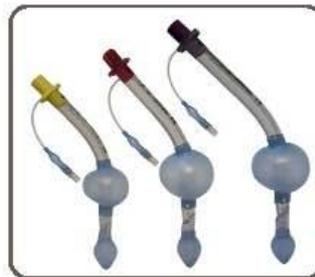


# KLTD/KLTSD

Disposable Supralaryngeal Airways\*

\*KING LT-D™ and KING LTS-D™



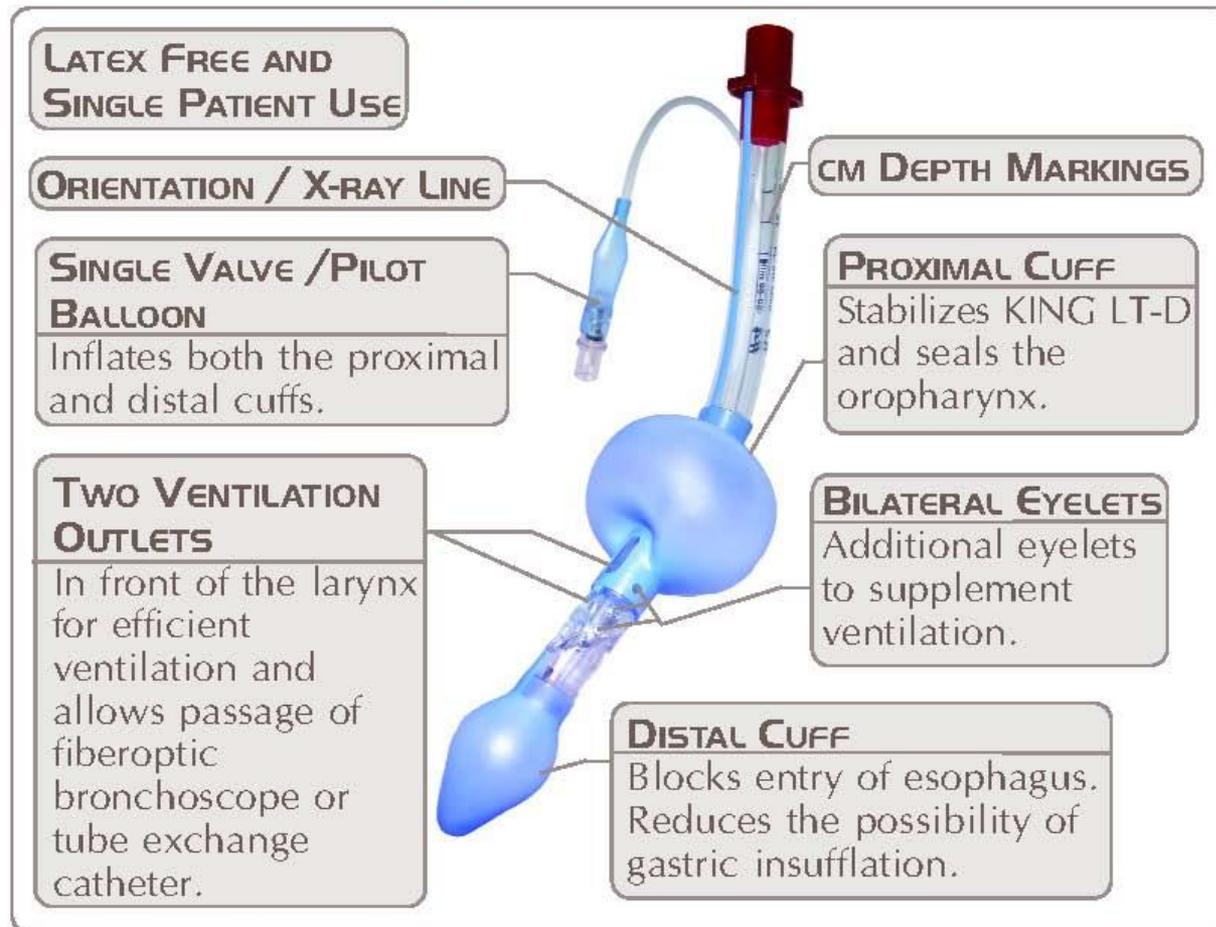
Inservice Program



## **KLTD/KLTSD Disposable Supralaryngeal Airways**

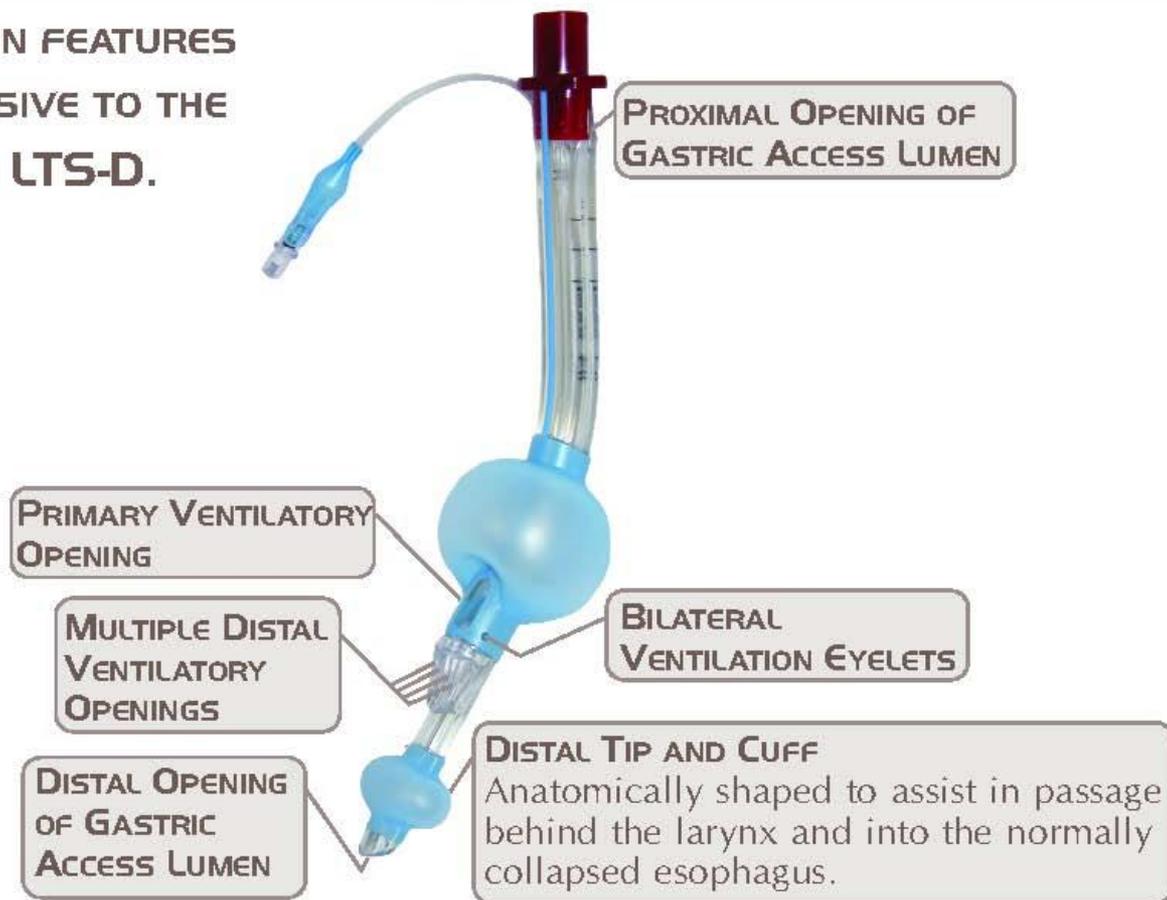
The KLTD/KLTSD are disposable supralaryngeal airways created as alternatives to tracheal intubation or mask ventilation. The KLTD/KLTSD are designed for positive pressure ventilation as well as for spontaneously breathing patients, thereby allowing maximum versatility as airway management tools. The KLTD/KLTSD consistently achieve a ventilatory seal over 30 cm H<sub>2</sub>O. They are easy to insert and result in minimal