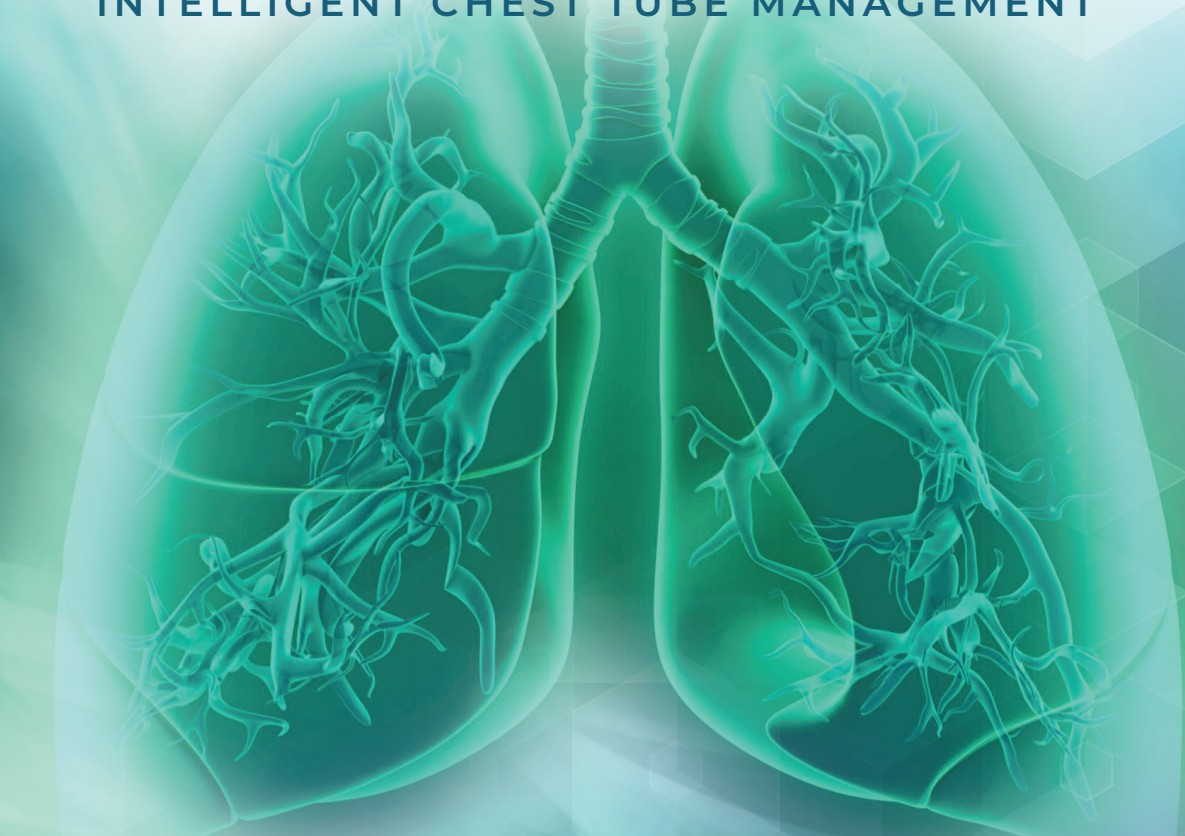
THORACIC SURGERY

CENTESE

THORAGUARD®

INTELLIGENT CHEST TUBE MANAGEMENT



CONTINUOUS, DIGITAL CHEST TUBE MANAGEMENT RESULTS IN:

- Improved air leak assessment[1-5]
- Shorter chest tube duration[1-7]
- Shorter hospital stays[1-6,8]
- Enhanced user satisfaction[5]

Safeguard patient recovery.
CONTINUOUSLY.

Legacy chest drains are inadequate for today's surgical practice

Traditional chest drain systems present a myriad of challenges when it comes to patient recovery after thoracic surgery.

