Can the Laryngeal Mask Airway Replace Endotracheal Intubation for Airway Control?

Key words: laryngeal mask airway, endotracheal intubation, airway control

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The laryngeal mask airway was developed by Brain in 1983 [1] as a blindly inserted device that could be adequate for airway control during anesthesia and serve as a compromise between facemasks and tracheal tubes. Over the past 14 years the LMA has been used in about 150 million anesthesia procedures, and more than 2,400 studies relating to it have been published [2].

It has gained worldwide acceptance, as evidenced by the fact that by the early 1990s it was utilized in Britain for more than 50% of the anesthesia procedures for which an endotracheal tube was previously used [3]. In 1991 Benumof [4] included this device in the difficult airway algorithm for the setting "cannot ventilate, cannot intubate," and in the same year the LMA was approved for clinical use in the United States.

Despite its widespread use, some colleagues remain reluctant to employ the LMA in certain situations and still believe that it should not be used with controlled ventilation [5], in procedures lasting for 2 or more hours, or when a prone or Trendelenburg position is required [6]. In addition, some anesthesiologists do not feel comfortable using the laryngeal mask for otolaryngologic or eye operations because of potential difficulty in accessing the patient's airway should that become necessary, or for laparoscopic surgery due to theoretical concerns about the increased risk of aspiration of gastric contents [7].

We present arguments for and against the use of tracheal intubation or laryngeal mask airway in situations where airway manipulation is required.

The Argument for the Laryngeal Mask Airway

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We contend that the laryngeal mask airway can be used in most cases in which endotracheal tube intubation is required, and we provide evidence for the safety and efficacy of LMA in non-conventional settings.

LMA in the emergency setting

During cardiopulmonary resuscitation good airway control and effective ventilation are of the utmost importance because every delay to the provision of adequate oxygenation has a potentially severe deleterious effect on outcome [8]. ETT remains the gold standard for airway control during CPR. However, physicians trained in ETT are not always present and much time may be lost trying to intubate patients with cardiac arrest, leading to a delay in ventilation that worsens the already impaired oxygenation [9].

Since the learning process is shorter and skill retention superior with the LMA than with standard ETT [10], and because ventilation through the LMA is better than through a facemask in unskilled hands [11], it seems reasonable to use the LMA for airway control where medical personnel involved in resuscitation are not experienced in advanced airway manipulation [12].

In summary, we believe that the LMA has a place in airway management during CPR and should be the method of choice for airway control when the medical personnel involved in the resuscitation process (nurses, paramedics or physicians) are inexperienced in advanced airway management.

LMA = laryngeal mask airway
ETT = endotracheal tube intubation
CPR = cardiopulmonary resuscitation

LMA in the setting of laparoscopic surgery

The use of laparoscopic surgery is increasing steadily. Laparoscopic operations reduce postoperative morbidity, shorten hospital stay, and enable the performance of many procedures in the outpatient arena [13]. As equipment and skills develop, more prolonged and sophisticated surgical procedures are being successfully conducted by laparoscopy.

Regurgitation and aspiration of gastric contents is considered to occur more often during laparoscopic surgery because of the raised abdominal pressure caused by iatrogenic pneumoperitoneum, operator pressure on the abdominal wall and stimulation of the peritoneum [14]. We believe that the risk of regurgitation during laparoscopic procedures under general anesthesia with controlled ventilation is overestimated.

Several studies have assessed the efficacy and safety of the LMA for laparoscopic surgery. Bapat and Verghese [15] conducted a prospective study to estimate the prevalence of regurgitation in 100 patients who swallowed capsules of methylene blue 10–15 minutes before undergoing anesthesia induction for gynecologic laparoscopy. In addition, a pH probe was attached to the bowl of the laryngeal mask for continuous monitoring. They found no trace of dye in the upper airways on bronchoscopic examination. The pH probe detected a pH lower than 4 in 9% of the patients. The authors concluded that the incidence of regurgitation is very low during laparoscopic surgery with controlled ventilation and LMA. Ho et al. [16] reported a similar incidence of gastroesophageal reflux during ambulatory gynecologic laparoscopic surgery using controlled mechanical ventilation delivered through either ETT or LMA. Recently, Maltby et al. [17] were unable to detect any difference in gastric distension during laparoscopic cholecystectomy performed under controlled positive pressure ventilation with LMA or ETT. These studies confirm the results of a previous retrospective survey in 11,910 patients, which showed that the LMA is safe and effective for gynecologic laparoscopy including operations lasting 2 hours or more [18]. In summary, the LMA can safely replace ETT for laparoscopic surgery.

