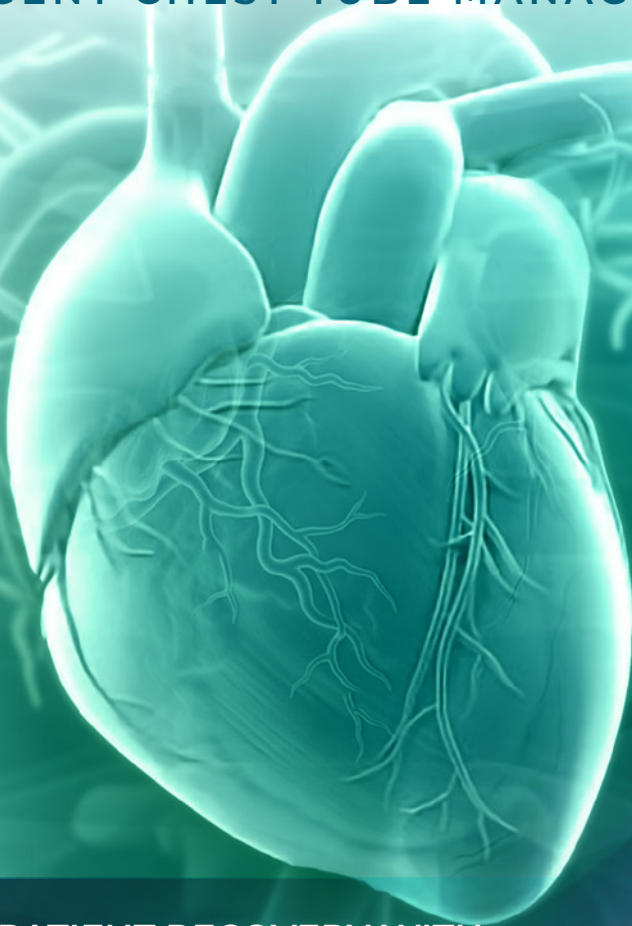


THORAGUARD[®]

INTELLIGENT CHEST TUBE MANAGEMENT



ENHANCE PATIENT RECOVERY WITH
AUTOMATED CHEST TUBE MANAGEMENT:

Ensure drainage¹

Reduce clogging²

Reduce complications³

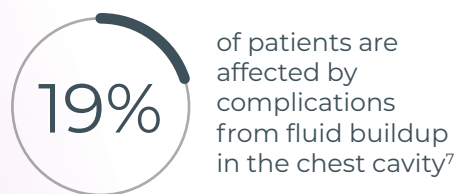
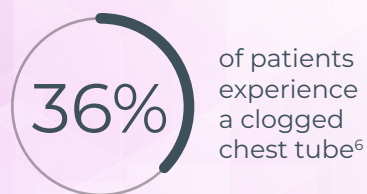
Lower pain scores³



Safeguard patient recovery.
AUTOMATICALLY.

FOR POSTOPERATIVE RECOVERY IN CARDIAC SURGERY, maintaining chest tube patency is critical in reducing complications.

STATUS-QUO LEGACY DRAINS: ADDED RISKS + WASTED RESOURCES



This leads to increased time spent at the bedside and potentially costly reinterventions.



5X HIGHER
IN-HOSPITAL MORTALITY



MORE
ICU HOURS




LONGER
LENGTH OF STAY



HIGHER
COSTS



The Thoraguard Intelligent Chest Tube Management System helps automatically maintain chest tube patency to reduce complications, including POAF, after cardiac surgery.



MOVE BEYOND THE STATUS QUO AND MOVE FORWARD WITH **THORAGUARD**[®]

INTELLIGENT CHEST TUBE MANAGEMENT

Specifically developed to optimize cardiothoracic recovery, Thoraguard is the first smart, automated chest tube management system.

Legacy chest drains have remained stagnant for decades while the rest of the cardiothoracic field has advanced.

