



Dr Tess Evans, intensive care trainee registrar

Early Career Research Program award recipients

A microbiome study of critical illness

It is arguable that few conditions in the hospital setting see a more pressing need than that of sepsis, which accounts for one-fifth of global deaths. Even in Australia, up to 30% of ICU patients who develop sepsis will die.

The average cost for 24 hours in the ICU is approximately \$4,375¹, and this cost is multiplied at least tenfold for a sepsis admission. Since the advent of antimicrobials, no new specific treatments for sepsis have been developed in the last 50 years.

Taking a closer look

In Dr Tess Evans' research, the Prospective Observational Embedded Microbiome Study (POEMS) of critical illness will identify meaningful patterns of the gut microbiome to improve the outcome and hasten recovery of critically ill patients with septic shock.

"The funding from the Early Career Research Program grant will profile the gut microbiome of patients admitted to ICU with and without sepsis," explains Dr Tess Evans.

"I hope to identify subclinical groups within the sepsis population. We can use these to prognosticate, to understand the impact and response to usual care and ultimately, match them to existing therapeutic candidates in a novel clinical trial of enhanced recovery from critical illness."

Understanding changes to gut bacteria

The human gut microbiome is the community of bacteria that normally live in our stomach and intestines. Healthy commensal bacteria of the gut microbiota encompass 500 – 1,000 species that are necessary for immune system development and regulation, hormonal homeostasis, macromolecule and biliary acid metabolism, synthesis of otherwise inaccessible vitamins, and anti-inflammatory pathways.

Changes to these bacteria may drive many major chronic diseases and their role in the ICU caring for patients remains poorly understood. This study will use cutting-edge techniques and lead laboratory and clinical investigators to identify microbiome patterns and their effects to set up a clinical trial of individualised therapy in patients with severe infection.

"Once I have surveyed a topic at the edge of our knowledge from every possible vantage, I will have the skills to communicate it, propose and test solutions, and eventually move on to all the other questions that bug me at the bedside," says Dr Evans.

Dr Evans is an Early Career Research Program award recipient, she commenced a PhD program at the University of Western Australia in early 2022.



Avant puts into practice words that we all hold true – that medical training, quality care and research should not be siloed. As an embedded point-of-care study, POEMS is an example of this integrative paradigm."

¹ Hicks, Peter, et al. *The financial cost of intensive care in Australia: a multicentre registry study*. Med J Aust 2019; 211 (7): 324-325. doi: 10.5694/mja2.50309 mja.com.au/journal/2019/211/7/financial-cost-intensive-care-australia-multicentre-registry-study

