

EDITORIAL

“Apples & Oranges” Kelman & Nunn vs. Severinghaus

Most of us in the field of Cardiovascular Perfusion realize and readily accept that change/progress is an inherent part of our profession. So has it held true regarding Oxygen Disassociation and Acid Base Physiology. For years Severinghaus has been referenced for his thinking on oxyhemoglobin disassociation, the effect of and correction for temperature and pH variations in human blood. Severinghaus conversion charts have become standard equipment for most perfusion teams. Some have recently begun to reference Kelman and Nunn as the standard for correction of blood pO_2 , pCO_2 , pH, and base excess during cardiopulmonary bypass. A quick comparison will demonstrate the disparity between the two sets of conversion factors which become quite substantial during hypothermia. The purpose of this editorial is not to argue one against the other, but to bare out a potential problem.

It is probably safe to say, most oxygenator manufacturers have referenced Severinghaus in designing the gas transfer characteristics of their oxygenators; all well and good. In-line analyzers are routinely being used which have been designed and standardized against the Kelman and Nunn conversion theory; all well and good. The problem arises in the resultant blood gas values with the low gas to blood flow ratios which we have all asked for and oxygenator manufacturers have sought to achieve.

The obvious question is: Should not one standard conversion system be utilized by all in the designing and manufacturing of oxygenators and blood pO_2 , pCO_2 , pH, and base excess analyzers?

Le Roy Ferries, BS CCP
Marshfield Clinic
Marshfield Wisc.