DETERMINING THE STATIC LUNG COMPLIANCE OF THE LAERDAL® SIMMAN SIMULATOR

William McIvor, John W. Lutz, Thomas Dongilli, John J. Schaefer III

University of Pittsburgh Medical Center (UPMC),
Peter M. Winter Institute for Simulation Education and Research (WISER) Pittsburgh, PA 15261

BACKGROUND

Background:
The anesthesiology department of the University of Pittsburgh School of Medicine uses mannequin-based human simulation to complement the education of medical students and physicians. Bag-mask ventilation is one of the skills practiced on the simulator. In order to better understand the haptic experience of facemask ventilating the simulator, and to provide a basis for determining the minute ventilation being delivered during a simulation exercise, the static compliance of SimMan’s lungs was measured.

MATERIALS & METHODS

Materials and Methods:
Static compliance was measured in seven Laerdal® SimMan human simulators. The simulators’ tracheas were intubated with 8.0 mm endotracheal tubes. Know volumes between 200 to 900 ml of air at 100 ml increments were slowly pushed into the lungs from a calibrated 1000ml syringe with a pressure gauge attached. None of the simulator’s lungs were airtight; therefore pressure readings were made immediately after slow, steady insufflation. Each pressure measurement was performed three times.

RESULTS

Results:
The average static lung compliance of the simulators was 21.62 ml/cmH₂O +/- 6.90, with a range of 17.56-ml/cmH₂O - 36.62-ml/cmH₂O.

CONCLUSION

Conclusion:
The static lung compliance of Sim Man is about 22 ml/cmH₂O, which compares to reported normal human values of about 100 ml/cmH₂O.

REFERENCES

References:
1. Using Mannequin-Based Human Simulation during the Third-Year Medical Student Clerkship in Perioperative Medicine, 2002 International Meeting on Medical Simulation

William McIvor