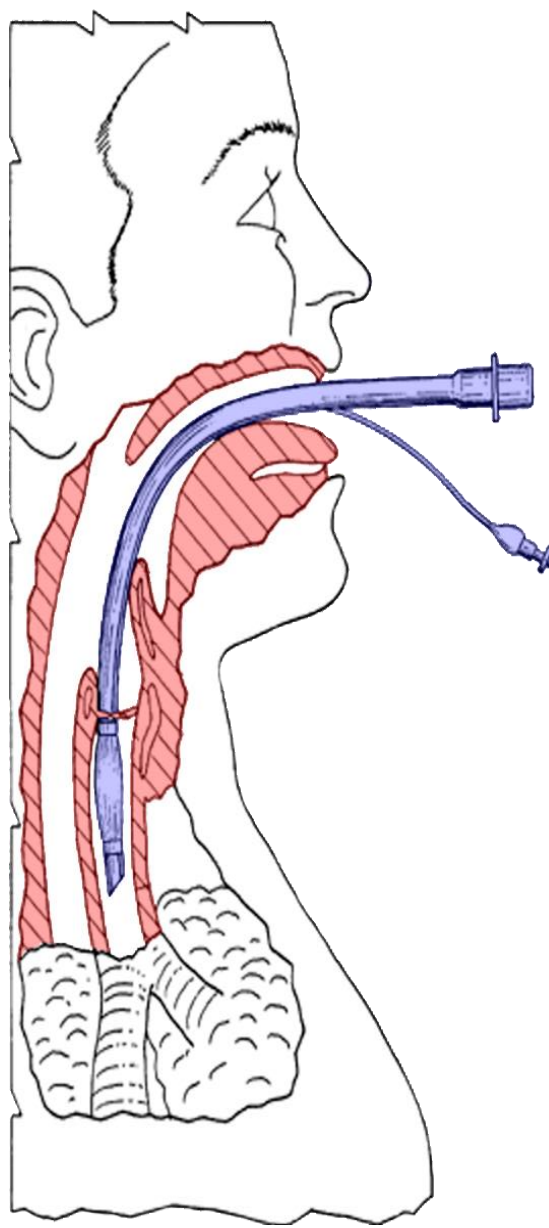


THE PROBLEM



- 51.7 million intubations performed annually in the US^{1,2}
- 10.3% experience complications³
- 5.3 million complications need to be addressed

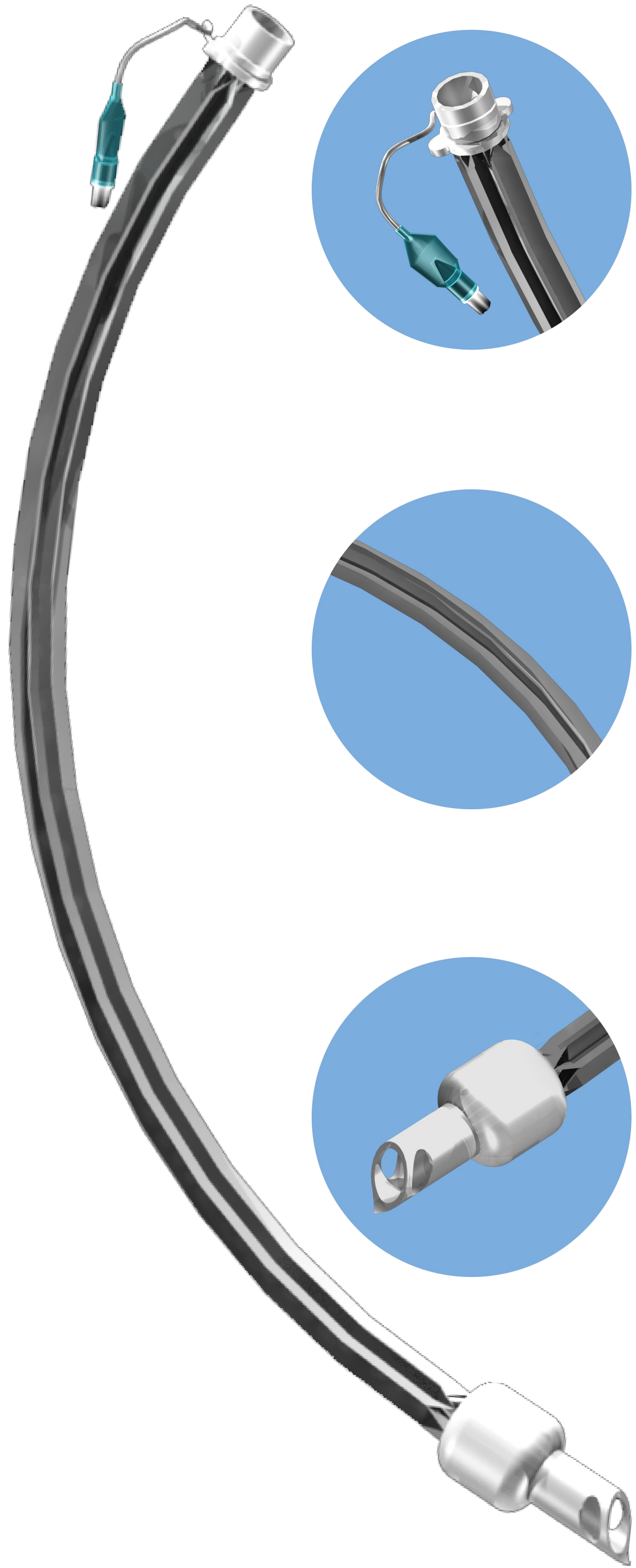
Current endotracheal tubes (ETTs) must **compromise** between **diameter** and **airflow**.

