UWTASP
tele-antimicrobial stewardship program

echo

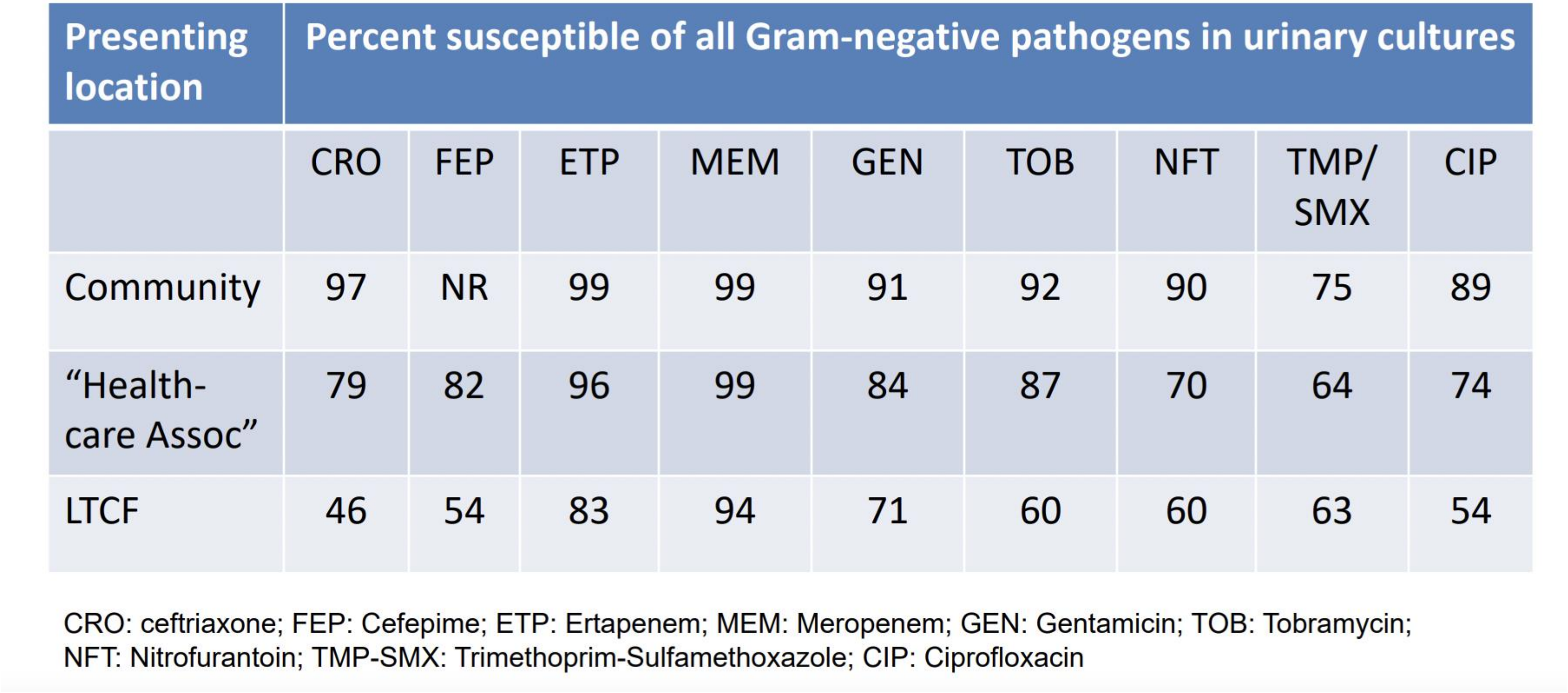
October 25th, 2022

Agenda

- Whitney Hartlage
- Zahra Kassamali Escobar
- Chloe Bryson-Cahn

Antibiograms: drug, bug, is that really it?

- Optimizing UTI in the ED using a risk-factor stratified antibiogram



Presenting location	Percent susceptible of all Gram-negative pathogens in urinary cultures								
	CRO	FEP	ETP	MEM	GEN	TOB	NFT	TMP/ SMX	CIP
Community	97	NR	99	99	91	92	90	75	89
"Health-care Assoc"	79	82	96	99	84	87	70	64	74
LTCF	46	54	83	94	71	60	60	63	54

CRO: ceftriaxone; FEP: Cefepime; ETP: Ertapenem; MEM: Meropenem; GEN: Gentamicin; TOB: Tobramycin; NFT: Nitrofurantoin; TMP-SMX: Trimethoprim-Sulfamethoxazole; CIP: Ciprofloxacin

Better represent a given patient

IDWeek 2022. Jason M. Pogue.

Antibiograms: drug, bug, is that really it?

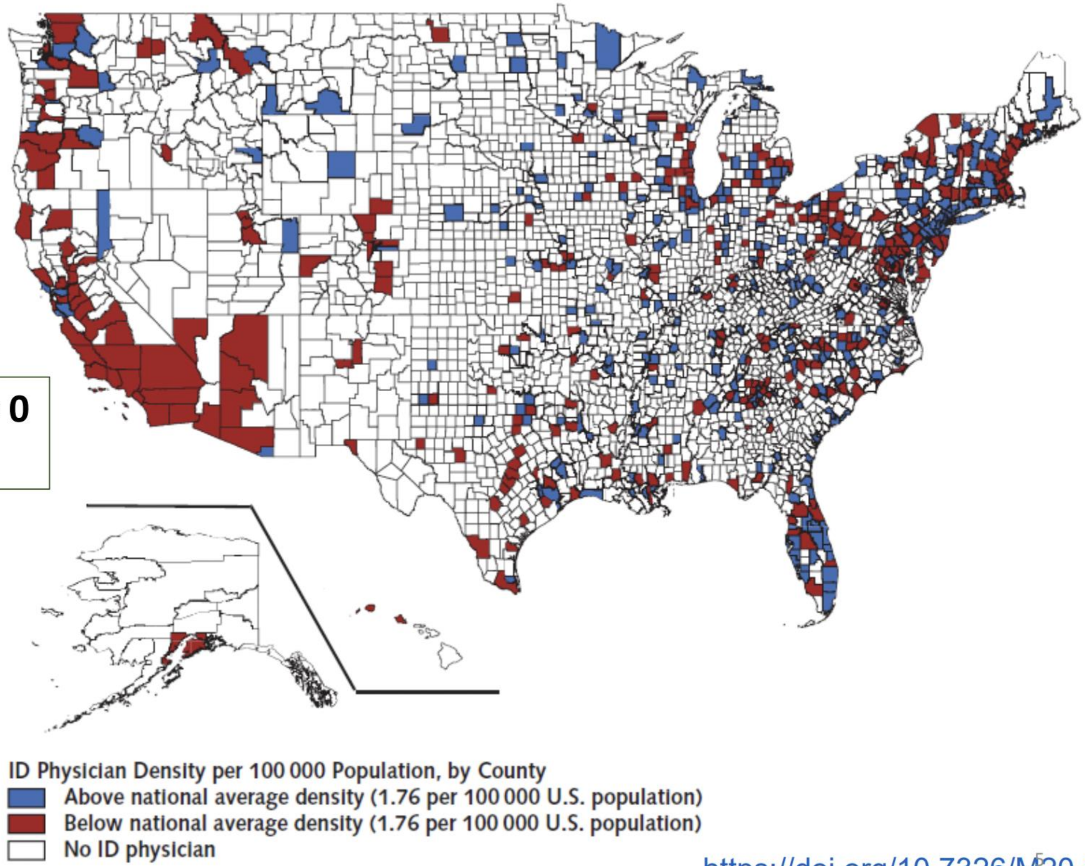
- Advance techniques offer significant advantages over conventional antibiograms
- Being creative with variations could be performed to better optimize care
  - Optimizing ICU pneumonia with a combination antibiogram
  - Decreasing time to interventions using a rapid diagnostic testing result based antibiogram
  - Helping a failing patient with escalation antibiogram

