

QUE 15-269: Combating Antimicrobial Resistance through Rapid Implementation of Available Guidelines and Evidence (CARRIAGE)

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Background: Annually, at least two million illnesses and 23,000 deaths are caused by antibiotic-resistant bacteria in the US alone, with an annual impact of \$20-35 billion in excess health care costs. The emergence of antibiotic resistance means the treatment of infections is becoming increasingly difficult, expensive, and, in some cases, nonexistent. Judicious use of antibiotics is essential to slow the emergence of resistance and extend the useful life of effective antibiotics, but prevention of resistance also requires efforts to control pathogen transmission across healthcare settings and reduce healthcare-associated infections. VA is not immune to this rising threat to patient safety, but our national, integrated healthcare system for Veterans offers unique opportunities to significantly alter the course of events and improve the outlook for our future through novel implementation and quality improvement efforts.

Objectives: The goal of this QUERI program is to address the growing concern of antimicrobial resistance through strategies targeting improved use of antibiotics and prevention of healthcare-associated infections (HAI) across VA patient care settings. In doing so, we will address the priority goals of our VA operational partners, the QUERI Strategic Plans, the 2014 VHA Blueprint for Excellence, and the goals of the National Action Plan for Combating Antibiotic-resistant Bacteria as put forth by President Obama. Our specific objectives are to (a) promote judicious inpatient antibiotic use through a novel antibiotic self-stewardship "timeout" project that prompts VA providers to evaluate the continued need for antibiotics; (b) support and enhance the implementation of new VA guidelines to detect and prevent the spread of carbapenem-resistant Enterobacteriaceae in VA hospitals; (c) foster improved handwashing practice by repairing the broken audit-and- feedback mechanism in VA acute-care hospitals via a VISN-wide quality improvement project; (d) evaluate and enhance the implementation of the national C. difficile bundle at VA acute-care facilities; and (e) increase adherence to central line maintenance practice and reduce central line-associated bloodstream infections using a human factors-designed "maintenance kit".

Methods: Program projects will vary in study timeframe and start date over the five-year QUERI program timeframe. Research designs utilized across projects will include the experimental stepped wedge design for implementation of interventions, prospective observational designs of practice implementation of large-scale policy initiatives, and rigorous evaluation of VA national policies. The program will employ complementary implementation strategies and theories guided by an Implementation Core consisting of a team of notable VA implementation scientists with proven track records in designing and executing programs to control antimicrobial resistance and HAIs. Specific implementation strategies will include audit and feedback, clinical decision support, external facilitation, provider education and activation, and adherence engineering. The Promoting Action on Research in Health Services (PARiHS) framework will be used to assess contextual factors influencing implementation within facilities, while work system barriers and facilitators will be assessed using the Consolidated Framework for Implementation Research (CFIR) and the Systems Engineering Initiative for Patient Safety (SEIPS) model. Data collection methods will include the use of national VA datasets, direct observation, and primary data (i.e., surveys, interviews, and focus groups).