LMA in the setting of otorhinolaryngologic surgery

The use of the laryngeal mask airway for adenotonsillectomy has not been optimally assessed to date. Surgeons may be concerned about interference with or limited access to the surgical field, possible cuff damage, loss of airway, and/or pulmonary aspiration of blood and debris.

Daum and O'Reilly [19] used the LMA in 217 patients undergoing a variety of otorhinolaryngologic procedures. They reported that LMA was advantageous over ETT in terms of speed of anesthesia induction, airway control (in two cases of known difficult intubation, airway was secured primarily by the LMA), and cost. They recommended that further research be conducted to establish whether LMA provides lower airway protection. Williams and Bailey [20] recommended the use of the reinforced LMA instead of ETT for adenotonsillectomy.

The laryngeal mask airway has also been reported to be useful for airway control during general anesthesia for post-tonsillectomy hemorrhage [21] and for endoscopic sinus surgery [22]. In summary, the LMA can effectively substitute for ETT in ear, nose and throat surgery.

LMA in the setting of ophthalmologic surgery

In ophthalmologic surgery under general anesthesia, it is considered good practice to ensure a secure airway since the surgical field is in close proximity to the eyes, and to ventilate the patient to facilitate mild hypocapnia, which can reduce intraocular pressure and provide support for intraocular surgery [23]. This latter phenomenon is more important in case of a perforated eye where uncontrolled rise of intraocular pressure may cause extrusion of the vitreous humor and loss of vision.

The LMA has been used successfully for routine extra- or intraocular surgery instead of ETT [24]. However, the risk of pulmonary aspiration may limit its use in emergency intraocular surgery. Since open-globe injury does not require immediate surgery, a fasting period can be assured in order to decrease the incidence of pulmonary aspiration of gastric content [25].

The advantages of the LMA over ETT in ophthalmologic surgery include less postoperative coughing [26] and a lower increase in intraocular pressure during airway manipulation [27]. Because of the potential deleterious effect of a sudden rise in intraocular pressure in the peri-operative period, the LMA should be used.

LMA and surgical positioning

Use of the LMA for operations in the supine position with either spontaneous or controlled ventilation is widely accepted. However, when lateral or supine positions are required for surgical access, some authors rule out the use of the LMA for airway control [28].

Rasanen [6] recommended the laryngeal mask airway for surgical procedures in the lateral decubitus or the Trendelenburg position, but not when a prone position is required. The prone position is needed for many minor ambulatory procedures such as excision of pilonidal sinuses, avulsion of short varicose veins, excision of lipomas from the back, etc.

Patients undergoing surgery in the prone position are normally anesthetized in the supine decubitus position and then turned face down following tracheal intubation. Special care has to be taken to avoid impairment of ventilation, reduction in venous return, and development of pressure points. This approach is time consuming and may delay tracking in ambulatory surgery. When the patient places him/herself in the prone position before the induction of anesthesia, better positioning is achieved because patients know their most comfortable position, thus simplifying the process and facilitating the operative track.

Despite these advantages most anesthesiologists do not use the LMA when a prone position is required, perhaps because of the fear of difficult laryngoscopy should an airway problem occur. In a recently published small series there were no adverse effects when the LMA was inserted in the prone position prior to the induction of anesthesia [29].

In summary, the LMA can safely replace ETT in operations that are expected to end quickly when lateral or prone positioning is necessary, thus improving utilization of operating rooms and reducing hospital costs.

Conclusion

After proper training of personnel in its use, the LMA can successfully replace ETT in most cases where airway control is required, without additional risk of pulmonary aspiration of gastric content.

