Monitoring intracranial pressure (ICP) is important for patients with increased intracranial pressure. Invasive methods of ICP monitoring include lumbar puncture manometry, which requires high precision, is costly, and can lead to complications. Non-invasive monitoring of ICP using tympanic membrane pulse (TMP) measurement can provide an alternative monitoring method that avoids such complications. In the current study, a piezo-based sensor was designed, constructed, and used to acquire TMP signals. The results showed that tympanic membrane waveform changed in morphology and amplitude with increased ICP, which was induced by changing subject position using a tilt table. In addition, the results suggest that TMP are affected by breathing, which has small effects on ICP. The newly developed piezo-based brain stethoscope may be a way to monitor patients with increased intracranial pressure thus avoiding invasive ICP monitoring and facilitating reduced cost and man-hours.

Major: Mechanical Engineering

Educational Career:
Bachelor's of Mechanical Engineering, BS, 2009, Rajshahi University of Engineering and Technology, Bangladesh

Committee in Charge:
Hansen A Mansy, Chair, Mechanical & Aerospace Engineering
Samik Bhattacharya, Mechanical & Aerospace Engineering
Alain, Kassab, Mechanical & Aerospace Engineering

Approved for distribution by Hansen A Mansy, Committee Chair, on October 17, 2017.

The public is welcome to attend.