How to Cut Your Cost per Intubation in Half

The Medical Device Challenge

Abstract
There is little doubt that switching from a reusable laryngoscope to a single-use device improves patient care. What is surprising is how much it reduces the overall cost of intubations.
Airway management is a primary consideration for emerging cases and anesthesia scenarios, and endotracheal intubation is the most practical way to open the airway and ventilate a patient. Success rates are so high that orotracheal intubation is a cornerstone skill even for emergency medical technicians working to save lives outside the hospital. A 2013 study published in the Emergency Medicine Journal reports first attempt success rates as high as 87.3 percent between hospital and field intubations.

The downside to intubation is cost. In a 2012 report issued by the Healthcare Cost and Utilization Project, intubation is listed as one of the top concerns for escalating medical expense. The report credits 7.9 billion dollars a year going towards respiratory intubation and mechanical ventilation alone.

The challenge facing medical professionals today is to find ways to bring health care costs down. Discovering subtle changes that will reduce expenses without lowering patient care quality is paramount. One step in the right direction is the change from reusable laryngoscope handles and blades to one piece single-use devices.

**Single-Use vs. Reusable Laryngoscopes**

Cost is certainly a consideration when considering a single-use laryngoscope, but not the only one. Single-use devices carry less risk of cross-contamination. Reusable scopes utilize disposable blades to protect patients. At one point that was thought to be enough. In a 2013 issue of the European Journal of Anesthesiology, researchers suggest the issue of bacterial contamination on reusable Laryngoscope handles is a largely overlooked one.

A 2009 clinical study tested 60 laryngoscope handles taken from the operating rooms of SUNY Upstate Medical University. Seventy-five percent of the handles gave positive results for bacterial contamination even after disinfection. Researchers concluded that cross-contamination was a serious risk with reusable laryngoscope handles and blades.

**Successful Application**

Even application is improved by switching to a single-use device. Failure rates are higher with reusable scopes and disposable blades due primarily to light source
issues. Reusable devices are notorious for fluctuations in light intensity after reprocessing. Thirty to fifty percent fail completely after reprocessing because of corrosion on contact points.

Single-use devices come better equipped with modern lighting technology meant to enhance accuracy and visualization. Single-use laryngoscopes offer augmented illumination with on-board LED light source available for every intubation – improving visualization with a focused, targeted light.

- The benefits of single-use laryngoscopes include:
  - 100 percent hygienic single-use units – both the handle and blade are single-use
  - Built-in LED light source
  - Faster handling with the one piece construction – no need for assembly
  - Ergonomic designs for easier and more effective handling.

**Environmental Issues**

Environmental waste is often a con associated with single-use devices. When broken down, however, reusable laryngoscopes offer just as much, if not more, environmental drawbacks. Reusable devices:

- Require disinfecting chemicals that are harmful to plants and even potentially toxic to staff if mishandled
- Contribute significantly to plastic waste – from chemical bottles to packaging
- Create a battery disposal nightmare – reusable handles require two “C” batteries that wear out often
- Energy Use – Proper cleaning necessitates equipment that uses electricity equal to 15,000 loads of laundry annually

Single-use products, on the other hand, produce less waste. There are no chemicals necessary for a second sterilization and they provide LED illumination with smaller batteries and less energy expense.

**Cost Considerations**

The reprocessing of reusable handles comes at significant expense. On average, each intubation costs 17 to 26 dollars per use. Processing these units takes both time and money.
• **Transportation** – Used handles go to a separate location for disinfecting.
• **Initial Cleaning** – Disinfecting requires each unit to soak in a cleaning solution before being taken apart and scrubbed.
• **Washing** – After breaking down the handle and cleaning each component, a technician rewashess all the elements before reassembling them.
• **Sterilization** – The laryngoscopes goes through a sterilization process to remove potential cross contamination.

Once the cleaning is complete, units must be tested to make sure there is no damage then bagged and sent back for reuse. Even with this stringent and costly process, the reusable handles still fail almost half the time and transfer pathogens to staff and patients.

Cleaning is not the only cost consideration either. Reusable handles are easy to lose, forcing medical facilities to replace them in order to utilize their stock of blades.

**Evidenced Based Proof of Savings**

A number of studies provide evidence-based proof that switching to single-use laryngoscopes is an effective way to cut the cost of intubation.

