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Associate Professor – Infectious Diseases
University of Maryland School of Pharmacy
Baltimore, MD

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Education and Training

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|---|------------------|
| <i>Master of Science in Clinical Research</i> University of Maryland School of Medicine Baltimore, MD Advisor: Anthony Harris, MD, MPH | Anticipated 2019 |
| <i>Infectious Diseases Specialty Resident</i> University of North Carolina Hospitals Chapel Hill, NC Director: Ralph Raasch, PharmD, BCPS, FCCP | 2010 - 2011 |
| <i>Pharmacy Practice Resident</i> University of North Carolina Hospitals Chapel Hill, NC Director: Stephen Eckel, PharmD, MHA, BCPS | 2009 - 2010 |
| <i>Doctor of Pharmacy with Highest Distinction</i> Eshelman School of Pharmacy University of North Carolina at Chapel Hill Chapel Hill, NC | 2005 - 2009 |
| <i>Clinical Scholars Program</i> Duke Area Health Education Center Duke University Medical Center Durham, NC Director: Philip Rodgers, PharmD, BCPS, CPP, CDE, FCCP | 2008 - 2009 |
| <i>Bachelor of Science in Pharmaceutical Science</i> Eshelman School of Pharmacy University of North Carolina at Chapel Hill Chapel Hill, NC | 2005 - 2008 |
| <i>Pre-Pharmacy Curriculum</i> University of North Carolina at Chapel Hill Chapel Hill, NC | 2003 - 2005 |

Professional Experience

Academic Appointments

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|---|----------------|
| <i>Associate Professor</i> | 2019 – Present |
| Pharmacy Practice and Science University of Maryland School of Pharmacy Baltimore, MD | |
| <i>Assistant Professor</i> | 2016 - 2019 |
| Pharmacy Practice and Science University of Maryland School of Pharmacy Baltimore, MD | |
| <i>Clinical Assistant Professor</i> | 2014 – Present |
| Department of Medicine, Division of Infectious Diseases University of Maryland School of Medicine Baltimore, MD | |
| <i>Clinical Assistant Professor</i> | 2011 - 2016 |
| University of Maryland School of Pharmacy Baltimore, MD | |
| <i>Clinical Instructor</i> | 2007 - 2011 |
| University of North Carolina Eshelman School of Pharmacy Chapel Hill, NC | |

Practice Experience

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|---|----------------|
| <i>Infectious Diseases Clinical Pharmacy Specialist</i> | 2011 – Present |
| University of Maryland Medical Center Baltimore, MD | |
| <i>Clinical Pharmacist (resident)</i> | 2009 - 2011 |
| University of North Carolina Hospitals Chapel Hill, NC | |
| <i>Pharmacy Intern</i> | 2005 – 2009 |
| Clinic Pharmacy Durham, NC | |

Trainee Leadership

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| <i>PGY2 Infectious Diseases Pharmacotherapy Residency Director</i> | 2017 – Present |
| University of Maryland School of Pharmacy Baltimore, MD | |
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Professional Development and Certifications

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| <i>Board Certified Infectious Diseases Pharmacist</i> | 2019- Present |
| <i>Johns Hopkins Armstrong Institute for Patient Safety and Quality Fundamentals in Leadership for Patient Safety and Quality</i> | Completed 2017 |
| <i>American Academy of HIV Medicine Pharmacist</i> | 2013 – Present |
| <i>Board Certified Pharmacotherapy Specialist Added Qualifications in Infectious Diseases</i> | 2010 – Present 2013 - Present |
| <i>Making a Difference in Infectious Diseases Pharmacotherapy Advanced Antimicrobial Stewardship Certificate</i> | Awarded 2011 |
| <i>Making a Difference in Infectious Diseases Pharmacotherapy Basic Antimicrobial Stewardship Certificate</i> | Awarded 2010 |
| <i>Teaching Certificate University of North Carolina Eshelman School of Pharmacy</i> | Awarded 2010 |
| <i>American Pharmacists Association Pharmacy-Based Immunization Delivery Certification</i> | 2007 - 2011 |
| <i>Basic Life Support Certification</i> | 2006 - Present |

Honors and Awards

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| <i>University of Maryland School of Pharmacy American Association of Colleges of Pharmacy Teacher of the Year</i> | 2019 |
| <i>American College of Clinical Pharmacy Infectious Diseases Practice and Research Network Clinical Practice Award</i> | 2016 |
| <i>Maryland Society of Health System Pharmacy Medication Safety Award</i> | 2016 |
| <i>Maryland Society of Health System Pharmacy Pharmacist of the Year Award</i> | 2015 |
| <i>University of Maryland Residency & Fellowship Programs Preceptor of the Year Award</i> | 2014 |
| <i>Maryland Society of Health System Pharmacy Medication Safety Award Awarded to MSHP members for significant contributions to medication</i> | 2013 |

use safety.

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| <i>Linda Rodgers Memorial Award</i> | 2008 |
| Kappa Epsilon Professional Pharmacy Fraternity | |
| <i>Awarded by the national Grand Council to one collegiate member who exemplifies the qualities of leadership, dedication, diplomacy, friendship, and is an inspiration to others</i> | |
| <i>Phi Lambda Sigma Leadership Society</i> | 2007 – 2009 |
| Eshelman School of Pharmacy | |
| University of North Carolina at Chapel Hill | |
| <i>Rho Chi Pharmacy Honor Society, Xi Chapter</i> | 2007 – 2009 |
| Eshelman School of Pharmacy | |
| University of North Carolina at Chapel Hill | |
| <i>Howard and Mescal Ferguson Scholarship</i> | 2007 – 2009 |
| Pharmacy Foundation of North Carolina, Inc. | |
| <i>Awarded to PharmD students with above average academic achievement, excellent communication skills, capacity for leadership and service, high moral and ethical character, and excellence in pharmacokinetics, and pharmacotherapy</i> | |
| <i>J. Barnwell and Mary Blair Allison Scholarship</i> | 2006 - 2007 |
| Pharmacy Foundation of North Carolina, Inc. | |
| <i>Awarded to PharmD students for academic achievement and leadership</i> | |

Professional Affiliations

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| Infectious Diseases Society of America | 2019- Present |
| Society for Healthcare Epidemiology of America | 2016 - Present |
| American Society for Microbiology | 2015 - Present |
| Maryland Society of Health-System Pharmacy | 2011 - Present |
| Society of Infectious Diseases Pharmacists | 2010 – Present |
| American College of Clinical Pharmacists | 2008 – Present |
| American Society of Health-System Pharmacists | 2005 – 2011 |
| American Pharmacists Association | 2005 - 2009 |
| Kappa Epsilon Professional Pharmacy Fraternity | 2005 - Present |
| North Carolina Association of Pharmacists | 2005 – 2011 |

Leadership and Service

National Involvement

Infectious Diseases Society of America

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| Pharmacy Representative, Sepsis Task Force | 2019 – Present |
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Society for Healthcare Epidemiology of America

Member, Public Policy and Government Affairs Committee 2016 – Present

American Society of Consultant Pharmacists

Member, Innovations and Business Development Group 2015 – 2018

Society of Infectious Diseases Pharmacists

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| Secretary/Treasurer | 2018 - Present |
| Past Chair, Fundraising Committee | 2018 - Present |
| Chair, Fundraising Committee | 2016 - 2017 |
| Past Chair, Political Advocacy Committee | 2016 - Present |
| Chair, Political Advocacy Committee | 2014 – 2016 |
| Member, Long-Term Care Stewardship Certificate Working Group | 2016 - Present |
| Member, Inter-organizational Relations Committee | 2013 – 2014 |
| Member, Political Advocacy Committee | 2011 - Present |

American College of Clinical Pharmacists

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| Member, Annual Meeting Program Committee | 2014 – 2016 |
| Student Travel Award Application Reviewer | 2013 - Present |
| Infectious Diseases Practice and Research Network | 2008 - Present |
| Member, Social Media Committee | 2016 - Present |
| Member, Education and Programming Committee | 2008 - 2010 |

State Involvement

Maryland Health Care Commission

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| Member, Maryland Campaign for Appropriate Antibiotic Use | 2016 - Present |
| Pharmacist Liaison, Healthcare-Associated Infections Advisory Committee | 2012 - Present |

Maryland Society of Health System Pharmacists

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| Chair, Antimicrobial Stewardship Committee | 2011 – 2017 |
| Member, Antimicrobial Stewardship Committee | 2011 - Present |

North Carolina Association of Pharmacists

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| Member at Large, New Practitioner Executive Committee | 2009 – 2011 |
| Member, Governmental Affairs Committee | 2010 – 2011 |

Kappa Epsilon Professional Pharmacy Fraternity

Founder, Greater Triangle Area Alumni Chapter 2008

University Involvement

University of North Carolina Hospitals Pharmacy Residency Program

Chief Resident 2010 - 2011

Carolina Association of Pharmacy Students

Chair, Student Political Information Network 2006 – 2008
Member at Large, APhA – ASP Executive Committee 2006 - 2008

Kappa Epsilon Professional Pharmacy Fraternity (KE)

President 2007 – 2008
Vice President 2006 – 2007
Executive Committee Member at Large 2005 – 2006

Institutional Service

University of Maryland Medical System

Chair, Antimicrobial Stewardship Clinical Performance Workgroup 2016 – Present
Pharmacy Representative, Sepsis Task Force 2013 - 2015