IDWeek 2022. Jason M. Pogue.

Building the ID workforce from the ground up

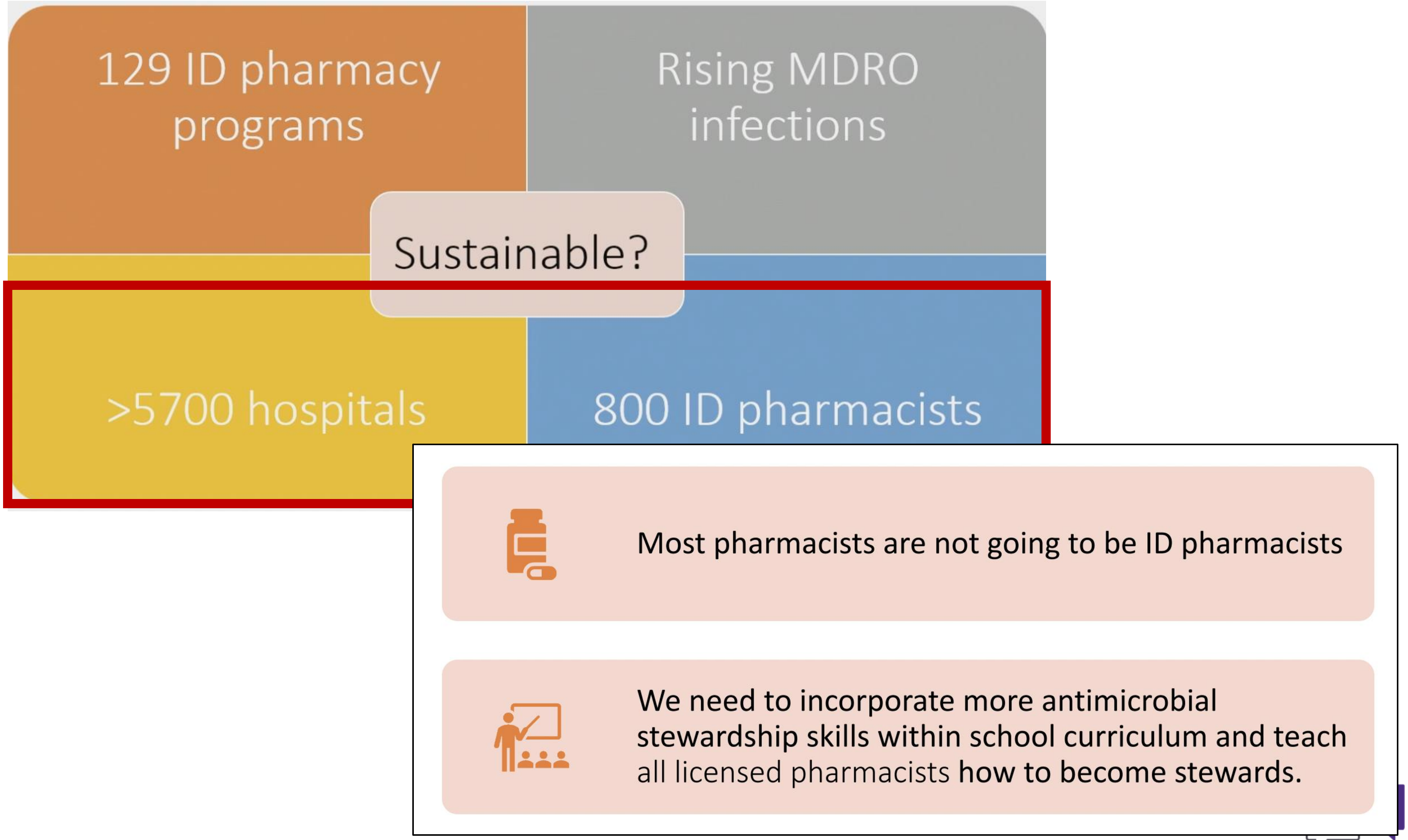
Where are we now?

79.5% Counties (2499) = 0 ID physicians



https://doi.org/10.7326/M20-2684

Where are we now?



129 ID pharmacy programs

Rising MDRO infections

Sustainable?

>5700 hospitals

800 ID pharmacists

Most pharmacists are not going to be ID pharmacists

We need to incorporate more antimicrobial stewardship skills within school curriculum and teach all licensed pharmacists how to become stewards.

IDWeek 2022. Erin Bonura, Wendy Armstrong, and Rupali Jain.

Strategies to increase interest in ID field – start early!

Exposure and visibility

Quality of experience

Mentorship

Understanding of specialty

Advocacy

IDWeek 2022. Erin Bonura, Wendy Armstrong, and Rupali Jain.

ZKE's IDWeek Highlights

- Seeing friends and future friends in real life
- New Science to stretch the brain muscle
- Poster Sessions = research you can touch

When is the best time to get infected?