References

1. Brain AI. The laryngeal mask – a new concept in airway management. *Br J Anaesth* 1983;55:801–5.
2. Cook TM. Novel airway devices: spoilt for choice? *Anaesthesia* 2003;58:107–10.
3. Sasada MP, Gabbott DA. The role of the laryngeal mask airway in pre-hospital care. *Resuscitation* 1994;28:97–102.
4. Benumof JL. Management of the difficult adult airway. With special emphasis on awake tracheal intubation. *Anesthesiology* 1991;75:1087–110.
5. Griffin RM, Hatcher IS. Aspiration pneumonia and the laryngeal mask airway. *Anaesthesia* 1990;45:1039–40.
6. Rasanen J. The laryngeal mask airway – first class on difficult airways. *Finnanest* 2000;33:302–5.
7. Akhtar TM, Street MK. Risk of aspiration with the laryngeal mask. *Br J Anaesth* 1994;72:447–50.
8. Alexander R, Hodgson P, Lomax D, Bullen C. A comparison of the laryngeal mask airway and Guedel airway, bag and facemask for manual ventilation following formal training. *Anaesthesia* 1993;48:231–4.
9. de Latorre F, Nolan J, Robertson C, Chamberlain D, Baskett P. European Resuscitation Council Guidelines 2000 for Adult Advanced Life Support. A statement from the Advanced Life Support Working Group (1) and approved by the Executive Committee of the European Resuscitation Council. *Resuscitation* 2001;48:211–21.
10. Weksler N, Tarnopolsky A, Klein M. Insertion of the endotracheal tube, laryngeal mask airway and oesophageal-tracheal Combitube. A 6-month comparative study of acquisition and retention skills by medical students. *Eur J Anaesthesiol* 2003;20:1–4.
11. The use of the laryngeal mask airway by nurses during cardiopulmonary resuscitation. Results of a multicentre trial. *Anaesthesia* 1994;49:3–7.
12. Dickson M, Curry P. Training for the use of the laryngeal mask in emergency and resuscitation situations. *Resuscitation* 1998;28:111–13.
13. Smith I. Anesthesia for laparoscopy with emphasis on outpatient laparoscopy. *Anesthesiol Clin North Am* 2001;19:21–41.
14. Duffy BL. Regurgitation during pelvic laparoscopy. *Br J Anaesth* 1979;51:1080–90.
15. Bapat PP, Verghese C. Laryngeal mask airway and the incidence of regurgitation during gynecological laparoscopies. *Anesth Analg* 1997;85:139–43.
16. Ho BY, Skinner HJ, Mahajan RP. Gastro-oesophageal reflux during day case gynaecological laparoscopy under positive pressure ventilation: laryngeal mask vs. tracheal intubation. *Anaesthesia* 1998;53:921–4.
17. Maltby JR, Beriault MT, Watson NC, Fick GH. Gastric distension and ventilation during laparoscopic cholecystectomy: LMA-Classic vs. tracheal intubation. *Can J Anaesth* 2000;47:622–6.
18. Verghese C, Brimacombe JR. Survey of laryngeal mask airway usage in 11,910 patients: safety and efficacy for conventional and nonconventional usage. *Anesth Analg* 1996;82:129–33.
19. Daum RE, O'Reilly BJ. The laryngeal mask airway in ENT surgery. *J Laryngol Otol* 1992;106:28–30.
20. Williams PJ, Bailey PM. Comparison of the reinforced laryngeal mask airway and tracheal intubation for adenotonsillectomy. *Br J Anaesth* 1993;70:30–3.
21. Lim NL. The use of the laryngeal mask airway in post-tonsillectomy haemorrhage – a case report. *Ann Acad Med Singapore* 2000;29:764–5.
22. Danielsen A, Gravningsbraten R, Olofsson J. Anaesthesia in endoscopic sinus surgery. *Eur Arch Otorhinolaryngol* 2003;260:481–6.
23. El-Gohary MM, Hanna MG. Intraocular pressure and haemodynamic changes associated with the use of LMA and endotracheal tube: a comparative study in glaucomatous and nonglaucomatous children. *Eur J Anaesth* 2003;19:67–71
24. Langenstein H, Moller F, Krause R, Kluge R, Vogelsang H. Safe handling of the laryngeal mask airway in eye surgery. *Anaesthesist* 1997;46:389–97.
25. Kudlak TT. Open-eye injury. In: Yao FF, Artusio JF, eds. Anesthesiology: Problem-Oriented Patient Management. 3rd edn. Philadelphia: JB Lippincott, 1993:563–78.
26. Thomson KD. The effect of the laryngeal mask airway on coughing after eye surgery under general anesthesia. *Ophthalmic Surg* 1992;23:630–1.
27. Holden R, Morsman CD, Butler J, Clark GS, Hughes DS, Bacon PJ. Intraocular pressure changes using the laryngeal mask airway and tracheal tube. *Anaesthesia* 1991;46:922–4.
28. Poltronieri J. The laryngeal mask. *Ann Fr Anesth Reanim* 1990;9:362–6.
29. Ng A, Raitt DG, Smith G. Induction of anesthesia and insertion of a laryngeal mask airway in the prone position for minor surgery. *Anesth Analg* 2002;94:1194–8.

