Use of selective gut decontamination in critically ill children: PICnIC a pilot RCT and mixed-methods study

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Primary conflicts of interest: Nazima Pathan is an Associate Professor of Paediatrics at the University of Cambridge and a member of the National Institute for Health and Care Research (NIHR) Health

Technology Assessment (HTA) research prioritisation panel (March 2021 to March 2026). Kathryn Rowan is the Director of the Clinical Trials Unit at Intensive Care National Audit and Research Centre (ICNARC) and the Programme Director of NIHR Health and Social Care Delivery Research (HSDR) programme and a member of HTA (2007/2009) and HSDR (2016/2019) committees. Lyvonne N Tume is a member of the research prioritisation and funding panels of the NIHR (HTA). John Myburgh is the Chair of Selective Decontamination of the Digestive Tract in the Intensive Care Unit (SuDDICU) Australia Management Committee, Director of The George Institute for Global Health and Leadership Fellowship of National Health and Medical Research Council, Australia. Richard Feltbower is principal investigator at the Paediatric Intensive Care Clinical Audit Network program at Leeds University. David A Harrison is a member of the HTA General Committee.

Disclaimer: This report contains transcripts of interviews conducted in the course of the research, or similar, and contains language which may offend some readers.

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Plain language summary

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Plain language summary

Each year, around 20,000 critically ill children are admitted to paediatric intensive care units in the UK. These children are at a higher risk of healthcare-associated infections, one of the main sources of which is the large number of bacteria in the digestive tract. Spread of bacteria from the digestive tract into other organs, such as the lung (causing ventilator-associated pneumonia) or bloodstream (causing sepsis), can be life-threatening. The risk is highest in those children whose illness is so severe that they require prolonged mechanical ventilation.

Stopping the growth of bacteria in the digestive tract (called selective decontamination of the digestive tract) has been shown in adults to reduce the number of hospital-acquired infections. However, there have been no trials in children. We wanted to assess how practical and acceptable such a trial would be comparing standard infection control to selective decontamination of the digestive tract-enhanced infection control and monitoring how each intervention affected antimicrobial resistance.

We undertook a pilot study to examine whether clinicians could identify eligible children, enrol them in the study and follow study procedures during the course of paediatric intensive care unit admission. Alongside this, we interviewed parents and clinicians to get their views on the proposed trial. Six hospitals recruited 559 patients over a period of roughly 7 months. Hospitals were randomly allocated to continue with the standard infection control procedure or to give selective decontamination of the digestive tract. Overall, recruitment was higher than expected. Alongside this, we examined the views of patients, caregivers and healthcare professionals to assess their views on whether a trial should be carried out to see if selective decontamination of the digestive tract should become part of the infection control regime for children most at risk of hospital-acquired infection in the paediatric intensive care unit.

Overall results suggest that a larger PICnIC trial incorporating patient stakeholder and clinical staff feedback on design and outcomes is feasible and that it is appropriate to conduct a trial into the effectiveness of selective decontamination of the digestive tract administration to minimise hospital-acquired infections.

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