obese patients are often at risk of gastro-esophageal reflux, increasing their risk for aspiration. How can you address this concern? (Select 2)
   a. Agree they should use an ETT for full aspiration protection
   b. Show them the deviation alarm which will sound when there is displacement or regurgitation
   c. Explain that it is impossible for patients to aspirate with SafeLM
   d. Explain that with video visualization, they can feel confident that the mask seal is secure over the glottis, and any aspiration can be visualized and managed accordingly.

Answer: B, D. There is never a 100% guarantee that the patient will not aspirate, even with an ETT so it is

important not to promise this. However, SafeLM can greatly reduce the aspiration risk by confirming an accurate seal over the airway, and early detection of aspiration can be managed by inserting a nasogastric tube into the gastric port.

12) Which of these patient groups can benefit from a laryngeal mask over ETT due to the improved hemodynamic stability with laryngeal mask? (Select 2)
    a. Eye surgery patients
    b. Neurosurgery patients
    c. Unfasted patients
    d. Female patients <40 years old

Answer: A, B. ETTs can irritate sensitive nerves in the trachea, which can cause a rise in heart rate and blood pressure, which can effect intra-ocular pressure and intra-cranial pressure.

13) Which surgeries can be performed with a laryngeal mask airway (LMA) without muscle relaxants?
    a. Hysteroscopic surgery
    b. Laparoscopic surgery
    c. Bronchoscopic treatment
    d. Orthopedic surgery

Answer: A, D. Many cases of laparoscopy and bronchoscopy still require muscle relaxant, regardless of whether or not they are using an ETT or SGA.

14) What is the ASA Classification used for? (Select 1)
    a. Determine patient's pre-operative health before anesthesia.
    b. Determine the patient's post-operative health after anesthesia.
    c. Determine the type of anesthesia used for the surgery
    d. Determine the patient's life expectancy

Answer: A. ASA anesthesia commonly refers to the American Society of Anesthesiologists (ASA) Physical Status Classification System, which is used to assess and communicate a patient's preoperative health before anesthesia. It categorizes patients from ASA I (healthy) to ASA VI (brain-dead organ donor), with higher classes indicating greater systemic disease and perioperative risk. Most anesthetists will select an ETT for ASA III/IV.

15) How can SafeLM reduce the need for muscle relaxants?
    a. Visualization of the stomach through the gastric channel
    b. Preserve pulmonary function
    c. Reduce regurgitation of gastric contents
    d. Reduce the need for endotracheal intubation, which requires paralysis to suppress airway reflexes
    e.

Answer: D. Endotracheal intubation insertion requires muscle relaxants to prevent laryngospasm. Laryngeal mask insertion does not touch the glottis, so reduces the likelihood of laryngospasm (even though it is still possible). SafeLM's gastric channel does not support gastroscope access.

16) Which of the following statements best describes enhanced recovery after surgery (ERAS)? Select 1.
    a. The pain relief medication protocol for post-operative use
    b. A peri-operative care pathway designed to reduce surgical stress, maintain physiological function, and accelerate recovery.
    c. How to turn all surgeries into day case surgeries
    d. A manual on how to discharge patients from hospital within 10 days

Answer: B. ERAS integrates optimized anesthesia, analgesia, nutrition, and early mobilization to improve outcomes, shorten hospital stay, and reduce complications.

17) Select 3 ways in which a video laryngeal mask can support ERAS.
    a. Reduced airway trauma for less post-operative sore throat or hoarseness
    b. Improved hemodynamic stability maintains cardiovascular stability
    c. Lower anaesthetic and opioid requirements as compared to ETT
    d. Ensure all cases are day case surgeries

Answer: A, B, C. It is impossible to guarantee that all cases will be day case surgeries, the purpose of ERAS is to support early mobilization and shorter hospital stay, not necessarily same-day discharge.

18) How can SafeLM help to improve work efficiency?
    a. Supports surgeries that do not require muscle relaxant, reducing time needed to prepare/administer muscle relaxants and their antagonists, and the time needed for the drugs to take effect
    b. Faster and easier extubation that can be performed by a nurse/junior doctor
    c. Supports intubation for difficult airways

d. Guided repositioning if air leak or regurgitation is detected

Answer: A, B, D. While SafeLM does support intubation for difficult airways, this is a niche area which does not necessarily improve work efficiency.

Competitor Review

2) Anesthetist B tells you that they have tried the video laryngeal mask system before, and did not find it helpful. You know that you have not yet introduced SafeLM to them. How can you approach the situation?
    a. Tell them that's impossible as there are no other third generation laryngeal masks in the market except SafeLM
    b. Acknowledge that there are other video laryngeal mask systems in the market like SaCoVLM and C-Trach. The visualization was likely poor as they do not have the
    c. adjustable view angle, which increases the glottic exposure for more airway anatomies.
    d. Acknowledge that there are other third generation laryngeal masks, but they are all more expensive than SafeLM
    e. Agree that video laryngeal masks are not helpful and walk away.

Answer: B. The most well known video laryngeal mask is C-trach from Teleflex, which has a fixed angle and cannot visualize many patient's anatomy (review the BJA publication on this). SafeLM has patented the adjustable view angle, so is the only video laryngeal mask which has this key feature. This supports improved views for more patients as everyone's airway anatomy is different.