

Application

Education Innovation Grant Program 2016-2017

Section I

Project Lead: STEPHEN M KIMANI		Credentials: <input checked="" type="checkbox"/> MD, <input type="checkbox"/> DO, _____	
<input checked="" type="checkbox"/> Male <input type="checkbox"/> Female	Date of birth: June 20, 1984	NC medical license no.: RTL	
Preferred mailing address (<input type="checkbox"/> business or <input checked="" type="checkbox"/> home) 240 Mt Evans Drive	City, State, Zip Durham, NC, 27705	Business Telephone 919 684 8111	
Preferred email steve.kimani@duke.edu	Fax	Cell Phone 919 949 2172	
Current Residency program Duke University Hospital		Est. completion date June, 2018	
Program Director Aimee Zaas, MD, MHS	Director's phone	Director's email Aimee.zaas@duke.edu	
Program Coordinator Lynsey Michnowicz	Coordinator's phone	Coordinator's email Lynsey.michnowicz@dm.duke.edu	

Additional Project Team Members		
Name	Credentials	Email address
Aparna Kamath	MD	Aparna.kamath@duke.edu
	<input type="checkbox"/> MD, <input type="checkbox"/> DO, _____	
	<input type="checkbox"/> MD, <input type="checkbox"/> DO, _____	
	<input type="checkbox"/> MD, <input type="checkbox"/> DO, _____	

Section II

Personal Statement: Please indicate how this grant, if funded, will help your career desires and focus. Outline your expected career path and how this aligns with the Education Innovation Grant program objectives and criteria. (500 words max.)

I have diverse interests in clinical medicine (physical diagnosis in general inpatient medicine, pulmonology and infectious disease), research (clinical quality, health disparities/global health and infectious disease biomarkers) and medical education. This project provides me with an opportunity to nurture these interests while working on identifying the best opportunity, be it a fellowship or hospital medicine, that provides the best fit. Through identifying opportunities for improving diagnostic test utilization and informing the design of an educational intervention geared towards delivery of high-value care, findings from this study will promote delivery of quality patient care and lead to excellence in graduate medical education. Leveraging on Duke's position as leading provider of health care to citizens of North Carolina and the university hospital's position as the largest hospital in the state, such gains are likely to have major and longstanding impact on health care delivery in the state.

Section III – Details of the proposal

Abstract summary

Background and Objective: High-value cost conscious care is defined as care that balances clinical benefit with costs and harms with the goal of improving patient outcomes. Providing high value care is dependent upon healthcare providers choosing high-value diagnostic and management strategies for patients in specific clinical situations without hindering outcomes. This study proposes to assess utilization, benefits, costs, and harms of urine pneumococcal antigen test in patients admitted with diagnosis of community acquired pneumonia, with a goal of informing development of an effective educational intervention geared towards providing high value cost conscious care.

Study design and approval: This will be a retrospective descriptive study. Study approval will be sought from Duke University Health System institutional review board.

Data sources and extraction: Electronic medical records at Duke university medical center and Duke regional hospital will be searched for urine pneumococcal antigen test ordered between July 1, 2015 through June 30, 2016. Only patients aged 18 years or older and admitted to non-ICU units will be included.

Main measures: We will assess the following regarding urine pneumococcal antigen testing: a) clinical characteristics (indications, demographics, severity of illness, and comorbid conditions) of patients who had the test ordered; b) impact of test results on antibiotic selection; and c) impact on cost of hospitalization.

Dissemination: We will share findings from this study with internal medicine and emergency medicine residents during joint resident conference. We will submit an abstract to regional and/or national meetings for consideration. A manuscript will be submitted for publication at a peer-reviewed journal.

