

Maintaining Chest Tube Patency After Cardiac Surgery

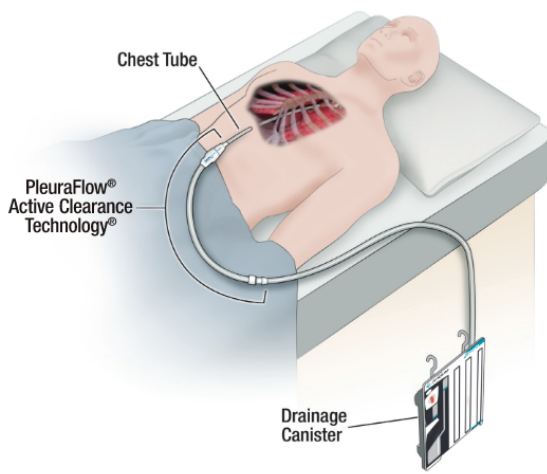
with the PleuraFlow® Active Clearance Technology® (ACT®) System

Chest tubes can clog with clot any time after placement. A recent prospective study showed that the incidence of completely obstructed chest tubes was 36% of cardiac surgery patients. And, in 86% of those cases, the obstruction was inside the patient where the clotting couldn't be observed by the nursing staff.¹

PleuraFlow ACT is the only CE marked, Canada Health, and 510(k) cleared medical chest drain that allows you ACT vs. REACT to maintain tube patency reliably in the post-operative period in a completely sterile system. PleuraFlow ACT has proven, superior drainage and evacuation compared to traditional drainage systems.^{2,3}

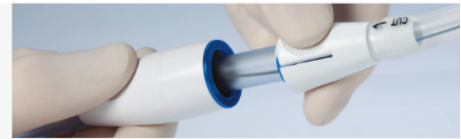
How to Operate the PleuraFlow® ACT® System

This information assumes the users are trained on the use and troubleshooting procedures. Detailed information can be found in the instructions for use.



Actuate

(See recommended actuation schedule below)



Slowly slide the Shuttle Guide toward the distal connector (connects to drainage canister tubing) then advance Clearance Wire back into the Chest Tube. Repeat as necessary.

Park

Click the Shuttle Guide into the proximal connector during use (Clearance Wire and Loop are inside the PleuraFlow Chest Tube).

Wire Withdraw

Slide the Shuttle Guide toward the distal connector (connects to drainage canister tubing) and leave it when the patient is moved or sitting up.

Removal

The Clearance Apparatus can be removed or discontinued in one of 2 ways:

- 1 The entire Chest Tube and Clearance Apparatus can be removed and discarded in one piece.
- 2 The Clearance Apparatus only can be removed and the Chest Tube can be connected to the drainage tubing.

**Remove the PleuraFlow Clearance Apparatus within 5 days. Remove the PleuraFlow Chest Tube within 2 weeks.

Recommended Actuation Schedule

LOCATION	PHASE	RECOMMENDED TIMING	ACT FREQUENCY	CYCLES/HR	It is most critical in the first 24 hours post-surgery.
Operating Room (OR)	Chest Closure	1 time when PleuraFlow System is connected			
	Prep for transfer to ICU	1 time upon transfer from OR table to bed Every 15 minutes (if there is a delay in transfer)*			
Intensive Care Unit (ICU)	Early Bleeding	0-8 Hours	Every 15 Minutes*	4 per hour	* This should be repeated as necessary to keep the tube patent and free of any occlusions.
	Slowed Bleeding	8-24 Hours	Every 30 minutes*	2 per hour	
	Serosanguineous Drainage	> 24 Hours	Every Hour*	1 per hour	

Key Points

Monitor all chest tubes for bleeding and/or clots and record assessments per local protocol.

The Magnetic Safety Release (MSR) is a safety feature to avoid forcing the Clearance Loop against a fixed obstruction; it is sensitive to patient position, tube angle or kinking, drainage character, and speed of actuation.

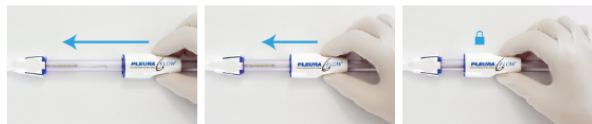
Slow actuation is sometimes more effective than rapid. Only actuate if

Clearance Wire moves freely. If you are encountering resistance or the MSR is repeatedly activated, adjust patient position or recline patient to minimize potential for compression.

If obstructive clot is forming on the wire, steps should be taken to dislodge the clot or fibrinous material stuck to the wire. Do not strip or milk PleuraFlow Chest Tube when Clearance Wire and Loop are advanced inside the Chest Tube.

Troubleshooting

Occasional friction or other pressure can occur which may activate the Magnetic Safety Release. This is a safety feature and the wire may be re-engaged by advancing the Shuttle Guide over the magnets.



1 Karimov, J.H., Gillinov, A.M., 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.

2 Shiose, A., Takaseya, T., Fumoto, H., et al. Improved drainage with active chest tube clearance. *Interact CardioVasc Thorac Surg.* 2010;10:685-688. doi: 10.1510/icvts.2009.229393.

3 Arakawa, Y., Shiose, A., Takaseya, T., et al. Superior Chest Drainage With an Active Tube Clearance System: Evaluation of a Downsized Chest Tube. *Ann Thorac Surg.* 2011;91:580-583. doi: 10.1016/j.athoracsur.2010.10.018.

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