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The Argument against the Laryngeal Mask Airway

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Any innovation in anesthesia is evaluated in the light of risk-benefit analyses. The risk of an adverse event associated with a new anesthetic technique should be lower than that of older, well-accepted techniques, and the new technique should improve outcome [1]. Given that proponents of the universal use of the laryngeal mask airway will emphasize all its potential advantages, we will focus on its salient problems and drawbacks.

LMA and aspiration

Aspiration of gastric content is a dangerous occurrence in

anesthesia, but a rare event because all possible measures are taken to avoid it. The incidence of aspiration is estimated to range from 2.6:10,000 in elective patients to 11:10,000 in emergency patients, based on data of a large prospective trial reported by Warner et al. [2]. It is noteworthy that all cases of aspiration occurred either during artificial ventilation with the facemask or following extubation. No aspiration occurred when an endotracheal tube was in place. Based on these data Brimacombe and Berry [3] performed a meta-analysis of the risk of aspiration with LMA. They calculated that a minimum trial size of 500,000 cases would be required to obtain sufficient power to prove that the risk of aspiration is the same with the LMA as with ETT. However, their meta-analysis, which "suggests" (!) that the risk of pulmonary aspiration with the LMA is the same as with the facemask and ETT included only 12,901 patients.

Haden et al. [4] demonstrated that the incidence of regurgitation and aspiration is increased when the LMA is used instead of the facemask, because of the possible reduction of esophageal sphincter pressure by the LMA. Thus, in light of the above, one can hardly recommend use of the LMA as a standard airway device for almost every patient. In conclusion, the cuffed tracheal tube remains the "gold standard" for protecting the airway from gastrointestinal tract contents in fasting and non-fasting patients [5].

LMA and airway trauma

The LMA is usually inserted by means of a blind, sometimes traumatic technique. However, there are guidelines for the use of a laryngoscope to make insertion easier and devoid of trauma [6]. In direct comparison with ETT, the LMA was not found to reduce minor laryngopharyngeal morbidity. However, the pattern of patient complaints differs. After ETT, patients suffer more often from dysphonia, while patients after LMA insertion suffer more from dysphagia [7]. In terms of major injuries, most of the complications resulting from ETT are also seen after LMA insertion; namely, pharyngeal erythema, nerve palsies (recurrent laryngeal, hypoglossal, lingual), arytenoid dislocation, epiglottitis, and uvular bruising [8–10]. Tongue swelling and cyanosis is another known side effect of the LMA [11,12]. Bloody secretions are frequently seen at its removal and hematomas of the pharyngeal mucosa have been reported [13]. In one study, 26 of 74 LMAs were bloodstained at removal with an inflated cuff, in accordance with the manufacturer's guidelines [14]. In conclusion, there is no published evidence that use of the LMA reduces the risk of airway trauma. Apparently, it is so easy to use the LMA that fewer precautions are taken to avoid airway trauma. Modifications of the LMA, such as the intubating laryngeal mask airway, may even increase the incidence of upper airway morbidity [15].

LMA and cross-infection

Reusable LMAs may serve as a vector for the transmission of prion diseases [16–18], a risk that is non-existent with disposable endotracheal tubes. Contamination can be caused by traumatic insertion or removal of the LMA, especially in surgical procedures where the surgeons work in close proximity to the airway (ear-nose-throat, dental). In addition to the risk of obstruction and/or dislocation of the LMA, these patients are at high risk of exposure to blood contamination. In light of the new variant Creutzfeld-Jakob disease in Britain, the Health Ministry has advised the introduction of single-use surgical instruments to avoid contamination with prions and the possibility of cross-infection [19]. Even if vigorous efforts are made to clean the LMA, no method can guarantee the removal of all proteinaceous material [16]. In conclusion, given the potential transmission of prion diseases, there is no evidence that multiple-use LMAs are safe. Single-use LMAs are so expensive that their possible advantages with regard to a faster recovery are offset by their price [20].

