Identify Gaps and Meeting the Needs of Antimicrobial Stewardship Research

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Disclosures

» Content developer and speaker for FreeCE.com

» Content developer and speaker for Rockpointe Inc.

» Non-commercial disclosure:
  ▪ Co-director of Southeastern Research Group Endeavor (SERGE-45)
Learning Objectives

• Identify key gaps in the antimicrobial stewardship literature

• Discuss opportunities within antimicrobial stewardship programs to meet scholarship needs

• Identify strategies to increase the scholarly output of your antimicrobial stewardship program

Overview for Conducting Stewardship-Related Research

1) Needs Assessment: Identify gaps in the literature, local research needs and research infrastructure

2a) Identify research team members & establish roles

2b) Discuss institutional goals & stewardship program goals related to research

3) Establish research strategy

4) Execute, evaluate and report out deliverables
### Level of Evidence among IDSA Guidelines

<table>
<thead>
<tr>
<th>Level of Evidence</th>
<th>% of Recommendations</th>
<th>Median % (IQR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>14.8</td>
<td>15.8 (5.8-28.3)</td>
</tr>
<tr>
<td>II</td>
<td>29.7</td>
<td>30.9 (23.3-43.2)</td>
</tr>
<tr>
<td>III</td>
<td>55.5</td>
<td>50.0 (38.1-58.6)</td>
</tr>
</tbody>
</table>

**Class of Recommendation**

<table>
<thead>
<tr>
<th>Class</th>
<th>% of Recommendations</th>
<th>Median % (IQR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>40.2</td>
<td>41.5 (28.7-55.6)</td>
</tr>
<tr>
<td>B</td>
<td>37.7</td>
<td>40.3 (27.1-47.9)</td>
</tr>
<tr>
<td>C</td>
<td>14.0</td>
<td>8.1 (1.8-14.7)</td>
</tr>
<tr>
<td>Other</td>
<td>8.1</td>
<td>0 (0.6.7)</td>
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IQR=Interquartile range


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### Implementing an Antimicrobial Stewardship Program: Guidelines by the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America

- **8 interventions**
- **6 optimization**
- **6 microbiology & laboratory diagnostics**
- **3 measurement**
- **5 special populations**

- 2 good practice recs
- 3 good practice recs

28 Total Recommendations in 2016 IDSA Antibiotic Stewardship Guidelines

What percentage of stewardship programs have formally evaluated rapid diagnostic technologies?

A. 90%
B. 30%
C. 60%
D. 10%

Reported Assessment
Rapid Diagnostics

- Survey of pharmacists involved in antimicrobial stewardship (n=214)
- Focus was on rapid diagnostic technology (RDT) familiarity/utilization and measuring impact

Outcomes Assessed with RDTs

Identifying Gaps in the Infectious Diseases Literature that Impact Patients – British Columbia Experience

- **Purpose:** Review research activity & infrastructure in BC and link to a process for identifying public health needs, gaps and opportunities
  - Focus was on infectious diseases topics and public health

**Step 1:** Environmental scan to describe current activity in BC

**Step 2:** Consultation to describe gaps/needs (key informants) AND end users of results (stakeholders)

**Step 3:** Prioritization of research needs

<table>
<thead>
<tr>
<th>Nine Priorities Identified**:</th>
</tr>
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<tbody>
<tr>
<td>1) Efficacy &amp; cost-benefit</td>
</tr>
<tr>
<td>2) Disease patterns</td>
</tr>
<tr>
<td>3) Emerging infectious disease</td>
</tr>
<tr>
<td>4) Immunology &amp; vaccines</td>
</tr>
<tr>
<td>5) Disease-specific research</td>
</tr>
<tr>
<td>6) Health promotion &amp; communications</td>
</tr>
<tr>
<td>7) Safe food &amp; water</td>
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<tr>
<td>8) Knowledge translation research &amp; genomics</td>
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*Identified six research capacity building themes