airway trauma. The KLTD/KLTSD are 100% latex free and are designed for single patient use. The KING LTS-D offers the unique ability to pass a gastric tube through a second channel of the airway into the stomach.

# KING LT-D Design



# KING LTS-D Design

**DESIGN FEATURES  
EXCLUSIVE TO THE  
KING LTS-D.**



# KLTD/KLTSD EMS Kits

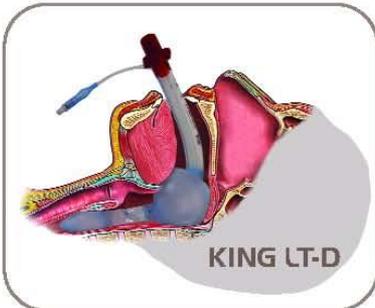
## Each EMS Kit Includes:

- KLTD or KLTSD
- Syringe
- Lubricant
- Instructions for Use

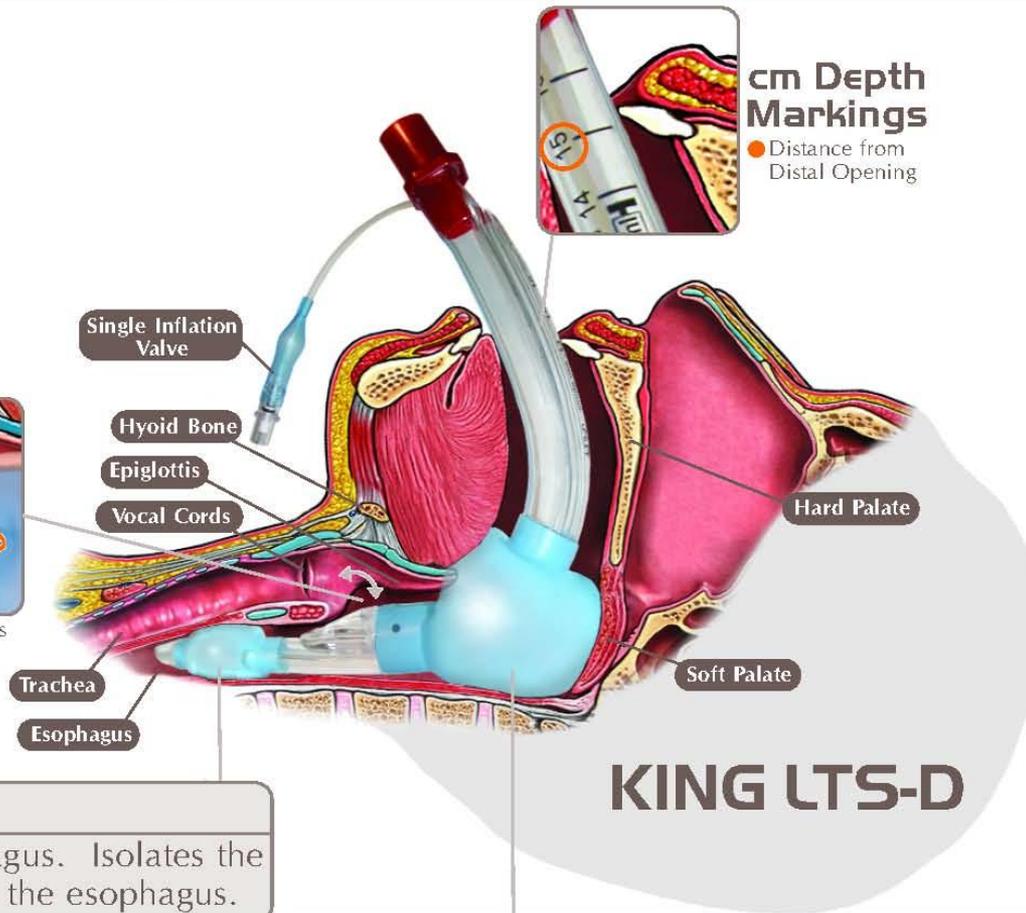
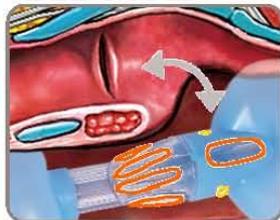


\*KING LT-D EMS Kits pictured

## Placement Diagram



### Gas Flow



### Distal Cuff

Inflates in the esophagus. Isolates the laryngopharynx from the esophagus.