University of Maryland Medical Center

Editor, UMMC Antibiotic Guidebook 2015 - Present
Chair, Multi-disciplinary *C. difficile* Task Force 2015 - Present
Pharmacy Representative, Surgical Site Infection Reduction Task Force 2015- 2016
Pharmacy Representative, Microbiology Performance Improvement Committee 2015 - 2016
QIPS (Quality Improvement Patient Safety) Resident Interest Group, Faculty 2014 - Present
Pharmacy Representative, Novel Pathogens Management Committee 2014 - Present
Pharmacy Representative, Executive Resource Utilization Committee 2014 - Present
Pharmacy Representative, Sepsis Performance Workgroup 2014 - Present
Member, PGY2 Emergency Medicine Residency Advisory Committee 2013 - Present
Infectious Diseases Fellowship Selection, Faculty Interviewer 2013 - Present
Member, Drug Shortages Committee 2011 - Present
Secretary, Antimicrobial Subcommittee 2011 - Present
Pharmacy Representative, Infection Control Executive Committee 2011 - Present
Chair, Antimicrobial Management Taskforce for Surgical Infections 2012 – 2013
Member, PGY1 & PGY2 Pharmacotherapy Residency Advisory Committee 2011 - Present

University of Maryland School of Pharmacy

Faculty Affairs Committee 2018 - Present
Faculty Advisor, Phi Lambda Sigma 2018 - Present
Chair, Student Affairs Committee 2017 – Present
Pediatric Faculty Search Committee 2017 - Present
Practice Workgroup, Strategic Planning Committee 2016 – Present

Residency and Fellowship Directors Committee

2016 - Present

Professional Service

Board of Pharmacy Specialties

2017

Infectious Diseases Specialty Exam Question Writer

National Quality Forum

2017 – 2018

Long-term Care Antimicrobial Stewardship Working Group

Contagion® Infectious Diseases Today

2017 - Present

Editorial Advisory Board

Positively Aware Annual HIV Drug Guide

Contributing Editor

2013 - 2015

Journal Reviewer

Antimicrobial Agents and Chemotherapy

2016 - Present

Journal of Antimicrobial Chemotherapy

2016 - Present

Clinical Infectious Diseases

2015 - Present

Annals of Pharmacotherapy

2011 – Present

Pharmacotherapy

2011 – Present

American Journal of Health System Pharmacy

2011 –

Present

Community Service

City Uprising HIV Outreach

Volunteer Faculty Preceptor

2013 - Present

Student Health Action Coalition Clinic

Volunteer Pharmacy Faculty Preceptor

2009 - 2011

Interfaith Council Clinic

Volunteer Pharmacy Faculty Preceptor

2009 - 2011

Taking Action By Service (TABS)

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| University of North Carolina Children's Hospital Playroom | 2005 -2008 |
| Ronald McDonald House | 2005 - 2008 |
| SeniorCare Medication Reviews | 2005- 2008 |

Teaching Experience

Didactic Education

University of Maryland, Baltimore – Interprofessional Courses

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| Critical Issues in Global Health (PREV 664/NRSG 664) | 2018 – Present |
| Global Burden of Infectious Diseases/Antimicrobial Stewardship | |
| Introduction to Interprofessional Practice | 2017 – Present |
| Interprofessional Communication | |
| Values and Ethics for Interprofessional Practice | |

University of Maryland School of Pharmacy

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| Clinical Pharmacokinetics (PHAR 556) | 2018 – Present |
| Vancomycin and Aminoglycoside Dosing | |
| Geriatric Pharmacotherapy (PHMY 517) | 2018 – Present |
| Infectious Diseases in Geriatric Patients | |
| Health-System Pharmacy Practice (PHMY 5007) | 2016 – Present |
| Antimicrobial Stewardship | |
| Infectious Diseases Therapeutics (PHAR5016) – Course Manager | 2016 - Present |
| Basic Antibiotic Pharmacokinetics and Pharmacodynamics | |
| Aminoglycoside and Vancomycin Pharmacokinetics and Pharmacodynamics | |
| <i>C. difficile</i> Infection | |
| Intra-abdominal Infections | |
| Hospital Acquired Pneumonia | |
| Infective Endocarditis | |
| Multi-drug Resistant Infections | |
| Sepsis/Septic Shock | |
| Antimicrobial Stewardship | |
| Emerging Infectious Diseases | |
| Acute Care Adult Internal Medicine (PHMY 5004) | 2016 – Present |
| Respiratory Infections | |
| HIV Opportunistic Infections | |
| Case-Based Infectious Diseases (PHMY 513) | 2012 - Present |
| Infections in Burn Patients | |

Pneumonia
Management of Multidrug Resistant Gram Negative Organisms
Opportunistic Infections in Solid Organ Transplant Recipients
Treatment of Hepatitis C Virus

Interdisciplinary Management of HIV (PHMY 539)
Gardiner's Cascade and Gaps in HIV Care

2013 – 2016

University Teaching Hospital (Lusaka, Zambia) - Internal Medicine/Infectious Diseases Residents 2017-Present

Antibiotics 101
Antibiotic Resistance

University of Maryland School of Nursing – Nurse Practitioner Program

Clinical Pharmacology and Therapeutics Across the Lifespan (NURS 723)
Antimicrobial Agents and General Principles
Antifungal Agents and Anti-mycobacterial Agents
Antiviral and Antiretroviral Agents

2012 - Present

University of Maryland School of Medicine

Host Defenses and Infectious Diseases (MMIC520)
Humanism Symposium (MSPR 500)
Pharmacokinetic Problem Solving (MSPR 520)

2017 - Present

2017 - Present

2014 – 2016

University of Maryland Institute of Human Virology International Physician Exchange Program

Antimicrobial Stewardship 2016 – Present

University of Maryland School of Medicine – Infectious Diseases Fellows

Antibiotic Dosing in Special Populations 2017 - Present
Vancomycin AUC-Based Dosing 2016 - Present
Antibiotic Boot Camp 2012 - Present
Pharmacokinetics and Pharmacodynamics of Antimicrobial Agents 2012 - Present
Antimicrobial Stewardship 2012 - Present
Medication Errors with Antiretrovirals 2012 - Present
Antimicrobial Drug Interactions 2012 - Present
Beta-lactam Allergy and Penicillin Skin Testing 2012 - Present

University of Maryland School of Medicine – Center for Infectious Diseases

Novel Direct Acting Antivirals (DAAs) – Drug interaction potential

2015

University of Maryland Pathology Laboratory

Management of Gram Negative Infections 2016

University of Maryland School of Medicine – Internal Medicine Program

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| Durations of Therapy in Common Infections | 2019 |
| Antimicrobial Stewardship Update | 2019 |
| Infections in Persons Who Inject Drugs | 2018 |
| Antimicrobial Stewardship Updates | 2017 |
| Antimicrobial Stewardship – Rapid Technologies and Vancomycin Dosing | 2017 |
| Management of <i>C. difficile</i> Infection | 2016 |
| What's New in Antimicrobial Stewardship | 2015 |
| Infectious Diseases Update – New Antimicrobials | 2015 |
| Bad Bugs, No Drugs – An Antimicrobial Stewardship Primer | 2014 |
| A Potpourri of Antibiotic Wisdom | 2013 |

University of Maryland Emergency Medicine Program – Grand Rounds

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| Management of Skin and Soft Tissue Infections | 2016 |
| Infectious Diseases Top 10 | 2014 |

University of North Carolina Eshelman School of Pharmacy

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| Urinary Tract Infections (DPPE 811) | 2011 |
| Skin and Soft Tissue Infections (DPPE 811) | 2011 |

Laboratory Instructor

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| Pharmaceutical Care Laboratory (PHCY 405) | 2010 |
| Pharmaceutical Care Laboratory (PHCY 404) | 2010 - 2011 |
| Pharmaceutical Care Laboratory (PHCY 403) | 2009 |
| Pharmaceutical Care Laboratory (PHCY 402) | 2008 |
| Pharmaceutical Care Laboratory (PHCY 401) | 2007 |

University of North Carolina School of Medicine

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| Clinical Medicine Cases – CNS Infections (MSDI 246) | 2011 |
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Experiential Education and Mentorship

Johns Hopkins University 2016 - 2017
Center for Bioengineering Innovation and Design
Graduate Advisory Committee

University of Maryland Medical Center

Preceptor

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| Antimicrobial Stewardship (students, residents, ID Fellows) | 2016 - Present |
| Medicine – Infectious Diseases Service (students, residents) | 2011 - Present |

Infectious Diseases Consults services (residents)

2011 - Present

Residency Advisor

| | |
|---------------|-----------|
| Ana Vega | 2016-2017 |
| Sharon Martin | 2013-2014 |
| Omayma Kishk | 2012-2013 |

