**Department of Surgery 2026 Research Day**
**6th May 2026 (Wednesday) | 7 am – Noon | MART Auditorium**

**Title:**
Transauricular Vagus Nerve Stimulation (taVNS) for Delirium

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**Background:**
Delirium is a common hospital condition associated with long-term cognitive decline, morbidity, mortality, and institutionalization, with no FDA-approved therapy. Evidence suggests delirium involves neuroinflammation-driven dysconnectivity in the dorsolateral prefrontal cortex (DLPFC). A major anti-inflammatory pathway in the brain is mediated by the vagus nerve. Transauricular vagus nerve stimulation (taVNS), a non-invasive neuromodulatory approach, may reduce neuroinflammation and modulate DLPFC activity. This pilot study evaluates feasibility of taVNS in hospitalized adults with delirium as a step toward larger trials.

**Methods:**
This single-arm, open-label pilot study aims to recruit 10 participants. Eligible patients are ≥22 years old, right-handed, and screen positive for delirium on the Confusion Assessment Method-ICU with psychiatric confirmation. Exclusions include traumatic brain injury, baseline cognitive impairment, epilepsy, implanted stimulators or pacemakers, pregnancy, weight <40 kg, substance abuse, facial or ear pain or trauma, or intubation. Frontal EEG is obtained in patients willing to participate with limited montage. Participants receive taVNS (current 0.5–5 mA, determined by perceptual threshold) to the left tragus (vagal auricular branch) for 30 minutes twice daily (≥6-hour interval between sessions) for 7 days or until delirium resolution or discharge. Feasibility is assessed as delivered relative to prescribed stimulation time, defined as >80% of patients receiving ≥10% of prescribed stimulation. Post-stimulation assessments for skin irritation are performed. Intention-to-treat analysis will include all patients receiving at least one session.

**Preliminary Results:**
Two of the planned 10 participants have completed the study. One had postoperative hyperactive delirium and the other hypoactive/mixed delirium with presumed sepsis. Due to delirium severity, perceptual thresholds could not be formally determined. Stimulation was initiated per protocol, and both participants tolerated sessions at 0.6 mA. Each received four 30-minute sessions before delirium resolution, with 100% adherence to prescribed stimulation. Electrode contact was adequate with brief corrected interruptions. No adverse events, device-related complications, hemodynamic changes, or skin irritation were observed. Both participants received 100% of prescribed stimulation, meeting predefined feasibility criteria.

**Preliminary Conclusions:**
Early findings suggest taVNS is feasible and well tolerated in hospitalized adults with delirium, supporting continued enrolment and further evaluation in larger studies. As this is a feasibility study, conclusions regarding efficacy cannot be made; however, these findings may inform larger randomized trials evaluating therapeutic effect.