### Proximal Cuff

Inflates at the base of the tongue. Isolates the laryngopharynx from the oropharynx and nasopharynx.

## The design of the KLTD & KLTSD offers:

1. The ability to provide positive pressure ventilation as well as spontaneous breathing.
2. A seal pressure over 30 cm H<sub>2</sub>O.
3. Ease of insertion.
4. Low incidences of sore throat and trauma.
5. Minimizes gastric insufflation.
6. KLTSD allows easy passing of a gastric tube through the gastric access lumen into the stomach.





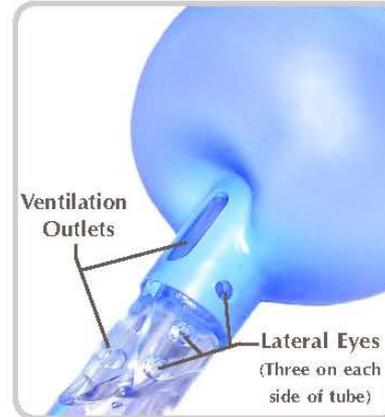
## KING LT-D Design



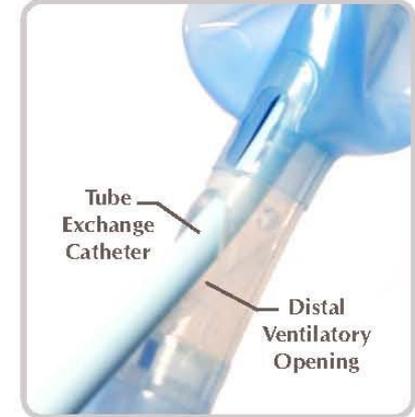
Soft, flexible  
beveled tip inside  
distal cuff



Soft, pliable  
cuffs



Two main  
ventilation outlets and  
bi-lateral eyes  
for additional  
ventilation



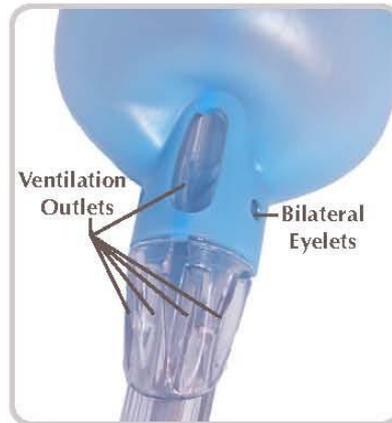
Ramp directs  
tube exchange  
catheter out  
ventilation opening



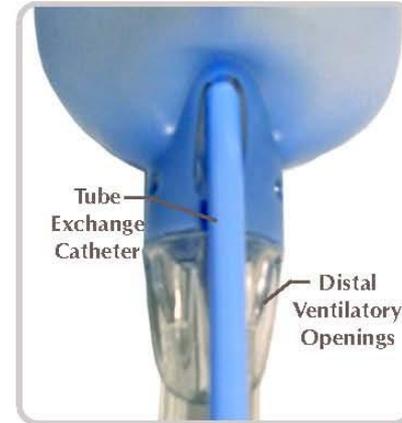
## KING LTS-D Design



Distal tip and cuff flattened for more anatomical fit behind larynx



Multiple ventilation outlets and bilateral eyelets for best ventilation



Ramp directs tube exchange catheter out Primary Ventilatory Opening

## Curved Design

The KLTD/KLTSD supraglottic airways are designed with a straightened, beveled distal tip that assists in directing the airways posterior to the larynx and into the upper esophagus. Due to this unique configuration, there is minimal risk of either device entering the trachea.





## **Indications of the KLTD/KLTSD**

The KLTD/KLTSD is intended for airway management in patients for controlled (over 30 cm H<sub>2</sub>O) or spontaneous ventilation. Also indicated for difficult and emergent airway cases and well suited for ambulatory and office-based anesthesia.

## **Contraindications**

- Responsive patients with an intact gag reflex.
- Patients with known esophageal disease.
- Patients who have ingested caustic substances.



## Sizing & Information

### KING LTS-D



### KING LT-D



### Cuff Pressure

#### Gauge

ITEM #KLT 900



#### PRODUCT INFORMATION

Product	Size 2	Size 2.5	Size 3	Size 4	Size 5
<b>KLTD</b>	KLTD202	KLTD2025	KLTD203	KLTD204	KLTD205
<b>KLTD EMS</b>	KLTD212	KLTD2125	KLTD213	KLTD214	KLTD215
<b>KLTS D</b>	n/a	n/a	KLTS D403	KLTS D404	KLTS D405
<b>KLTS D EMS</b>	n/a	n/a	KLTS D413	KLTS D414	KLTS D415

**EMS kits are non-sterile and contain a KING LT-D or KING LTS-D, syringe for cuff inflation, lubricant, and abbreviated instructions for use.**

#### SIZING INFORMATION

SIZE	2	2.5	3	4	5
<b>CONNECTOR COLOR</b>	Green	Orange	Yellow	Red	Purple
<b>PATIENT CRITERIA</b>	35-45 inches (90-115 cm) or 12-25 kg	41-51 inches (105-130 cm) or 25-35 kg	4-5 feet (122-155 cm)	5-6 feet (155-180 cm)	greater than 6 feet (>180 cm)
<b>CUFF PRESSURE</b>	60 cm H <sub>2</sub> O	60 cm H <sub>2</sub> O	60 cm H <sub>2</sub> O	60 cm H <sub>2</sub> O	60 cm H <sub>2</sub> O
<b>KLTD O.D./I.D.</b>	11 mm/7.5 mm	11 mm/7.5 mm	14 mm/10 mm	14 mm/10 mm	14 mm/10 mm
<b>KLTS D O.D./I.D.*</b>	n/a	n/a	18 mm/10 mm	18 mm/10 mm	18 mm/10 mm
<b>KLTD CUFF VOLUME</b>	25-35 ml	30-40 ml	45-60 ml	60-80 ml	70-90 ml
<b>KLTS D CUFF VOLUME</b>	n/a	n/a	40-55 ml	50-70 ml	60-80 ml

