1033-92-84 **Philip S Crooke*** (philip.s.crooke@vanderbilt.edu), Department of Mathematics Vanderbilt Universi, Vanderbilt University, Nashville, TN, **Murat Kaynar** (kaynarm@upmc.edu), Department of Critical Care Medicine, University of Pittsburgh, Pittsburgh, PA 15261, and **John R Hotchkiss** (hotchkissjr@upmc.edu), Department of Critical Care Medicine, Pittsburgh, PA 15261. *Using Mathematical Modeling to Reduce Ventilator-induced Lung Injury.*

It is well accepted among clinicians that mechanical ventilation can by itself damage the lungs. Experimental work in animals has indicated that airspace over-distention (volutrauma) and elevated distending pressures (barotraumas) cause the injury. Clinicians are often advised to ventilate in a manner that stays away from the two "inflection points" of lung compliance. In part of the lecture we investigate a mathematical model that permits a non-invasive way to access the location of these points. The heterogeneity of the lungs can also play a role and we propose a five compartment model that can be used to distinguish which of the two major forms of mechanical ventilation, pressure-controlled ventilation (PCV) and volume-controlled ventilation (VCV), lead to lower peak compartmental pressures. (Received September 07, 2007)