If Clocks could talk: Circadian regulation of lung injury and inflammation

SHAON SENGUPTA

Assistant Professor

University of Pennsylvania Perelman School of Medicine

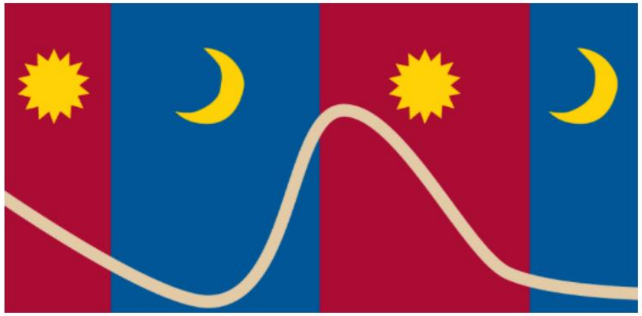
Children's Hospital of Philadelphia

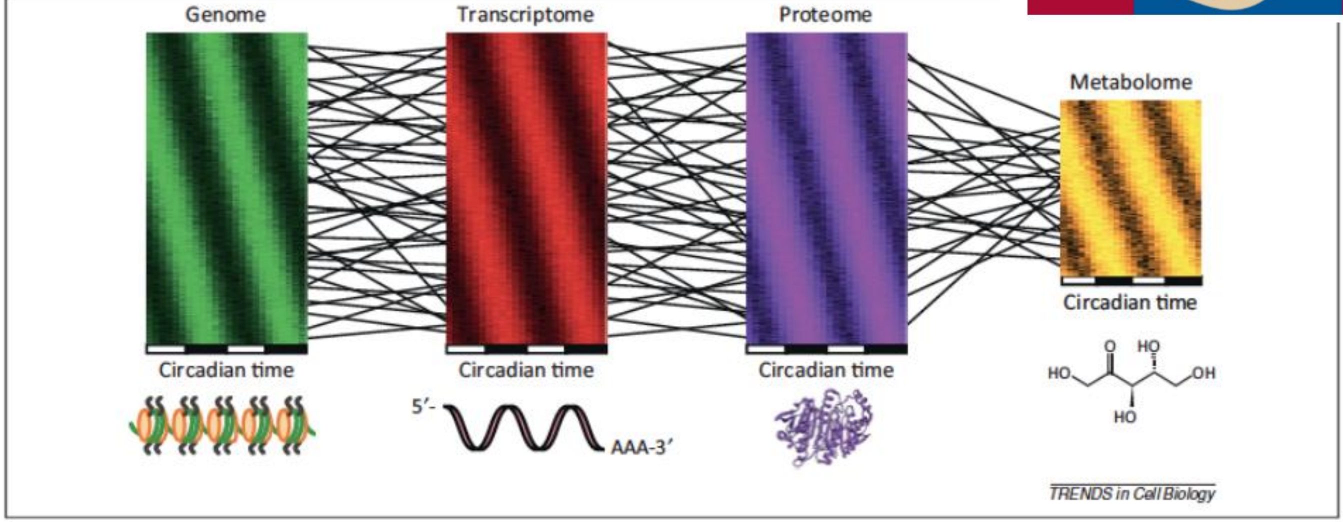
October 20th, 2022

ITMAT

Institute of Translational Medicine and Therapeutics

Circadian: Circa (approximately) + Diem (Day





TRENDS in Cell Biology

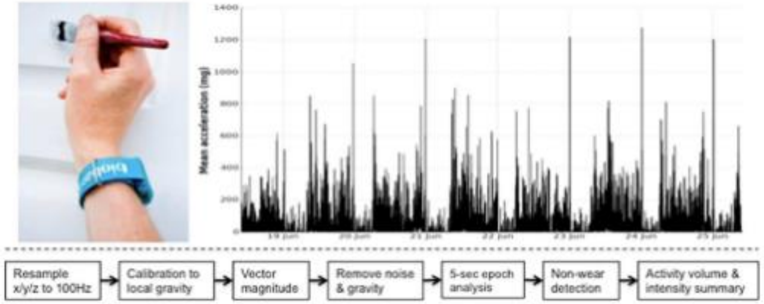
- 25-40% of transcriptome under circadian regulation
- Circadian transcriptomes are tissue specific
- Often involves vital pathways

Rey et al, Trends in Cell biology, 2013

Methods (II)
UK biobank analyses

Large large-scale biomedical database and research resource
500,000 adult participants overall

<u>For our study:</u>
~100,000 adult participants
1-2 weeks data from hand worn devices
(pre-validated for the evaluation of circadian rhythms)



