

Biomedical Engineering



Seminar

Mechanical Design Parameters of a Low Flow Rate Sidestream Capnograph

By

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Information Technology Engineering Building, room 336

9:00-10:00am

Abstract:

The use of sidestream capnographs, with a sampling rate of 150-250 cc/min, as a means of measuring a patient's expired CO₂ (ETCO₂) and respiratory rate, has been a common practice for many years. However, in recent years, there has been a focus on lower flow rate sampling sidestream systems due to the benefits of less loss of tidal volume for patients, such as infants or neonates. When developing a sidestream system, four principle issues must be considered; 1) The signal fidelity of the gas sample must be sufficiently maintained from the sampling site to the measurement site. 2) Condensate from a patient's breath, as well as blood, mucus, or other contaminants often pose problems for sidestream systems and requires mitigation. 3) The mechanics of transporting a gas sample at a constant flow rate through the sampling system, regardless of atmospheric or clinical conditions must be developed. 4) The physics of handling CO₂ gas throughout the transport process must be understood in order to ensure accurate readings. These issues lead to a complex web of interrelations that are explored in the development of a low flow rate sidestream capnograph.