**Southeast Health**

In 2012, Dewayne Whitener, a Performance Improvement Specialist in Southeast Health in Cape Girardeau, Missouri, offered some interesting facts on the cost expenditure of reusable laryngoscopes. This study took into account the actual cost of reprocessing the equipment, inventory control, the risk liability from cross-contamination issues and the reduced quality due of reused devices. Whitener found:

• Southeast Health would need to increase their stock of handles by up to 300 percent just to accommodate reprocessing times, and ensure full coverage for the facility.
• Reprocessing resulted in high failure rates of the equipment by as much as 50 percent due to corrosion on the battery contacts.
• Cost of reusable products was **17.02** dollars per intubation.
• The increase risk of hospital acquired infection added up to 40,000 dollars in unreimbursed expense per year. Just one infection could increase the per intubation costs to **27.40** per use.

**Glendale Adventist Hospital**

Glendale Adventist Hospital offers a comprehensive cost study of reprocessing laryngoscope blades and handles. Researchers looked at the expense of cleaning the tools, cost of sterilization and how reduced effectiveness from processing added up to a loss.

- Annual Cost of Soaking Handles = $18,346
- Annual Cost of Washing Handles = $5,873
- Annual Cost of Sterilization, including equipment and labor = $59,053
- Annual Cost of Preparation Time = $41,667

This study shows that money is lost not only in the material necessary to reprocess the handles, but also in labor hours to complete the process. The two biggest cost expenditures, sterilization and prep, were due primarily to labor expense.

In addition, the Glendale study looked at the inventory budget necessary to equip the reusable blades.

- Bulb replacement due to light source failure = $2,700 per year
- Six new trays each year = $210
- Three to four replacement handles a month due to lost equipment or failure = $630
- 12 to 20 new batteries per month = $384

The Glendale report estimates the average cost per intubation, taking all these factors into account, is **$25.97**.

**How the SURE-SCOPE Single-Use One Piece Laryngoscope Cuts Costs**

The innovative one piece design of the SURE-SCOPE laryngoscope offers everything medical professionals need to cut the cost of intubation while improving quality of patient care at the same time. The SURE-SCOPE by OBP Medical eliminates the need for reprocessing by incorporating the blade and handle into one ergonomic design. Features of the SURE-SCOPE include:
**Built-in Light Source** – The SURE-SCOPE comes ready to use with a quality LED light. The LED light source generates no heat and stays bright for up to 20 minutes. The SURE-SCOPE offers an easy tab-pull design to turn on the light, as well.

**One Piece Construction** – Time is a consideration during emergency intubations.

**Time Savings** – The SURE-SCOPE cuts back on prep time by eliminating the need to attach a disposable blade to a reusable handle. This also cuts back on necessary replacement parts like handles or batteries.

**Fully Sterilized** – Cross-contamination is a major risk with reusable handles even when they are broken apart and sterilized. A 2010 study published in the Journal of Hospital Infections shows 85 percent of instrument handles test positive for bacteria. With the SURE-SCOPE, the laryngoscope remains sterile until taken out of the package for the intubation.

**Ergonomic Design** – The SURE-SCOPE is lightweight and offers a comfortable grip. The small battery means there is no excess heat coming off the handle that may affect the user’s ability to complete the intubation. The blunt tip also reduces patient trauma.

With reusable units, the handle/light sources are sold separately from the disposable blades. This inefficient system requires high volume facilities to purchase multiple handles to ensure there are several available at any given time. The SURE-SCOPE is an all-in-one system that makes purchasing a one-step process.

Disposable blades are often made with poor quality materials to save on cost. This means they are flimsy and have the potential to break during a routine intubation. With the SURE-SCOPE, the casing is both lightweight and strong, reducing the likelihood of equipment complications during intubation.

The SURE-SCOPE offers medical facilities more than just cost savings. Switching to a one piece design improves patient safely.

- No risk of cross-contamination
- Enhanced visualization with a built-in LED light source
- Maximized efficiency with little risk of failure
The SURE-SCOPE is available in four blade sizes:

- MAC 3
- MAC 4
- MILLER 2
- MILLER 3

Each unit is latex free and individually packaged for safety.

**Conclusion**

There is little doubt that switching from a reusable laryngoscope to a single-use device improves patient care. What is surprising is how much it reduces the overall cost of intubations. Studies show that medical facilities can cut the per patient expense of this life-saving procedure almost in half simply by eliminating the need for cumbersome reprocessing of handles and eradicating bulky replacement batteries and inefficient disposable blades.

An all-in-one product like the SURE-SCOPE from OBP Medical is just smart business. It abolishes cross-contamination issues that lead to hospital-acquired infections while offering a tool that improves visualization, saves valuable time and reduces the risk of laryngoscope failure – all for about half the cost of reusable scopes.

**References:**

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