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**Impact of an antibiotic stewardship audit and feedback programme on a general internal medicine ward: a before and after Study**

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**Background:** Prospective audit and feedback (PAF) is a strategy recommended by the Centers for Disease Control and Prevention to optimize antibiotic use. Studies of PAF in the critical care setting have consistently demonstrated improvements in antibiotic utilization leading to reductions in total antibiotic use and antibiotic expenditure without any compromise to patient safety. However, results of PAF studies in the non-critically ill population have shown conflicting results. We aimed to evaluate the impact of an antibiotic stewardship audit and feedback program on a general internal medicine ward.

**Material/methods:** The PAF intervention was implemented on a 36-bed general internal medicine ward (4D) in an acute care community hospital in Toronto, Canada. ABx Alert™, an antibiotic stewardship software database integrated with the hospital's electronic medical records system, was used to identify patients who were prescribed antibiotics. All identified opportunities for antibiotic therapy optimization were reviewed twice weekly by a pharmacist and physician with infectious diseases training, then discussed with the most responsible physicians during a dedicated meeting. Antibiotic utilization, antibiotic expenditure and clinical outcomes from the 1 year pre-intervention period were compared against results from the first and second year of PAF.

**Results:** The acceptance rate of antibiotic stewardship recommendations was 94% in year 1 of PAF and 92% in year 2 of PAF. Discontinuation of antibiotic therapy, duration optimization and de-escalation of antibiotics accounted for the majority of the recommendations. Compared to the pre-intervention period, broad-spectrum antibiotic use in days of therapy (DOT) per 1,000 patient-days was reduced by 38% in year 1 of PAF (p=0.007) and 48% in year 2 of PAF (p=0.001). The reduction

in broad-spectrum antibiotic use was driven by a 58% decrease in fluoroquinolone use in year 1 of PAF compared to the pre-intervention period (113 vs. 48 DOT per 1,000 patient-days,  $p=0.001$ ). In year 2 of PAF, the decrease in fluoroquinolone use was sustained (113 vs 44 DOT per 1,000 patient-days,  $p=0.0005$ ), while piperacillin-tazobactam and vancomycin use were reduced by 51% ( $p=0.03$ ) and 56% ( $p=0.03$ ) compared to the pre-intervention period. Antibiotic expenditure was reduced from \$2.80 CAD per patient-day in the pre-intervention period to \$2.34 CAD in year 1 of PAF ( $p=0.03$ ) and \$1.83 CAD in year 2 of PAF ( $p=0.007$ ). Although the incidence of nosocomial *Clostridium difficile* infections appeared to increase in year 1 of PAF, the rate from the pre-intervention period was atypically low for the ward, and results from years 1 and 2 of PAF were comparable to the ward's historic rates. There were no significant changes in length of stay, hospital readmission rates nor mortality rates.

**Conclusions:** Prospective audit and feedback antibiotic stewardship programs can safely and effectively optimize broad-spectrum antibiotic use and reduce antibiotic expenditure in the general internal medicine setting.