

SUPRALARYNGEAL AIRWAYS

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Alternative Airway Devices currently so popular they are challenging the “gold standard” of Endotracheal Intubation.

THE LMA IS CONSIDERED
THE GRANDEFATHER OF ALL
SUPRALARYNGEAL AIRWAY
DEVICES

ASA PRACTICE GUIDELINES FOR THE MANAGEMENT OF THE DIFFICULT AIRWAY

Many patients continue to be difficult to intubate with conventional laryngoscopy. One of the main advantages of Supralaryngeal Devices is the fact that they do not rely on direct visualization of the larynx. A major step in the development of these devices came in 1993 when the LMA was incorporated in the “practice guidelines for the management of the difficult airway. Today only two devices are recognized by the ASA D.A algorithm as rescue devices: The LMA and the Combitube. In the coming years it is predicted that more devices will be endorsed by the ASA, and perhaps their role might change and some maybe consider no just as rescue devices. Some consider this present era of airway management as the ERA of Supralayngeal Airways. There are currently #10 different kind of products derived just from the original Classic LMA and produced by the same company. That is not taking in to account devices produced by other companies that share many similarities with the original LMA.

The LMA original purpose was to provide greater control than the face mask, without the invasiveness of an ETT. Look at was has become of that original concept now more than 20 years later!. It is estimated that there have been over 150 million safe uses of the device worldwide.



Newer Supralaryngeal Airway Devices

United States Patent [19]		[11] Patent Number: 4,509,514
Brain		[45] Date of Patent: Apr. 9, 1985
[54] ARTIFICIAL AIRWAY DEVICE		2,175,726 10/1939 Gebauer 128/207.15
[76] Inventor: Archibald I. J. Brain, Flat 1, 6		3,417,744 12/1968 Miskin et al. 604/101 X
Claremont Rd., Folkestone, Kent,		4,351,342 9/1982 Witta et al. 604/43
England		<i>Primary Examiner</i> —Dalton L. Truluck
[21] Appl. No.: 449,728		<i>Attorney, Agent, or Firm</i> —Sughrue, Mion, Zinn,
[22] Filed: Dec. 14, 1982		Macpeak and Seas
[30] Foreign Application Priority Data		[57] ABSTRACT
Dec. 16, 1981 [GB] United Kingdom 8137899		An artificial airway device, for use in place of an endo-
[51] Int. Cl. A61M 25/00		tracheal tube to facilitate lung ventilation in an uncon-
[52] U.S. Cl. 128/207.15; 604/96		scious patient, is in the form of a laryngeal mask com-
[58] Field of Search 128/207.15; 206/26,		prising a tube opening into the interior of a mask portion
604/96-103		whose periphery, which may be inflatable, is adapted to
[56] References Cited		seal around the mlet to the larynx, thus securing the
U.S. PATENT DOCUMENTS		patient's airway, permitting spontaneous or controlled
2,099,127 11/1937 Leach 128/207.15		ventilation and preventing inhalation of extraneous
		matter.
		5 Claims, 3 Drawing Figures

LMA US Patent

The LMA is now endorsed by the AHA, NASA, ASA, and the European Resuscitation Council. There are over 2500 scientific publications about the LMA



Anesthesia and Analgesia—January-February, 1937

Nov. 16, 1937. B. C. LEECH
PHARYNGEAL BULB GASWAY
Patent No. 2,099,127

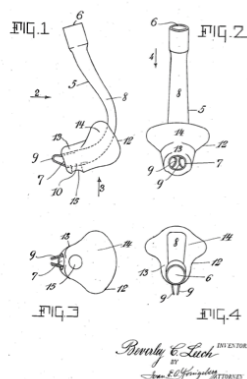


Fig. 1. Shows Radiographically the Gasway in Situ.

The Pharyngeal Bulb Gasway
IT IS BELIEVED that the new device as here presented, and as supplied by the Foregger Company, Inc., New York City, will prove to be simple and convenient of operation, as well as universally efficient in the administration of cyclopropane or other re-breathing gas for the following procedures: operations upon the face, nose, ear, head and neck; dental and other operations within the mouth. It is not suitable for throat operations, and in tonsillectomy operations it is probably not so convenient as in the intratracheal method. It is

Leech's Pharyngeal Bulb Airway as described and studied in 1937

Any resemblance with today's devices? Congratulations to the people that figured this device out



LMA of North America

Many of the newer inventions we hear about are just basically a modification of an original idea by a pioneer predecessor who most likely has unfortunately been forgotten over time.

The American Patent for the LMA was filled in 1985 as you can see from the picture above; it was not until 1991 that the FDA allowed the device to be released in the U.S.A, but with one main restriction: "it could NOT replace endotracheal tube placement for airway management"
How things change overtime

CURRENT ROLE OF SUPRALARYNGEAL DEVICES

Currently -although we need to keep in mind that newer devices are being developed and "older" devices are being modified- there are four main uses of Supralaryngeal Airways:

- As definite airway devices
- As rescue airway devices
- As conduits for intubation
- As a method for assisted extubation.

CLASSIFICATION OF SUPRALARYNGEAL DEVICES

There is currently no uniform method of classifying Supralaryngeal airways. In fact the term "supralaryngeal" is not universally accepted and some use the term "supraglottic" others use the term "extraglottic", and "periglottic", others use the term "epipharyngeal", "perilaryngeal", "hypopharyngeal" and still other authors call them "laryngopharyngeal" devices. If that does not lead to much confusion the current classification might: some classify them based on type of use into Re-usable and non re-usable devices, others based on route of insertion in to oral and nasal airways, others based on mechanism of seal

in to cuffed and un-cuffed devices and still others classify them based on anatomical location of the device.

