

# The Vest™ Airway Clearance System: A Retrospective Chart Review of 67 Post-Cardiac Surgical Patients

Retained secretions pose a significant obstacle to recovery in high-risk post-operative patients.

Post-operative pulmonary complications are associated with significant:

- Post-surgical morbidity and mortality
- Intensive care unit (ICU) utilization
- Excess healthcare costs

Retained airway secretions resulting from transient impairment of mucociliary clearance and cough mechanisms can cause post-operative pulmonary complications including:

- Bronchopulmonary infections
- Atelectasis
- Pneumonia
- Respiratory failure

To manage post-operative secretions, some form of airway clearance therapy (ACT) is usually prescribed. Unfortunately, these methods—especially chest physiotherapy (CPT)—are labor-intensive, technique-dependent, and associated with significant discomfort and contraindications. Physicians are challenged to identify the most efficient, reliable, and cost-effective treatment strategy for this patient population.

The Vest airway clearance system may be the practical solution for many patients, especially those for whom other ACT methods are unsuccessful.

- The Vest system utilizes a technology called high-frequency chest wall oscillation (HFCWO). Increased airflow velocities are generated that create repetitive cough-like shear forces; mucus adherent to bronchial walls is loosened, thinned, and mobilized towards central airways where it can be cleared by coughing or suctioning.
- The Vest system consists of an inflatable vest connected by tubes to an air-pulse generator. During therapy, the vest gently inflates and deflates rapidly.

For over a decade, more than 20,000 patients with conditions including cystic fibrosis, bronchiectasis, and neuromuscular disease have used The Vest system to manage their airway secretions. Increasingly, physicians are using The Vest system to prevent or treat pulmonary complications in post-operative or acute care patients. Currently, The Vest system is used nationwide in nearly 1,500 hospitals and clinics and in more than 110 intensive care units.

*In a retrospective chart review of 130 post-cardiac surgical patients, 67 were treated postoperatively with HFCWO\**

Diagnosis	Procedure	Comorbidities	Post-op status	Safety and tolerance
<ul style="list-style-type: none"> <li>• MI: 17%</li> <li>• Chest pain: 19.3%</li> <li>• Unstable angina: 6.4%</li> <li>• Valve: 4.6%</li> <li>• Valve/CAB: 4.6%</li> <li>• CAB: 28.4%</li> <li>• Cath: 17.4</li> <li>• Other: 1.8%</li> </ul>	<ul style="list-style-type: none"> <li>• Aortic valve replacement</li> <li>• Mitral valve repair</li> <li>• Bilateral mammary artery grafting</li> <li>• Gastroepiploic graft to the inferior wall</li> <li>• Tricuspid valve annuloplasty</li> </ul>	<ul style="list-style-type: none"> <li>• Asthma</li> <li>• Bronchiectasis</li> <li>• Rheumatoid arthritis</li> <li>• Emphysema</li> <li>• Active Smoking history</li> </ul>	<ul style="list-style-type: none"> <li>• 100% of patients had been extubated at the time of initiation</li> <li>• 16.4% had chest tubes in place at time of initiation of therapy</li> <li>• 3% had Swan-Ganz catheter in place at time of initiation of The Vest system therapy</li> <li>• 100% had external pacer wires in place at time of initiation of The Vest system therapy</li> </ul>	<ul style="list-style-type: none"> <li>• Incidence of complications from sternal incision (bleeding, sternal instability, etc.): 0%</li> <li>• Incidence of chest tube/J-P related problems (increased output, displacement, etc.): 0%</li> <li>• Incidence of catheter-related complications (ectopy, migration, etc.): 0%</li> <li>• Incidence of pacer wire related complication (ectopy, displacement, etc.): 0%</li> <li>• Other complications (wound infection, stroke, etc.): 1.4%†</li> </ul>

\* Data provided courtesy of Dr. Mace Braxton, Salina Regional Health Center, Salina, Kansas.

† This rate is within or below the general post thoracic surgical population.

Experience Suggests:

- The Vest system is a safe addition to the cardiac/thoracic surgeon's armamentarium against post-operative pulmonary complications.
- Nurses and Respiratory Therapists find The Vest system easy to use and readily accept it.
- Patients generally tolerate and significantly benefit from its use without collateral morbidity.



1020 West County Road F  
 St. Paul, Minnesota 55126  
 phone: **800-426-4224** or 651-490-1468  
 fax: 877-368-5081 or 651-234-1209  
[www.thevest.com](http://www.thevest.com)



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