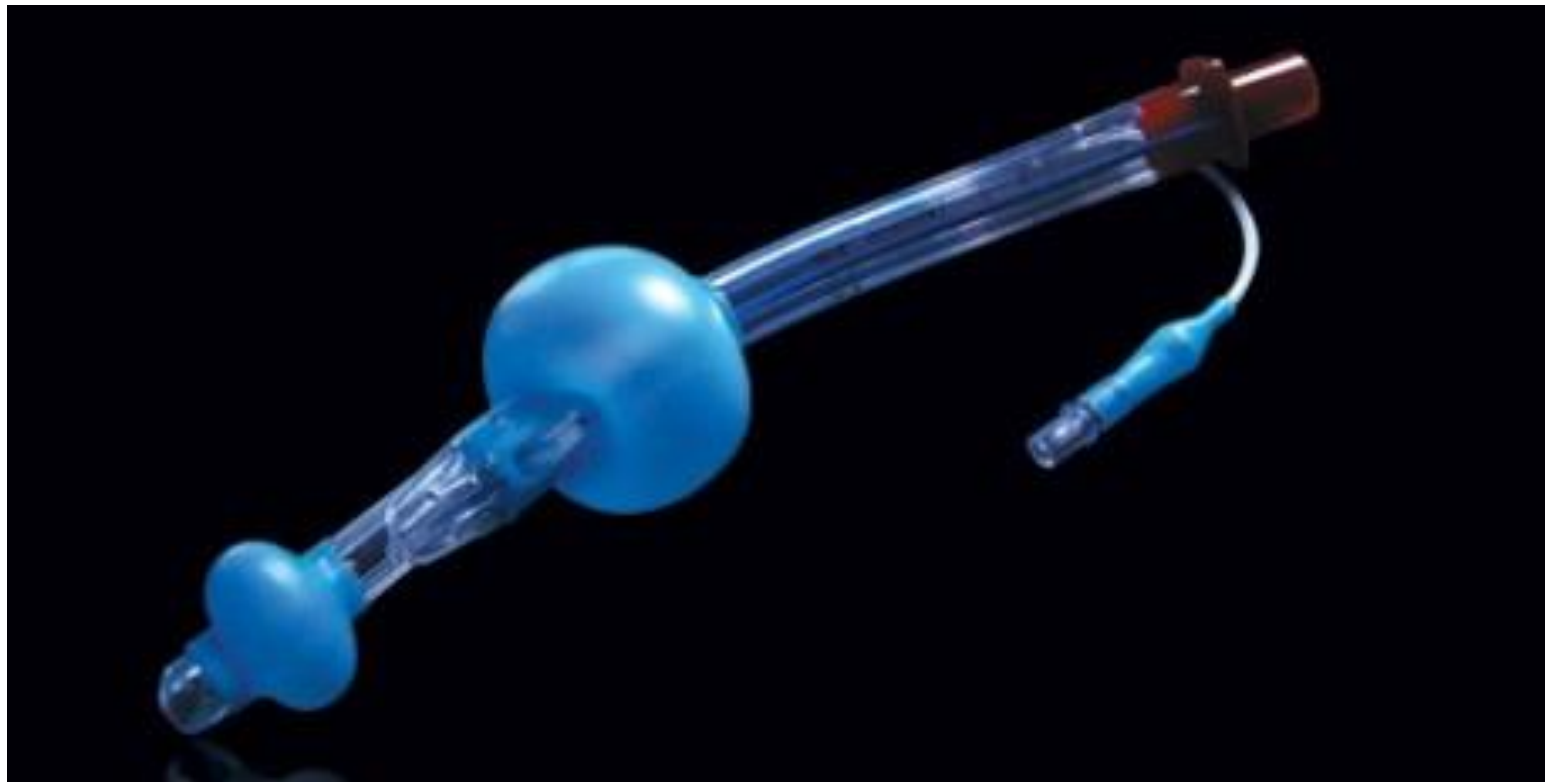




# Proposed Change: Supraglottic Airways



**Dr. Mel Otten**



# Current TCCC Guidelines

## Tactical Evacuation Care

### 1. Airway Management

a. Unconscious casualty without airway obstruction:

- Chin lift or jaw thrust maneuver
- Nasopharyngeal airway
- Place casualty in the recovery position



# Current TCCC Guidelines

## Tactical Evacuation Care

### 1b. Casualty with airway obstruction or impending airway obstruction:

- Chin lift or jaw thrust maneuver
- Nasopharyngeal airway
- Allow casualty to assume any position that best protects the airway, to include sitting up.
- Place unconscious casualty in the recovery position.
- If above measures unsuccessful:
  - Laryngeal Mask Airway (LMA)/intubating LMA or
  - Combitube or
  - Endotracheal intubation or
  - Surgical cricothyroidotomy (with lidocaine if conscious).