Publications

Peer Reviewed

1. Johnson M, Jones B, **Heil E**, Stover K, Trone S, Fulford M, Bland C. Self-Perceived knowledge and confidence regarding infectious diseases of advanced pharmacy practice experience students. *Curr Pharm Teach Learn* 2019 (epub ahead of print).
2. Schmalzle S, Mark A, **Heil E**, Deming M, Palmeiro R, Nyemba V. Cognitive biases and knowledge deficits leading to delayed recognition of cryptococcal meningitis. *IDCases* 2019 [epub ahead of print].
3. Freedman SR, Ravichandran BR, Masters BM, Bromberg JS, Haririan A, Saharia KS, **Heil EL**, Sparkes TM. Clinical Outcomes of Valganciclovir Prophylaxis in High Risk (D+/R-) Renal Transplant Recipients Experiencing Delayed Graft Function. *Transplant Infect Dis* 2019;00:e13125.
4. Bork JT, **Heil EL**, Berry S, Lopes E, Dave R, Gilliam BL, Amoroso A. Dalbavancin Use in Vulnerable Patients Receiving Outpatient Parenteral Antibiotic Therapy for Invasive Gram-Positive Infections. *Infect Dis Ther* 2019 [epub ahead of print], DOI: 10.1007/s40121-019-0247-0.
5. Claeys KC, Hopkins T, Brown J, **Heil EL**. Pharmacists' Perceptions of Implementing an Area Under the Concentration Time Curve Pharmacist-to-Dose Program at a Large Academic Medical Center. *J Am Coll Clin Pharm* 2019 [epub ahead of print], DOI:10.1002/jac5.1092.
6. Mattingly TJ, Meninger S, **Heil EL**. Penicillin skin testing in methicillin-sensitive staphylococcus aureus bacteremia: A cost-effectiveness analysis. *PLoS ONE* 2019; 14(1):e0210271.
7. Bland CM, Bookstaver PB, Griffith NC, **Heil EL**, Jones BM, Justo JA, Staicu ML, Torney NP, Wall GC. From Theory to Practice: A Practical Guide for Pharmacists to Implement Penicillin Allergy Skin Testing. *Am J Health Syst Pharm* 2019;76:136-47.
8. Gallagher JC, Satlin MJ, Elabor A, Saraiya N, McCreary EK, Molnar E, El-Beyrouty C, Jones BM, Dixit D, **Heil EL**, Claeys KC, Hiles J, Vyas NM, Bland CM, Suh J, Biason K, McCoy D, King MA, Richards L, Harrington N, Guo Y, Chaudhry S, Lu X, Yu D. Ceftolozane-tazobactam for the treatment of multidrug-resistant *Pseudomonas aeruginosa* infections: A multicenter study. *Open Forum Infect Dis* 2018;5(11):ofy280., doi:10.1093/ofid/ofy280.
9. Plazak ME, Tamme PD, **Heil EL**. The antibiotic arms race: current and emerging therapy for *Klebsiella pneumoniae* carbapenemase (KPC)-producing bacteria. *Expert Opin Pharmacother* 2018 [epub ahead of print]. Doi:10.1080/14656566.2018.153854.

10. Vega A, Hynicka L, Claeys KC, **Heil EL**. Effectiveness of Eight Weeks of Ledipasvir/Sofosbuvir for Hepatitis C in HCV/HIV-coinfected Patients. *Antivir Ther* 2018 [epub ahead of print].
11. Claeys KC, Schlaffer KE, **Heil EL**, Leekha S, Johnson JK. Validation of an Antimicrobial Stewardship Driven Verigene Blood-Culture Gram-Negative Treatment Algorithm to Improve Appropriateness of Antibiotics. *Open Forum Infect Dis* 2018;5(10) doi:10.1093/ofid/ofy223.
12. **Heil EL**, Nicolau DP, Farkas A, Roberts JA, Thom KA. Pharmacodynamic target attainment for cefepime, meropenem and piperacillin/tazobactam using a pharmacokinetic/pharmacodynamic-based dosing calculator in critically ill patients. *Antimicrob Agent Chemother* 2018; 62:eo1008-18.
13. Lewis PO, **Heil EL**, Covert KL, Cluck DB. Treatment Strategies for Persistent Methicillin-Resistant *Staphylococcus aureus* Bacteremia. *J Clin Pharm Ther* 2018; 43:614-25. doi:10.1111/jcpt.12743.
14. **Heil EL**, Claeys KC, Mynatt RP, Hopkins TL, Brade K, Watt I, Rybak MJ, Pogue JM. Making the Shift to Area Under the Curve-Based Vancomycin Dosing: The Why and the How. *Am J Health Syst Pharm* 2018;75:1986-95.
15. Outpatient Stewardship Working Group: Blanchette L, Gauthier T, **Heil E**, Klepser M, Madaras Kelly K, Nailor M, Wei W, Suda K. The Essential Role of Pharmacists in Antibiotic Stewardship in Outpatient Care: An Official Position Statement of the Society of Infectious Diseases Pharmacists. *J Am Pharm Assoc* 2018; 58:481-4. doi:10.1016/j.japh.2018.05.013.
16. Blanco N, O'Hara LM, Robinson GL, Brown J, **Heil E**, Brown CH, Stump BD, Sigler BW, Belani A, Miller HL, Chiplinski AN, Perlmutter R, Wilson L, Morgan DJ, Leekha S. Healthcare worker perceptions toward computerized clinical decision support tools for *Clostridium difficile* Infection reduction. *Am J Infect Control* 2018;46:1160-6. doi:10.1016/j.ajic.2018.04.204.
17. Claeys KC, **Heil EL**, Pogue JM, Lephart PR, Johnson JK. The Verigene Dilemma: Gram-negative Polymicrobial Bloodstream Infections and Clinical Decision Making. *Diag Microbiol Infect Dis* 2018;91:144-6. doi 10.1016/j.diagmicrobio.2018.01.012
18. Pogue JM, **Heil EL**, Lephart P, Johnson JK, Mynatt RP, Salimnia H, Claeys KC. An Antibiotic Stewardship Program Blueprint for Optimizing Verigene BC-GN within an Institution: a Tale of Two Cities. *Antimicrob Agents Chemother* 2018;62(5). doi: 10.1128/AAC.02538-17.
19. **Heil EL**, Pineles L, Mathur P, Morgan DJ, Harris AD, Srinivasan A, Thom KA and the CDC Epicenters. Accuracy of provider-selected indications for antibiotic orders. *Infect Control Hosp Epidemiol* 2018;39:111-113.
20. Mattingly TJ, Fulton A, Lumish R, Williams A, Yoon S, Yuen M, **Heil EL**. The cost of self-reported penicillin allergy: a systematic review. *J Allergy Clin Immunol Pract* 2018;6:1649-54. DOI: 10.1016/j.jaip.2017.12.033.
21. Claeys KC, Hopkins TL, Vega A, **Heil EL**. Fluoroquinolone restriction as an effective antimicrobial stewardship intervention. *Curr Infect Dis Report* 2018;20:7. DOI:10.1007/s11908-018-0615-z.

22. Bork JT, Morgan D, **Heil EL**, Pineles L, Kleinberg M. Peer Comparison of Anti-MRSA Agent Prescription in the Inpatient Setting. *Infect Control Hosp Epidemiol* 2017;38:1506-8.
23. Bork JT, **Heil EL**, Leekha S, Fowler RC, Hanson ND, Majumdar A, Johnson JK. Impact of CLSI and EUCAST Cefepime Breakpoint Changes on the Susceptibility Reporting for *Enterobacteriaceae*. *Diagn Microbiol Infect Dis* 2017;89:328-33.
24. King M, **Heil E**, Kuriakose S, Bias T, Huang V, El-Beyrouty C, McCoy D, Hiles J, Richards L, Gardner J, Harrington N, Biason K, Gallagher J. Outcomes with ceftazidime/avibactam in patients with carbapenem-resistant *Enterobacteriaceae* (CRE) infections: a multi-center study. *Antimicrob Agents Chemother* 2017; 61(7)e00449-17.
25. Kumarachandran G, Johnson JK, Shirley DA, Graffunder E, **Heil EL**. Predictors of adverse outcomes in children with *Staphylococcus aureus* bacteremia. *J Pediatr Pharmacol Ther* 2017;22:218-226.
26. Oliver WD, **Heil EL**, Thom KA, Martinez JP, Hayes BD. Allergy profile should be updated after uneventful administration of a penicillin or penicillin-related antibiotic to a patient with penicillin allergy. *J Allergy Clin Immunol Pract* 2017;5:184-6.
27. Mattingly TJ, **Heil EL**, Hoke KS. Exploring the case for eminent domain of Hepatitis C virus treatment patents. *J Health Care Poor Underserved* 2017;28:621-5.
28. **Heil EL**, Bork JT, Schmalzle SA, Kleinberg M, Kewalramani A, Gilliam BL, Buchwald UK. Implementation of an Infectious Diseases Fellow Managed Penicillin Allergy Skin Testing Service. *Open Forum Infect Dis* 2016, 3(3): doi: 10.1093/ofid/ofw155.
29. Allison MG, **Heil EL**, Hayes BD. Appropriate antibiotic therapy: Severe Sepsis Care in the Emergency Department. *Emerg Med Clin North Am* 2016, 35:25-42.
30. Thom KA, **Heil EL**, Croft L, Duffy A, Morgan DJ, Johantgen M. Advancing interprofessional patient safety education for medical, nursing and pharmacy learners during clinical rotations. *J Interprof Care* 2016;30:819-22. doi 10.1080/13561820.2016.1215972.
31. Kishk OA, Lardieri A, **Heil EL**, Morgan JA. Vancomycin AUC/MIC and Corresponding Troughs in a Pediatric Population. *J Pediatr Pharmacol Ther* 2017;22:41-7.
32. Brandt NJ, **Heil EL**. Antimicrobial Stewardship in the Post-Acute Long-Term Care Setting. *J Gerontol Nurs* 2016;42:10-14.
33. Aitken SL, Dilworth T, **Heil EL**, Nailor M. Antibiotics in Agriculture: a Danger to Human Health and a Call to Action from the Society of Infectious Diseases Pharmacists. *Pharmacotherapy* 2016;36:422-32. doi: 10.1002/phar.1737.
34. D'Angelo R, Johnson JK, Bork JT, **Heil EL**. Treatment options for extended-spectrum beta-lactamase (ESBL) and AmpC producing bacteria. *Expert Opin Pharmacother* 2016;17:953-67.
35. **Heil EL**, Johnson JK. Impact of CLSI Breakpoint Changes on Microbiology Laboratories and Antimicrobial Stewardship Programs. *J Clin Microbiol* 2016;54:840-4.