#### KING LTS-D is not available in size 2 and 2.5

**KLTD:** Maximum Size Fiberoptic Bronchoscope: 7.0 mm O.D. (size 3, 4, 5) and 4.7 (size 2, 2.5); Maximum Size Tube Exchange Catheter: 19 Fr (size 3, 4, 5) and 14 Fr (size 2, 2.5); Minimum Mouth Opening: 16 mm (size 3, 4, 5) and 12 mm (size 2, 2.5)

**KLTS D:** \*Ventilation Lumen is not round, but is equivalent to a 10 mm I.D. tube; Maximum Size Tube Exchange Catheter: 19 Fr; Maximum Size Fiberoptic Bronchoscope: 6 mm OD; Minimum Mouth Opening: 20 mm

## **KLTD/KLTSD Insertion Guide, Preparation**

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- Choose correct size based on patient's height (weight can also be used for size 2 and 2.5):
  - 35-45 in (90-115 cm)      Size 2\*
  - 41-51 in (105-130 cm)      Size 2.5\*
  - 4 to 5 ft (122-155 cm)      Size 3
  - 5 to 6 ft (155-180 cm)      Size 4
  - > than 6 ft (>180 cm)      Size 5
- Test cuff inflation system for air leak.
- Apply water-soluble lubricant to the distal tip.

*\* Size 2 and 2.5 only available in KING LT-D.*



## Insertion Guide, Step 1

Hold the KLTD/KLTSD at the connector with dominant hand.

With non-dominant hand, hold mouth open and apply chin lift, unless contraindicated by C-spine precautions or patient position.

Using a lateral approach, introduce tip into corner of mouth.



## Insertion Guide, Step 2

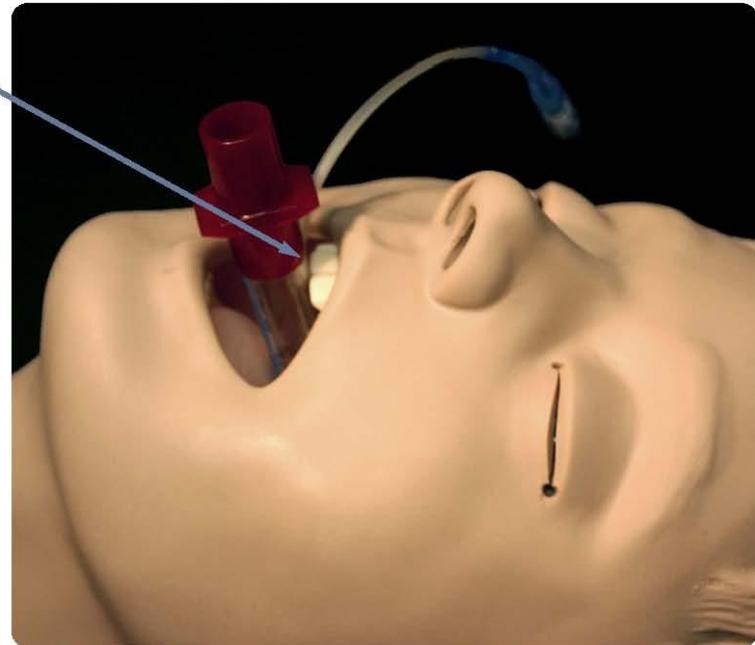
Advance the tip behind the base of the tongue while rotating tube back to midline, so that the blue orientation line faces the chin of the patient.





## Insertion Guide, Step 3

Without exerting excessive force, advance tube until base of connector is aligned with teeth or gums.





## Insertion Guide, Step 4

Inflate cuffs to 60 cm H<sub>2</sub>O or to “just seal” volume.

EMS Kit: Inflate cuffs using the maximum volume of the syringe provided.

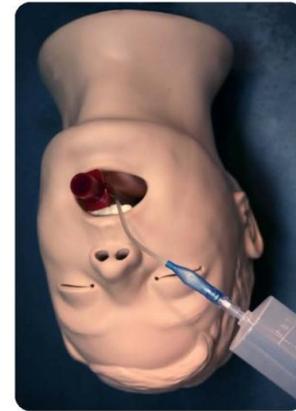
Typical inflation volumes are as follows:

**KING LT-D**

Size #2 25-35 ml  
Size #2.5 30-40 ml  
Size #3 45-60 ml  
Size #4 60-80 ml  
Size #5 70-90 ml

**KING LTS-D**

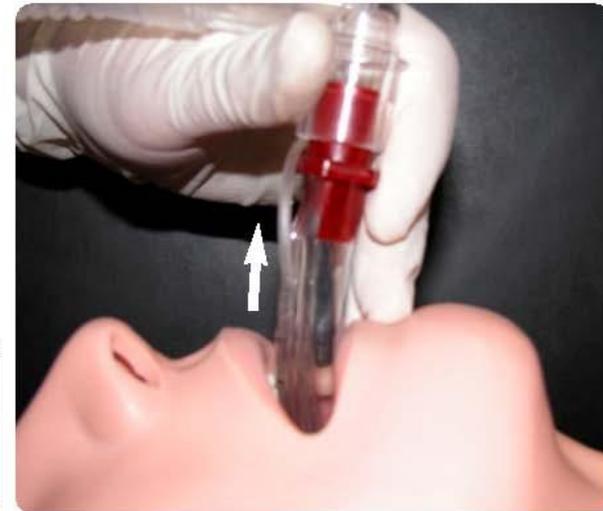
Size #3 40-55 ml  
Size #4 50-70 ml  
Size #5 60-80 ml



## Insertion Guide, Step 5

Attach the breathing circuit/resuscitator bag to the KLTD/KLTSD.

While gently bagging the patient, withdraw the tube until ventilation is easy and free flowing (large tidal volume with minimal airway pressure).





## Insertion Guide, Step 6

If necessary, add additional volume to cuffs to maximize seal of the airway.



## Insertion Guide, Step 7

**When utilizing the KING LTS-D's gastric access lumen:**

Lubricate gastric tube (up to an 18 Fr) prior to inserting into the KLTSD's gastric access lumen.