### 1c. Spinal immobilization is not necessary for casualties with penetrating trauma.



# Supraglottic Airways

## Endotracheal Intubation (ETI)

- **ETI has in the past been considered the Gold Standard for airway management. The use of ETI in the prehospital environment, however, has been questioned in recent papers. (Bledsoe 2009)**



# Supraglottic Airways

## Endotracheal Intubation

- **High failure rates for ETI have been reported, even when done by experienced paramedics. (Cook 2005) Potential complications are increased even further in trauma patients. (Cook 2005) ETI was not found to improve outcomes when performed in civilian trauma victims. (Lecky 2009)**



# Supraglottic Airways

## Endotracheal Intubation (ETI)

- **A Cochrane Review of ETI concluded that: 1) the efficacy of emergency intubation as currently practiced has not been rigorously studied; 2) the skill level of the operator may be key in determining efficacy; 3) in non-traumatic cardiac arrest, it is unlikely that intubation carries the same life saving benefit as early defibrillation and bystander cardiopulmonary resuscitation (CPR); and 4) in trauma and pediatric patients, the current evidence base provides no imperative to extend the practice of prehospital intubation in urban systems. (Lecky 2009)**



# Supraglottic Airways

## Endotracheal Intubation without Sedation and Paralysis

- **The high failure rate of ETI in the prehospital setting may reflect the fact that these are often attempts at intubating without sedation and paralysis. Placing either an endotracheal tube or an SGA in a struggling, conscious patient without sedation and paralysis will be difficult.**



# Supraglottic Airways

## Endotracheal Intubation (ETI) vs Supraglottic Airways (SGA)

- **Supraglottic airways (SGAs) have a number of advantages in comparison to endotracheal intubation (ETI):**
  - **Ease and speed of insertion (Castle 2011, Burns 2010)**
  - **Decreased risk of harming the casualty from malposition (Burns 2011)**
  - **Improved ventilation compared with BVM**
  - **Less training and experience required to use successfully (Castle 2011)**

