Antibiotic dosing technology speeds recovery of ICU patients, study finds

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University of Queensland researchers have used dosing software to accelerate the effects of antibiotics in patients being treated for sepsis in Intensive Care Units.

Co-senior study author Professor Jason Roberts from UQ's Center for Clinical Research said the technique trialed in the DIRECT study meant patients received effective antibiotics in half the usual time, leading to faster recovery, higher quality care, cost savings and increased bed availability in the hospitals. The study is published in the journal *Intensive Care Medicine*.

"We found we could dramatically improve the accuracy and quality of the treatment provided to adults and children, meaning less time in the ICU and a faster cure," Professor Roberts said.

"We did this by rapidly identifying which bacteria was causing their severe infection, and then applying a personalized dosing approach to ensure each patient received the most effective dose for their needs.

"The team used Bayesian dosing software in four adult and pediatric ICUs, leading to an estimated health care saving of $12,000 per patient in some groups."

The clinical trial was unusual because it included children and involved collaborators at four major Brisbane hospitals.

UQCCR Principal Research Fellow and co-senior author Associate Professor Adam Irwin said improving the accuracy of infection treatment was a great outcome.

"In this study, clinicians in pediatric and adult intensive care settings alike were confident to apply the dosing software recommendations, meaning critically ill children and adults will benefit from the results," Dr. Irwin said.

"We had ICU doctors and nurses, pharmacists, infectious diseases doctors, microbiologists and experts in health economics involved in the

study.

"This research highlights our strong commitment to providing the best possible care for Queenslanders.

"We hope that further funding will allow us to demonstrate the value of this treatment approach to a broader international audience."

DIRECT was conducted at the Herston Infectious Diseases Institute in collaboration with Metro North Health, Queensland Children's Hospital and Metro South Health.

More information: Gene G. Chai et al, Achievement of therapeutic antibiotic exposures using Bayesian dosing software in critically unwell children and adults with sepsis, *Intensive Care Medicine* (2024). DOI: 10.1007/s00134-024-07353-3

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