LEGACY DRAINS

Air leak severity based on subjective assessment

THORAGUARD®

Objective air leak measurement **enables superior clinical decisions**

LEGACY DRAINS

Require external suction source, do not actively regulate suction at the chest, and limits ambulation

THORAGUARD

Integrated suction source regulates suction at the chest and **facilitates rapid ambulation in any setting**

LEGACY DRAINS

Require clinician to manually measure and track volume

THORAGUARD

Real-time fluid measurement and display with hourly trends

Superior battery life for longer mobile operation

THORAGUARD VS ANALOG SYSTEMS

Enhanced clinical outcomes

Studies demonstrate that when compared to legacy systems, digital chest drains result in:

- **SHORTER POSTOPERATIVE LOS**[1-6,8]
- **SHORTER CHEST TUBE DURATION**[1-7]
- **REDUCED COMPLICATIONS**[6]
- **LOWER COST OF CARE**[8]

96% **Data driven decision-making reduces LOS compared to analog systems**

96% of Thoraguard users reported better display of clinically relevant information, including the rate of air leak[5]

	CENTESE THORAGUARD	LEGACY CHEST DRAIN SYSTEMS
PRECISION		
Air Leak Reading	**Digital**	**Bubbles**
Fluid Drainage Volume Reading	**Digital**	**Manual**
SAFETY		
Patient Safety Alarms	**Automated**	**No**
Intelligent Decision Support	**SmartCheck™**	**No**
FUNCTIONALITY		
Suction Source	**Integrated**	**Wall**
Water Seal at 0 cm H_2O	**Yes**	**Yes**
Drainage Line Clearance	**Automated**	**No**
Touchscreen Control	**Yes**	**No**
Chest Tube Clog Clearance Option	**Yes**	**No**
ERAS Guidelines: Thoracic / Cardiac[9,10]	**Thoracic / Cardiac**	**No**
Preferred by Clinicians[11]	**Yes**	**No**

THORAGUARD VS GENERATION 1 DIGITAL DRAINS

Superior technology

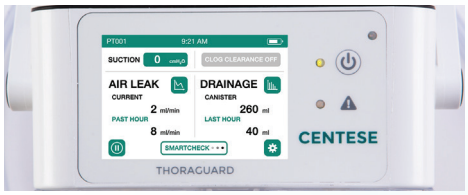
Thoraguard's touchscreen display is designed for simple, seamless communication and visualization.

PLEURAL ASSESSMENT

- Real-time intrapleural pressure measurement

SMARTSEAL™ ZERO-SUCTION WATER SEAL

- Water seal at 0 cm H_2O
- Precision management of applied suction



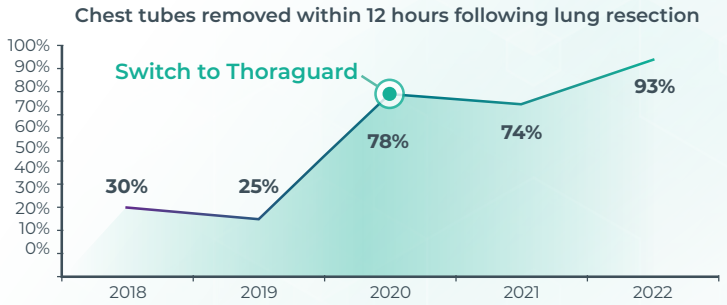
PRECISION AIR LEAK MANAGEMENT

- No rounding features
- True zero-leak calibration and setup

SUPERIOR CAPABILITY ENABLES SUPERIOR OUTCOMES[7]

Using Thoraguard led to safe chest tube removal in under 12 hours following thoracic surgery:

- Improved patient comfort
- Accelerated discharge



	CENTESE THORAGUARD	GEN. 1 DIGITAL CHEST DRAIN SYSTEMS
PRECISION		
Water Seal at 0 cm H_2O	Yes	No
Low Air Leak Measurement (0–15 mL/min)	Yes	Rounding
SAFETY		
Patient Safety Alarms	Automated	Automated
Intelligent Decision Support	SmartCheck™	No
FUNCTIONALITY		
Air Leak Reading	Digital	Digital
Fluid Volume Reading	Digital	Digital
Suction Source	Integrated	Integrated
Real-time Pleural Assessment	Yes	No
Touchscreen Control	Yes	No
Chest Tube Clog Clearance Option	Yes	No
Maximum Chest Tubes per System	3	2
ERAS Guidelines: Thoracic / Cardiac[9,10]	Thoracic / Cardiac	Thoracic
Preferred by Clinicians[11]	Yes	No