Outline of the problem

Rates of mortality and cost of healthcare due to pneumonia remain high despite advances in antimicrobial therapy.¹ Adoption into clinical practice of innovative rapid tests for detection of bacterial antigens and nucleic acid amplification techniques has improved diagnosis of common etiologic pathogens.^{1,2} When appropriately used, these tests have been shown to improve antibiotic selection, shorten exposure to empiric broad spectrum antibiotics and lower cost of hospitalization for pneumonia.^{1,3} A urinary antigen test for detection of *Streptococcus pneumoniae*, a leading cause of community-acquired pneumonia, is widely available.^{1,4} This quick and simple test is based on an immunochromatographic membrane technique to detect the pneumococcal C-polysaccharide antigen and has demonstrated acceptable sensitivity and specificity in several studies.³⁻⁷ Moreover, compared to respiratory or blood culture, its yield is less affected by prior antibiotic use.³

The clinical benefits resulting from use of the urine pneumococcal antigen test among hospitalized patients remains controversial. For example, while use of the urine pneumococcal antigen test allows early use of a targeted antibiotic therapy strategy,⁸ such strategy may not carry substantial outcome-related or economic benefits and might have a higher risk of clinical relapse.^{9,10} Citing lack of robust scientific evidence, current guidelines remain equivocal, only suggesting potential value of urine pneumococcal antigen testing in certain subgroups.¹¹ Ultimately, physicians are left to choose who or when to test for urine pneumococcal antigen based on clinical or epidemiological circumstances. Consequently, variability among physicians in exploiting a positive test result for decision-making negatively impacts clinical value of this test. This was demonstrated in one study where only a small number of physicians (8.6%) exploited a positive test result (43% of the patients) to narrow the spectrum of therapy.⁸

Increasing costs of health care in the US remains an area of huge concern and has led to a renewed focus on high-value care defined as care that balances clinical benefit with costs and harms with the goal of improving patient outcomes.¹² A key feature of high-value care is dependent upon healthcare providers choosing high-value diagnostic and management strategies for patients in specific clinical situations without hindering outcomes. Cognizant of efforts by the American College of Physicians (ACP) to promote high-value care and

the key role played by trainees in delivery of quality patient care, this study seeks to assess utilization of urine pneumococcal antigen test at Duke University Medical Center with a subsequent goal to design an educational intervention geared towards improving delivery of quality patient care in line with principles of high-value care.

Anticipated results

We anticipate that urine pneumococcal antigen test will be over-utilized in this setting. Also, we anticipate low impact on antibiotic selection and a trend towards higher cost of treatment for pneumonia. We hope to use results from this study to design an educational intervention geared towards improving delivery of quality patient care guided by principles of high-value care.

Relation to the NC Chapter's long-term strategic goals (check all that apply)

- ☒ Delivery of Quality Patient Care
☒ Reform of Health Care Delivery System
☒ Excellence in Education
☐ NC Chapter, ACP: Leader and Unifier of the Internal Medicine Community in North Carolina

Time schedule (note: The grant period is from July 2016 through January 2018. Consideration for multi-year projects may be given to applicants who have demonstrated ability to complete similar projects.)

- ☒ Grant Award period (7/2016 to 1/2018)
☐ Multi-year; Time schedule:

Grant amount requested (max \$2500)

\$2500

Section IV – Detailed budget for proposed project period

Personnel		Amount
Name or entity	Role in project	
Data management and statistical analysis	Research Assistant, Statistician	1000
Registration and travel to conferences/meetings	Project Lead	1000
Total cost for personnel		\$ 2000

Material	Amount
Devices, equipment, extension to existing equipment, etc.	
Total cost for material	\$

Supplies	Amount
Itemize below	
Poster, publication costs	500
Total cost for supplies	\$ 500

Rental of equipment	Amount
Itemize below	
Total cost for rental equipment	\$

Section V

If selected for participation in the program, the grantee agrees to the record keeping and reporting requirements as outlined in the program overview, and to conduct herself/himself professionally according to the principles of medical ethics, and to be governed by the Bylaws of the North Carolina Chapter of the American College of Physicians.

Applicant's signature: Stephen M Kimani, MD, M.Sc Date: 09-01-2016

Program Director's signature: Aimee K Zaas MD, MHS Date: 09-01-2016

To be considered for the 2016-2017 grant year,
this application and the primary applicant's CV are due by 5:00 pm on **June 15th, 2016.**

Please sign your completed form and return it along with your CV by email, mail or fax to:
NC-ACP, PO Box 27167, Raleigh, NC 27611 | Fax: 919-833-2023 | ncacp@ncmedsoc.org