Making the move away from legacy drains to the Thoraguard system can help accelerate recovery as a key element of the Enhanced Recovery After Cardiac Surgery (ERAS-C) Society guideline recommendations, which advise chest tube patency to be maintained without breaking the sterile field.¹



**IMPROVED
DRAINAGE**



**FEWER
ICU HOURS**



**REDUCED
LENGTH OF STAY**







**LOWER
COSTS**



SUPERIOR TECHNOLOGY. BETTER OUTCOMES.¹⁻³

IMPROVED DRAINAGE

• Enhanced drainage rates when compared to conventional chest tubes based on a 2022 single-center study^{1*}

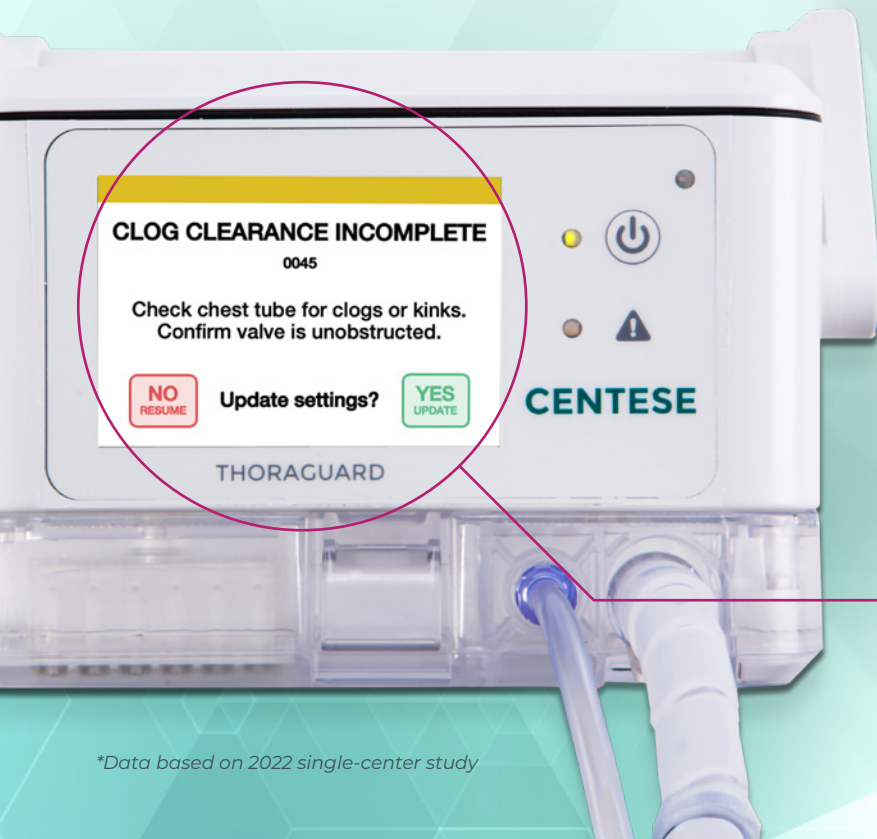
-  75% greater first-hour output^{1*}
-  12% greater total output^{1*}
-  98% actively draining at removal²
-  0 retained blood complications^{1*}

ENHANCED RECOVERY

- Maintains chest tube patency while adhering to ERAS-C guidelines¹
- Fewer complications including POAF leads to reduced need for reintervention³
 -  **40% reduction in new POAF³**
- Significant reduction in pain scores compared to conventional tubes
 -  **Lower pain scores at postoperative day 3 and at discharge³**



	THORAGUARD	CONVENTIONAL
POAF rate ³	18.1%	30.8%
Postoperative pain score: Day 3 ³	5	6
Postoperative pain score: Discharge ³	0	3
Chest tube patency	98% ²	64% ⁵



REDUCED CLOGGING

- Self-monitoring system alerts care teams of abnormal events, such as excess drainage, line kinks, and other system disruptions
- Automated chest tube clearance eliminates the need for manual stripping or milking
- Multi-setting control empowers users to address various clinical scenarios

DATA DISPLAYED ON SIMPLE AND INTUITIVE TOUCHSCREEN

**Data based on 2022 single-center study*

THORAGUARD®

INTELLIGENT CHEST TUBE MANAGEMENT

ENHANCE RECOVERY

with automated drainage, monitoring,
and chest tube clearance

- First and only system with built-in digital intelligence and responsiveness
- Automatically clears chest tubes and tracks fluid output¹
- Hands-free operation