LMA and laryngospasm

There are many reports of the risk of intra- and postoperative laryngospasm associated with the use and removal of the LMA. Recommendations for reducing this risk involve the size of the mask; cuff pressure; insertion and removal technique; timing of removal; and administration of additional local anesthetics, muscle relaxants, and/or propofol. Reports of the effect of these techniques on the incidence of laryngospasm have been extensively published in the literature, but this issue is beyond the scope of the present paper (see [13] for an overview). In conclusion, there is a typical risk of laryngospasm associated with LMA use and there is no convincing evidence that this complication can be prevented.

LMA as a standard airway device

Since intubation skills are essential for anesthesiologists, every opportunity should be exploited to increase these skills. If the LMA becomes the standard airway device there will be a serious decline in intubation experience. The LMA is easy to insert and has a success rate of about 94% on the first attempt. ETT requires about 50–100 attempts to reach a success rate > 90% [21,22]. Overuse of the LMA has already led to serious concerns regarding the lack of mask ventilation and intubation skills in recently trained anesthesiologists [23,24]. In conclusion, routine use of the LMA seems to reduce the level of experience with essential anesthesiologic skills such as mask ventilation and intubation. Since use of the LMA can be helpful in difficult airway management, every anesthesiologist should know how to use it [25]. This should be applied in a limited number of fasting patients who do not have an increased risk of aspiration and who are undergoing elective, peripheral procedures (not abdominal, thoracic or head/neck surgery) that are performed in the supine position and are expected to take less than 90 minutes.

Conclusion

If airway protection and patient safety are paramount, there is no alternative to ETT for airway protection. However, ETT is a difficult and potentially dangerous procedure that should be performed by skilled anesthesiologists. The LMA can be considered as a useful emergency airway device and its use should be learned under routine circumstances. As long as questions about its safety profile remain unanswered, the LMA cannot replace ETT as the gold standard for airway control.

References

1. Sidaras G, Hunter JM. Is it safe to artificially ventilate a paralysed patient through the laryngeal mask? The jury is still out. *Br J Anaesth* 2001;86:749–53.
2. Warner MA, Warner ME, Weber JG. Clinical significance of pulmonary aspiration during the perioperative period. *Anesthesiology* 1993;78:56–62.
3. Brimacombe JR, Berry A. The incidence of aspiration associated with the laryngeal mask airway: a meta-analysis of published literature. *J Clin Anesth* 1995;7:297–305.
4. Haden RM, Pinnock CA, Scott PV. Incidence of aspiration with the laryngeal mask airway. *Br J Anaesth* 1994;72:494–500.
5. Verghese C, Jago R. Is it safe to artificially ventilate paralysed patients through a laryngeal mask? *Br J Anaesth* 2002;88:149–51.
6. Jenkins J. The laryngoscope and the laryngeal mask airway. *Anaesthesia* 1993;48:735.
7. Rieger A, Brunne B, Hass I, Brummer G, Spies C, Striebel HW, Eyrich K. Laryngo-pharyngeal complaints following laryngeal mask airway and endotracheal intubation. *J Clin Anesth* 1997;9:42–7.
8. Dziewas R, Ludemann P. Hypoglossal nerve palsy as complication of oral intubation, bronchoscopy and use of the laryngeal mask airway. *Eur Neurol* 2002;47:239–43.
9. McHardy FE, Chung F. Postoperative sore throat: cause, prevention and treatment. *Anaesthesia* 1999;54:444–53.
10. Stewart A, Lindsay WA. Bilateral hypoglossal nerve injury following the use of the laryngeal mask airway. *Anaesthesia* 2002;57:264–5.
11. Twigg S, Brown JM, Williams R. Swelling and cyanosis of the tongue associated with use of a laryngeal mask airway. *Anaesth Intensive Care* 2000;28:449–50.
12. Wynn JM, Jones KL. Tongue cyanosis after laryngeal mask airway insertion. *Anesthesiology* 1994;80:1403.
13. Hempel V. Injuries and dangers in the use of the laryngal mask. *Anaesthesist* 1999;48:399–402.
14. Deakin CD, Diprose P, Majumdar R, Pulletz M. An investigation into the quantity of secretions removed by inflated and deflated laryngeal mask airways. *Anaesthesia* 2000;55:478–80.
15. Kihara S, Yaguchi Y, Brimacombe J, Watanabe S, Taguchi N. Routine use of the intubating laryngeal mask airway results in increased upper airway morbidity. *Can J Anaesth* 2001;48:604–8.
16. Coetzee GJ. Eliminating protein from reusable laryngeal mask airways. A study comparing routinely cleaned masks with three alternative cleaning methods. *Anaesthesia* 2003;58:346–53.
17. Lynch M. Risk of infection from laryngeal mask airways. *Anaesthesia* 2001;56:87.
18. Miller DM, Youkhana I, Karunaratne WU, Pearce A. Presence of protein deposits on 'cleaned' re-usable anaesthetic equipment. *Anaesthesia* 2001;56:1069–72.
19. Department of Health, UK. Risk assessment for transmission of vCJD via surgical instruments: a modelling approach and numerical scenarios. 2001.
20. Sidaras G, Hunter JM. Is it safe to artificially ventilate a paralysed patient through the laryngeal mask? The jury is still out. *Br J Anaesth* 2001; 86:749–53.
21. Schupfer GK, Konrad C, Poelaert JI. Manual skills in anaesthesiology. *Anaesthesist* 2003;52:527–34.
22. Konrad C, Schupfer G, Wietlisbach M, Gerber H. Learning manual skill in anesthesiology: is there a recommended number of cases for anesthetic procedures? *Anesth Analg* 1998;86:635–9.
23. Cross J. Airway management – a current training problem? *Anaesthesia* 2000;55:515–16.
24. Abdalla S, Thomson KD. Away with the LMA? *Anaesthesia* 1999;54:1116–17.
25. Practice guidelines for management of the difficult airway. A report by the American Society of Anesthesiologists Task Force on Management of the Difficult Airway. *Anesthesiology* 1993;78:597–602.

