Short-term emergency ventilation is mostly accomplished through bag valve mask (BVM) systems. BVMs are cost-effective and easily transported but are also quite prone to user error, especially in high-stress emergent situations. Inaccurate and erratic manual ventilation has the potential to greatly harm a patient. The goal of this project was to create a device with the following functions:

- Monitor tidal volumes delivered by manual ventilators
- Provide real-time feedback on the depth and quality of respirations
- Inform users when to begin and end respiration

Using our device, called the BVM Emergency Narration Guided Instrument (BENGI), healthcare providers would be able to provide consistent and accurate tidal volumes, minimizing the risk of causing inadvertent trauma to a patient and improving pre-hospital patient outcomes.

### Validation Methods

- n = 20 (physicians, med/PA students)
- n = 10 Group 1
- n = 10 Group 2
- After 2 weeks
- Ventilate manikin w/ device
- Ventilate manikin w/o device

### Results

- BENGI use significantly reduced deviations in tidal volume and respiratory rates from the target values
- Long-term variations in delivered tidal volume and respiratory rate were also reduced

### Conclusions

- BENGI use improved both tidal volume and respiratory rate accuracy and consistency in a manikin simulation study
- The BENGI may have utility as a medical device for improving the quality of manual ventilation and reducing the sequelae associated with manual hyper- and hypoventilation
- Future work will include testing the efficacy of the BENGI as a training device
- **A USPTO non-provisional application has been filed on this technology**