REDUCE COMPLICATIONS

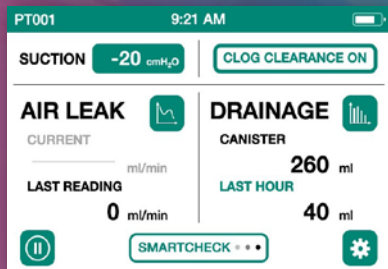
including decreased rates of postoperative atrial fibrillation (POAF)

- Continuously drains shed blood and fluids from around the heart to improve recovery
- Reduces exposure to shed blood which can cause an inflammatory response that triggers complications such as POAF^{4,5}

**AUTOMATIC CHEST TUBE CLEARANCE
ELIMINATES THE NEED FOR MANUAL
STRIPPING OR MILKING**

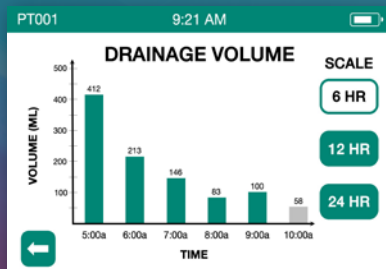
STABLE, MOBILE, INTUITIVE DESIGN

delivers an all-in-one solution for use throughout the hospital



CONTINUOUS TRENDS MONITORING

informs clinical decisions with 6-, 12-, and 24-hour drainage trends



ACTIVE SYSTEM MONITORING

alerts care teams of abnormal events or disruptions



Bring chest drainage into the modern era

LESS REINTERVENTION = **LOWER COSTS**

1 in 5

Studies have found that nearly 1 in 5 patients who undergo cardiac surgery are **affected by complications** from fluid buildup in the chest cavity.⁷

These complications could result in an additional cost of approximately **\$14,200 per patient** affected by poor drainage⁸ or **\$16,000 per POAF patient**.⁹

THORAGUARD ORDERING INFORMATION



THORAGUARD CONTROL MODULE

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



THORAGUARD POWER SUPPLY

Catalog #: TGPS0100
Qty: 1 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 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. Obafemi OO, Wang H, Bajaj SS, O'Donnell CT, Elde S, Boyd JH. An automated line-clearing chest tube system after cardiac surgery. *JTCVS Open*. 2022;10:246-253. Published 2022 Feb 24. doi:10.1016/j.xjon.2022.02.020 **2.** Wang H, Bajaj S, Obafemi T, O'Donnell C, Elde S, Boyd J. An innovative chest tube system for active blockage detection and automated line clearance after routine cardiac surgery. Paper presented at: The Society of Thoracic Surgeons 17th Annual Perioperative and Critical Care Conference; September 24-26, 2020; Virtual. **3.** Obafemi OO, et al. Automated line-clearing chest tubes reduce post-operative pain and atrial fibrillation after cardiac surgery. Abstract presented at: The American Association for Thoracic Surgery 104th Annual Meeting. April 29, 2024. **4.** Baribeau Y, Westbrook B, Baribeau Y, Maltais S, Boyle EM, Perrault LP. Active clearance of chest tubes is associated with reduced postoperative complications and costs after cardiac surgery: a propensity matched analysis. *J Cardiothorac Surg*. 2019;14(1):192. Published 2019 Nov 8. doi:10.1186/s13019-019-0999-3 **5.** Gaudino M, Di Franco A, Rong LQ, et al. pericardial effusion provoking atrial fibrillation after cardiac surgery: JACC review topic of the week. *J Am Coll Cardiol*. 2022;79(25):2529-2539. doi:10.1016/j.jacc.2022.04.029 **6.** Karimov JH, Gillinov AM, Schenck L, et al. Incidence of chest tube clogging after cardiac surgery: a single-centre prospective observational study. *Eur J Cardiothorac Surg*. 2013;44(6):1029-1036. doi:10.1093/ejcts/ezt140 **7.** Balzer F, von Heymann C, Boyle EM, Wernecke KD, Grubitzsch H, Sander M. Impact of retained blood requiring reintervention on outcomes after cardiac surgery. *J Thorac Cardiovasc Surg*. 2016;152(2):595-601.e4. doi:10.1016/j.jtcvs.2016.03.086 **8.** Data on file at Centese. **9.** Lopes LA, Agrawal DK. Post-operative atrial fibrillation: current treatments and etiologies for a persistent surgical complication. *J Surg Res (Houst)*. 2022;5(1):159-172. doi:10.26502/jsr.10020209

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.

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