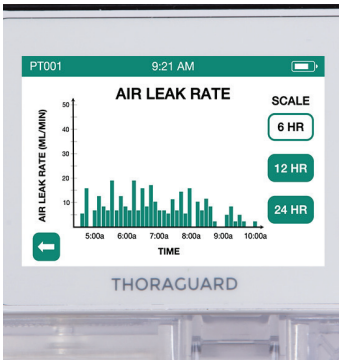
THORAGUARD®

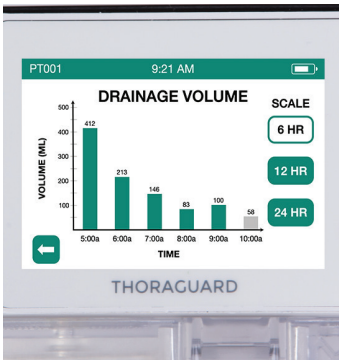
INTELLIGENT CHEST TUBE MANAGEMENT

CONTINUOUS TRENDS MONITORING
INFORMS CLINICAL DECISIONS

6-, 12-, and 24-hour air leak and fluid drainage trends

> Objective air leak assessment is critical for removing variability in clinical decision-making, shortening chest tube duration, and decreasing length of stay (LOS).[1-4]

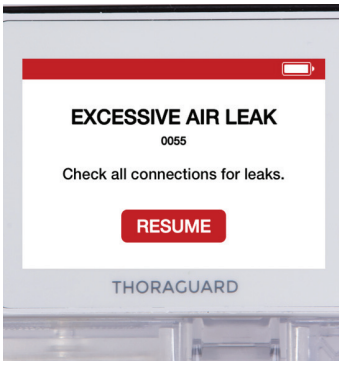




ACTIVE SYSTEM MONITORING
PROMOTES PATIENT SAFETY

Safety monitoring alarms for device or system failures and malfunctions

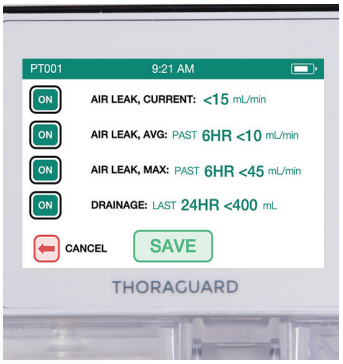
> Objective insights on detailed patient recovery metrics and trends enabled by detailed data collection drive improvement to patient safety and increase alignment on care decisions.

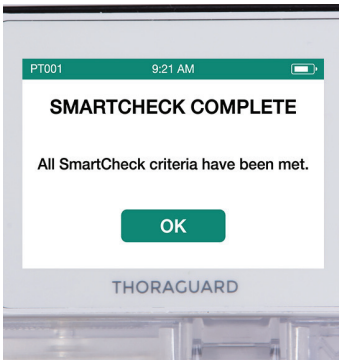


SMARTCHECK™ DECISION SUPPORT
STANDARIZES DRAIN PROTOCOLS

Real-time monitoring and alerts across the following criteria:

- Current Air Leak Rate
- Average Air Leak
- Air Leak Spikes
- Drainage Volume Level





Bring chest drainage into the modern era

Superior accuracy in air leak measurement › Improves decision-making › Reduces chest tube duration and hospital LOS

REDUCE CHEST TUBE DURATION[5] › **-1 day**

REDUCE HOSPITAL LOS[5] › **-1 day**

By reducing LOS and the associated per-day costs, hospitals can save over **$2,600 per acute care day.**[8]

THORAGUARD ORDERING INFORMATION

THORAGUARD CONTROL MODULE

Catalog #: TGCM1000
Qty: 1 unit
Includes 1 TGPS0100 per unit

THORAGUARD DRAINAGE KIT

Catalog #: TGDK110012
Qty: 6 units per box
Includes dual lumen drainage tube, 1,200 mL canister, and 2 Y-connectors per kit