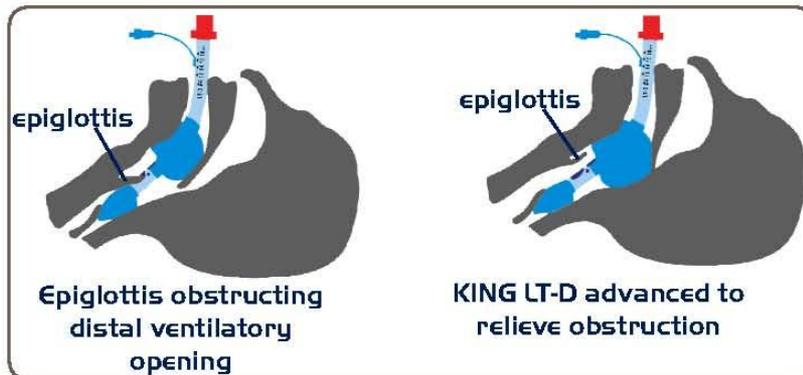
## User Tips

1. The key to insertion is to get the distal tip of the KLTD/KLTSD around the corner in the posterior pharynx, under the base of the tongue. Experience has indicated that the lateral approach, in conjunction with a chin lift, facilitates the placement of the KLTD/KLTSD. Alternatively, a laryngoscope or tongue depressor can be used to lift the tongue anteriorly to allow easy advancement of the KLTD/KLTSD into position.
2. Insertion can also be accomplished via a midline approach by applying a chin lift and sliding the distal tip along the palate and into position in the hypopharynx. In this instance, head extension may also be helpful.
3. As the KLTD/KLTSD is advanced around the corner in the posterior pharynx, it is important that the tip of the device be maintained at the midline. If the tip is placed or deflected laterally, it may enter into the piriform fossa and the tube will appear to bounce back upon full insertion and release. Keeping the tip at the midline assures that the distal tip is properly placed in the hypopharynx/upper esophagus.

4. Depth of insertion is key to providing a patent airway. Ventilatory openings of the KLTD/KLTSD must align with the laryngeal inlet for adequate oxygenation/ventilation. Experience has indicated that initially placing the KLTD/KLTSD deeper (base of connector is aligned with teeth or gums), inflating the cuffs, and retracting until ventilation becomes easy and free flowing is preferred because:

- It ensures that the distal tip has not been placed laterally in the piriform fossa (see item #3).
- With a deeper initial insertion, only withdrawal is required to realize a patent airway. A shallow insertion will require deflation of cuffs to advance the tube deeper.
- As the KLTD/KLTSD is withdrawn, the initial ventilation opening exposed to/aligned with the laryngeal inlet is the proximal opening. Since the proximal opening is closest to and is partially surrounded by the proximal cuff, airway obstruction is less likely.
- Withdrawal of the KLTD/KLTSD with the cuffs inflated results in a retraction of tissue away from the laryngeal inlet, thereby encouraging a patent airway.

5. During spontaneous ventilation, the epiglottis or other tissue can be drawn into the distal ventilatory opening, resulting in obstruction. Advancing the KLTD/KLTSD 1-2 cm or initiating deeper placement normally eliminates this obstruction.



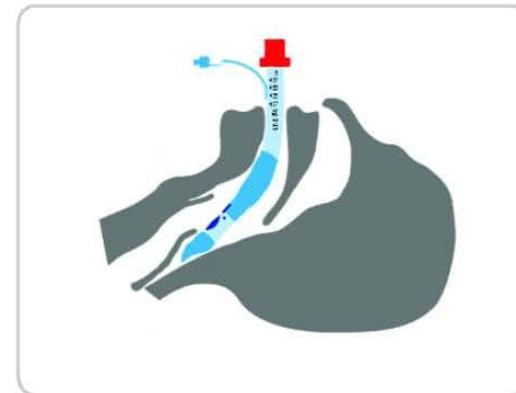
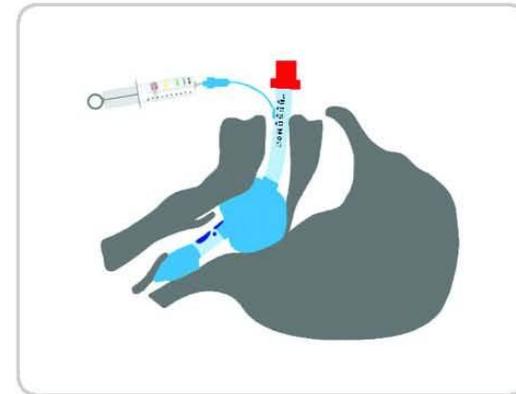
6. Ensure that the cuffs are not over inflated. Cuff pressure should be adjusted to 60 cm H<sub>2</sub>O or to “just seal” volume.

7. Removal of the KLTD/KLTSD is well tolerated until the return of protective reflexes. For later removal, it may be helpful to remove some air from the cuffs to reduce the stimulus during wake-up.

8. **KING LTS-D**: Lubricate the gastric tube prior to inserting into gastric access lumen.

## KLTD/KLTSD Removal

- Suction above cuffs in the oral cavity, if indicated.
- FULLY deflate both cuffs before removal of the KLTD/KLTSD.  
Note: Depending on the volume used for cuff inflation, it may require more than one filling of the syringe to achieve complete evacuation of the KLTD/KLTSD cuffs.
- Remove the KLTD/KLTSD when protective reflexes have returned.





### Critical Steps

#### 1. Preparation:

- Use only water soluble lubricant. Do not apply lubricant near ventilatory openings.

#### 2. Induction:

- Patient should be “deep enough”, do NOT insert the KLTD/KLTSD if the patient is swallowing, retching, moving or gagging.

#### 3. Insertion:

- Hold the KLTD/KLTSD with the dominant hand at the proximal end (connector) such that insertion will be accomplished in a single, continuous motion.
- Use the lateral approach with chin lift.
- Insert the KLTD/KLTSD until the base of the connector is aligned with teeth or gums.
- The KLTD/KLTSD should not “bounce out” after release.