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Comments

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This pro and con presentation, part of a series of similar discussions planned in this journal, concerns a well-known, controversial issue in anesthesiology, namely the place of a relatively new artificial airway device, the laryngeal mask airway.

Since the early 1990s, use of the LMA has been accompanied by controversy regarding indications and safety inside and outside the operating room. On one hand the LMA has been enthusiastically recommended for its easy learning curve and the possibility of training non-medical personnel in its use in difficult situations. In large series of patients it proved to be safe and its associated complication rate did not differ significantly from the classical endotracheal tube intubation. The LMA saved lives in cases of impossible tracheal intubation and in cases where ETT was difficult to perform outside of the hospital. It can replace the facemask, thus freeing anesthesiologists' hands during anesthesia. Over recent years the LMA has replaced ETT and the facemask in many cases, to the satisfaction of the medical staff. It has became so popular that many professional have now expanded its use to unusual settings, such as anesthesia for surgery in prone patients or for prolonged operations in critically ill patients.

On the other hand, critics of the new device have tried to prove that the LMA has a very limited role in the arsenal of the modern anesthesiologist. At first the controversy focused on the incidence of aspiration of gastric content during anesthesia.

Following this, the danger of cross-infection was raised, since the cleaning process for LMA is cumbersome and takes days to complete. This drawback, together with its high cost (approximately $US 200 per piece) was cited to discourage the use of the LMA on a regular basis.

At the same time, anesthesiologists have started to learn a new technique as an alternative to the LMA, namely, the fiberoptic insertion of a tracheal tube in cases of impossible intubation.

As with most controversial issues, the truth in the case of the LMA lies somewhere in the middle. Nobody today can deny the role of this device in the anesthesiologist's technical arsenal. The new LMA devices – such as LMA for tracheal intubation, LMA combined with nasogastric tube, and disposable LMA – have made their way into daily practice and most anesthesiology departments have them and use them. The LMA has a clear place outside the operating room as well, e.g., for cardiopulmonary resuscitation. However, it should not be used in cases where there is even a remote danger of potential complications such as in patients in the prone position or in a non-fasted state.

The laryngeal mask airway is a fact of life today. Clinical judgment and experience should assist the practitioner in defining its real place, and patient welfare and outcome should be the main considerations in the decision-making process.

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