



# Automated Optical Chest Tube Air Leak Detection System

Tech ID: 27586 / UC Case 2016-049-0

## SUMMARY

UCLA researchers in the Department of Surgery have developed an air leak detection system for use in patients requiring chest tube placement.

## BACKGROUND

The standard “state of the art” in the vast majority of medical situations requiring chest tube placement is for the tube to be connected to a “collection system” which includes a “waterseal” chamber to manually detect pulmonary air leaks. Recently, the Thopaz<sup>TM</sup> collection system has been introduced and consists of a proprietary drainage system used to remove air and liquids, similar to common chest tubes. However, the additional feature of air flow and pressure detectors provides clinicians with information regarding the presence and extent of air leakage. The drawback is that this system requires the purchase of a completely new “electronic” system and significant personnel training. This has kept it from gaining traction in the clinic.

## INNOVATION

Researchers at UCLA have developed an air leak detection system that consists of a LED and photo-detector placed on the “waterseal chamber” portion of a chest tube drainage system that is normally used clinically to visibly detect air leaks. This system is connected to a computer system that generates a time log of the amount of air leaking out of the chest tube drainage system and allows for 24 hour monitoring. It also alerts hospital staff in case of irregular behavior.

## APPLICATIONS

Management and monitoring of chest tube drainage systems

## ADVANTAGES

- ▶ Allows for 24 hour monitoring of chest tube drainage systems
- ▶ Does not require significant personnel training
- ▶ Does not require purchase additional “electronic” system
- ▶ Allows for simple automatic monitoring of air leaks
- ▶ Can be easily attached to existing drainage systems currently being used in the clinic

## PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,464,894	10/11/2022	2016-049

## RELATED MATERIALS

- ▶ Cameron, Robert J., and Huw Richard HR Davies. "Intra-pleural fibrinolytic therapy versus conservative management in the treatment of adult parapneumonic effusions and empyema." The Cochrane Library (2008).
- ▶ Van Natta, Timothy L., et al. "Thoracoscopic thoracic duct ligation for persistent cervical chyle leak: utility of immediate pathologic confirmation." JSLS: Journal of the Society of Laparoendoscopic Surgeons 13.3 (2009): 430.

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## INVENTORS

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## OTHER INFORMATION

### KEYWORDS

Chest tube, chest tube drainage system, pleural effusion, autonomous monitoring, air leak detection

### CATEGORIZED AS

- ▶ Medical
  - ▶ Devices
  - ▶ Disease: Respiratory and Pulmonary System
  - ▶ Other
- ▶ Sensors & Instrumentation
  - ▶ Medical

### RELATED CASES

2016-049-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

► [Computer-Driven Hemodynamics Simulator](#)

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