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Laura Ellwein Fix* (lellwein@vcu.edu). *Dynamics of spontaneous breathing in the extremely preterm infant.*

The extremely preterm infant is at risk of developing chronic lung disease despite common treatments such as surfactant replacement therapy and non-invasive ventilation. Progressive lung collapse observed clinically in these infants has been attributed in part to their undermineralized rib cage and consequent high chest wall compliance, but the underlying mechanisms are not well understood and difficult to assess in this fragile population. To study the impact of variable chest wall compliance on dynamic changes in lung volume, we developed a computational model of nonlinear lung mechanics depicting dynamic airflow and esophageal pressure during spontaneous breathing in an idealized 1 kg infant. Results to date have demonstrated a faster loss of lung volume under high chest wall compliance conditions. We present additional findings from a parameter identifiability study using pseudo-data generated from simulated tracings and published clinical data, and further discuss simulation of thoracoabdominal asynchrony. (Received January 21, 2020)