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# An Innovative Antimicrobial Stewardship Program for Children in Remote and Regional Areas

Initiative Type

Redesign

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## Summary

This quality improvement study, conducted in remote and regional paediatric inpatient facilities, was associated with an increase in the proportion of antibiotics switched from intravenous (IV) to oral

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therapies, as well as a reduction in duration of IV therapy and incidence of adverse events. Seven facilities were in scope: Toowoomba, Redcliffe, Caboolture, Redland, Mount Isa, Hervey Bay and Gladstone. The baseline phase included semi-structured interviews to review resources, tailoring of tools, and retrospective data collection. The intervention phase included: education, tools, and retrospective data collection. The post-implementation phase included semi-structured interviews and data analysis.

### Key dates

Mar 2022

Mar 2022

### Implementation sites

Hervey Bay; Gladstone; Toowoomba; Mt Isa; Caboolture; Redlands and Redcliffe hospitals

### Partnerships

Australian Centre for Health Services Innovation, Centre for Healthcare Transformation, School of Public Health and Social Work, Queensland University of Technology

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## **Aim**

To evaluate the benefit of timely IV to oral conversion of antibiotic therapy in remote and regional areas following the implementation of a multifaceted package of interventions.

## **Benefits**

It is expected that by upscaling the program to at least 22 sites in Queensland (a cohort of at least 100 patients annually) 164 line-associated complications would be prevented and an extra 7 per cent of patients would be discharged at two days compared to three days representing additional occupied bed days saved attributed to the intervention. Also prescribing appropriateness increased by a relative 32 per cent in the intervention period, a core antimicrobial stewardship (AMS) key performance indicator important for accreditation. We also upskilled the local clinicians which facilitated the sustainability of the program. We have obtained the endorsement of the Directors of Paediatrics and Pharmacists Forum for the model of care.

## **Background**

There has been a need for evidence-based intervention in the proportion of antibiotics switched from IV to oral therapy in children in rural and remote areas of Queensland. Research has shown that one in three children in remote facilities are less likely to receive the correct antibiotic. This is significant because 50 per cent of children in hospitals are on antibiotics. It highlights the lack of resources or targeted education for remote facilities.

## **Solutions Implemented**

We developed a package of intervention tools to promote the IV to oral conversion of antibiotic therapy for children with Community Acquired Pneumonia and Skin and Soft Tissue Infections. Clinicians could tailor the tools to their practice setting and patients requirements, which is more realistic of a real-world situation. Onsite training during the implementation period and continued telehealth support for the intervention phase were provided to participants by the multi-disciplinary research team from the Queensland Statewide Antimicrobial Stewardship Program and the Antimicrobial Stewardship Program based at the Queensland Children's Hospital. In addition, the uptake of the intervention materials was supported by onsite paediatric clinical champions (doctors, pharmacists and/or nurses) at each facility.

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## Evaluation and Results

There were 357 patients enrolled in the study with 178 in the baseline and 179 in the intervention phase. Patients were reviewed at 24 to 48 hours. The proportion of antibiotics switched from IV to oral therapy increased from (133/178) 74.7 per cent (baseline) to (151/179) 84.4 per cent (intervention) ( $p = 0.03$ ). The median patient length of stay was two days for both phases. The average number of extra IV days decreased from 0.45 days in the baseline period to 0.18 days in the intervention period ( $p < 0.005$ ). The only adverse events recorded were line-associated infiltrates, with a decrease from 34.3 per cent (61/178) (baseline) to 17.9 per cent (32/179) (intervention) (RR 0.52 with 95 per cent CI: 0.36–0.76,  $p$ ). The antibiotic compliance per guidelines increased from 43 per cent at baseline to 51 per cent post intervention. Readmission to hospital and recommencement of IV therapy did not significantly change post intervention. Results have shown that an extra seven per cent of patients would be discharged at two days compared to three days. The prescribing of appropriate antibiotics increased by a relative 32 per cent.

## Lessons Learnt

The importance of the engagement with local clinicians, including onsite visits by the research team, as well as appointing appointment of local champions at each facility. These factors have been identified as being key strategies to promote the sustainability of Antimicrobial Stewardship Programs in remote hospitals. Adapting evidence-based intervention resources based on feedback from the clinicians and parents/caregivers who will be utilising the tools in their daily practice. This facilitates the uptake of the implantation package. The affect of high turnover of staff.

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