36. Sarg M, Waldrop G, Beier M, **Heil EL**, Thom KA, Preas MA, Johnson JK, Harris AD, Leekha S. Impact of Changes in Urine Culture Ordering Practices on Antimicrobial Utilization in Intensive Care Units at an Academic Medical Center. *Infect Control Hosp Epidemiol* 2016;37:448-54.
37. Oliver W, **Heil EL**, Gonzales JP, Mehrotra S, Robinett K, Saleeb P, Nicolau DP. Ceftolozane/tazobactam pharmacokinetics in a critically ill patient on continuous veno-venous hemofiltration. *Antimicrob Agents Chemother* 2015; 60:1899-1901.
38. **Heil EL**, Hynicka L, Kottilil S, Tang L. What does the pharmacological future of treating chronic hepatitis C look like? *Expert Rev Clin Pharmacol* 2015;8:605-22. doi: 10.1586/17512433.2015.1074859.
39. Hines MC, Al-Salamah T, **Heil EL**, Witting M, Johnson JK, Winters M, Mallemat H, Hayes BD. Resistance patterns of *Escherichia coli* in women with uncomplicated urinary tract infection does not correlate with institutional antibiogram. *J Emerg Med* 2015;49:998-1003. doi: 10.1016/j.jemermed.2015.06.028.
40. Hollis AL, **Heil EL**, Nicolau DP, Odonkor P, Dowling TC, Thom KA. Validation of a dosing strategy for Cefazolin for surgery requiring cardiopulmonary bypass. *Surg Infect* 2015;16:829-32. doi: 10.1089/sur.2014.250.
41. Wiener ES, **Heil EL**, Hynicka LM, Johnson JK. Are fluoroquinolones appropriate for the treatment of extended-spectrum beta-lactamase producing gram-negative bacilli? *J Pharm Tech* 2016;32:16-21. doi: 10.1177/8755122515599407.
42. Bork JT, Leehka S, **Heil EL**, Zhao L, Badamas R, Johnson JK. Rapid Testing Using Verigene® BC-GN Microarray in Combination with Antimicrobial Stewardship Intervention in Gram-negative Bacteremia. *Antimicrob Agents Chemother* 2015;59:1588-95. doi:10.1128/AACo4259-14.
43. Nguyen AD, **Heil EL**, Patel NK, Duffy A, Gilmore S. A single-center evaluation of the risk for colonization or bacteremia with piperacillin-tazobactam and cefepime resistant bacteria in patients with acute leukemia receiving fluoroquinolone prophylaxis. *J Oncol Pharm Pract* 2016;22:303-7. doi: 10.1177/1078155214567161.
44. **Heil EL**, Shah KP, Amoroso A. Successful salvage therapy using daptomycin and ceftaroline following the emergence of daptomycin non-susceptible *Staphylococcus aureus* endocarditis and infected pacemaker/implantable cardioverter-defibrillator. *Infect Dis Clin Prac* 2015;23:155-7.doi:10..1097/IPC.oooooooooooo000022.
45. **Heil EL**, Lowery AV, Thom KA, Nicolau DP. Treatment of Multi-Drug Resistant *Pseudomonas* Using Extended-Infusion Antibiotic Regimens. *Pharmacotherapy* 2015;35:54-8. Doi:10.1002/phar.1514.
46. Memoli D, Shepardson A, Joshi M, **Heil E**. Reducing daptomycin expenditures by standardizing doses. *Am J Health System Pharm* 2014;71:12-14. doi: 10.2146/ajhp130391.
47. Fleming E, **Heil EL**, Hynicka LM. Treatment Strategy for a Multi-drug Resistant *Klebsiella* UTI: A Case Report. *Ann Pharmacother* 2014;48:123-7. doi: 10.1177/1060028013509974.

48. Shirley DA, **Heil EL**, Johnson JK. Ceftaroline Fosamil: A Brief Clinical Review. *Infect Dis Ther* 2013; doi: 10.1007/s40121-013-0010-x.
49. Hynicka L, **Heil EL**. Anemia management in patients with chronic Hepatitis C Virus. *Ann Pharmacother* 2013;47:228-236. doi: 10.1345/aph.1R513.
50. **Heil E**, Daniels L, Long D, Rodino K, Weber D, Miller M. Impact of Yeast Traffic Light Peptide Nucleic Acid Fluorescence In Situ Hybridization (PNA FISH) identification of *Candida* species in conjunction with pharmacy intervention at an academic medical center. *Am J Health System Pharm*. 2012;69:1910-14. doi: 10.2146/ajhp110604.
51. **Heil E**, Daniels L, Walko C, Nicolau D, Smith E. Validation of doripenem dosing in patients with end-stage renal disease receiving hemodialysis. *Ann Pharmacother*. 2011;45:1455-6. doi: 10.1345/aph.1Q395.
52. **Heil E**, Corbett A. Guidelines for the use of extended-release nevirapine in HIV-infected patients. *Expert Opin Pharmacother* 2011;12:2713-18. doi: 10.1517/14656566.2011.630391.
53. **Heil E**, Townsend M, Shipp K, Johnson M, Clarke A. Incidence of Severe Hepatotoxicity Related to Antiretroviral Therapy in HIV/HCV Coinfected Patients. *AIDS Res Treat*. 2010;2010: 856542. doi: 10.1155/2010/856542.

Non-Peer Reviewed

1. Tang K, **Heil EL**. Antimicrobial Stewardship for the Hospital Pharmacist. *Pharmacy Times Health Systems Edition*. 2015.
2. Talwani R, **Heil EL**, Gilliam B, Temesgen Z. Simeprevir: A Macrocyclic HCV Protease Inhibitor. *Drugs Today* 2013;49:769-779.
3. Kapelusznik L, **Heil EL**, Temesgen Z, Talwani R. Setrobuvir: RNA-directed RNA polymerase inhibitor. *Drugs Fut*. 2012;37:725-35.
4. Talwani R, **Heil EL**, Temesgen Z, Kapelusznik L. Filibuvir. *Drugs Fut*. 2012;37:767-75.
5. **Heil E**. Pharmacist Rounds: MRSA Endocarditis. *Pharmacy Times Health Systems Edition*. 2012;78:20-1.
6. Askew JP, **Heil EL**. Obsessive-Compulsive Disorder: An Overview for Pharmacists. *America's Pharmacist*, 2007; 129(12):36-51.

Letters and Other Communications

1. Dodds-Ashley E, Davis SL, **Heil EL**, LaPlante KL, Chahine EB, Bosso JA. Best care for patients is achieved through multi-disciplinary stewardship. *Clin Infect Dis* 2018;67(10):1637.
2. **Heil EL**, Gallagher JC, Kuti JL, Bearden D on behalf of the Society of Infectious Diseases Pharmacists and the American Society of Health System Pharmacy. The Essential Role of

Pharmacists in Antimicrobial Stewardship. *Infect Control Hosp Epidemiol* 2016;37:753-4.
doi:10.1017/ice.2016.82.

3. Hynikca L, **Heil EL**. Hepatitis C Treatment Exposed or Experienced? *Ann Pharmacother* 2016;50:328.
4. **Heil EL**, Thomas J. CDC Antimicrobial Stewardship Recommendations: One State's Assessment Identifies Need for Compliance. *Am J Health System Pharm* 2014;71:1833-84.
doi:10.2146/ajhp140273.

Book Chapters

1. **Heil EL**. Sepsis. In: *Infectious Diseases Case Study Approach for PharmDs*. Burr Ridge, IL: McGraw-Hill 2019.
2. Pandit NS, **Heil EL**. Principles of applied clinical pharmacokinetics and pharmacodynamics in antiretroviral therapy. In: *Fundamentals of HIV Medicine*. Oxford, UK: Oxford University Press 2019.
3. **Heil EL**, Banoub M, Corbett AH. Human Immunodeficiency Virus Infection. In: Chisholm-Burns et al., eds. *Pharmacotherapy Principles & Practice*, 5th Ed. Burr Ridge, IL: McGraw-Hill 2017.
4. Vanschoonveld T, **Heil EL**. Syndrome-driven antimicrobial stewardship. *Practical Implementation of Antimicrobial Stewardship Programs*. Chicago, IL: University of Chicago Press 2017 [in press].
5. Pandit NS, **Heil EL**. Principles of applied clinical pharmacokinetics and pharmacodynamics in antiretroviral therapy. In: *Fundamentals of HIV Medicine*. Oxford, UK: Oxford University Press 2016.
6. **Heil EL**, Corbett AH. Opportunistic Infections in HIV Infected Patients. In: Koda-Kimble et al., eds. *Applied Therapeutics: The Clinical Use of Drugs*, 11th Ed. Philadelphia, PA: Lippincott, Williams & Williams 2015.
7. **Heil EL**, Corbett AH. Human Immunodeficiency Virus Infection. In Katz et al., eds. *Pharmacotherapy Principles and Practice Study Guide: A Case Based Care Plan Approach*, 4th Ed. Burr Ridge, IL: McGraw-Hill 2015.
8. **Heil EL**, Trezza CR, Corbett AH. Human Immunodeficiency Virus Infection. In: Chisholm-Burns et al., eds. *Pharmacotherapy Principles & Practice*, 4th Ed. Burr Ridge, IL: McGraw-Hill 2015.
9. **Heil EL**, Standiford H. Approaches in Benchmarking. In: Mylonakis, ed. *Antimicrobial Stewardship: Principles and Practice*, 1st Ed. London, England: CTY Publishers 2015 [in press].
10. **Heil EL**, Sheth NU, Wright W. Introduction to Antimicrobial Agents. In: Wright, ed. *Clinical Infectious Diseases Essentials*, 1st Ed. New York, NY: DemosMedical 2013.
11. Corbett A, **Heil E**. Opportunistic Infections in HIV Infected Patients. In: Koda-Kimble et al., eds. *Applied Therapeutics: The Clinical Use of Drugs*, 10th Ed. Philadelphia, PA: Lippincott, Williams & Williams 2012.

