PROBLEM

CURRENT DRAINAGE PRACTICE IS SUB-OPTIMAL

36% of cardiac surgery patients experience clogged chest tube, increasing risk of blood build-up in chest cavity[1]

19% of patients affected by complications from fluid build-up in chest cavity[2]

Large variability in assessing air leaks[3]

IMPACT

SUB-OPTIMAL DRAINAGE IMPAIRS OUTCOMES

Complications from fluid build-up in chest cavity lead to:*

5x
higher in-hospital mortality rate[2]

13 day
increase in hospital length of stay[2]

5x
higher postoperative transfusion rate[2]

*in patients with retained blood versus those without, based on retrospective analysis of outcomes of 6,909 cardiac surgery patients using conventional chest drains

Variability of analog air leak assessment results in:**

2x
longer air leak duration[4]

1 day
increase in hospital length of stay[4]

Less agreement
within care team on air leak severity[3]

**versus digital assessment

References:

1. Karimov JH, Gillinov AM, Schenck L, Cook M, Kosty Sweeney D, Boyle EM, et al. Incidence of chest tube clogging after cardiac surgery: a single-center prospective observational study. *Eur J Cardiothorac Surg.* 2013;44:1029-36.
2. 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
3. McGuire AL, Petrcich W, Maziak DE, et al. Digital versus analogue pleural drainage phase 1: prospective evaluation of interobserver reliability in the assessment of pulmonary air leaks. *Interact Cardiovasc Thorac Surg* 2015;21:403–7.
4. 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: 490-6; discussion 496-7.

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Surgical Drainage Made Certain

Introducing

THORAGUARD,

a transformative digital drainage system for cardiothoracic surgery

CENTESE

Patient outcomes can hinge on chest tube patency or the accuracy of air leak tracking. Yet, surgical drainage systems have seen little innovation and remain unreliable. The result can be complications, longer hospital stays, wasted resources, and unnecessary costs.

Bringing Digital Intelligence to Drainage

Thoraguard integrates sensors and software to transform surgical drainage with digital intelligence

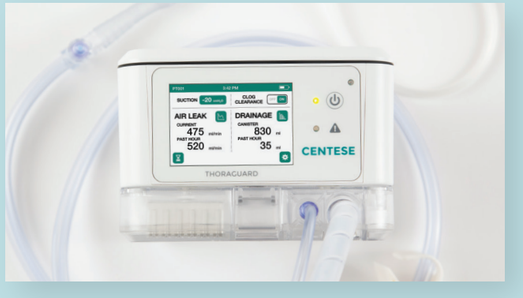
System delivers **automated clog clearance** for the first time ever, clearing chest tubes without human intervention

Precise, objective and easy-to-read data on fluid output levels and air leak trends enables you to make the right patient decisions, quicker

Self-monitoring system **notifies care team** in the event of disruption

Same system **works for both cardiac and thoracic surgery**

THORAGUARD IN CARDIAC SURGERY



First and only automated clog clearance system clears proprietary 20 Fr. chest tube every 5 minutes, with no human manipulation

Digitally measures and displays hourly drainage volume and trends to provide objective data for decision-making

Actively monitors system and alerts care team in the event of abnormal drainage rate, line kinks or other system disruption

Displays data on simple and intuitive touchscreen

Incorporates soft and flexible small-bore chest tubes

THORAGUARD IN THORACIC SURGERY

Digitally measures and displays air leak rate and 24-hour trends to assist in objective discharge decisions

Actively monitors system and alerts care team in the event of abnormal air leak rate, line kinks or other system disruption

Compact and self-contained system enables early patient ambulation

Rapid set-up; no water required

All-in-one solution incorporates digital monitor, suction control, canister, and chest tubes for use throughout hospital