

CLINICAL SCENARIO

## Postoperative Pulmonary Complications

Postoperative Pulmonary Complications (PPCs) are broadly defined as conditions affecting the respiratory tract that can adversely influence a patient's clinical course following surgery. Grouped in two categories – patient-related factors and procedure-related factors – PPCs have a multifactorial etiology and are associated with many preoperative, intraoperative and postoperative risk factors. Some characteristics of patients experiencing PPCs are atelectasis, decreased oxygenation and pneumonia.

	Criteria	Benefits of therapy
<b>acapella® Vibratory PEP System</b>	Patients with history of chronic secretions/hypersecretions	Decreases viscosity of secretions that may cause atelectasis or infection
	Versatile therapy that patient can perform seated or supine	Simple to use leading to high patient compliance; can be self-administered
	Patient unable to clear secretions and short of breath	Use acapella® with EzPAP® therapy if patient needs to break up tenacious secretions
<b>TheraPEP® PEP Therapy System</b>	Patient is at high risk for developing atelectasis (chronic obstructive pulmonary disease - COPD, congestive heart failure, age, surgical procedure type and length)	Highly effective at preventing or reversing atelectasis without further patient compromise
	Patient has inadequate inspiratory volumes	PEP therapy is expiratory maneuver which will recruit alveoli and open airways
	Impaired oxygenation	Improve partial pressure of oxygen in the arterial blood (PaO <sub>2</sub> ) and oxygen saturations
	Versatile therapy	Self-administered
	Decreased pulmonary functions	Improves lung function
	Incentive Spirometry not recommended	Meets recommendations for PEP therapy by clinical societies such as AARC
<b>EzPAP® PAP Therapy System</b>	Atelectasis present	PAP therapy reverses atelectasis by opening collapsed alveoli by stenting and collateral ventilation
	Increased oxygen demands	Increases functional residual capacity (FRC)
	Unable to inspire	Provides inspiratory boost making it easier to overcome work of breathing (WOB)
	Shortness of breath/increased WOB	Adjustable flow to overcome WOB
	Hospitalized	Less cumbersome than other therapies
	Versatile	Easy to administer – passive patient participation, can be given with mouthpiece or mask
<b>Palm Cups® Chest Physiotherapy</b>	Mobilize secretions	Loosen secretions
	Patient unable to tolerate “hand” percussion	Tolerates treatment
<b>Coach 2® and CliniFLO® Incentive Spirometry</b>	Adjunct to deep breathing techniques	May prevent atelectasis

# Targeted therapies, reliable results



## TheraPEP® PEP System

For patients who can take a deep breath and can work independently, the TheraPEP® System can improve airflow by allowing air to enter the lungs and get behind the mucus to push it up to the central airways. The use of this system improves patient comfort by making it easier for them to breathe, and can decrease the need for more invasive therapies.

### Finding:

Periodic face mask administration with a commercially available PEP mask is superior to Incentive Spirometry with respect to gas exchange, preservation of lung volumes and development of atelectasis after upper abdominal surgery. PEP therapy is also preferable as compared to conventional continuous positive airway pressure (CPAP) in that it is portable, not restricted to the ICU and can be harmlessly self-administered.

### Study:

Ricksten SE, Bengtsson A, Soderberg C, Thorden M, Kvist H. **Effects of periodic positive airway pressure by mask on postoperative pulmonary function.** Chest. Jun 1986;89(6):774-781.



## EzPAP® Positive Pressure Airway System

When lung expansion therapy is needed and incentive spirometry alone isn't enough to open a patient's airways, the EzPAP® System allows for positive pressure throughout the breathing cycle. For patients who have increased WOB, shortness of breath or decreased saturation, it is an easy-to-use therapeutic option for the prevention and treatment of atelectasis.

### Finding:

The EzPAP® Positive Pressure Airway System is a versatile tool for the physiotherapist to employ to increase lung volumes, clear secretions and improve gas exchange. Because patient compliance is high, rapid clinical improvements were shown. 12% of those studied demonstrated a more effective cough to clear secretions after treatment with the EzPAP® System.

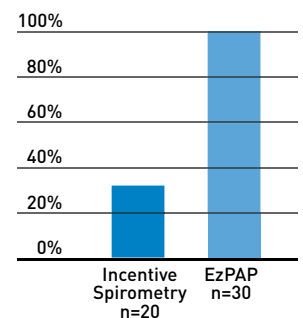
### Study:

Elliott S. **A study to investigate the clinical use and and outcomes of EzPAP positive pressure device.** Thorax. December 1, 2011;66(Suppl 4):A96.

### Finding:

As compared with an Incentive Spirometry control group where patients showed a 25% improvement in atelectasis, the EzPAP® group showed 100% improvement. EzPAP® demonstrated measurable improvement in atelectatic post-surgical coronary artery bypass graft (CABG) patients and should be considered a viable option in the pulmonary management of this population.

Post-Surgical Atelectasis Improvement in CABG Patients



### Study:

Wiersgalla S. **Effects of EzPAP Postoperatively in Coronary Artery Bypass Graft Patients.** Abstract presented at 48th International Respiratory Congress for the AARC Annual Convention. Oct 5, 2002:Tampa FL

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