Research

Grants and Contracts

1. Bland CM, Principal Investigator. **Heil EL**, Co-Investigator. Assessment of long-term antimicrobial prescribing in patients who have documented negative allergy after receiving penicillin skin testing: A multi-center study. ALK-Abello. July 1, 2019-July 31, 2020. \$42,636.
2. Claassen C, Principal Investigator. **Heil EL**, Co-Investigator. Advancing antimicrobial stewardship in Lusaka, Zambia. Center for Global Education Initiatives, University of Maryland, November 1, 2018. \$5,000.
3. Leekha S, Principal Investigator. **Heil EL**, Co-investigator. Implementation of a *Clostridium difficile* Infection Reduction Statewide Collaborative. Centers for Disease Control Contract, collaboration with Maryland Department of Health and Mental Hygiene. September 1, 2018 – August 31, 2019. \$750,000. Percent effort, 20.
4. Brandt NJ, Principal Investigator. **Heil EL**, Co-Investigator. Pilot of Implementing Antibiotic Stewardship Programs in the Post Acute-Long Term Care Setting. Maryland Department of Health and Mental Hygiene. March 30, 2018. \$200,000. Percent effort, 10.
5. Pandit N, Principal Investigator. **Heil EL**, Co-Investigator. Assessment of medical and pharmacy student knowledge of antimicrobial spectrum in Lusaka, Zambia. Center for Global Education Initiatives, University of Maryland, November 11, 2017. \$5,000.
6. Claeys KC, **Heil EL**, Pandit NP, Co-Principal Investigators. Design and Implementation of a Novel Interactive Application to Enhance Learning of Antimicrobial Spectrum of Activity. University of Maryland School of Pharmacy SharkTank Competition, May 2017. \$50,000.
7. **Heil EL**, Mattingly TJ, Co-Principal Investigators. Cost-effectiveness of penicillin skin testing services to confirm patient-reported penicillin allergy on admission in the acute care setting. Alk-Abello, April 2017. \$60,000. Percent effort, 10.
8. **Heil EL**, Principal Investigator. Society of Infectious Diseases Residency Expansion Grant. July 1, 2017-June 30, 2018. \$60,000.
9. **Heil EL**, Principal Investigator. Building the foundation for an antimicrobial stewardship program in Lusaka, Zambia. Center for Global Education Initiatives, University of Maryland, November 11, 2016. \$5,000.
10. Hynicka L, Principal Investigator. **Heil EL**, Co-investigator. Hepatitis C Medication Management. Maryland Department of Health and Mental Hygiene. \$474,579. Percent effort, 10.
11. Leekha S, Principal Investigator. **Heil EL**, Co-investigator. Implementation of a *Clostridium difficile* Infection Reduction Bundle in Acute Care Hospitals: Feasibility and Pilot to Guide a Multicenter Stepped Wedge Cluster Trial. Centers for Disease Control Epicenter Contract. September 30, 2016 – September 30, 2017. \$455,478. Percent effort, 10.

12. Gulati M, Principal Investigator. **Heil EL**, Co-investigator. Building a high-reliability organization – inter-professional development for safer care. Interprofessional Education and Interprofessional Care Seed Grant. University of Maryland Center for Interprofessional Education, March 17, 2016. \$9,000.

13. **Heil EL**, Principal Investigator. Clinical validation of an antibiotic dosing program in critically ill patients. Society of Infectious Disease Pharmacists Young Investigator Award, September 2015. \$20,000.

14. Buchwald U, Principal Investigator. **Heil E**, Co-Investigator. Implementation and outcomes of an Infectious Disease Fellow Run Penicillin Allergy Consult Service. Alk-Abello, September 2014. \$10,000.

15. Thom K, Principal Investigator. **Heil E**, Co-Investigator. Patient Safety and Quality Improvement at the Point of Care. Interprofessional Education and Interprofessional Care Seed Grant. University of Maryland Center for Interprofessional Education, March 3, 2014. \$9,000.

16. Mellemat H, Principal Investigator. **Heil E**, Co-Investigator. Identification of susceptibility patterns of urinary isolates in patients with uncomplicated urinary tract infections in the University of Maryland Medical Center Adult Emergency Department. University of Maryland Emergency Medicine Intramural Research Grant, October 2013. \$5,000.

Abstracts

1. Panagos K, Blanco-Herrera N, Leekha S, von Rosenvinge E, **Heil E**. Assessing the time course of proton pump inhibitor use and *Clostridioides difficile* infection. ID Week. Washington DC. October 2019.
2. Ntem-Mensah A, **Heil E**, Pajoumand M, Rabinowitz R, Galvagno S, Schrank G. Baloxavir marboxil in combination with oseltamivir in 2 critically ill patients with Influenza A (H1N1; 2009 strain) on veno-venous Extra-Corporeal Membrane Oxygenation. ID Week. Washington DC. October 2019.
3. Shams M, Oni I, **Heil E**, Morales M, Bork J. Liposomal amphotericin B use before and after implementation of voriconazole prophylaxis in cancer patients. ID Week. Washington DC. October 2019.
4. Blackman A, Jarugula P, Nicolau D, Chui S, Joshi M, Gopalakrishnan M, **Heil EL**. Evaluation of linezolid pharmacokinetics in obese patients with severe skin and soft tissue infections. ID Week. Washington DC. October 2019.
5. Blackman A, Ali S, Gao X, Mesumbe R, Cheung C, Banoub M, Claeys KC, **Heil EL**. Evaluation of intraoperative topical vancomycin and the incidence of acute kidney injury. ID Week. Washington DC. October 2019.
6. Claeys KC, **Heil EL**, Loughry N, Chainani S, Johnson JK, Leekha S. Use of rapid diagnostic testing in Gram-negative bloodstream infections with and without antimicrobial stewardship. ID Week. Washington DC. October 2019.

7. Vega AD, Blackman AL, Banoub M, **Heil EL**, Leekha S, Johnson JK, Claeys KC. No mortality benefit to adding intravenous metronidazole to oral vancomycin for critically-ill patients with severe *C. difficile* infection. ID Week. Washington DC. October 2019.
8. Bork JT, Claeys KC, Johnson JK, Obiekwe U, Lusby M, Jones J, **Heil EL**, Leekha S. Back to the future: The impact of multi-step algorithm *C. difficile* testing at a large tertiary medical center. ID Week. Washington DC. October 2019.
9. Fong G, Chahine E, Justo J, Narayanan N, **Heil E**, Stover K, Cho J, Jenkins Z, MacDougall C. Assessment of antimicrobial pharmacokinetics curriculum in schools and colleges of pharmacy across the United States. American Association of Colleges of Pharmacy Annual Meeting. Chicago IL. July 2019.
10. Vega A, **Heil EL**, Blackman A, Banoub M, Johnson JK, Leekha S, Hopkins T, Claeys KC. No mortality benefit to adding intravenous metronidazole to oral vancomycin in for critically ill patients with severe *C. difficile* infection. Making a Difference in Infectious Diseases (MAD-ID) Annual Meeting. Orlando, FL. May 2019.
11. Claeys KC, **Heil EL**, Loughry N, Chainani S, Johnson JK, Leekha S. Impact of Verigene Blood Culture Gram-Negative without Active Stewardship Intervention. Making a Difference in Infectious Diseases (MAD-ID) Annual Meeting. Orlando, FL. May 2019.
12. Herbert A, Callahan P, Vega A, Masich A, **Heil E**, Pandit NS, Hachaambwa L, Claassen C. Building a Foundation for Antimicrobial Stewardship at University Teaching Hospital in Lusaka, Zambia. Consortium of Universities for Global Health Annual Global Health Conference. Chicago, IL. March 2019.
13. Zarowitz BJ, Sheikh F, Naqvi F, **Heil E**, Brandt N. Interprofessional Collaboration Improves Antibiotic Stewardship. AMDA – The Society of Post-Acute and Long-Term Care Medicine 2019 Annual Conference. Atlanta, GA. March 2019.
14. **Heil E**, Callahan P, Vega A, Claeys K. Impact of an AUC-guided versus trough-guided vancomycin dosing strategy. American College of Clinical Pharmacy Global Conference on Clinical Pharmacy. Seattle, WA. October 2018.
15. Claeys K, Hopkins T, Brown J, **Heil E**. Perceptions of a transition to an AUC-guided pharmacist-to-dose vancomycin practice at a large academic medical center. American College of Clinical Pharmacy Global Conference on Clinical Pharmacy. Seattle, WA. October 2018.
16. Vega A, Ibikunle S, Hopkins T, **Heil E**, Leekha S, Johnson JK, Claeys K. Oral vancomycin plus intravenous metronidazole for severe *Clostridium difficile* infection in critically ill patients. American College of Clinical Pharmacy Global Conference on Clinical Pharmacy. Seattle, WA. October 2018.
17. Vega A, Nguyen C, Claeys K, **Heil E**. Characterizing variability in calculated vancomycin pharmacokinetic parameters using an AUC-based dosing strategy in hospitalized patients.