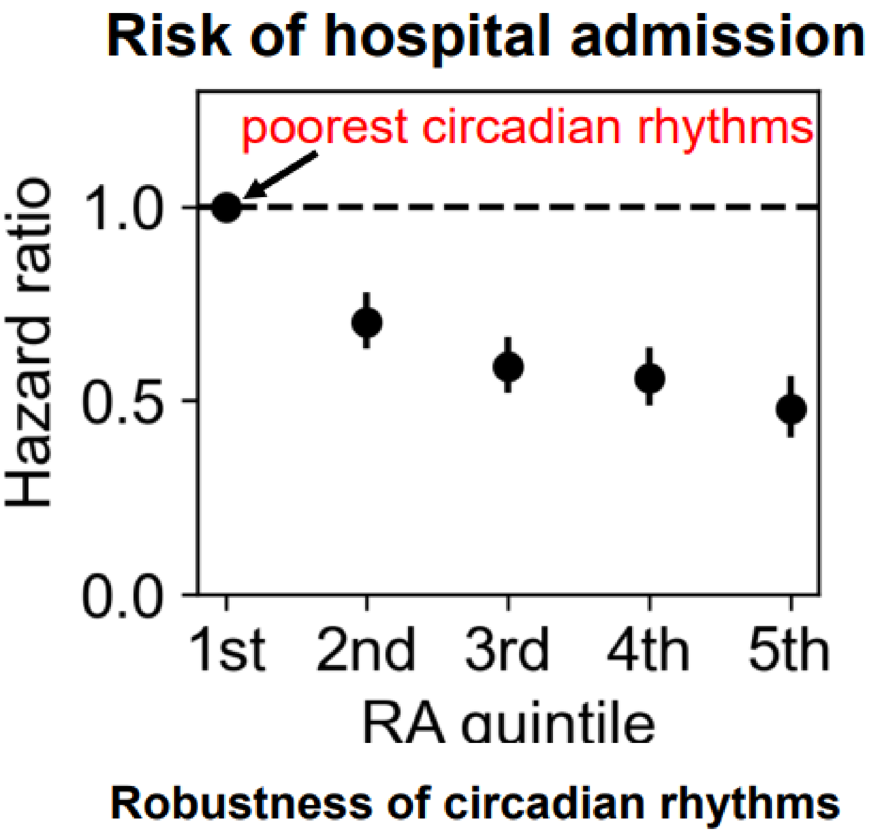
Doherty et al, PLOS one, 2017

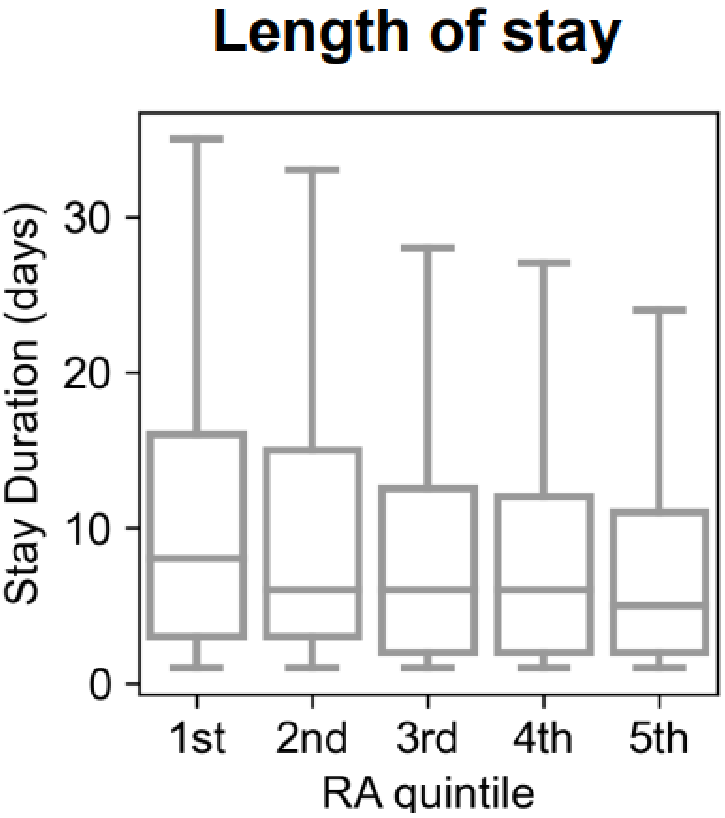
<u>Outcomes:</u>
Disease conditions
(mainly infections)

Relative Amplitude of Circadian rhythms:

$$= \frac{(\text{day} - \text{night})}{(\text{day} + \text{night})}$$

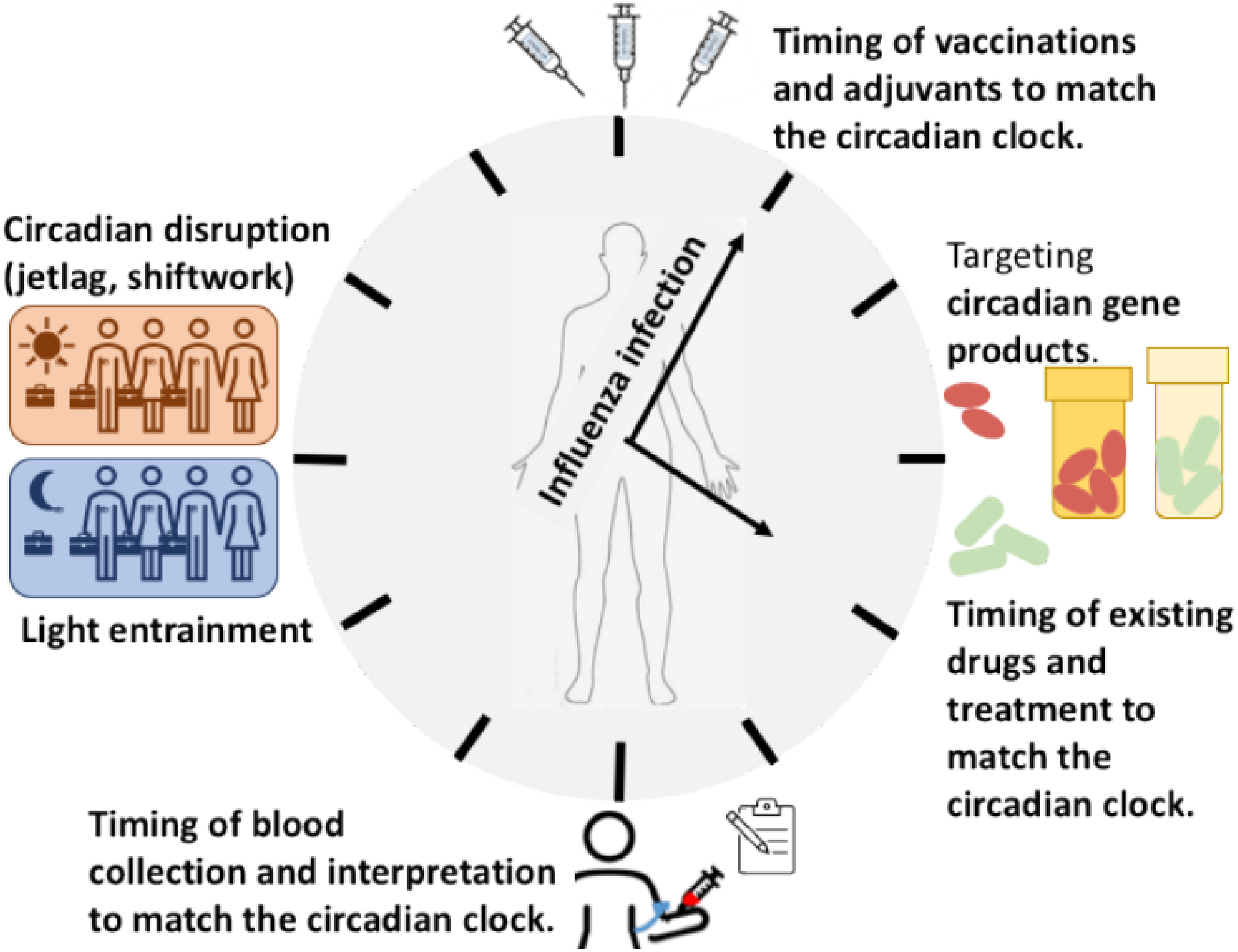
Poor circadian rhythms predict worse outcomes and longer hospital stay





Courtesy Tom Brooks for
Naik et al, Manuscript under review

Broader Speculations



Timing of vaccinations and adjuvants to match the circadian clock.