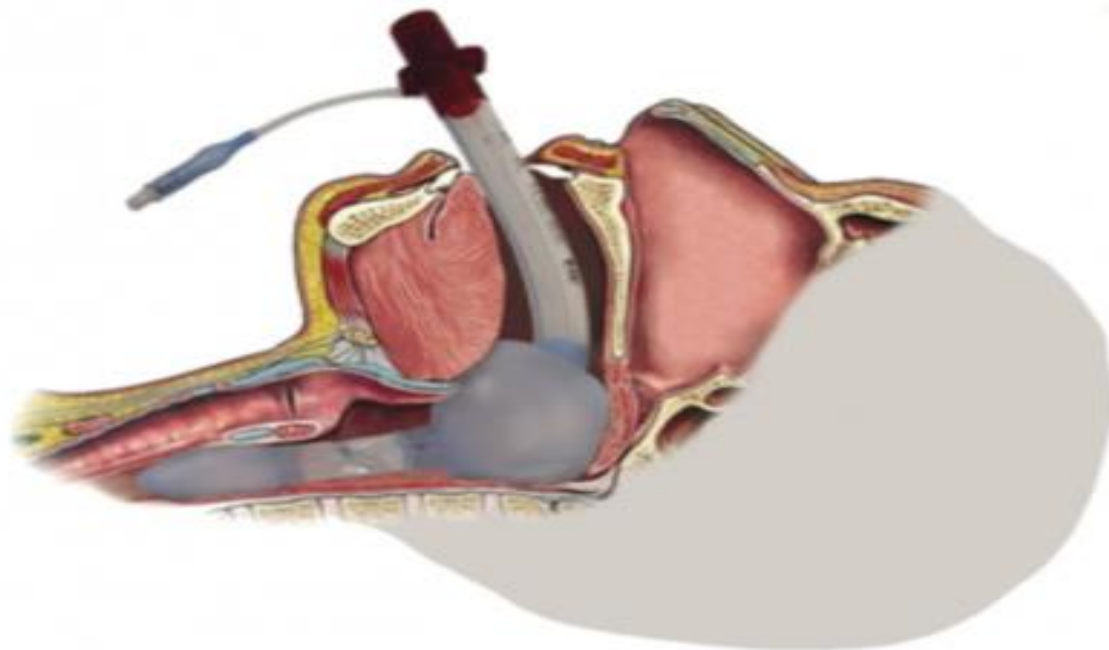




# King LT: Reusable Supraglottic Airways



King LT: Reusable  
supraglottic airways





# Supraglottic Airways

## Endotracheal Intubation (ETI) vs Supraglottic Airways (SGA)

- **SGAs, in particular the classic LMA, have revolutionized airway mgt in anesthesia, but not necessarily in resuscitation. (Hernandez 2012, Cook 2005). SGAs are not widely used in the prehospital care of combat casualties. (Adams 2008)**



# Supraglottic Airways

## Endotracheal Intubation (ETI) vs Supraglottic Airways (SGA)

- Improperly done ETI can kill the patient; in contrast, SGAs are relatively safe and easy to use by operators with limited airway experience (Ragazzi 2012, Cook 2005)
- Compared to ETI, SGAs have a higher success rate and are quicker to insert. (Timmerman 2011)



# Supraglottic Airways

## Supraglottic Airways

- **SGAs may not be well-tolerated by casualties who are not unconscious and may not be effective in casualties with direct airway trauma. (Timmerman 2011)**



# Supraglottic Airways

## SGAs in Trauma

**Many studies on SGAs are performed on manikins, cardiac arrest patients, or individuals being administered anesthesia for elective surgery. (Castle 2011, Burns 2010, Joffe 2011, Kajino 2011, Ragazzi 2012, Ruetzler 2011, Russi 2009, Schalte 2011, Seet 2010, Tan 2010, Timmerman 2011, Tumbach 2009, Wharton 2008) The evidence is very limited for the effectiveness of SGAs in patients with direct airway trauma.**



# Supraglottic Airways

## Surgical Airways in Combat

- Mabry and Frankfurt's analysis of 72 pre-hospital surgical airways based on records from the Joint Theater Trauma Registry found that: 1) 66% of the patients died; 2) those patients injured by gunshot wounds to the head or thorax all died; 3) the largest group of survivors had gunshot or blast-related wounds to the face and/or neck;



# Supraglottic Airways

## Surgical Airways in Combat

- **Mabry and Frankfurt (cont): 4) the failure rate for the procedure as performed by combat medics was 33% compared to 15% for physicians and physician assistants. (Mabry 2012)**



# Supraglottic Airways

## Airway Protection by Sitting Up and Leaning Forward

- **Many casualties with isolated maxillofacial injury can protect their airways by simply sitting up, leaning forward, spitting out the blood in their airway, and continuing to breathe in that position. Surgical airways should be reserved for those casualties in whom this strategy is not successful at maintaining an adequate airway. Maxillofacial injury should not trigger a knee jerk reflex for the medic to attempt a surgical airway. (Butler 2010)**





# Supraglottic Airways

## SGAs in Trauma

- **If the patient can tolerate either ETI or an SGA without sedation and paralysis, the casualty is unlikely to have a favorable outcome, in that the most common causes of unconsciousness on the battlefield are hemorrhagic shock and severe TBI, both of which are associated with a high mortality. These individuals are, however, still the best candidates for SGAs among the combat wounded because the casualty is better able to tolerate the SGA.**



# Supraglottic Airways

## SGAs

- **The only SGAs mentioned in 1996 TCCC paper were the LMA and the Combitube. These two devices were also the only SGAs mentioned in the 2000 International Liaison Committee on Resuscitation (ILCOR) Guidelines. (Cook 2005)**
- **The classic Laryngeal Mask Airway (LMA) is less likely to harm a patient if malpositioned than esophageal intubation, whereas an unrecognized esophageal intubation is more likely to result in the death of the patient. (Cook 2005) The LMA is still very widely used. (Joliffe 2008)**



# Supraglottic Airways

## SGAs

- **Many variations of SGA have come into use in recent years. (Hernandez 2012, Ragazzi 2012, Darlong 2011, Erlacher 2011, Hooshangi 2008, Joffe 2011, Joliffe 2008, Ragazzi 2012, Ruetzler 2011, Schalte 2011, Schmidbauer 2009, Timmerman 2011, Wharton 2008)**