American College of Clinical Pharmacy Global Conference on Clinical Pharmacy. Seattle, WA. October 2018.

18. Pizzuti A, Patel K, McCreary E, **Heil E**, Bland C, Love B, Bookstaver PB. Views of social media for educational use in healthcare. American College of Clinical Pharmacy Global Conference on Clinical Pharmacy. Seattle, WA. October 2018.
19. Masich A, Kalaria S, Gonzales J, **Heil E**, Tata A, Claeys K, Patel D, Gopalakrishnan M. Characterization of vancomycin pharmacokinetics and pharmacodynamics in obese septic shock patients. American College of Clinical Pharmacy Global Conference on Clinical Pharmacy. Seattle, WA. October 2018.
20. **Heil EL**, Martinelli A, Oliver W, Claeys KC. Emergency Department Resource Utilization after Implementation of a Dalbavancin Pathway for Skin and Soft Tissue Infections. ID Week. San Francisco, CA. October 2018.
21. Gandotra S, Ravichandran B, Lockman DK, Thom KA, Amoroso A, Pajoumand M, **Heil EL**. Impact of de-escalation of antibiotic surgical prophylaxis in lung transplant recipients. ID Week. San Francisco, CA. October 2018.
22. Vega A, Hopkins T, **Heil E**, Johnson JK, Leekha S, Claeys K. Oral Vancomycin plus Intravenous Metronidazole for Severe *Clostridium difficile* Infection in Critically Ill Patients. ID Week. San Francisco, CA. October 2018.
23. Roth B, Laps A, Stafford K, **Heil E**, Hachaambwa L, Yamba K, Kalumbi M, Patel D, Johnson JK, Claassen C. High Frequency of Multi-Drug Resistant Organisms at University Teaching Hospital, Lusaka, Zambia. ID Week. San Francisco, CA. October 2018.
24. Claeys KC, Loughry N, Chainani S, Leekha S, **Heil EL**. Oral Antibiotics for the Treatment of Gram-negative Bloodstream Infections: Prescribing Practices and Outcomes at a Large Academic Medical Center. ID Week. San Francisco, CA. October 2018.
25. Meninger S, **Heil EL**, Mattingly TJ. Cost-effectiveness of Penicillin Allergy Skin Testing in Methicillin-Sensitive *Staphylococcus aureus* (MSSA) bacteraemia. ID Week. San Francisco, CA. October 2018.
26. Berry S, Brinckhaus E, **Heil EL**, Dave R, Amoroso A, Gilliam BL, Bork JT. Multicenter experience with dalbavancin for non-acute bacterial skin and skin structure infections. American Society of Microbiology Microbe. Atlanta, GA. June 2018.
27. Freedman SR, Ravichandran BR, Masters BM, **Heil EL**, Saharia KK, Bromberg JS, Haririan A, Sparkes TM. Cytomegalovirus prophylaxis following alemtuzumab induction in high risk renal transplant recipients experiencing delayed graft function. American Transplant Congress. Seattle, WA. June 2018.

28. Claeys KC, **Heil EL**, Nguyen C. Can previously published literature combined with a small institution-specific data-set aid in the prediction of drug resistance in pneumonia presenting from the community? ECCMID 2018. Madrid, Spain. April 2018.

29. Gallagher JG, **Heil EL**, Claeys KC, Hiles J, Dixit D, King MA, Vyas N, Elabor A, El-Beyrouty C, Satlin M, Saraiya N, Guo Y, Harrington NS. Ceftolozane-tazobactam for the treatment of multi-drug resistant *Pseudomonas aeruginosa* (MDRPA) infections: a multicentre study. ECCMID 2018. Madrid, Spain. April 2018.

30. Rinomhota G, **Heil E**, Pandit N, Valentine D, Doyle K, Claassen C. Analysis of Antibiotic Administration in Patients Admitted in Medical and Surgical Wards at the University Teaching Hospital in Lusaka, Zambia. Consortium of Universities for Global Health Annual Global Health Conference. New York, NY. March 2018.

31. Ma S, Claeys KC, Gandotra S, **Heil EL**. Nephrotoxicity of colistimethate versus polymyxin B after a change in dosing strategy at University of Maryland Medical Center. American Society of Health-System Pharmacy Midyear Meeting. Orlando, FL. December 2017.

32. Fulton A, Mattingly TJ, **Heil EL**. Risk factors for invalid immunoglobulin E (IgE) mediated penicillin skin testing results in an inpatient setting. American Society of Health-System Pharmacy Midyear Meeting. Orlando, FL. December 2017.

33. Nguyen C, **Heil EL**, Claeys KC. Determining risk for pneumonia caused by drug resistant pathogens after health-care associated pneumonia. American Society of Health-System Pharmacy Midyear Meeting. Orlando, FL. December 2017.

34. Reed BN, **Heil EL**. Accuracy of an Abbreviated Cockcroft-Gault Equation for Predicting Creatinine Clearance. American College of Clinical Pharmacy Annual Meeting. Phoenix, AZ. October 2017.

35. Pandit NS, **Heil EL**. Virologic outcomes in HIV infected patients following bariatric surgery. American College of Clinical Pharmacy Annual Meeting. Phoenix, AZ. October 2017.

36. Bland CM, Bookstaver PB, Gauthier T, Goff D, **Heil EL**, McCreary EK, Stover KR, Young HN, Hurst HE. Evaluation of Pharmacist Use of Social Media for Educational Purposes. American College of Clinical Pharmacy Annual Meeting. Phoenix, AZ. October 2017.

37. Masich AM, Gonzales JP, Kalaria SN, **Heil EL**, Tata AL, Claeys K, Patel D, Gopalakrishnan M. Characterization of vancomycin pharmacokinetics and pharmacodynamics in obese septic patients with gram-positive bacteremia. American College of Clinical Pharmacy Annual Meeting. Phoenix, AZ. October 2017.

38. **Heil EL**, Farkas A, Robinson G, Nicolau D, Thom KA. Pharmacodynamic Target Attainment for Meropenem and Piperacillin/Tazobactam Using a PK/PD-based Dosing Calculator in Critically Ill Patients. ID Week. San Diego, CA. October 2017. [Platform].

39. **Heil EL**, Pineles L, Morgan D, Harris AD, Thom KA. Indications for antibiotic orders: How accurate are they? ID Week. San Diego, CA. October 2017.

40. **Heil EL**, Sivasailam B, Park S, Diaz J, von Rosenvinge E, Claeys KC, Hopkins T, Leekha S. Impact of a Multi-Disciplinary *C. difficile* Action Team. ID Week. San Diego, CA. October 2017.

41. Vega A, Hynicka L, Claeys KC, **Heil EL**. Effectiveness of 8 or 12 Week Treatment Duration of Ledipasvir/Sofosbuvir for Hepatitis C: Evidence from a Large Academic Medical Center. ID Week. San Diego, CA. October 2017.

42. Schlaffer KE, **Heil EL**, Leekha S, Johnson JK, Claeys KC. Validation of an Antimicrobial Stewardship Derived Verigene Blood-Culture Gram-Negative Treatment Algorithm to Improve Appropriateness of Antibiotics in Gram-Negative Bacteremia. ID Week. San Diego, CA. October 2017.

43. Claeys KC, Pogue JM, Lephart PR, Johnson JK, **Heil EL**. Gram-Negative Polymicrobial Bloodstream Infections and Clinical Decision Making with a Microarray Testing System. ID Week. San Diego, CA. October 2017.

44. Molnar EM, **Heil EL**, Claeys KC, Hiles J, Gallagher JC. Ceftolozane-tazobactam for the Treatment of Multi-drug Resistant *Pseudomonas aeruginosa* (MDRPA) Infections. ID Week. San Diego, CA. October 2017.

45. Bland CM, Jones BM, **Heil EL**, Hinton S, Maguire C, Fulford MJ, Stover KR. Self-perceived knowledge and confidence regarding infectious diseases advanced pharmacy practice experience (APPE) students. American Association of Colleges of Pharmacy Annual Meeting. Nashville, TN. July 2017.

46. Sivasailam B, Park E, von Rosenvinge E, Leekha S, **Heil EL**. Gastroenterology consults and fecal microbiota transplant for *C. difficile* infection patients after the implementation of a multi-disciplinary *C. difficile* action team. American College of Physicians Maryland Region Annual Associates Meeting. May 2017. 12th Annual UVA Annual Conference of Liver Disease and Gastroenterology. June 2017.

47. Claeys KC, **Heil EL**, Johnson JK, Lephart P, Mynatt RP, Salimnia H, Pogue JM. An Antimicrobial Stewardship Program (ASP) blueprint for optimizing Verigene BC-GN within an institution: A tale of two cities. ECCMID. Vienna, Austria. April 2017.

48. King M, Huang V, Gallagher J, **Heil EL**. Outcomes with ceftazidime/avibactam in patients with carbapenem-resistant *Pseudomonas* infections: a multi-center study. ID Week. New Orleans, LA. October 2016.

49. King M, **Heil EL**, Kuriakose S, Bias T, Huang V, El-Beyrouty C, McCoy D, Hiles J, Gardner J, Gallagher J. Outcomes with ceftazidime/avibactam in patients with carbapenem-resistant Enterobacteriaceae (CRE) infections: a multi-center study. ID Week. New Orleans, LA. October 2016.

