Can EMT-Bs Safely Use Supraglottic Airway Devices with Minimal Training?

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Abstract

EMT-B airway management is typically limited to bag-valve mask (BVM) ventilation. An alternative and potentially more reliable device for establishing an airway in the complicated out of hospital environment are supraglottic airways (SGAs), which sit above the glottis and maintain an open upper airway. This narrative review evaluated whether EMT-Bs can reliably use SGAs with minimal training. Brief training regimens of 30–120 minutes produced first-pass success rates of approximately 70–80% in OHCA, with overall success frequently exceeding 90%. Failures were uncommon and usually related to patient-specific factors. Overall, current evidence suggests SGAs are technically feasible for EMT-B providers with minimal training, but further research is needed to determine their clinical effectiveness compared to BVM for BLS providers.

Introduction

The current national scope model for EMT-Bs outlines BVM ventilation with OPAs and NPAs as the only BLS ventilation technique. However, limitations are associated with BVM including difficulty in establishing a reliable seal and lower chest compression fraction in OHCA, which are especially prevalent in rural areas with few ALS providers and long transport times.

Supraglottic airway devices (SGAs) offer a more secure airway with simple insertion. They are able to create a seal which if inserted correctly and coupled with WaveForm Capnography, can provide reliable ventilation for longer periods of time. Substantial research identifies the efficacy of SGAs in the paramedic toolkit, but their feasibility for EMT-Bs is debated.

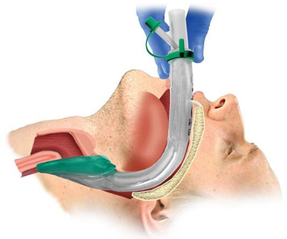


Figure 1: I Gel Airway Device (SGA)

Scan to View EMT-B Application of Device

Figure 2: LMA Airway Device (SGA)

Scan to View EMT-B Application of Device

Methods

Searches on PubMed, Cochrane Library, and Google Scholar identified relevant studies. Studies evaluating SGA use among BLS, non-intubating providers were included. Studies not in English, published prior to 2010, or evaluating SGA use among ALS providers in comparison to endotracheal intubation were excluded. Four studies satisfied the inclusion criteria, reflecting the limited body of literature focused exclusively on BLS providers. Studies were evaluated according to pre-established themes including dose of training, type of SGA used, placement success, and skill translation to out-of-hospital cardiac arrest (OHCA) clinical use.

Results

Table 1: Training Models

	Roth et al[1]	Fiala et al[2]	Länkimäki et al[3]	Andresen et al[4]
Device Used	Laryngeal Tube	Laryngeal Tube	Laryngeal Tube	i-Gel
Providers	EMTs	EMTs	Firefighter/first responders	Firefighter/first responders
Training Model	Lecture + Manikin practical	Lecture + Manikin practical + 3 confirmed placements required to pass	Lecture + Manikin practical + 2 confirmed placements required to pass	Lecture + Manikin practical
Source of Training Program	Austrian Red Cross developed program	Manufacturer recommended program (VBM)	Study group developed program	Study group developed program
Training Dose (minutes)	**120**	**120**	**30**	**45**

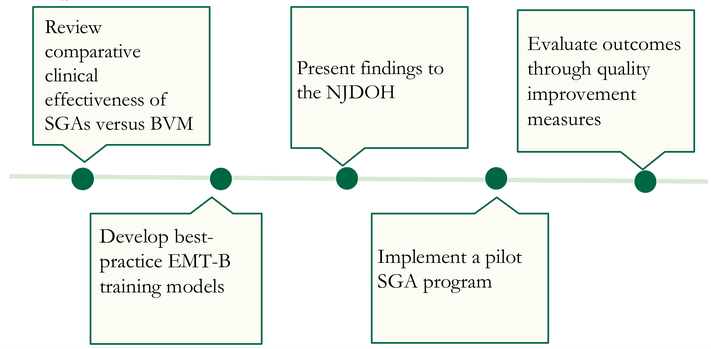
Table 2: Clinical Outcomes and Feasibility

	Roth et al[1]	Fiala et al[2]	Länkimäki et al[3]	Andresen et al[4]
OHCA cases with SGA use	395	35	64	23
First-attempt success (%)	**67.7**	**74.3**	**71.9**	**78.0**
Cumulative success ≤2 attempts (%)	88.3	NR	92.2	NR
Effective ventilation achieved (%)	**93.0**	**71.4**	**90.7**	**87.0**
Median time to insertion (s)	NR	NR	23.1	30.0
Procedural complication rate (%)	**11**	**2.9**	**NR**	**13**
Causes of complication	Regurgitation, cuff ruptures, injuries	Mucosal membrane injury (bleeding)	Regurgitation, air leak, cuff ruptures, improper size	Air leak

Discussion/Conclusion

This study is part of a proposal to the New Jersey Department of Health Office of EMS to allow agency-specific i-gel use with Medical Director approval. Multiple studies suggest EMT-Bs and other first responders can quickly acquire the knowledge and skills required for competent SGA use after short training regimens. These skills translated effectively into clinical use with high first-pass success rates on OHCA patients and low rates of complication, noninferior to BVM[1,2]. Additionally, SGAs provide BLS first responders with a mechanism to overcome common limitations with BVM ventilation such as in patients with substantial facial hair or without teeth. When implemented thoughtfully and as an adjunct to, rather than replacement of BVM ventilation, current evidence supports inclusion of SGAs as a valuable component of the BLS airway toolkit.

Next Steps:



Acknowledgments

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References

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2. Fiala A, et al. *Scand J Trauma Resusc Emerg Med.* 2017;25:104.
3. Länkimäki S, et al. *Resuscitation.* 2013;84(4):446–449.
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