# Supraglottic Airways

## SGAs

- **The U.S. Army is currently using the King LT SGA as part of 68W training and equipping. The Combitube is not presently being issued to Army Combat medics.**
- **The King LT had a higher prehospital first-attempt insertion success rate than ETI (87.8% vs 57.6%) in a study of 351 out-of-hospital cardiac arrest patients. (Gahan 2011)**



# Supraglottic Airways

## SGAs

- **The King LT had the highest success rate (96.5%) in a meta-analysis of prehospital airway control options, although the authors note that the data is limited. The authors further note that data regarding the efficacy of the King LT in trauma patients were lacking. (Hubble 2010)**



# Supraglottic Airways

## SGAs

- **Four different SGAs were able to be successfully inserted on manikins by 141 lay persons in 95+ percent of trials after only 3 minutes of training, (Schalte 2011)**
- **Despite numerous studies comparing different SGAs in manikins, there are few randomized, controlled trials comparing different SGAs in patients with difficult airways. (Timmerman 2011)**



# Supraglottic Airways

## SGAs

- **There is not enough evidence to support a recommendation for any specific SGA in pre-hospital airway management. (Timmerman 2011)**
- **The King LT device was noted to be improperly positioned in four out of seven combat fatalities examined post-mortem. (Harcke 2012)**



# NOMLLC TCCC Equipment Evaluation

19. The airway device(s) that I used was/were effective in establishing an airway in casualties who did not have direct trauma to the airway (Note: Only rate items you used and leave rating blank for items not used)

	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	Rating Average	Response Count
Nasopharyngeal airway	0.7% (1)	3.6% (5)	20.1% (28)	44.6% (62)	30.9% (43)	4.01	139
LMA	0.0% (0)	0.0% (0)	11.1% (1)	55.6% (5)	33.3% (3)	4.22	9
Intubating LMA	0.0% (0)	0.0% (0)	8.3% (1)	41.7% (5)	50.0% (6)	4.42	12
King LT	0.0% (0)	1.4% (1)	9.7% (7)	47.2% (34)	41.7% (30)	4.29	72
Endotracheal tube	1.5% (1)	1.5% (1)	3.0% (2)	35.8% (24)	58.2% (39)	4.48	67
Comments: (Ease of use, most difficult aspect of airway, performance in cold/heat/rain, etc.) Specify items in your comments. <a href="#">Show replies</a>							47
answered question							168
skipped question							123





# Supraglottic Airways Conclusions

- **The recommendation for supraglottic airway use in Tactical Evacuation Care should be expanded to include supraglottic airways other than the LMA and Combitube.**
- **The King LT is well-supported as a choice for Army medics, although other SGAs may suffice as well.**



# Supraglottic Airways Conclusions

- **Casualties who are unconscious from hemorrhagic shock or severe TBI but who have not suffered direct airway trauma are likely to be the best candidates for SGAs among the combat wounded.**
- **Casualties who are able to tolerate ETI or SGA without sedation and paralysis are likely to have a poor prognosis.**



# Supraglottic Airways Conclusions

- **Airway obstruction caused by direct trauma to the airway structures is generally best treated with a surgical airway.**



# Supraglottic Airways Conclusions

- **Many casualties with isolated maxillofacial injury can protect their airways by simply sitting up, leaning forward, spitting out the blood in their airway, and continuing to breathe in that position. Surgical airways should be reserved for those casualties in whom this strategy is not successful at maintaining an adequate airway. Maxillofacial injury should not trigger a knee jerk reflex for the medic to attempt a surgical airway.**



# Supraglottic Airways Conclusions

- **Use of SGAs is recommended as both a combat medic and a combat paramedic skill.**
- **SGA training should emphasize the need for ensuring proper placement when these devices are used.**



# Proposed Change

## Tactical Evacuation Care

### 1b. Casualty with airway obstruction or impending airway obstruction:

- Chin lift or jaw thrust maneuver
- Nasopharyngeal airway
- Allow casualty to assume any position that best protects the airway, to include sitting up.
- Place unconscious casualty in the recovery position.
- If above measures unsuccessful:
  - Supraglottic airway or
  - Endotracheal intubation or
  - Surgical cricothyroidotomy (with lidocaine if conscious).

### 1c. Spinal immobilization is not necessary for casualties with penetrating trauma.



# Questions?