50. Shah K, Fay E, Kleinberg M, **Heil EL**, Bork JT. Outcomes and Safety of De-escalation Therapy in Cancer Patients Receiving Empiric Meropenem. American Society of Microbiology/ Interscience Conference on Antimicrobial Agents and Chemotherapy Microbe Conference. Boston, MA. June 2016.

51. Thom KA, **Heil EL**, Croft L, Duffy A, Morgan DJ, Johantgen M. Advancing interprofessional patient safety education during clinical rotations. National Academies of Practice Annual Meeting and Forum. Baltimore, MD. April 2016 [platform].
52. Oliver W, Gonzales JP, **Heil EL**, Mehrotra S, Robinett K, Saleeb P, Nicolau D. Ceftolozane-tazobactam pharmacokinetics in a patient on continuous venovenous hemofiltration. 44th Critical Care Congress Society of Critical Care Medicine. Orlando, FL. February 2016 [platform].
53. D'Angelo R, Gonzales JP, Tata A, **Heil EL**, Patel D, Shanholtz C. Healthcare-associated pneumonia treatment characterization in medical intensive care unit patients. 44th Critical Care Congress Society of Critical Care Medicine. Orlando, FL. February 2016.
54. **Heil EL**, Bork JT, Buchwald U. Implementation of an Infectious Disease Fellow Managed Penicillin Allergy Skin Testing Service. ID Week. San Diego, CA. October 2015.
55. Bork JT, **Heil EL**, Pineles L, Kleinberg M. How to 'Excel' at Antimicrobial Stewardship without Clinical Decision Support System. ID Week. San Diego, CA. October 2015.
56. D'Angelo RG, Gonzales JP, Tata AL, **Heil EL**. Characterization of *Clostridium difficile* infection treatment during the use of concomitant antibiotics. American College of Clinical Pharmacy Annual Meeting. San Francisco, CA. October 2015.
57. Patel Z, **Heil EL**, Magarakis M, Klyushnenkova E, Leekha S, Bruns B, Tesoriero R, Diaz JD. Time to onset of bacterial versus fungal infectious complications in acute pancreatitis. Surgical Infection Society 35th Annual Meeting. Westlake Village, CA. April 2015.
58. Bork JT, **Heil EL**, Leekha S, Badamas R, Johnson JK. Rapid testing using Verigene Microarray in combination with antimicrobial stewardship intervention in Gram-negative bacteremia. ID week. Philadelphia, PA. October 2014.
59. Al-Salamah T, Hines MC, Hayes B, **Heil EL**, Witting M, Johnson JK, Winters M, Gaasch W, Mallemat H. Antibiogram does not predict *Escherichia Coli* resistance to ciprofloxacin in women presenting with uncomplicated urinary tract infection to an urban, academic medical center emergency department: a prospective, observational study [Abstract program #254]. 2014 American College of Emergency Physicians Scientific Assembly. Chicago, IL. Ann Emerg Med 2014;64(4 Supplement):S91.
60. **Heil EL**, Leekha S, Bork JT, Johnson JK. Impact of CLSI Enterobacteriaceae Breakpoint Changes on Antibiotic Use at a Large Academic Medical Center. Interscience Conference on Antimicrobial Agents and Chemotherapy, Washington DC. September 2014.
61. Bork JT, **Heil EL**, Leekha S, Johnson JK. Impact of CLSI Guideline 2014 Changes on the Reporting of Cefepime Susceptibility for Enterobacteriaceae. Interscience Conference on Antimicrobial Agents and Chemotherapy. Washington DC. September 2014.
62. Hollis A, **Heil EL**, Nicolau DP, Odonkor P, Dowling T, Thom K. Validation of a dosing strategy for cefazolin for surgery requiring cardiopulmonary bypass. American College of Clinical Pharmacy

Annual Meeting. Austin TX. October 2014 [poster]. Interscience Conference on Antimicrobial Agents and Chemotherapy. Washington DC. September 2014 [platform presentation].

63. Kishk O, **Heil EL**, Morgan J. Vancomycin AUC/MIC and corresponding troughs in a pediatric population. Pediatric Pharmacy Advocacy Group 23rd Annual Meeting. Nashville, TN. April 2014 [platform presentation].
64. Good BL, Lee SJ, **Heil EL**, Hynikca LM. Evaluation of the therapeutic drug monitoring process at a large academic medical center for quality improvement. American Society of Health-System Pharmacist Annual Midyear Meeting. Orlando, FL. December 2013.
65. Thakkar N, **Heil EL**, Hollis A, Yeung A, Patel D. Assessment of Appropriateness of Carbapenem Prescribing in the Medical Intensive Care Unit at a Large Academic Medical Center. American Society of Health-System Pharmacist Annual Midyear Meeting. Orlando, FL. December 2013.
66. **Heil E**, Johnson JK. Characterizing Ceftazidime and Daptomycin MICs Compared to Vancomycin MICs in *S. aureus* Blood Culture Isolates at a Large Academic Medical Center. Interscience Conference on Antimicrobial Agents and Chemotherapy. Denver, CO. September 2013.
67. Flurie R, **Heil E**, Hynicka L. Characterizing Anemia Management in Patients Receiving Telaprevir, Ribavirin and Peginterferon for Hepatitis C Virus. University Health System Consortium at the American Society of Health-System Pharmacist Annual Midyear Meeting. Las Vegas, NV. December 2012.
68. Karani M, Johnson JK, **Heil E**. Treatment of urinary tract infections caused by vancomycin resistant Enterococcus. University Health System Consortium at the American Society of Health-System Pharmacist Annual Midyear Meeting. Las Vegas, NV. December 2012.
69. **Heil E**, Daniels L, Weber D, Miller M. Impact of Peptide Nucleic Acid Fluorescence In Situ Hybridization (PNA FISH™) -Based Identification of *Candida* Species on Antifungal Therapy Costs and Patient Outcomes. Making Difference in Infectious Diseases Annual Meeting. Orlando, FL. May 2011; Infectious Diseases Society of America Annual Meeting. Boston, MA. October 2011.
70. **Heil E**, Lewis A, Oertel M. Evaluation of prophylactic enoxaparin use and adherence to institutional prescribing guidelines. University Health System Consortium at the American Society of Health-System Pharmacist Annual Midyear Meeting. Las Vegas, NV. December 2009.
71. **Heil E**, Johnson M, Shipp K, Townsend M. Incidence of severe hepatotoxicity related to antiretroviral therapy in HIV/HCV co-infected patients at Duke University Medical Center. 43rd ASHP Midyear Clinical Meeting, Orlando, FL, Dec 2008 [Poster], North Carolina Association of Pharmacists, April 2009 [Platform presentation].

Invited Presentations

International

Antimicrobial Resistance: Epidemiology and Mechanisms
Antimicrobial Resistance Symposium

March 2016

Rwanda Ministry of Health/University of Maryland School of Medicine/World Health Organization
Kigali, Rwanda

Antimicrobial Resistance: Focus on Bacterial Resistance March 2016
Antimicrobial Resistance Symposium
Rwanda Ministry of Health/University of Maryland School of Medicine/World Health Organization
Kigali, Rwanda

National

Definitive Treatment for Penicillin Allergies: How Do We Improve Antimicrobial Stewardship? June 2019
ASM Microbe
San Francisco, CA
ACCME/ACPE Accredited Continuing Education Program

Probiotics: What Do We Tell Our Patients? March 2019
Edmund G. Beacham 46th Annual Current Topics in Geriatrics
Baltimore, MD
ACCME Accredited Continuing Education Program

HIV/HCV September 2018
Infectious Diseases Pharmacotherapy Webinar
American College of Clinical Pharmacy

Stewardship PR: Marketing Your Program May 2018
Making a Difference in Infectious Diseases Annual Meeting
Orlando, FL
ACPE Accredited Continuing Education Program

Penicillin Allergy: Practice and Policies May 2018
Making a Difference in Infectious Diseases Annual Meeting
Orlando, FL
ACPE Accredited Continuing Education Program

Probiotic Stewardship February 2018
Edmund G. Beacham 45th Annual Current Topics in Geriatrics
Baltimore, MD
ACCME Accredited Continuing Education Program

Are you really allergic to penicillin? Effectively managing self-reported cases December 2017
American Society of Health-System Pharmacy
Midyear Clinical Meeting
Orlando, FL
ACPE Accredited Continuing Education Program