THORAGUARD POWER SUPPLY

Catalog #: TGPS0100
Qty: 1 unit

THORAGUARD CHEST TUBE KIT

Catalog # (20 fr.): TGCT120020
Catalog #(28 fr.): TGCT120028
Qty: 10 units per box
Includes silicone chest tube and SmartValve

Make the intelligent choice to optimize your thoracic surgery outcomes.
orders@centese.com | **888.220.0040**

Indications for use: The Thoraguard System is indicated for use in aspiration and removal of surgical fluids, tissue, gases, bodily fluids or infectious materials. The Thoraguard System is indicated for all situations where chest drains are applied; especially for thoracic drainage in the pleural and mediastinal cavity in situations such as pneumothorax, after cardiac or thoracic surgery (post-operative), thorax injury, pleural effusion, pleural empyema or other related conditions. The Thoraguard System is intended for use on patients in appropriate care settings.

References:
1. Geraci TC, Chang SH, Shah SK, Kent A, Cerfolio RJ. Postoperative air leaks after lung surgery: predictors, intraoperative techniques, and postoperative management. *Thorac Surg Clin*. 2021;31(2):161-169. doi:10.1016/j.thorsurg.2021.02.005 **2.** Pompili C, Detterbeck F, Papagiannopoulos K, et al. Multicenter international randomized comparison of objective and subjective outcomes between electronic and traditional chest drainage systems. *Ann Thorac Surg*. 2014;98(2):490-497. doi:10.1016/j.athoracsur.2014.03.043 **3.** Mayor JM, Lazarus DR, Casal RF, et al. Air leak management program with digital drainage reduces length of stay after lobectomy. *Ann Thorac Surg*. 2018;106(6):1647-1653. doi:10.1016/j.athoracsur.2018.07.029 **4.** Cerfolio RJ, Bryant AS. The benefits of continuous and digital air leak assessment after elective pulmonary resection: a prospective study. *Ann Thorac Surg*. 2008;86(2):396-401. **5.** Geraci TC, Sorensen A, James L, et al. Use of a novel digital drainage system after pulmonary resection. *J Thorac Dis*. 2022;14(9):3145-3153. doi.10.21037/jtd-22-574 **6.** Miller DL, Helms GA, Mayfield WR. Digital Drainage System Reduces Hospitalization After Video-Assisted Thoracoscopic Surgery Lung Resection. *Ann Thorac Surg*. 2016;102(3):955-961. doi:10.1016/j.athoracsur.2016.03.089 **7.** McCormack AJ, El Zaeedi M, Geraci TC, Cerfolio RJ. The process and safety of removing chest tubes 4 to 12 hours after robotic pulmonary lobectomy and segmentectomy. *JTCVS Open*. 2023;16:909-915. doi:10.1016/j.xjon.2023.09.028 **8.** Patel C, Ruppert SD, Cao H, Fraser C, Laury T, Vaporciyan A. Use of a digital air leak detection device to decrease chest tube duration. *Critical Care Nurse*. 2023;43(6):11-21. doi:10.4037/ccn2023951 **9.** Batchelor TJP, Rasburn NJ, Abdelnour-Berchtold E, et al. Guidelines for enhanced recovery after lung surgery: recommendations of the Enhanced Recovery After Surgery (ERAS®) Society and the European Society of Thoracic Surgeons (ESTS). *Eur J Cardiothorac Surg*. 2019;55(1):91-115. doi:10.1093/ejcts/ezy301 **10.** Engelman DT, Ben Ali W, Williams JB, et al. Guidelines for Perioperative Care in Cardiac Surgery: Enhanced Recovery After Surgery Society Recommendations. *JAMA Surg*. 2019;154(8):755–766. doi:10.1001/jamasurg.2019.1153 **11.** Data on file with Centese, Inc.

Caution: Federal (US) law restricts Thoraguard to sale by or on the order of a physician. Thoraguard is not cleared for use outside of the US.

info@centese.com | **888.220.0040** | **centese.com**

Centese, Inc.
4156 S. 52nd St. Omaha, NE 68117

LBL-2280 Ver 0

CENTESE