In 2004 Brimacombe (Anesthesiology 2004;101(2) pp 559 proposed the following classification but as of today it has not been widely accepted and many devices have emerged as well:

Classification of Extraglottic Airway Devices by 1) Presence/Absence of a Cuff, 2) Oral/Nasal Route of Insertion; and 3) Anatomic Location of the Distal Portion	
	Year
Uncuffed, orally-inserted laryngopharyngeal airways	
Williams airway intubator*	1981
Patil oral airway*	1982
Ovassapian fiberoptic intubating airway*	1987
Combined oropharyngeal airway and dental pack	1981
Modified Connell airway	2001
Cuffed, orally-inserted laryngopharyngeal airways	
Mehta's cuffed oropharyngeal airway†	1990
Cuffed oropharyngeal airway†	1992
Uncuffed, nasally-inserted laryngopharyngeal airways	
Variable flange nasopharyngeal airway	1988
Linder nasopharyngeal airway	1988
Cuffed, nasally-inserted laryngopharyngeal airways:	
Boheimer's cuffed nasopharyngeal airway†	1990
Cuffed, orally-inserted hypopharyngeal airways	
Classic LMA‡	1988
Flexible LMA‡	1991
Intubating LMA*	1997
Disposable LMA‡	1998
ProSeal LMA‡	2000
Glottic aperture seal airway‡	1998
Streamlined pharynx airway liner‡	2002
Soft Seal laryngeal mask‡	2002
Laryngeal tube airway†	1999
Laryngeal tube suction†	2002
Airway management device†	2000
Pharyngeal airway express†	2002
Cobra pharyngeal lumen airway†	2003
Uncuffed, orally-inserted esophageal airways	
Tracheo-esophageal airway	1981
Cuffed orally-inserted esophageal airways	
Pharyngeal tracheal lumen airway†	1984
Esophageal tracheal combitube†	1987

Classification II

In 2004 as well Miller in Anesth Analg 2004;99:1553-9 proposed the following classification and scoring system for Supraglottic devices (see below):

Sealing Mechanism Classification

Cuffed perilaryngeal sealers
 Nondirectional sealing (e.g., Laryngeal Mask Airway [LMA™])
 Directional sealing (e.g., ProSeal™ LMA)
 Cuffed pharyngeal sealers
 Without esophageal sealing (e.g., Cuffed Oropharyngeal Airway [COPA®])
 With esophageal sealing (e.g., Combitube®)
 Cuffless anatomically preshaped sealers
 e.g., Streamlined Liner of the Pharynx Airway [SLIPA™]

His review remains one of the best and most referenced articles on the subject and a recommended reference for all readers interested in the subject.

As we can see there are now more devices than ever imagined and the list and interest on the subject keeps

growing. There is -as we can see- a need to come up with a definite and simple classification to allow us to fully compare different devices and further

more to allow us to come with specific indications and d

contraindications of these devices. Right now there no agreement among experts. While some authors and experts specifically from European countries are more liberal in the use of these devices, other countries

and I include the United States in this group are more conservative in their use.

Right now there are many still unanswered questions, hopefully newer evidence will shed some light with some controversial issues such as:

References:

1-Ferson and Brain A.I, LMA in Benumof's Airway Management 2nd edition, Mosby-Elsevier, pp 476-501.
 2-Brimacombe Anesthesiology 2004;101(2) pp 559

- 1- Use of these devices and positive pressure ventilation.
- 2-Use in non supine positions
- 3-Use in Obese patients.
- 4-Aspiration risks and use of SGAs?
- 5-Use in Laparoscopic Surgery
- 6-Use in Obstetrics
- 7-Need for gastric drainage
- 8-Use in trauma
- 9-Use in out of Hospital setting
- 10-During Resuscitation
- 11-Use in ICU

3-Miller in Anesth Analg 2004;99:1553-9

Assessment of Airways for Routine Use

Desirable Features	Cuffed perilaryngeal sealers					Cuffed pharyngeal sealers with esophageal cuffs					Cuffed pharyngeal sealers without esophageal cuff			Cuffless anatomically preshaped sealers	
	LMA-Classic ^a	LMA Unique SoftSeal ^a	PLM	ILM ^a	GO ₂	Combitube*/Easytube	LT	Sonda LT	AMD	Elisha Airway ^a	COPA	PAX	Cobra	SLIPA standard	SLIPA wedge
Noninvasive conduit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Easy insertion	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
First insertion successful	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
Reliable hands-free	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0
Seals for IPPV	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0
Minimal aspiration risk	2	2	0	2	1	0	2	0	1	0	2	2	0	0	0
Single use	2	0	2	2	0	1	2	2	2	2	0	0	0	0	0
No serious side effects	1	1	1	1	1	2	0	0	0	0	0	1	0	0	0
Routine score	6	4	3	6	5	3	0	0	0	0	5	3	0	0	0

For each variable and airway device, a score has been assigned. A score of 0 means that the device is ideal for the purpose. A score of 1 for any variable would suggest that there is satisfactory performance, but that there could be improvement. A score of 2 would suggest that there is a vulnerable issue that clearly could do with improvement. Where there are insufficient objective data or incomplete data, no scores have been assigned. The routine score total pertains to routine airway management.

LMA = Laryngeal Mask Airway; PLM = ProSeal™ Laryngeal Mask; ILM = Intubating Laryngeal Mask Airway; GO₂ = Glottic Aperture Seal Airway; LT = Laryngeal Tube®; AMD = Airway Management Device; COPA = Cuffed Oropharyngeal Airway; PAX = The PAXpress™; Cobra = Cobra Perilaryngeal Airway; SLIPA™ = Single-Use Liner of the Pharynx Airway; IPPV = intermittent positive pressure ventilation.

^a Airways that may be specifically suitable for difficult airway management.

Miller in Anesth Analg 2004;99:1553-9