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CHALLENGE

Improper ventilation during anesthesia can increase post-operative lung complications by over 60%.[1]

SOLUTION

Increased visibility to utilization of lung protective strategies and their impact on patient outcomes.

OUTCOME

Helps identify opportunities and measure results to support lung protection initiatives.

Consequences of Improper Mechanical Ventilation in OR

Post-operative lung complications are common and costly. Mechanical ventilation can contribute to lung injury and post-operative pulmonary complications (PPC) by delivering either too high or too low pressure and volume, resulting respectively into overdistension and collapse.

PPCs are associated with higher post-operative mortality rate and prolonged ICU and hospital length of stay.[2]

Improper ventilation during anesthesia can cost over

$25,000/case

in post-operative lung complications.

Lung Protective Ventilation Strategies

Lung protective ventilation (LPV) strategies usually include the respective roles of tidal volumes, positive end-expiratory pressure, and recruitment maneuvers.[3] Intraoperative lung-protective ventilation has the potential to reduce the incidence of PPCs.

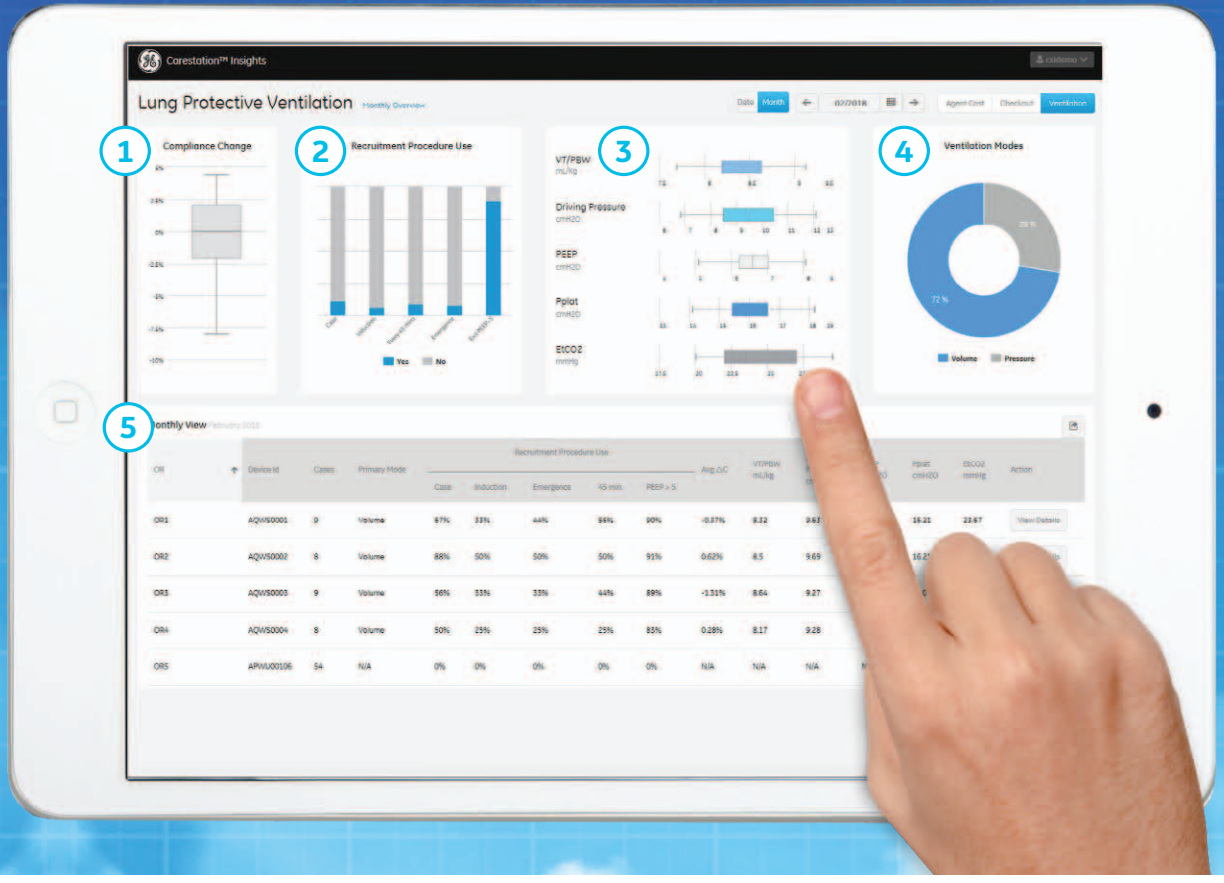
Research[1] shows a reduction in pneumonia, the need for invasive ventilation, sepsis and overall length of stay when LPV strategies were used:

	LPV	Non-LPV
Pneumonia	1.5%	8.0%
Need for invasive ventilation	1.0%	3.5%
Sepsis	6.5%	14.5%
Length of stay	11 days	13 days

CARESTATION INSIGHTS

Lung Protective ***Ventilation*** Application

Lung protection strategies can be used to help clinicians improve patient lung function and post-operative clinical outcomes. The Lung Protective Ventilation Application provides visibility into various criteria associated with these strategies.



1. **Change in patient lung compliance** during maintanance phase.
2. **Use of recruitment maneuvers during the case,** as well as during specific phases of each case. Use of PEEP directly after maneuver.
3. **Ventilation settings used throughout the cases** and resulting patient measurements, including VT/PBW, driving pressure, PEEP, PPLAT, and $ETCO_2$.
4. **Percentage of case time** spent in volume vs. pressure or other supportive ventilation modes.
5. **Ventilation setting and measurement averages** shown by OR. Sorting and drill-down supported for case level detail.

1. Futier, E., M.D., Constantin, J., M.D., PhD., et al (2013). A Trial of Intraoperative Low-Tidal-Volume Ventilation in Abdominal Surgery. The New England Journal of Medicine, 369(5). doi:10.341/f.718056191.793482037.
2. Fleisher, L. A., & Linde-Zwirble, W. T. (2014). Incidence, outcome, and attributable resource use associated with pulmonary and cardiac complications after major small and large bowel procedures. Perioperative Medicine, 3(7). doi:10.1186/2047-0525-3-7.
3. Güldner A, Kiss T, Serpa Neto A, et al. Intraoperative Protective Mechanical Ventilation for Prevention of Postoperative Pulmonary Complications: A Comprehensive Review of the Role of Tidal Volume, Positive End-expiratory Pressure, and Lung Recruitment Maneuvers. Anesthesiology 2015;123(3): 692-713. doi: 10.1097/ALN.0000000000000754.

Imagination at work

Carestation Insights

GE Healthcare's Edison portfolio includes Carestation Insights, a cloud-based suite of analytics applications for the operating room. By capturing and analyzing over 300 breath-by-breath parameters from anesthesia devices, insights can be displayed to provide visibility into clinical behavior, allowing clinicians and administrators to drive change to help improve outcomes.

Edison

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