Circadian disruption (jetlag, shiftwork)

Light entrainment

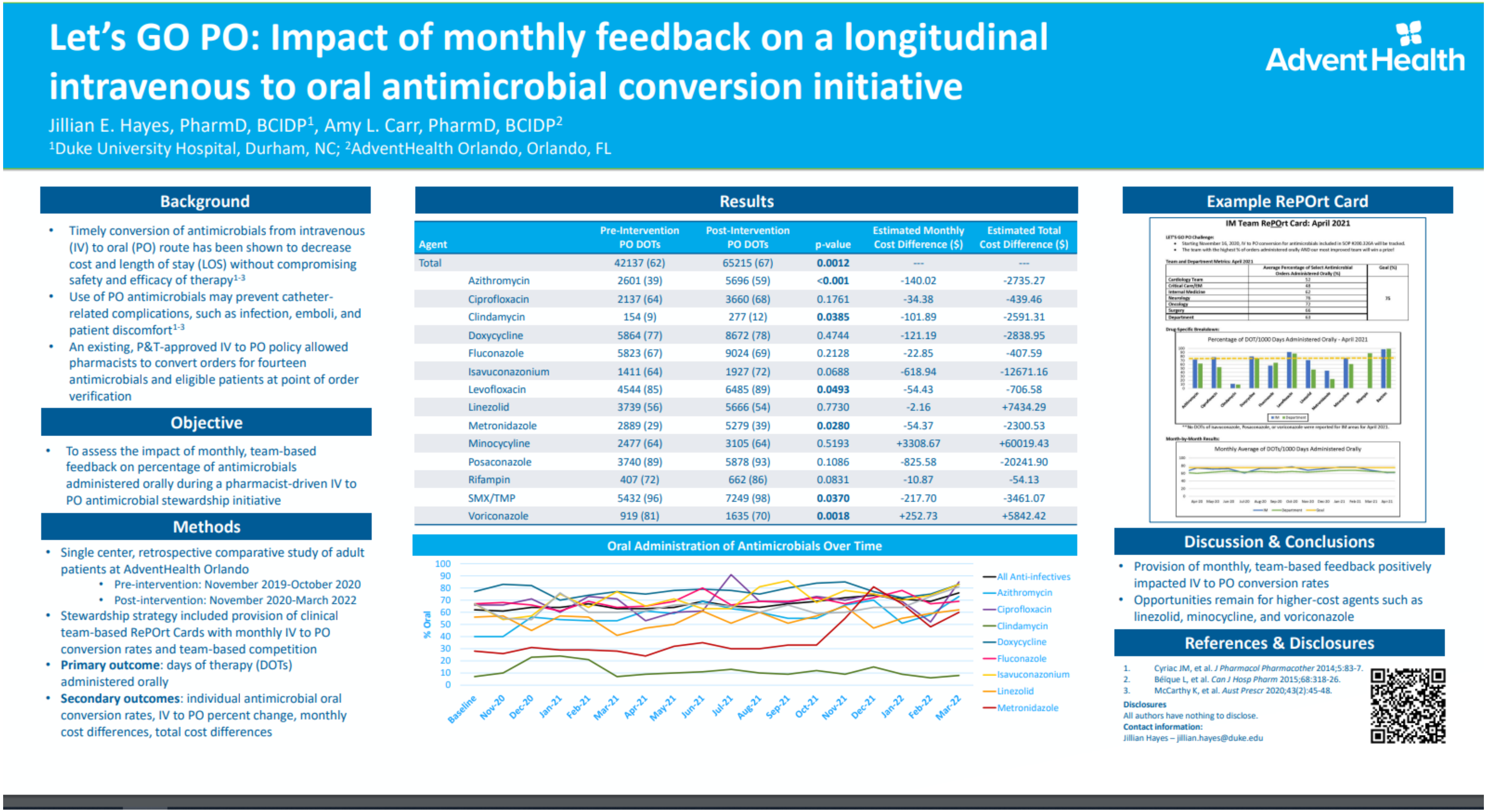
Targeting circadian gene products.

Timing of existing drugs and treatment to match the circadian clock.

Timing of blood collection and interpretation to match the circadian clock.

Sengupta et al, Journal of Biological Rhythms 2021

Poster Session (N = 2246)



Let's GO PO: Impact of monthly feedback on a longitudinal intravenous to oral antimicrobial conversion initiative

Jillian E. Hayes, PharmD, BCIDP[1], Amy L. Carr, PharmD, BCIDP[2]
[1]Duke University Hospital, Durham, NC; [2]AdventHealth Orlando, Orlando, FL

AdventHealth

Background

- Timely conversion of antimicrobials from intravenous (IV) to oral (PO) route has been shown to decrease cost and length of stay (LOS) without compromising safety and efficacy of therapy[1-3]
- Use of PO antimicrobials may prevent catheter-related complications, such as infection, emboli, and patient discomfort[1-3]
- An existing, P&T-approved IV to PO policy allowed pharmacists to convert orders for fourteen antimicrobials and eligible patients at point of order verification

Objective

- To assess the impact of monthly, team-based feedback on percentage of antimicrobials administered orally during a pharmacist-driven IV to PO antimicrobial stewardship initiative

Methods

- Single center, retrospective comparative study of adult patients at AdventHealth Orlando
  - Pre-intervention: November 2019-October 2020
  - Post-intervention: November 2020-March 2022
- Stewardship strategy included provision of clinical team-based RePOrt Cards with monthly IV to PO conversion rates and team-based competition
- **Primary outcome**: days of therapy (DOTs) administered orally
- **Secondary outcomes**: individual antimicrobial oral conversion rates, IV to PO percent change, monthly cost differences, total cost differences

Results

Agent		Pre-Intervention PO DOTs	Post-Intervention PO DOTs	p-value	Estimated Monthly Cost Difference ($)	Estimated Total Cost Difference ($)
Total		42137 (62)	65215 (67)	**0.0012**	---	---
	Azithromycin	2601 (39)	5696 (59)	**<0.001**	-140.02	-2735.27
	Ciprofloxacin	2137 (64)	3660 (68)	0.1761	-34.38	-439.46
	Clindamycin	154 (9)	277 (12)	**0.0385**	-101.89	-2591.31
	Doxycycline	5864 (77)	8672 (78)	0.4744	-121.19	-2838.95
	Fluconazole	5823 (67)	9024 (69)	0.2128	-22.85	-407.59
	Isavuconazonium	1411 (64)	1927 (72)	0.0688	-618.94	-12671.16
	Levofloxacin	4544 (85)	6485 (89)	**0.0493**	-54.43	-706.58
	Linezolid	3739 (56)	5666 (54)	0.7730	-2.16	+7434.29
	Metronidazole	2889 (29)	5279 (39)	**0.0280**	-54.37	-2300.53
	Minocycyline	2477 (64)	3105 (64)	0.5193	+3308.67	+60019.43
	Posaconazole	3740 (89)	5878 (93)	0.1086	-825.58	-20241.90
	Rifampin	407 (72)	662 (86)	0.0831	-10.87	-54.13
	SMX/TMP	5432 (96)	7249 (98)	**0.0370**	-217.70	-3461.07
	Voriconazole	919 (81)	1635 (70)	**0.0018**	+252.73	+5842.42

Oral Administration of Antimicrobials Over Time

Example RePOrt Card

IM Team RePOrt Card: April 2021

LET'S GO PO Challenge:

- Starting November 16, 2020, IV to PO conversion for antimicrobials included in SOP #200.326A will be tracked.
- The team with the highest % of orders administered orally AND our most improved team will win a prize!