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|---|--------------|
| <i>Accurately Assessing Antibiotic History and Patient Allergies</i> | July 2017 |
| Vizient Antimicrobial Stewardship Education Webinar | |
| ACPE Accredited Continuing Education Program | |
| <i>Social Media Lite</i> | July 2017 |
| Vizient Programming, Innovation and Engagement Webinar | |
| ACPE Accredited Continuing Education Program | |
| <i>What Every Steward Should Know About Pharmacokinetics and Pharmacodynamics</i> | March 2017 |
| Society for Healthcare Epidemiology of America | |
| Spring 2017 Conference | |
| St. Louis, MO | |
| ACCME/ACPE Accredited Continuing Education Program | |
| <i>Allergies, Interactions and Adverse Events, oh my!</i> | March 2017 |
| Society for Healthcare Epidemiology of America | |
| Spring 2017 Conference | |
| St. Louis, MO | |
| ACCME/ACPE Accredited Continuing Education Program | |
| <i>It's Time to Regulate: Antimicrobial Stewardship Standards in Acute Care Settings.</i> | March 2017 |
| Maryland Healthcare Education Institute | |
| 13 th Annual Maryland Patient Safety Conference | |
| Baltimore, MD | |
| AACME Accredited Continuing Education Program | |
| <i>The abCs of HCV</i> | January 2017 |
| Society of Infectious Diseases Pharmacists Education Center | |
| ACPE Accredited Continuing Education Program | |
| <i>Antibiotic dosing in special populations: Hunting for Goldilocks</i> | October 2016 |
| ID Week | |
| New Orleans, LA | |
| ACCME/ACPE Accredited Continuing Education Program | |
| <i>Regulatory standards related to antimicrobial stewardship in acute care</i> | October 2016 |
| American College of Clinical Pharmacy Annual Meeting | |
| Hollywood, FL | |
| ACPE Accredited Continuing Education Program | |
| <i>2016 CLSI Updates and Controversies in Gram Negative Antimicrobial Stewardship</i> | October 2016 |
| ACCP ID-PRN/CLSI/SIDP Annual CE Webinar | |
| ACPE Accredited Continuing Education Program | |

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| <i>Guess the Resistance Mechanism!</i> Microbe (ASM/ICAAC) Boston, MA ACCME/ACPE Accredited Continuing Education Program | June 2016 |
| <i>FARMaceuticals: Antibiotic Use in Animals and Agriculture</i> Society of Infectious Diseases Pharmacists Annual Meeting Boston, MA ACPE Accredited Continuing Education Program | June 2016 |
| <i>Antimicrobial Stewardship in Long-Term Care</i> Edmund G. Beacham 43 rd Annual Current Topics in Geriatrics Johns Hopkins, Baltimore, Maryland ACCME Accredited Continuing Education Program | March 2016 |

Regional

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| <i>The Role of Antibiotic Allergies in Antimicrobial Stewardship in Long-Term Care</i> Maryland Department of Health & Peter Lamy Center ACPE/CNE Accredited Continuing Education Program | April 2019 |
| <i>Goodbye Fluoroquinolone Use, Hello Reduced <i>C. difficile</i> Rates</i> Maryland SPARC Collaborative | March 2019 |
| <i>Microbiology, Antibiograms, and Anti-Infective Basics 101</i> Maryland Long-Term Care Stewardship Summit ACPE Accredited Continuing Education Program | September 2018 |
| <i>Strategies and Opportunities for Reducing the Incidence of <i>Clostridium difficile</i> Colitis in the Hospital.</i> Society of Hospitalist Medicine – Maryland Chapter Meeting Baltimore, MD | January 2018 |
| <i>Addressing Antibiotic Allergies for Antibiotic Stewardship</i> North Carolina Association of Pharmacists Annual Convention ACPE Accredited Continuing Education Program | September 2017 |
| <i>No Allergist? No Fear! The Role of Penicillin Skin Testing in Antimicrobial Stewardship</i> Medication Safety Dinner Maryland Society of Health System Pharmacy ACPE Accredited Continuing Education Program | November 2016 |
| <i>Incorporating AUC-based Vancomycin Dosing into Practice</i> Advancing Clinical Knowledge in Pharmacotherapeutics Washington Metro Society of Health-System Pharmacy | September 2016 |

ACPE Accredited Continuing Education Program

Goodbye Troughs, Hello AUC? A New Era of Vancomycin Dosing
4th Annual Updates in Infectious Diseases
Maryland Society of Health System Pharmacy
ACPE Accredited Continuing Education Program

September 2016

Overview of Antimicrobial Stewardship Program Essentials
Antimicrobial Stewardship Workshop
DC- College of Clinical Pharmacy
ACPE Accredited Continuing Education Program

June 2014

Probiotics for C. difficile Prevention: You Make the Call
Tackling C. difficile Infection Through Prevention and Stewardship
Delmarva Foundation Conference
AACME Accredited Continuing Education Program

September 2013

Microbiology 101 for Pharmacists
Updates in Infectious Diseases
Maryland Society of Health System Pharmacists
ACPE Accredited Continuing Education Program

June 2013

Key Components of an Antimicrobial Stewardship Program
Tackling C. difficile Infection Through Prevention and Stewardship
Delmarva Foundation Conference
AACME Accredited Continuing Education Program

January 2013

Time for a Revolution? Telaprevir for Previously Treated Chronic Hepatitis C Virus
12th Annual North Carolina Anti-Infective Workshop
Greensboro, North Carolina
ACPE Accredited Continuing Education Program.

November 2010

Local

Pharmacokinetic Dosing of Antimicrobials
Duke School of Medicine Infectious Diseases Grand Rounds
Durham, NC
ACCME Accredited Continuing Education Program

April 2018

AUC/MIC Based Vancomycin Dosing
Clinical Updates in Pharmacotherapy Conference
University of Maryland
ACPE Accredited Continuing Education Program

December 2016

Just Child's Play? Taking advantage of the seesaw effect for difficult to treat Gram Positive infections
Clinical Updates in Pharmacotherapy Conference
University of Maryland

March 2015

ACPE Accredited Continuing Education Program

Infectious Diseases Grand Rounds
University of Maryland
AACME Accredited Continuing Education Program

February 2015

Pharmacotherapeutics Update: Antibiotics November 2014
9th Annual Nurse Practitioner and Physician Assistant Clinical Conference
University of Maryland
ANCC Accredited Continuing Education Program

An Inescapable Trough? Why Vancomycin May be Obsolete in the Next 10 Years. June 2012
Clinical Updates in Pharmacotherapy Conference
ACPE Accredited Continuing Education Program

Emerging Treatment Options for Hepatitis C – A Look into the Future November 2010
University of North Carolina Hospitals
ACPE Accredited Continuing Education Program

Cystic Fibrosis: An Update on the Management of Acute Exacerbations March 2010
ACPE Accredited Continuing Education Program
University of North Carolina Hospitals

Other Selected Presentations

Medication Allergies – Areas for Optimization August 2017
Quality Improvement and Patient Safety Council
University of Maryland Medical Center

Medication Reconciliation April 2017
Quality Improvement and Patient Safety Council
University of Maryland Medical Center

Medication Safety January 2015
Quality Improvement and Patient Safety Council
University of Maryland Medical Center

Fighting Back: Closing the Knowledge Gap Between Antibiotic Resistance and C. difficile November 2013
Delmarva Foundation Webinar

Anemia Management in Hepatitis C Treatment August 2012
Hepatitis C Interest Group Meeting
University of Maryland Hepatology and Infectious Disease physicians

Not Your Average Runny Nose – A Case of Zygomycosis in a Liver Transplant Patient

January 2011

Department of Pharmacy Seminar Series
University of North Carolina Hospitals

Proton Pump Inhibitors and Clostridium difficile Infection: What's the Connection?

August 2010

Department of Pharmacy Seminar Series
University of North Carolina Hospitals

An Atypical Case of an Atypical Bacteria

April 2010

Department of Pharmacy Seminar Series
University of North Carolina Hospitals

Gimme a Boost! The Development of New Pharmacokinetic Enhancers for Antiretroviral Therapy

November 2009

Department of Pharmacy Seminar Series
University of North Carolina Hospitals

When Oral Medications No Longer Suffice: Insulin Glargine versus Exenatide in an Uncontrolled Type 2 Diabetic Patient

January 2009

Duke Area Health Education Center Seminar Series
Duke University Hospital

The Role of Integrase Inhibitors in HIV Management

September 2008

Duke Area Health Education Center Grand Rounds
Duke University Hospital

Innovative Educational Programs and Curricula

Academic Life in Emergency Medicine CAPSULES Pharmacology Curriculum

1. Reviewer of Concepts in Infectious Diseases module

ID Stewardship medical blog

1. 5 Things People in Healthcare Should Know About Antibiotics and Agriculture.
Published online July 6, 2016. <https://www.idstewardship.com/5-things-healthcare-providers-know-antibiotic-use-agriculture/>

Academic Life in Emergency Medicine medical blog

1. Sulfamethoxazole-trimethoprim for Skin and Soft Tissue Infections: 1 or 2 tablets BID? Published online Feb 16, 2015. <https://www.aliem.com/2015/sulfamethoxazole-trimethoprim-ssti-1-2-tablets-bid/>
2. The Not-so-sick health-care associated pneumonia patient: new treatment strategy. Published online Nov 26, 2013. <https://www.aliem.com/2013/new-treatment-strategy-not-so-sick-health-care-associated-pneumonia/>

Media

Ralph Nader Radio Hour
Fighting Superbugs, Air Date April 8, 2017.

Washington Post
How Maryland can combat the spread of antibiotic-resistant bacteria. OpEd, February 3, 2017.

Contagion® Infectious Diseases Today
The Globalization of Antibiotic Stewardship Programs: The World is Waiting, August 2018
Antibiotic Indications, October 2017
IV to PO Conversions: What Should Clinicians Know? April 9, 2017.
How Can Pharmacokinetics and Pharmacodynamics Impact Stewardship? April 6, 2017.
What is the Ideal Antimicrobial Stewardship Team? March 30, 2017.
Current Concerns About the Use of Antibiotics in Animals and Agriculture, June 18, 2016.

WYPR Midday Show
The Arms Race Against Antibiotic Resistance, Air Date March 25, 2016

Licensure

Maryland Pharmacy License #20231 2011 – Present

North Carolina Pharmacy License #20428 2009 - Present

References

Available upon request

I CERTIFY THAT THIS CURRICULUM VITAE IS ACCURATE AND TRUE



Rev 7/30/19