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Title: An audit of patients managed on the home intravenous antibiotic service at Christchurch Hospital over 12 months
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Introduction:
The home intravenous antibiotic service since its inception in the 1970s, has become part of standard medical practice. The goal of this service is to provide safe and efficacious intravenous antibiotic therapy to the patient in the community rather than in a hospital bed. This results in a better patient experience and a reduction in costs to the healthcare system. In Canterbury, this has been in operation since 1999 and in 2000 an audit was undertaken to describe the patient population and outcomes.

Aim:
The number of patients currently under the care of the home intravenous service has grown substantially over the years and the clinical practice and outcomes of the service have not been formally assessed since the last audit in 2000. We aim to provide a detailed overview of the service and patient outcomes, specifically readmissions to hospital and potential predictors of readmission.

Impact: This project will provide an outlook for the clinical teams that manage the patients care on the current state of the home intravenous service and which patients are at risk of readmission. It will also be the beginning of further research to come into the many aspects of this service.

Method:
This is a retrospective cohort study looking at patients admitted on to the home intravenous antibiotic service in the Canterbury DHB in the 12 month period between 1 July 2015 and 30 June 2016. The data was extracted from the home intravenous antibiotic database and Concerto. Patients referred from paediatrics were excluded and patients receiving treatment for the chronic respiratory condition bronchiectasis.

The data extracted detailed patient demographics, comorbidities, length of initial hospitalisation, admissions in past 12 month, previous admission to home intravenous antibiotic service, intensive care unit stay, deaths, referral source, treated condition, organisms grown from sterile sites, intravenous antibiotics used, addition of oral antibiotics, device used to administer antibiotics, duration of treatment, location of drug administration, further admissions to hospital and the reason for admission, drug reactions and complication with the intravenous access device.
Statistical analysis was performed on all study variables, including univariate and multivariate analysis to assess the relationship with readmissions and determining which variables show a statistically significant relationship.

Results:
A total of 407 cases were included in this study, the median age was 59 years, 141 (35%) were female, 362 (89%) were of New Zealand European ethnicity and 21 (5%) were Maori. Out of the cases 230 (57%) had admissions to hospital 12 months prior, 23 (6%) had ICU admissions during their index hospitalisation and the most common comorbidities were type 2 diabetes (19%) and chronic kidney disease (11%). The most commonly treated condition was bone and joint infections in 186 cases (46%). Regarding microbiology 304 (75%) had positive cultures from sterile sites, 29 (7%) had more than one organism on culture and the most common pathogen was Staphylococcus aureus. The most common antibiotic prescribed was Flucloxacillin 110 (27%), median duration of home

therapy was 20 days with patients receiving on average 73% of total therapy in the community, 324 (80%) patients received treatment within Christchurch and 83 (20%) self-administered their treatment.

The results of the univariate and multivariate model found that patients with a hospitalisation 12 months prior were 233% more likely to have a readmission. There was other factor that were found to have a strong relationship with readmission; longer treatment duration and more time spent in hospital, line complications, >1 antibiotic prescribed and the prescription of either vancomycin or cefuroxime. There is an issue with using this list of factors to predict readmissions is whether these are contributors to the cause or descriptors of the patients that have readmissions. For example, patients with readmissions tend to require longer treatment as their infection may be progressing and more intravenous therapy is required, this puts the patients at risk of line complications as their treatment is prolonged further. As the previous antibiotic, may have been proven ineffectual or have caused an adverse drug reaction it can be switched eg. to vancomycin. However, vancomycin can contribute to an acute kidney failure and hence a readmission to hospital, so there are aspects of readmission that require a more thorough investigation.

Conclusion:
From this audit, we have given a description of the current population and their outcomes and bought forth many aspects of the patients care to further explore and assess to improve the safety and efficacy of this service.