#### 4. Inflation:

- Using a pressure gauge: 60 cm H<sub>2</sub>O.
- Using a syringe: just seal (average volumes: KLTD: Size #2, 25-35 ml; Size #2.5, 30-40 ml; Size #3, 45-60 ml; Size #4, 60-80 ml; Size #5, 70-90 ml). KLTSD: Size #3, 40-55 ml; Size #4, 50-70 ml; Size #5, 60-80 ml.
- Check that the blue (pharyngeal) cuff is not visible in the oropharynx.

#### 5. Final Positioning:

- Withdraw the KLTD/KLTSD until ventilation is optimized.
- Readjust cuff inflation.

#### 6. Taping:

- Disconnect the circuit and aggressively tape the KLTD/KLTSD in the midline to the maxilla.
- For the KLTSD, avoid taping over the opening to the gastric access lumen.

#### Goals:

- Seal pressure:  
≥30 cm H<sub>2</sub>O
- Ventilation parameters:  
appropriate tidal volumes (8-10 ml/kg) with low airway pressures (15-25 cm H<sub>2</sub>O)

## Conclusion

The KLTD/KLTSD are versatile airway tools offering:

1. The ability to provide positive pressure ventilation as well as spontaneous breathing.
2. A seal pressure over 30 cm H<sub>2</sub>O.
3. Ease of insertion.
4. Low incidences of sore throat and trauma.
5. Minimizes gastric insufflation.
6. The KING LTS-D allows easy passing of a gastric tube through the gastric access lumen into the stomach.



## Questions & Answers

### Q. What are the general indications for use?

- A. The KLTD/KLTSD can be used in:
- Elective cases involving spontaneous or positive pressure ventilation
  - Ambulatory and office-based anesthesia
  - Difficult airway cases
  - Emergency airway management
  - Prehospital Use

### Q. What are the possible cases for the KLTD/KLTSD to be used?

- A. The KLTD/KLTSD is suitable for the cases listed at the right.

#### General & Abdominal

Breast Biopsy  
 Colectomy  
 Colonoscopy  
 Femoral/umbilical hernias  
 Hemicolectomy  
 Hemorrhoidectomy  
 Inguinal herniorrhaphy  
 Laparoscopic cholecystectomy  
 Laparoscopic herniorrhaphy  
 Laparotomy  
 Mastectomy  
 Pelvic laparoscopy  
 Rectal surgery  
 Ventral hernia repair

#### Eyes, ENT

Eye lid repair  
 Strabismus  
 Middle ear surgery  
 Myringotomy  
 Plastic procedures  
 Sinus surgery

#### Gynecologic

D & C  
 Gynecologic laparoscopy  
 Hysteroscopy  
 Laparoscopic myomectomy  
 Myomectomy  
 Total abdominal hysterectomy  
 Tubal ligation  
 Vaginal hysterectomy

#### Neurosurgery

Ventriculoperitoneal shunt insertion  
 Stereotactic biopsy  
 Drainage of subdural hematoma

#### Orthopedic

Amputation  
 Arthroscopy  
 Carpal tunnel release  
 Hand and foot procedures  
 Podiatry  
 Shoulder reconstruction  
 Tendon repair  
 Total joint replacement

#### Outside OR

Electroconvulsive therapy  
 Endoscopic procedures  
 Medical imaging  
 Interventional radiology  
 Cardioversion

#### Plastics

Cosmetic  
 Face lift  
 Mastopexy  
 Skin grafts

#### Urologic

Cystoscopy  
 Open prostatectomy  
 Orchiopexy  
 TURF

#### Vascular

Carotid endarterectomy  
 Fem-pop bypass vein stripping



### **Q. Can the KLTD/KLTSD be used for positive pressure ventilation?**

A. The KLTD/KLTSD was designed for use with positive pressure ventilation as well as spontaneously breathing patients. It consistently achieves a ventilatory seal over 30 cm H<sub>2</sub>O.

### **Q. Does the KLTD/KLTSD provide protection from aspiration?**

A. Studies specifically evaluating the KLTD/KLTSD for aspiration protection have not been performed; such studies are not reasonable to perform on human subjects. However, the inflated distal cuff does represent a physical obstruction in the esophagus and has been shown to protect against gastric insufflation at pressures greater than 30 cm H<sub>2</sub>O. This would suggest that the distal cuff should provide some resistance to rising gastric contents.

### **Q. Is there an optimal head position for insertion?**

A. Sniffing position is optimal, however insertion can also be accomplished with the head in the neutral position. For obese patients, elevation of the shoulders and upper back should be considered.

### **Q. What sizes are available?**

A. The KLTD is available in size 2, 2.5, 3, 4, & 5 and can be used with patients 35 inches (90 cm) and taller. The KLTSD is available in size 3, 4, & 5 and can be used with patients 4 feet (122 cm) and taller. Size 2 and 2.5 are only available in KLTD.

### **Q. How do I determine what size to use?**

A. Pediatric sizes are based on the patient's height or weight and adult sizes are based on the patient's height. Size 2: 35-45 in (90-115 cm) in height or 12-25 kg in weight; Size 2.5: 41-51 in (105-130 cm) in height or 25-35 kg in weight; Size 3: 4 to 5 ft (122-155 cm); Size 4: 5 to 6 ft (155-180 cm); Size 5: > than 6 ft (>180 cm).

### **Q. What size gastric tube can be inserted through the gastric access lumen of the KING LTS-D?**

A. Up to an 18 Fr gastric tube can be inserted through the gastric access lumen of the KLTSD.  
Note: Lubricating the gastric tube greatly facilitates its passage.

### **Q. What is the best way to hold the KLTD/KLTSD during insertion?**

A. By grasping the connector, insertion can be easily accomplished with a single motion.



### **Q. How do I insert the KLTD/KLTSD?**

A. With the dominant hand holding the KLTD/KLTSD, apply chin lift with non-dominant hand. This technique is similar to intubation where a laryngoscope provides the chin lift and an endotracheal tube is inserted laterally.

### **Q. What is the correct depth of insertion?**

A. While each patient is unique and therefore requires clinical judgment, feedback has indicated that initially placing the product with connector to the teeth, inflating the cuffs, and withdrawing the KLTD/KLTSD until ventilation is optimized results in the best depth of insertion.