Team and Department Metrics: April 2021

	Average Percentage of Select Antimicrobial Orders Administered Orally (%)	Goal (%)
Cardiology Team	52	75
Critical Care/IM	48	
Internal Medicine	62	
Neurology	78	
Oncology	72	
Surgery	66	
Department	63	

Drug-Specific Breakdown:

**No DOTs of isavuconazole, Posaconazole, or voriconazole were reported for IM areas for April 2021.

Month-by-Month Results:

Discussion & Conclusions

- Provision of monthly, team-based feedback positively impacted IV to PO conversion rates
- Opportunities remain for higher-cost agents such as linezolid, minocycline, and voriconazole

References & Disclosures

1. Cyriac JM, et al. *J Pharmacol Pharmacother* 2014;5:83-7.
2. Béïque L, et al. *Can J Hosp Pharm* 2015;68:318-26.
3. McCarthy K, et al. *Aust Prescr* 2020;43(2):45-48.

Disclosures
All authors have nothing to disclose.

Contact information:
Jillian Hayes – jillian.hayes@duke.edu

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Pre-intervention

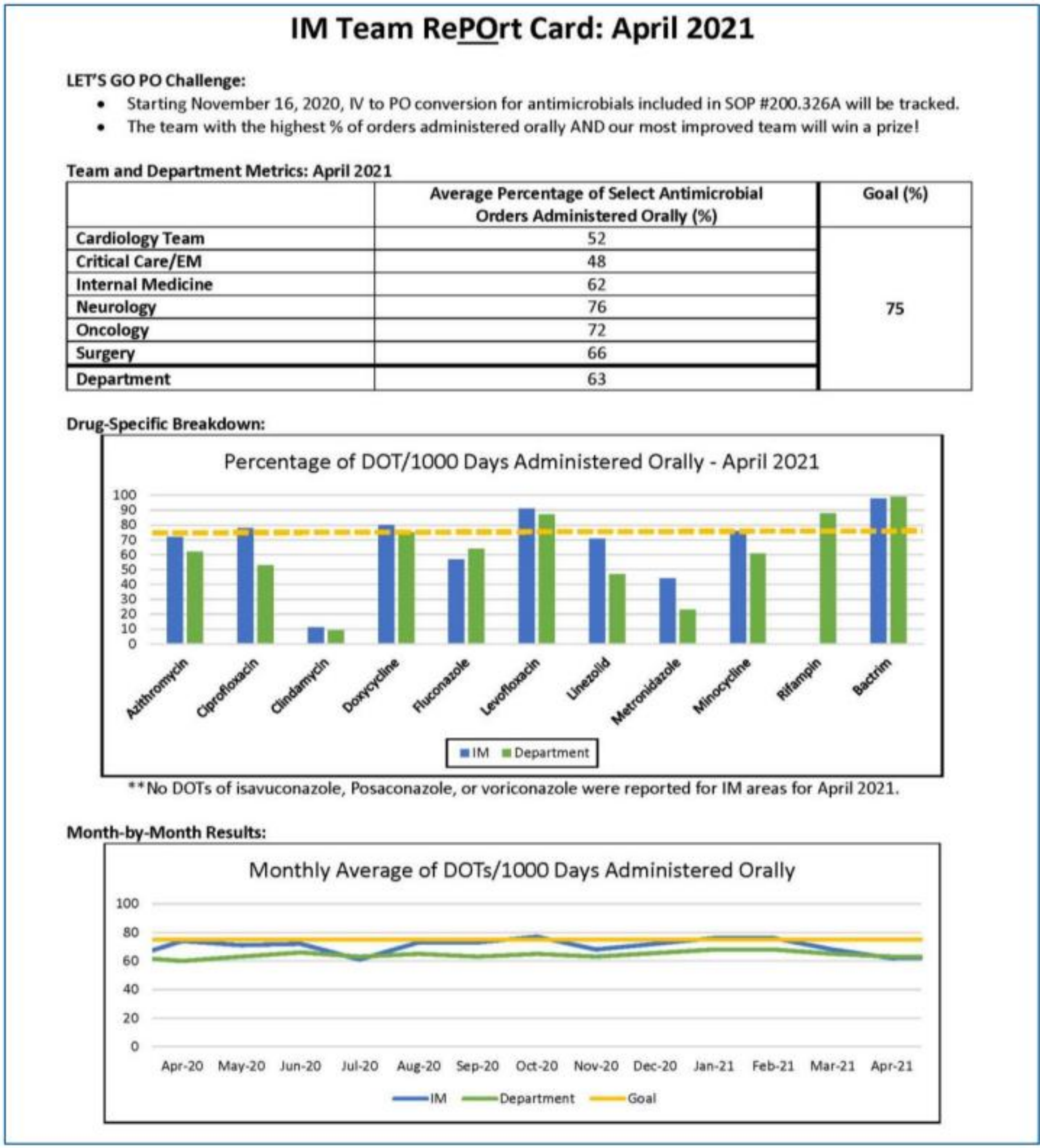
Measure PO antibiotic days of therapy
Nov '19 – Oct '20

Intervention

RePOrt Cards for pharmacists to convert orders from IV to PO at order verification

Post-intervention

Measure PO antibiotic days of therapy
Nov '20 – Mar '22



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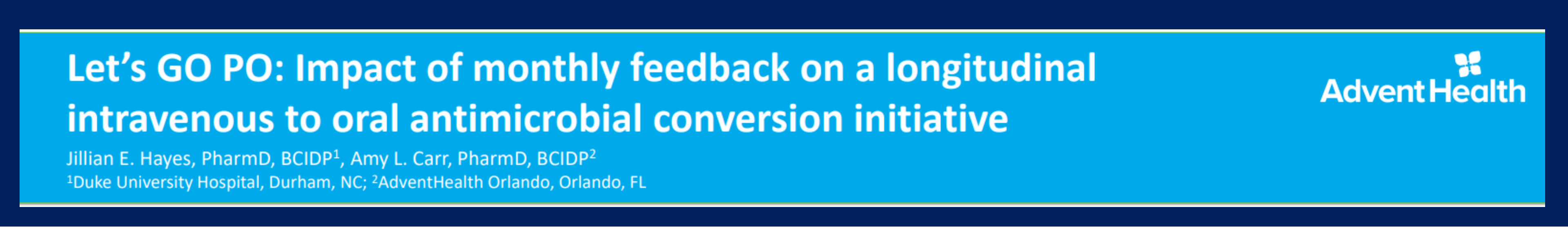
Drug-Specific Breakdown:

