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## Does Digital Matter- Using a Digital Air Leak Detection Device to Decrease Chest Tube Duration

### PURPOSE

The purpose of this scholarly project was to determine if the utilization of a digital air leak detection device will decrease the chest tube duration by one day in 50% of patients who have undergone a pulmonary lobectomy and continue to have an air leak on postoperative day 3.

### BACKGROUND

Air leaks are managed with chest tubes and are the primary cause for the hospital stay and risk of morbidities following lung resections. Air leaks can be assessed by using a traditional analog system or a digital device. By providing objective, reproducible data and removing inter-observer variability, digital air leak detection devices are thought to help detect air leak cessation sooner than traditional devices and prevent chest tubes from remaining in place longer than necessary.

### METHODOLOGY

Twenty-five patients who underwent a pulmonary lobectomy during the study period were assessed daily for an air leak. If they continued to have an air leak on postoperative day three, their traditional air leak detection device was changed to the Thopaz+ digital air leak detection device. With the chest tube on water seal or physiologic mode as it is called on the Thopaz+, once the airflow was 20 mL per minute or less for eight hours, there were no spikes in the flow, the drainage was not bloody

or chylous and was 400 mL or less in the past 24-hour period, the chest tube was considered eligible for removal. The chest tube duration and hospital length of stay from the project group were compared with historical patients from the thoracic surgery database who underwent a pulmonary lobectomy between January 2018 through December 2019.

### RESULTS

The project patients had a statistically significant overall median chest tube duration one day less than the historical patients with a p-value of 0.010 and a 95% confidence interval. A p-value of 0.004 with a 95% confidence level in the median hospital length of stay was achieved when the project patients were compared with the historical patients. A cost savings of \$2659 per hospital day was achieved.

### IMPLICATIONS

A reduction in chest tube duration following a pulmonary lobectomy decreases the risk for morbidity and affects the hospital length of stay and overall costs. A quicker turnover of beds allows more patients to receive care. The digital device is a limited resource at the project location and may not be necessary for all patients undergoing a pulmonary lobectomy.

The results from this project aided in developing and implementing a new chest tube management strategy for patients undergoing a pulmonary lobectomy using the digital air leak detection device.