### **Q. Can a laryngoscope be used?**

A. Although not routinely needed, a laryngoscope may be helpful for the inexperienced user or for difficult insertions.

### **Q. What volume of air is needed to properly inflate the cuffs?**

A. Always use the least amount of air needed to create a seal at the desired ventilatory pressures. The average inflation volume for each size is as follows: **KLTD**: Size 2 = 30 ml, 2.5 = 35 ml, Size 3 = 50 ml, Size 4 = 70 ml, Size 5 = 80 ml; **KLTSD**: Size 3 = 47 ml, Size 4 = 60 ml, Size 5 = 70 ml. Note that the inflation volume differs for each patient. Typical volumes will be within 10 ml of the average listed for each size. Preferably, cuffs should be inflated to a pressure of 60 cm H<sub>2</sub>O instead of inflating with a set volume. Sizes 2 and 2.5 are only available in KLTD.

### **Q. What pressure do I inflate the cuffs to?**

A. Using a pressure gauge similar to the KLT 900, inflate all sizes of the KLTD/KLTSD to 60 cm H<sub>2</sub>O.

### **Q. What is the reference point for the centimeter depth markings on the KLTD/KLTSD?**

A. The cm markings indicate the distance from the distal ventilatory opening. Like the cm markings found on a tracheal tube, KLTD/KLTSD cm markings serve as a visual reference after placement and can be used to document insertion depth.

### **Q. How long can the KLTD/KLTSD be left in place?**

A. The KLTD/KLTSD has been used in routine procedures up to 8 hours. For longer procedures it is important to monitor and limit cuff pressure to 60 cm H<sub>2</sub>O or less, or when N<sub>2</sub>O is used.



**Q. If I need to mechanically ventilate my patient, do I need to replace the KLTD/KLTSD with a tracheal tube as I would with an LMA type device?**

A. Due to the improved ventilatory seal of the KLTD/KLTSD compared to other supraglottic airways, the need to switch to a tracheal tube should be less frequent with the KLTD/KLTSD than with LMA type devices.

**Q. How do I exchange the KING LT-D for a tracheal tube?**

A. If tracheal intubation is indicated, a lubricated size 6.0 standard tracheal tube can be inserted directly through the KLTD (sizes 3-5) with tracheal placement confirmed fiberoptically. Experience has indicated that you may need to withdraw the KLTD slightly to facilitate alignment of the distal ventilatory opening with the laryngeal inlet, thereby allowing advancement of the tracheal tube into the trachea. Once the tracheal tube has been installed in the trachea, the KLTD can remain in place with the cuffs deflated, or the entire assembly can be exchanged for another tracheal tube using a tube exchange catheter.

**Q. Can a tube exchange catheter be used to exchange the KING LT-D for a tracheal tube?**

A. Yes; this is actually the preferred method when using the KLTSD (see below).

**Q. What method is used to exchange a tracheal tube for a KING LTSD?**

A. The technique involves the use of a tube exchange catheter inserted through the KLTSD ventilation channel. For best results, visualization of tube exchange catheter placement into the trachea is recommended. This can be accomplished by direct laryngoscopy or by using a fiberoptic bronchoscope. The Aintree Intubation Catheter (Cook Critical Care) allows a pediatric fiberoptic bronchoscope to be placed inside the exchange catheter. Note that lubrication of the exchange catheter is indicated to facilitate in passing it through the KLTSD.

**Q. How do I clean the KLTD/KLTSD?**

A. The KLTD/KLTSD are sold as single patient use products (packaged sterile for in-hospital use) and should not be reused. If you are interested in the reusable KING LT, contact your sales representative or King Systems at 800-642-5464.

**Q. Does King Systems offer a reusable version of the KLTD?**

A. Yes, in fact the reusable KING LT is available worldwide and has been used in over 2 million cases. A reusable version of the KLTSD is not available in the United States or Canada.



## Clinical Studies

### Overall Success

**"50 patients: Insertion was determined to be easy and a patent airway was achieved in all patients."** Hagberg C et al. An Evaluation of the Insertion and Function of a New Supraglottic Airway Device, the KING LT™, During Spontaneous Ventilation. *Anesth Analg* 2006; 102:621–5.

**175 patients: Successful mechanical ventilation in 169 patients (96.6%); unacceptable in 3 patients due to airway pressures above 40cm H<sub>2</sub>O; 3 due to unacceptable ventilation.** Gaitini L et al. An Evaluation of the Laryngeal Tube During General Anesthesia Using Mechanical Ventilation. *Anesth Analg* 2003; 96:1750-5.

**25 patients: LT inserted successfully on the first attempt in all cases.** Ocker H et al. A Comparison of the Laryngeal Tube with the Laryngeal Mask Airway During Routine Surgical Procedures. *Anesth Analg* 2002; 95:1094-7.

**30 patients: In all cases, the LT was inserted successfully on the first attempt.** Dorges V et al. The Laryngeal Tube: A New Simple Airway Device. *Anesth Analg* 2000; 90:1220-2.

**60 patients: In all patients the LT was inserted successfully on the first attempt.** Agro F et al. Preliminary Results Using the Laryngeal Tube for Supraglottic Ventilation. *Am J Emerg Med* 2002; Jan.

### Difficult Airway / Emergency Airway Use

**In a large regional air medical service, the KING LT-D was used as an alternative airway after three unsuccessful ETI attempts or in situations of anticipated ETI difficulty. Most were major trauma patients with facial injuries or blood and secretions in the airway. All 26 patients managed with the KING LT-D were successfully ventilated as confirmed by continuous waveform end tidal capnography.** Guyette F. King Airway Use by Air Medical Providers. *Prehospital Emergency Care*; 2007, 11:1-4.

**A significant time difference and simplicity exists in placing the laryngeal tube (LT), making it an attractive device for expeditious airway management. The LT's uncomplicated design allows for successful use by a variety of healthcare providers.** Russi C et al. The laryngeal tube device: a simple and timely adjunct to airway management. *American Journal of Emergency Medicine*; 2007, 25:263–267.

**Laryngeal Tube was successfully used in three patients in whom insertion of the laryngeal mask had failed.** Asai T et al. Use of the laryngeal tube after failed insertion of a laryngeal mask airway. *Anaesthesia* 2005; 60:825-826.