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Palmetto Health Antimicrobial Stewardship & Support Team (PHASST)

- 4 hospital system in central South Carolina (Columbia, SC)
- Approximately 1,500 patient beds

**Stewardship Team System-Wide (Core):**
- Majdi Al-Hasan, MBBS
- Brandon Bookstaver, PharmD (Faculty Full-time)
- Julie Ann Justo, PharmD (Faculty Full-time)
- Joey Kohn, PharmD
- Emily Haggard, PharmD
- Krutika Mediwalla, PharmD
Our stewardship research strategy...it’s simple really

1) We take clinical questions and look for practical answers using local data.

2) We strive to have objective, evidence-based recommendations (discussions) with our colleagues.

Palmetto Health ASST Evidence-Based Precision Medicine

Strength of association of risk factors & cumulative effect of multiple risk factors
Important Question to Ask yourself:
Is your research meaningful?

To you

To your trainees

To your institution

To your patients

To the greater medical/pharmacy community
regionally, nationally or internationally

Benefit of Scholarship to the individual

• Professional satisfaction
• Professional gain (eg promotion)
• Personal satisfaction
• “Black Tie Invitation Only List”
  • Speakers
  • Awards
  • Textbook chapters
  • Peer review requests
• Financial gain
Scholarship Strategy

Focus your area of study but diversify your approach
“Financial portfolio model”

Trainee-driven research

Internal collaborations

External collaborations

Utilize your resources

• Utilize (motivated) pharmacy and medical trainees
  • Pharmacy/Medical students, residents
  • ID or non-ID medical fellows
  • ID or non-ID Pharmacy resident/fellow

• Outside collaboration
  • Research networks (eg SHEA, SERGE-45–Southeastern Research Group Endeavor)

• Physicians and pharmacists who are excited and engaged in research productivity

• Data already available locally (eg. perpetual databases; infection control; claims data)

• Mentorship
Effective Mentoring in Research


Mentoring References


• Hoffman Brenda AACP, Mentoring: ON Having One & Being One. Available at: http://www.aacp.org/career/facultyrecruitment/Documents/AcademicLife_Mentoring.pdf

• The Bible – having wise counsel. (Proverbs 15:12; Proverbs 12:15)
Writing, Publishing & Citing your work: A trainee’s guide

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(Sample presentation for trainees/clinicians)

Scholarship as a metric

• Presentations, abstracts and publications are metrics for our stewardship program
Stratification of the Impact of Inappropriate Empirical Antimicrobial Therapy for Gram-Negative Bloodstream Infections by Predicted Prognosis

Sarah (Cain) Battle, MD
PH/USC SOM


PHASST Webpage

www.phformulary.net
AHRQ Definition: Practice Based Research Network (PBRN)

- “... groups of primary care clinicians and practices working together to answer community-based health care questions and translate research findings into practice. PBRNs engage clinicians in quality improvement activities and an evidence-based culture in primary care practice to improve the health of all Americans”

- “...address the full continuum of care and outcomes research, to link research to practice improvement, and to speed the dissemination of research findings to community practice settings...”


Available at:
http://www.aacp.org/resources/research/PBRN/Documents/PBRNFAQs.pdf
Advantages/Disadvantages of PBRNs

**Advantages**
- Great ROI
  - Point/period prevalence
- Retrospective or prospective
- Sites/Clinicians that WANT to do research, but difficult
  - No forced participation
- Funding opps. (+/-)
- Doable when funding not desired/available

**Disadvantages**
- “Herding cats”
- Apathy about research concept
- IRB coordination
- Lack of input on feasibility analysis or project ideas

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**SERGE-45**

Southeastern Research Group Endeavor-45

34 sites with 41 investigators
Development of the SERGE-45 Network, circa 2010/2011

- ‘Pieces’ (membership) of PBRN
  - Defined shared practice-base
    - PharmD or MD
  - Defined shared specialty/expertise
    - Infectious diseases
  - Defined shared case-mix or practice model and data access
    - Acute care; ambulatory care