Percentage of DOT/1000 Days Administered Orally - April 2021

**No DOTs of isavuconazole, Posaconazole, or voriconazole were reported for IM areas for April 2021.

Month-by-Month Results:

Monthly Average of DOTs/1000 Days Administered Orally



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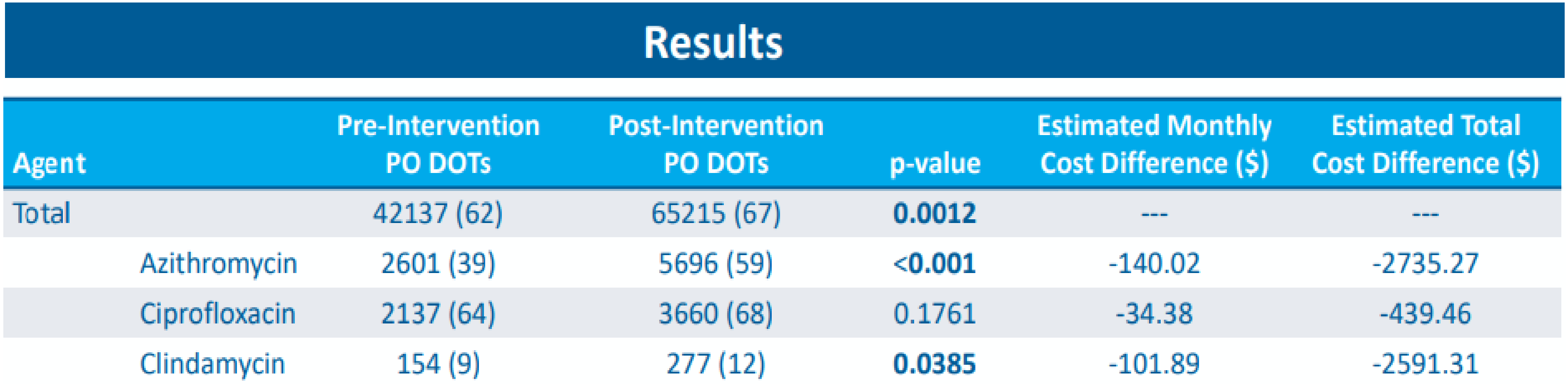

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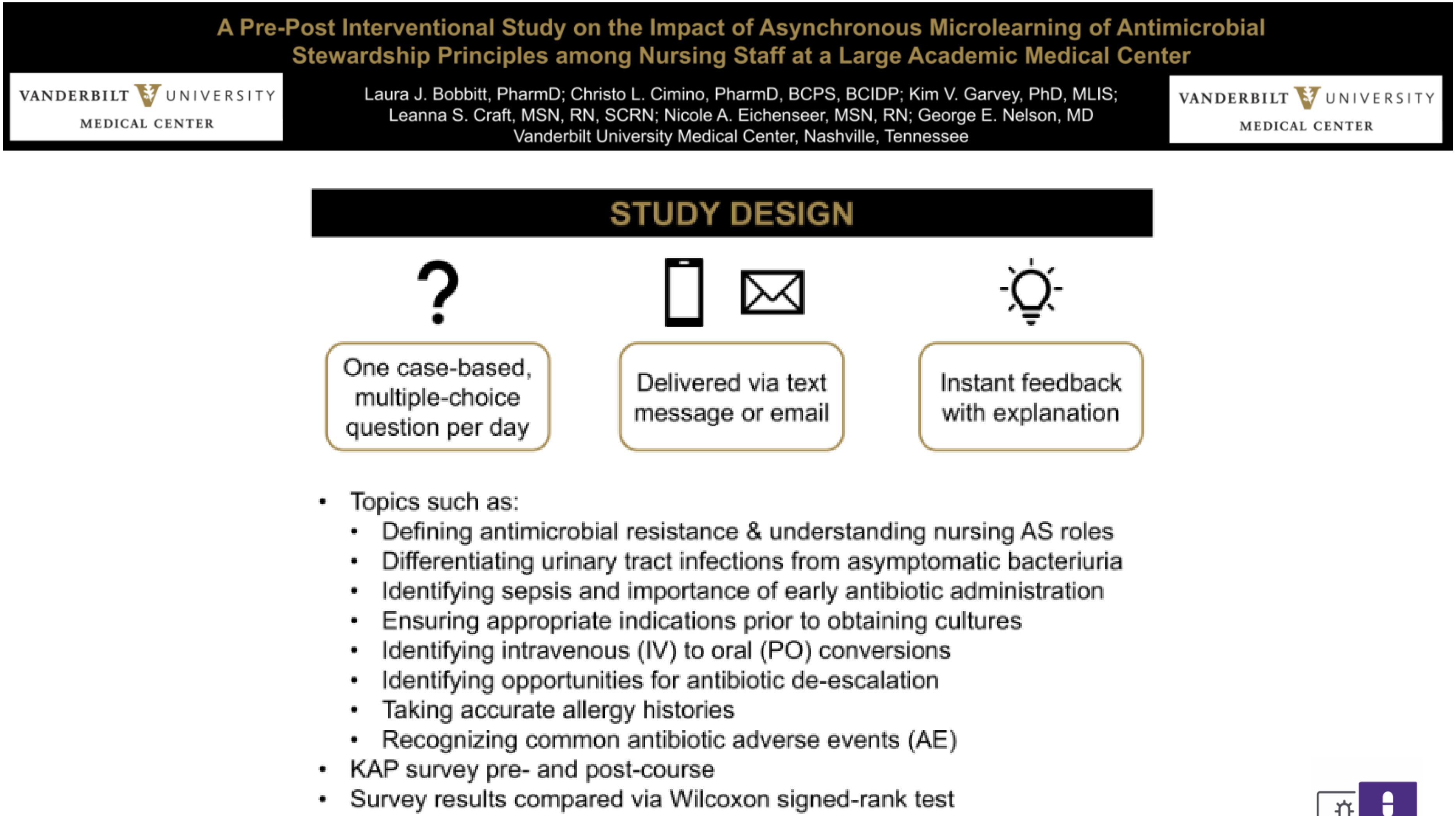
So <u>THIS</u> is how we could use NHSN AUR data!

