

The Impact of a Mobile Decision Support Tool (Spectrum) on Antimicrobial Use in St. John's Hospitals

Objective

To determine the impact of the Spectrum app on inpatient antimicrobial use (AMU) and on appropriateness in the Health Sciences Centre and St. Clare's hospital.

Practice Points

1. Excess AMU in hospitals selects for the expression of AM resistance genes among bacteria causing human infections. AM resistance is associated with attributable deaths and economic loss in Canada.
2. Hospital AM purchasing in the Atlantic provinces is twice as high as in Ontario.
3. Spectrum is a mobile app containing AM prescribing guidelines based on the local antibiogram, AM and pathogen information, and it advises on management of AM allergy, prophylaxis, dosing, duration and de-escalation strategies.

Methods (Dr. P. Daley)

1. Spectrum was introduced at start of Jan 2019. AMU was collected using Pyxis automated dispensing system from Jan 2019 to Mar 2020 (15 months).
2. Defined Daily Dose (DDD)/1,000 patient days was calculated.
3. Appropriateness was assessed using the Australian National AM prescribing survey on 25 Jun 2018 in 176 inpatients (6 months prior to Spectrum introduction) and on 25 Jun 2019 in 192 patients (6 months post introduction).

Results

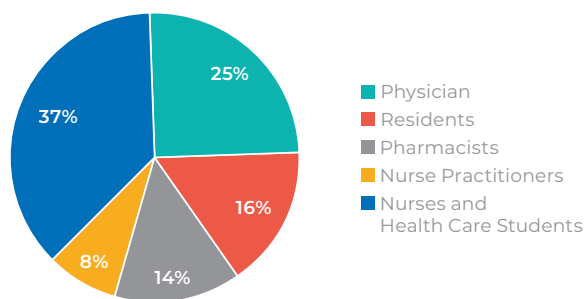


Figure 1. Spectrum Users by Health Profession

- Spectrum was accessed 20,016 times during 20 weeks of 2019, by a mean of 598 monthly active users, comprising multiple health provider groups.

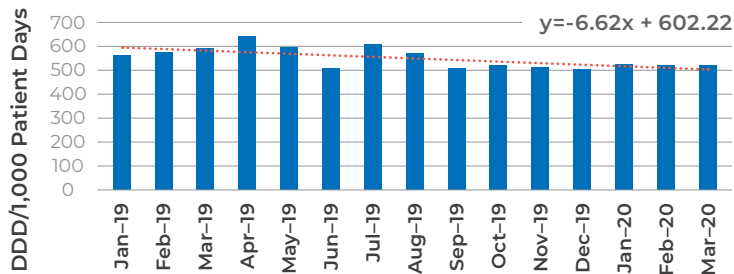


Figure 2. Total Monthly Antimicrobial Use (AMU)

- AMU declined by 6.62 DDD/1,000 patient days/month ($p=0.05$). Comparing rates of AMU use in Jan 2019 to Mar 2020 there was a 12% reduction.

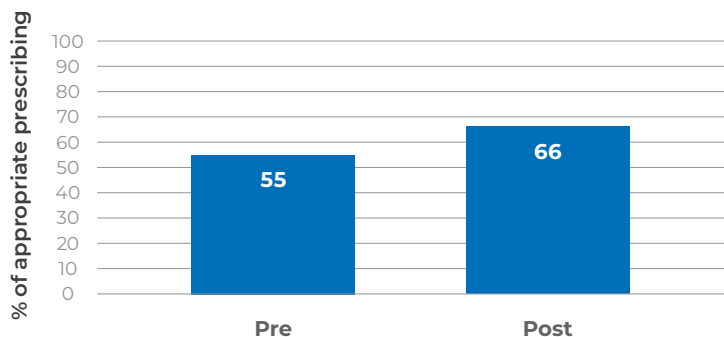


Figure 3. Appropriateness of AMU pre Spectrum Introduction and Post Introduction (% of Prescriptions Appropriate)

- Appropriateness of AMU improved by 11% ($p=0.05$) comparing pre to post Spectrum introduction. Carbapenem appropriateness improved from 17% of prescriptions pre to 86% post Spectrum introduction ($p=0.05$).

Conclusions

1. Reduction in inpatient AMU and increase in inpatient appropriateness was observed following introduction of a mobile decision support tool in the two St. John's hospitals. This association does not prove Spectrum was responsible for all the improvement.
2. National AMU in 2016 was 555/1,000 patient days, and in St. John's in 2020, it was lower at 514. Continued use of the Spectrum decision support tool and of other antibiotic stewardship measures are necessary to improve AMU.