

# A Systematic Review of Antimicrobial Stewardship Interventions in the Emergency Department

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## Background

- Infections are one of the most common reasons patients present to the emergency department (ED) and often result in antimicrobial prescribing
- Antimicrobial stewardship programs (ASPs) have been recommended to improve antimicrobial use and decrease antimicrobial resistance in the ED

## Objective(s)

- The primary objective of this study was to characterize ASPs in the ED and to identify interventions that decrease consequences of antimicrobial use and improve patient outcomes
- The secondary objectives were to evaluate impact of pharmacists participating in ASPs in the ED and to identify facilitators and barriers to implementing ASP in this setting

## Methods

- Medline, EMBASE, Cumulative Index to Nursing and Allied Health Literature, Scopus, and Web of Science were searched from inception through June 2015. An update was completed November 2016.
- A broad search including terms for antimicrobial stewardship were combined with terms for emergency department and antimicrobial agents (Table 1)
- All studies evaluating an antimicrobial stewardship intervention in the ED were considered for inclusion
- Manuscripts published in languages other than English were excluded
- Outcomes of interest included: patient outcomes, quality of care outcomes, or utilization of antimicrobial agents
- Two investigators independently screened titles and abstracts for inclusion and completed data extraction and bias assessment
- Disagreements were resolved by consensus

Randolph et al. Effect of a pharmacist-managed culture review process on antimicrobial therapy in the emergency department. *AM J Health Syst Pharm* 2011;68(10):916-9.  
 Baker et al. Pharmacist-managed antimicrobial stewardship program for patients discharged from the emergency department. *J Pharm Pract* 2012;25(2):190-4.  
 Miller et al. Pharmacist addition to the post-ED visit review of discharge antimicrobial regimens. *Am J Emerg Med* 2014;32(10):1270-4.  
 Dumkow et al. Impact of a Multidisciplinary culture-follow up program of antimicrobial therapy in the emergency department. *Infect Dis Ther* 2014;3(1):45-53.  
 Davis et al. Pharmacist-driven antimicrobial optimization in the emergency department. *Am J Health Syst Pharm* 2016;73 (5 Suppl 1): S49-56.  
 Santiago et al. Evaluation of Pharmacist Impact on Culture Review Process for Patients Discharged from the Emergency Department. *Hosp Pharm* 2015;51(9):738-43.  
 Kujawski et al. Outcomes associated with emergency department pharmacists' participation in antimicrobial stewardship. *Pharmacotherapy* 2012;10(32):e308.

Table 1: Search Terms

	Search Terms
<b>Stewardship</b>	steward* or program* or polic* or pathway* or audit or formlar* or guideline* or "order form" or "order forms" or streamlin* or educat* or optimiz* or optimis* or "quality improvement" or "quality assurance" or "quality indicator" or "quality indicators"
<b>Emergency Department</b>	Emergency Treatment/ or Emergency Medicine/ or emergency medical services/ or emergency service, hospital/ or trauma centers/ or triage/or exp Evidence-Based Emergency Medicine/ or exp Emergency Nursing/ or Emergencies/ or emergicent*.mp. or ((emergenc* or ED) adj1 (room* or accident or ward or wards or unit of units of department* or physician* or doctor* or nurs* or pharmacist* of treatment* or visit*)),mp. or (triage or critical care or (trauma adj1 (cent* or care))).mp
<b>Antimicrobial</b>	((antibiotic* or antimicrobi* or antibacteri* or "anti-bacterial" or "anti-microbial" or "anti-biotic" or "anti-infective" or antiinfect*)

Figure 1: Study Inclusion

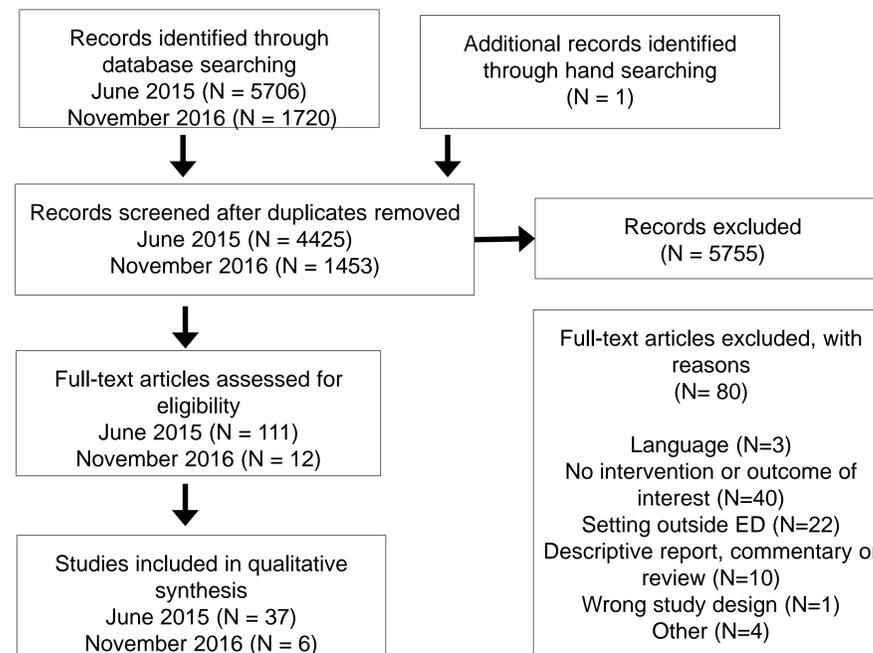


Table 2: Pharmacist Culture Review and Follow up

	Appropriateness of Therapy	Time to follow up	Frequency of intervening	ED Re-admission rates	Admission to hospital
Randolph				✓	
Baker	✗	✓			
Miller	✓				
Dumkow	✗			✗	✗
Davis		✗	✓		
Santiago		✗	✓		
Kujawski	✗			✗	

Pharmacist intervention compared to another healthcare provider: ✓ = significant improvement ✗ = no significant improvement

## Results

- 43 studies met inclusion criteria (Figure 1)
- Majority of studies were uncontrolled before and after studies with unclear or high risk of bias
- Most common interventions alone or in combination with others were education and clinical pathway or guideline implementation
  - Improved adherence to guidelines, appropriateness of prescribing, and decreased antimicrobial utilization observed
- Few studies reported improvement in clinical outcomes
- 6 studies evaluated audit and/or feedback and primarily demonstrated improved adherence to guidelines or appropriateness in prescribing
- Pharmacists participated in 13 studies. Involvement in culture review and follow up was compared to other healthcare providers in 7 studies. (Table 2)
- Most publications did not specifically report barriers and facilitators to ASP implementation. Need for dedicated personnel was reported in some studies.

## Conclusion

- ASPs in the ED may improve patient care however the preferred combination of interventions is unclear.
- Additional studies with more rigorous design evaluating core ASP interventions are needed

This study was funded in part by a grant from the CSHP Education and Research Foundation and by an internal grant from the Dalhousie University, Faculty of Health Professions.

We would like to acknowledge Melissa Helwig, Information Services Librarian for her assistance in developing and completing the literature search.

### Disclosures:

Authors of this poster have the following to disclose concerning possible personal or financial relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation:

- Emily Black – Nothing to disclose
- Tasha Ramsey – Nothing to disclose
- Mia Losier- Nothing to disclose
- Kyle Wilby – Nothing to disclose