

## **Audit of Intraoperative Ventilation Strategy in Prolonged Abdominal Surgery**

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**Abstract :** Introduction: Current literature shows that postoperative pulmonary complications following abdominal surgery may be reduced by using lower than conventional tidal volumes intraoperatively together with moderate levels of positive end expiratory pressure (PEEP). The recent studies demonstrated significant reduction demonstrated significant reduction in major complications in elective abdominal surgery through the use of lower tidal volumes (6-8 ml/kg predicted body weight), PEEP of 5 cmH<sub>2</sub>O and recruitment manoeuvres compared to higher 'conventional' volumes (10-12 mls/kg PBW) without lung recruitment. Our objective was to retrospectively audit current practice for patients undergoing major abdominal surgery in Sir Charles Gairdner Hospital. Methods: Patients over 18 undergoing elective general surgery lasting more than 3 hours and intubated during the duration of procedure were included in this audit. Data was collected over a 6 month period. Patients who had hepatic surgery, procedures necessitating one-lung ventilation, transplant surgery, documented history of pulmonary or intracranial hypertension were excluded. Results: 58 suitable patients were identified and notes were available for 54 patients. Key findings: Average peak airway pressure was 21cmH<sub>2</sub>O (+4), average peak airway pressure was less than 30 cmH<sub>2</sub>O in all patients, and less than 25 cmH<sub>2</sub>O in 80% of the cases. PEEP was used in 81% of the cases. Where PEEP was used, 75% used PEEP more than or equal to 5 cmH<sub>2</sub>O. Average tidal volume per actual body weight was 7.1 ml/kg (+1.6). Average tidal volume per predicted body weight (PBW) was 8.8 ml/kg (+1.5). Average tidal volume was less than 10 ml/kg PBW in 90% of cases; 6-8 ml/kg PBW in 40% of the cases. There was no recorded use of recruitment manoeuvres in any cases. Conclusions: In the vast majority of patients undergoing prolonged abdominal surgery, a lung protective strategy using moderate levels of PEEP, peak airway pressures of less than 30 cmH<sub>2</sub>O and tidal volumes of less than 10 cmH<sub>2</sub>O/kg PBW was utilised. A recent randomised control trial demonstrated benefit from utilising even lower volumes (6-8 mls/kg) based on findings in critical care patients, but this was compared to volumes of 10-12 ml/kg. Volumes of 6-8 ml/kg PBW were utilised in 40% of cases in this audit. Although theoretically beneficial, clinical benefit of lower volumes than what is currently practiced in this institution remains to be seen. The incidence of pulmonary complications was much lower than in the other cited studies and a larger data set would be required to investigate any benefit from lower tidal volume ventilation. The volumes used are comparable to results from published local and international data but PEEP utilisation was higher in this audit. Strategies that may potentially be implemented to ensure and maintain best practice include pre-operative recording of predicted body weight, adjustment of default ventilator settings and education/updates of current evidence.

**Keywords :** anaesthesia, intraoperative ventilation, PEEP, tidal volume

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