We aim to **ease the process** of intubation and **improve** patient outcomes by **reducing the diameter** of the ETT to **improve visibility**.

DESIGN CRITERIA

Objective	Target	Measured
Improvement in visibility	25%	25.8%
Improvement in tidal volume	33%	13%
Hardness	Shore 80A ⁴	Shore 92A ⁵
Cost	\$3	\$4.46

OUR DESIGN



Machine Connector & Pilot Balloon

Connects to ventilator to ventilate the lungs and fills the cuff, respectively.

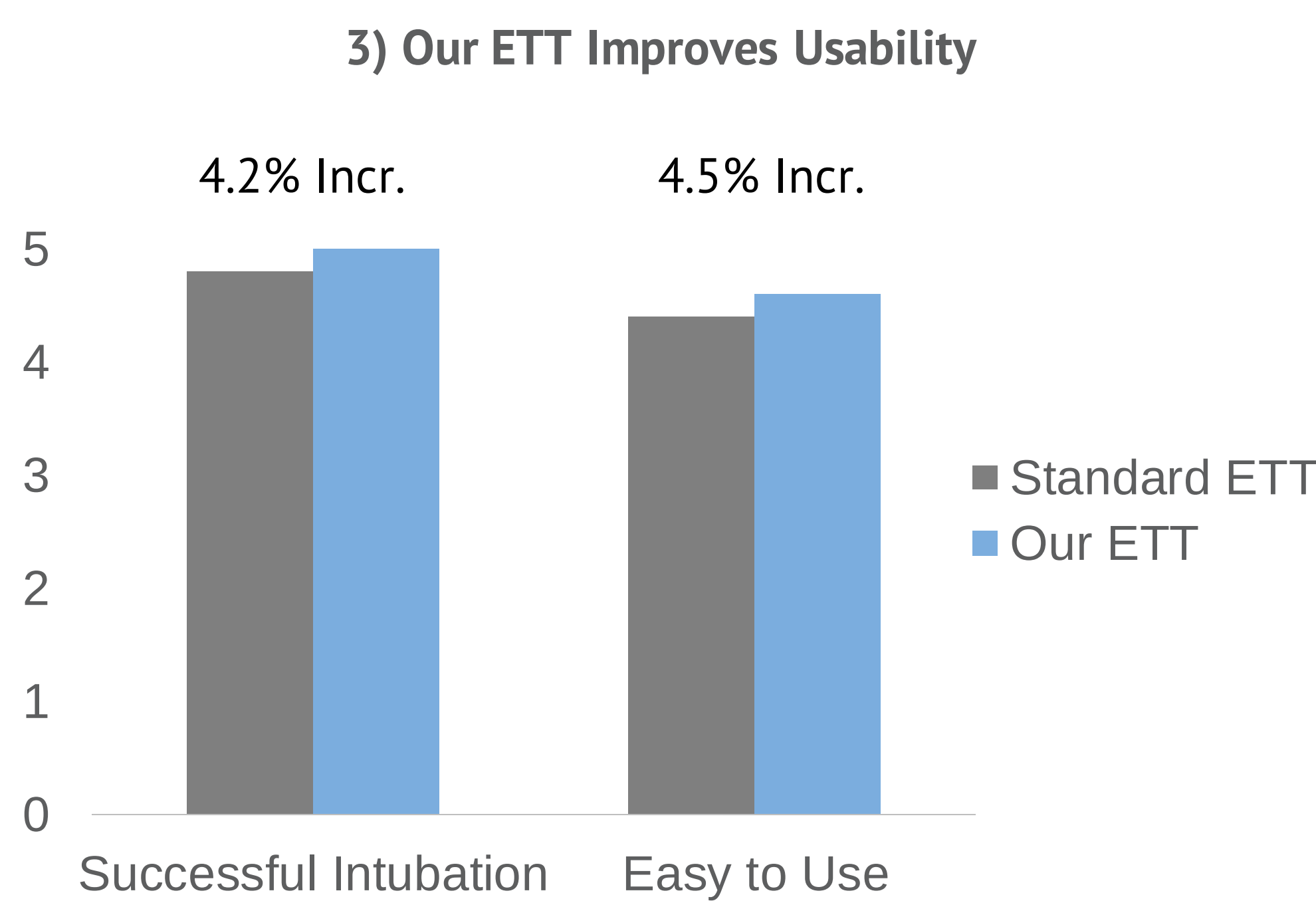
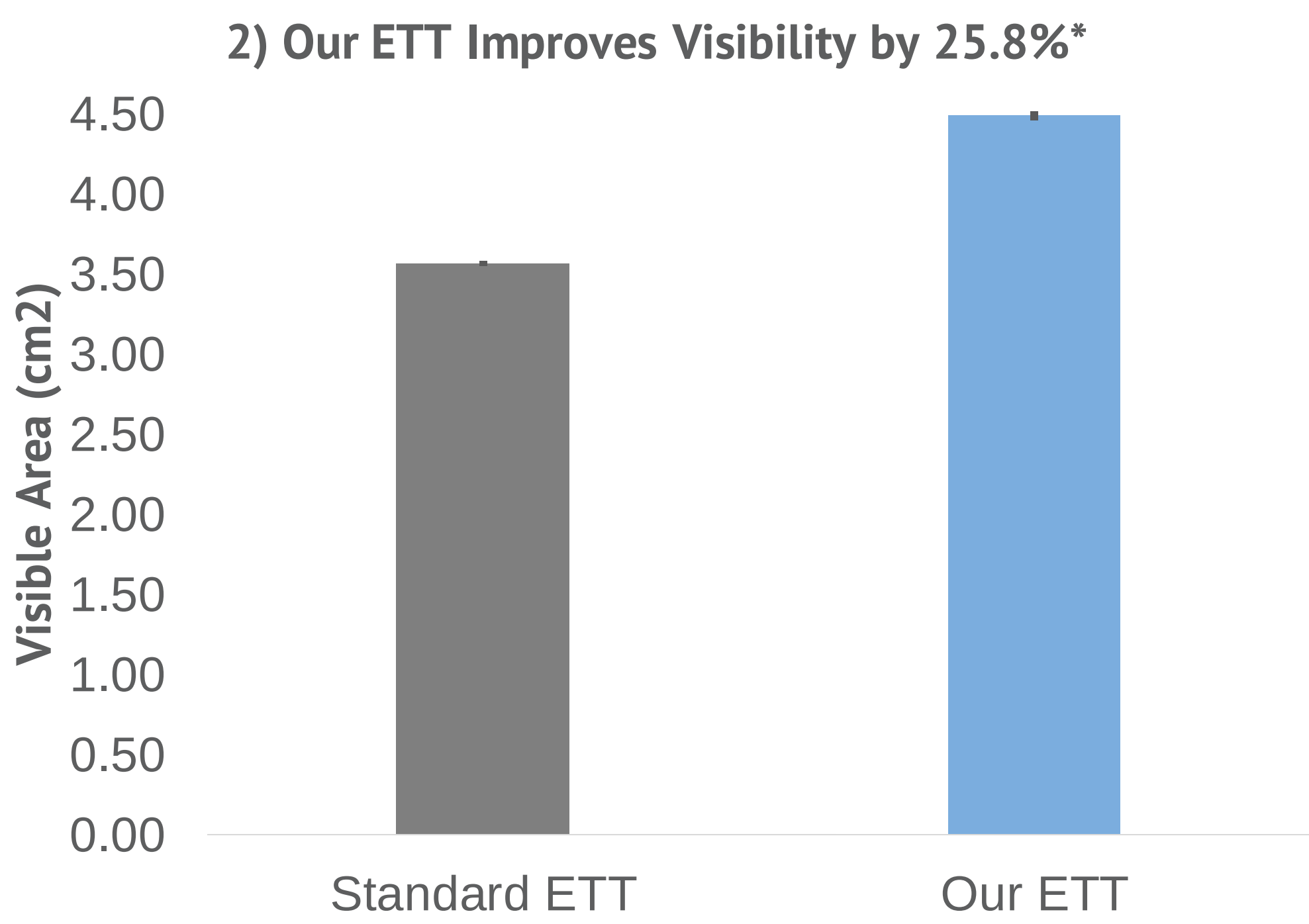