- Define additional pieces needed to achieve goals
  - Local support for grant writing and data analysis
  - IRB support
  - Coordinators/Executive board

SERGE-45: Process for Conducting Studies

- Email listserv available for discussion and facilitation of research ideas – NOT meant for general questions

- Research ideas can be submitted by anyone in the group
  - Question
  - Feasibility survey (email)
  - Facilitated by SERGE coordinators

- Data collection limited to one or two ongoing large studies (e.g. >10 institutions involved)
  - Multiple concurrent smaller studies ‘ok’

- Abstracts to include all investigators
  - Manuscript authorship based on level of interest/involvement
"How to successfully publish a manuscript"

**Step 1:**

**Write a manuscript**

_John Bosso, faculty development session (circa 2010ish)_

A good idea done well always has a home.

_April Miller Quidley (circa 2008)_

Scientific literature is not a children’s book.

_Paraphrasing John Williamson (circa 2006)_

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**Research & Career Direction**

- Participation in research among both pharmacy and medical students increases likelihood of future careers in research & discipline-specific areas of research
- Positive research mentoring leads to increased likelihood of subsequent mentee/mentor experiences for all participants
- Research participation for pharmacy trainees increases critical thinking
- Pharmacy students participating in research are significantly more likely to successfully match for post-graduate residency

Results and Data Specialties Matching Service, 2016 Appointment Year; NRMP, February 2016

Trends in the Number of Infectious Disease Programs in the SMS: Filled and Unfilled

Research & Career Direction

Infectious Diseases Pharmacy Training Programs (2015)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>ID PGY2 Programs (%)</th>
<th>ID Fellowship Programs (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of programs</td>
<td>74</td>
<td>15</td>
</tr>
<tr>
<td>No. of positions</td>
<td>75</td>
<td>18</td>
</tr>
<tr>
<td>Program location</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West</td>
<td>11 (15)</td>
<td>2 (13)</td>
</tr>
<tr>
<td>Midwest</td>
<td>23 (31)</td>
<td>7 (47)</td>
</tr>
<tr>
<td>Northeast</td>
<td>14 (19)</td>
<td>3 (20)</td>
</tr>
<tr>
<td>South</td>
<td>26 (35)</td>
<td>3 (20)</td>
</tr>
<tr>
<td>General/Adult ID focus</td>
<td>71 (96)</td>
<td>14 (93)</td>
</tr>
</tbody>
</table>

Avoid distractions, pitfalls & barriers

• Not establishing **end goal prior** to embarking on research
  • Lack of focus

• Lack of “wins”

• Failure to **grow** network/research base

• Spending **excessive** time/resources on “outliers”

Available on Twitter®
Included with permission of involved parties

Opportunities for Research Training & Funding

Series of papers published in Infection Control Hospital Epidemiology (ICHE) from June 2016 – November 2016 highlighting general research principles in stewardship and epidemiology:

• Quasi-experimental studies
• Survey methodology
• Mathematical modeling
• Qualitative analyses
Suggestions for Successful Research Pursuits

1) “The Best Yes” – marked by deadlines, not current workload

2) Diversify your publishing portfolio
   • Collaborations; journals

3) Have a research focus...but maintaining some variety may work for you
   • 60% = ID; 16% = Education/Academic; 16% = Med Safety

4) Each clinical, service or academic endeavor may be an opportunity for scholarship (including funding)

5) Find enjoyment and purpose in it

Summary Points

• What research is important to you?
  • It’s like anything else in life, if you have a calling/passion/drive behind it, you can be successful

• Doing research that’s meaningful – what gaps does it fill for you, your patients, and others regionally/nationally/internationally

• Match your institutional goals and vision with your research endeavors

• Mentorship, either internal or external, drives success for both mentee and mentor when effective relationships are established.
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