**Laryngeal Tube was inserted easily and adequate ventilation was obtained after failed nasotracheal fiberoptic intubation and failed LMA insertion.** Asai T. Use of the laryngeal tube for difficult fiberoptic tracheal intubation. *Anaesthesia* 2005; 60:826.

**The KING LT-D provides a secure, non-intubating emergency airway when direct laryngoscopy is not feasible.** Fowler R. KING LT-D to the Rescue. *JEMS* 2005; 07:90-92.

**In an out-of-hospital emergency setting, the LT was placed in 30 patients in cardiac arrest by minimally trained nurses. Ventilation was adequate in 80% of the cases; no episodes of regurgitation or vomiting occurred and no blood staining on the LT was observed.** Kette F et al. The use of laryngeal tube by nurses in out-of-hospital emergencies: Preliminary experience. *Resuscitation* 2005; 66:21-25.



EMT students found that they were able to initiate ventilation more rapidly but with equal effectiveness compared to tracheal intubation; compared to BMV, they were able to provide better minute ventilation with the KING LT. Kurota J et al. Airway management in cardiac arrest-comparison of the laryngeal tube, tracheal intubation and bag-valve mask ventilation in emergency medical training. *Resuscitation* 2004; 61:149-153.

Case report: The LT provided adequate ventilation in two difficult airway management cases. Maticic A et al. Use of the Laryngeal Tube™ in two unexpected difficult airway situations: lingual tonsillar hyperplasia and morbid obesity. *Canadian Journal of Anesthesia* 2004; 51:1018-1021.

Case report: With tracheal intubation not possible, LT was inserted successfully on first attempt. Ventilation and oxygenation were possible through the LT at all times. Genzwuerker H et al. Use of the laryngeal tube for out-of-hospital resuscitation. *Resuscitation* 2002; 52:221-4.

26 of 28 students stated that insertion with LT was easier than LMA. Tidal volume was significantly greater and the incidence of gastric insufflation was significantly lower with the LT. Asai T et al. Efficacy of the laryngeal tube by inexperienced personnel. *Resuscitation* 2002; 55:171-5.

LT placed in a 57 yr old female with acute progressive quadriplegia due to subluxation at the atlanto-axial level. Reinforced nasotracheal tube was subsequently placed fiberoptically along side the LT. Asai T. Use of the Laryngeal Tube in a patient with an unstable neck. *Can J Anaesth* 2002; 49(6): 642-3.

LT has a potential role in CPR especially in elderly patients without teeth. Asai T et al. Use of the laryngeal tube in patients without teeth. *Resuscitation* 2001; 51:213-214.

### Ventilatory Seal

In 22 patients, the mean leak pressure was significantly greater for LT vs. LMA; gastric insufflation did not occur with the LT, but was noted in 3 patients with the LMA. Asai T et al. The laryngeal tube compared with the laryngeal mask: insertion, gas leak pressure and gastric insufflation. *Br J Anaesth* 2002; 89(5):729-32.

In a study of 50 patients, the airway leak pressure observed with the LT was 36cm H<sub>2</sub>O vs. 22cm H<sub>2</sub>O with the LMA. Ocker H et al. A Comparison of the Laryngeal Tube with the Laryngeal Mask Airway During Routine Surgical Procedures. *Anesth Analg* 2002; 95:1094-7.

In 30 patients, airway pressures of 40cm H<sub>2</sub>O possible without gastric inflation. Dorges V et al. The Laryngeal Tube: A New Simple Airway Device. *Anesth Analg* 2000; 90:1220-2.

Delivered tidal volume of .486L with LT compared to .500L for endotracheal tube; auscultation over the epigastrium during lung inflation with the LT showed no sign of gastric insufflation. Vollmer T et al. Fiberoptic control of the laryngeal tube position. *Eur J Anaesthesiol* 2002; 19:306-7.

### Low Incidence of Complications

50 patients: The unique design of the KING LT allows for ease of placement and advancement, minimizes the risk of aspiration, and has acceptable rates of both intraoperative and postoperative complications. Hagberg C et al. An Evaluation of the Insertion and Function of a New Supraglottic Airway Device, the KING LT, During Spontaneous Ventilation. *Anesth Analg* 2006; 102:621-5.



In 60 patients, no adverse airway events occurred and no gastric inflation was detected. After 24 hrs no patient reported sore throat, mouth pain or dysphagia. Agro F et al. Preliminary Results Using the Laryngeal Tube for Supraglottic Ventilation. Am J Emerg Med 2002; Jan.

No blood was visualized in 171 of 175 cases; grade 1 upper airway trauma in 4 patients. Sore throat (12 cases) disappeared within 24 hrs (no treatment required); no complaint of hoarseness occurred. Gastric insufflation was not detected by epigastric auscultation in any patient. Gaitini L et al. An Evaluation of the Laryngeal Tube During General Anesthesia Using Mechanical Ventilation. Anesth Analg 2003; 96:1750-5.

An in vitro study determined that the storage capacity (regurgitated volume before aspiration occurs) is 3.5ml for the LMA vs. 15ml with the LT. Miller D et al. Storage Capacities of the Laryngeal Mask and Laryngeal Tube Compared and Their Relevance to Aspiration Risk During Positive Pressure Ventilation. Anesth Analg 2003; 96:1821-2.

### Likelihood of LT Tip Entering Trachea

In 500 attempts in a mannequin, no inadvertent tracheal intubation occurred. Even using a laryngoscope, the LT could not be placed in the trachea due to the form and length of the tube. Genzwuerker H et al. The Laryngeal Tube: A New Adjunct for Airway Management. Prehosp Emerg Care 2000; 4(2):168-72.

### Tracheal Intubation After Placement of the KING LT

Fiberoptic placement of a tube exchange catheter through the LT allowed successful switch to tracheal intubation in 9 of 10 patients. Genzwueker H et al. Fiberoptic tracheal intubation after placement of the laryngeal tube. Br J Anaesth 2002; 89(5):733-8.

After placement of the LT in a 24 yr old male with multiple fractures of the jaw, fiberoptic nasotracheal intubation along side the LT was accomplished. Asai T et al. Use of the laryngeal tube for nasotracheal intubation. Br J Anaesth 2001; 87(1).