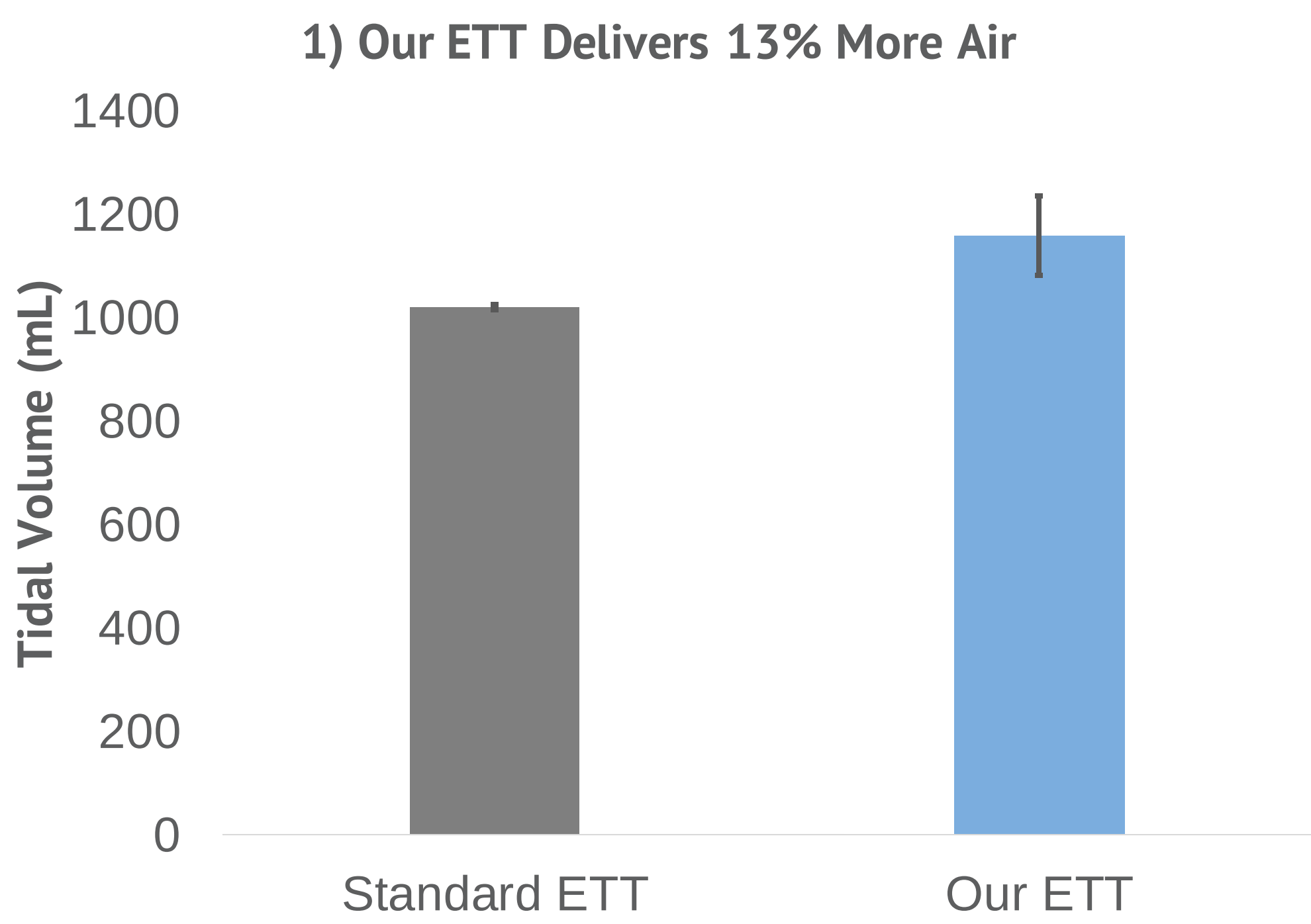
Collapsible Mylar Midsection

Twistable, puncture-resistant Mylar with metal wire reinforcement allows for dynamic behavior.

Beveled Tip, Cuff, & Murphy's Eye

Prevents blockage of airflow, seals away fluids, and aids in visualization, respectively.

TESTING



- Measured using a Laerdal SimMan® anesthesia simulator.
 - Calculated based on the difference between cross-sectional areas of the trachea and the ETT; assumed circular anatomy.
 - Determined via IRB-approved survey of experienced clinicians following intubation.
- * Note: Error bars too small to be seen.

CONCLUSIONS

- Ease of use increased by 4.5%
- Intubation success increased by 4.2%
- Diameter decreased by 79%
- Visibility increased by 25.8%
- Expansive tube increased tidal volume by 13%
- Mylar is highly puncture resistant
- Cost increased by 49%

NEXT STEPS

- Reinforce distal end of tube in case of biting
- Improve sealing between device components
- Increase cuff-to-tip ratio
- Conduct animal studies

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