

# What's new above the cords? Simulation based education for supraglottic airway management.

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## Introduction

Supraglottic airway management devices comprise a family of medical devices that facilitate oxygenation and ventilation without endotracheal intubation [1]. "Supraglottic airway" is a generic description for devices that facilitate ventilation and oxygenation with devices that do not penetrate the vocal cords. Classification of these devices can be constructed based on the laryngeal sealing mechanism of each device [2]. Three main mechanisms are identified: cuffed perilaryngeal sealers (e.g. laryngeal mask airway), cuffed pharyngeal sealers (e.g. laryngeal tube), and cuffless anatomically preshaped sealers (e.g. I-gel airway). Supraglottic devices became routinely used in the operating room with the advent of the laryngeal mask airway (LMA) over 20 years ago. Emergency resuscitation paradigms have traditionally utilised sealed facemask (a type of supraglottic device) ventilation by pre-hospital personnel and others who are untrained in intubation techniques. A variety of alternate devices have been developed which can be placed blindly, and reliably provide secure oxygenation and ventilation, some with the capability of secure conversion to an endotracheal tube. Advantages of these devices include higher seal pressures (allowing higher ventilation pressure), ease of insertion, the ability to drain gastric fluid and the ability to avoid cervical spine neck extension to visualize the larynx. The Combitube, Laryngeal tube, I-gel Airway, Streamlined Pharynx Airway Liner (SLIPA), and intubating laryngeal mask airway are examples of such devices. New commercial supraglottic devices are regularly introduced for clinical use and over 25 versions are currently available from multiple manufacturers. The King Laryngeal Tube is a simple-to-use, reliable device that results in >90% first attempt successful placement by paramedics in a pre-hospital clinical setting [3]. In general, blindly placed supraglottic devices are contraindicated in patients who are awake, with intact gag reflexes, or with distorted supraglottic anatomy. Complications can include malpositioning, aspiration and upper airway trauma. Reference [4] contains images of the described devices.

## Simulation-Based Training Methods

Simulation-based familiarisation and training in the indications, contraindications, and device-specific techniques can be utilised to provide practitioners exposure to multiple devices in a short period of time. Simulation can likewise be utilised to assess individual performance and device functionality. Effective use of simulation for these purposes requires knowledgeable matching of the selected supraglottic device to the airway simulator chosen for training [4]. A recent review concludes that none of the four airway training manikins studied was a single "best" match for all of the eight supraglottic devices tested, and that several devices were suitable for training with a wide variety of supraglottic airway devices. The Laerdal Airway Trainer and Trucorp Airsim simulators performed well with most supraglottic airway devices. Difficult airway simulation with pharyngeal swelling and trismus can be introduced as curriculum elements with the Laerdal Airway trainer, extending the versatility of the device for advanced airway management training.

## Summary

Simplicity of blind placement technique and high rates of correct positioning make supraglottic airway devices an important element in the armamentarium available for emergency airway rescue. A large variety of devices are available, with varying performance characteristics and variable degrees of evidence regarding use in the pre-hospital setting. Pre-hospital and emergency airway management with supraglottic devices is advocated more routinely as evidence accumulates [5]. Simple low cost airway simulators are available for evaluation of devices, training and assessment.

## Conclusions

The use of supraglottic airway devices is a pre-hospital airway management strategy whose time has come. "Above the cords" is now a validated anatomic location for definitive airway management strategies in pre-hospital and emergency settings.

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