Nursing Stewardship Education



A Pre-Post Interventional Study on the Impact of Asynchronous Microlearning of Antimicrobial Stewardship Principles among Nursing Staff at a Large Academic Medical Center

Laura J. Bobbitt, PharmD; Christo L. Cimino, PharmD, BCPS, BCIDP; Kim V. Garvey, PhD, MLIS;
Leanna S. Craft, MSN, RN, SCRN; Nicole A. Eichenseer, MSN, RN; George E. Nelson, MD
Vanderbilt University Medical Center, Nashville, Tennessee

VANDERBILT UNIVERSITY MEDICAL CENTER

STUDY DESIGN

One case-based, multiple-choice question per day

Delivered via text message or email

Instant feedback with explanation

- Topics such as:
  - Defining antimicrobial resistance & understanding nursing AS roles
  - Differentiating urinary tract infections from asymptomatic bacteriuria
  - Identifying sepsis and importance of early antibiotic administration
  - Ensuring appropriate indications prior to obtaining cultures
  - Identifying intravenous (IV) to oral (PO) conversions
  - Identifying opportunities for antibiotic de-escalation
  - Taking accurate allergy histories
  - Recognizing common antibiotic adverse events (AE)
- KAP survey pre- and post-course
- Survey results compared via Wilcoxon signed-rank test

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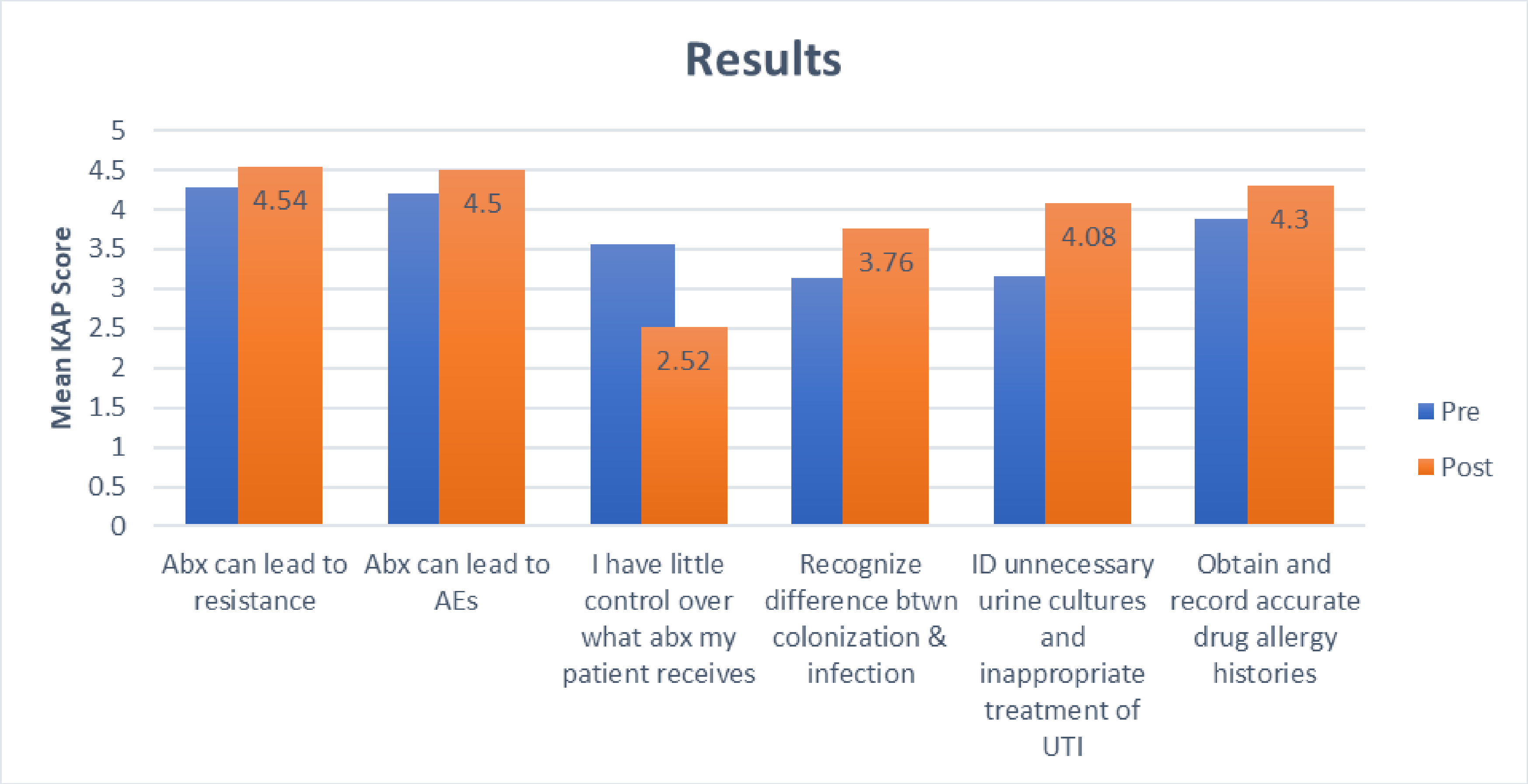
Results



No statistically significant change in "I am familiar with the term antibiotic resistance" and "I can usually tell if my patient's change in clinical status is due to a possible infection."

A Pre-Post Interventional Study on the Impact of Asynchronous Microlearning of Antimicrobial Stewardship Principles among Nursing Staff at a Large Academic Medical Center

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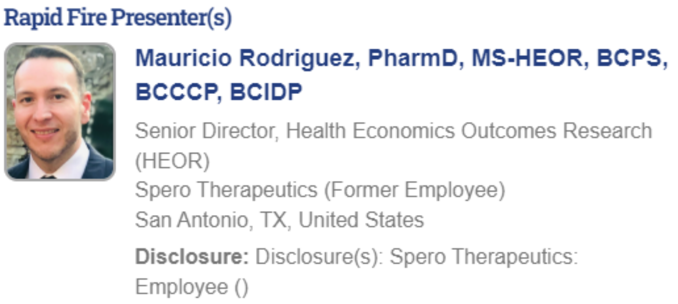
VANDERBILT UNIVERSITY MEDICAL CENTER

CONCLUSIONS

- Education on the role of nurses in AS provided in an asynchronous, brief educational format via a mobile platform resulted in statistically significant improvement in 90% (18/20) of topics
- After course completion, participants felt more confident in their ability to participate in key AS activities
- Nurses are integral members of a multidisciplinary AS team and should be empowered to help reduce unnecessary antibiotic use in their patients
- This study forms the basis for expanded AS educational efforts for all healthcare professionals

1488 – The Economic Burden of AEs on OPAT

- Multicenter retrospective claims analysis from UT, 2020
- 248,843 patients met criteria for an OPAT AE



Rapid Fire Presenter(s)

Mauricio Rodriguez, PharmD, MS-HEOR, BCPS, BCCCP, BCIDP

Senior Director, Health Economics Outcomes Research (HEOR)
Spero Therapeutics (Former Employee)
San Antonio, TX, United States

Disclosure: Disclosure(s): Spero Therapeutics: Employee ()

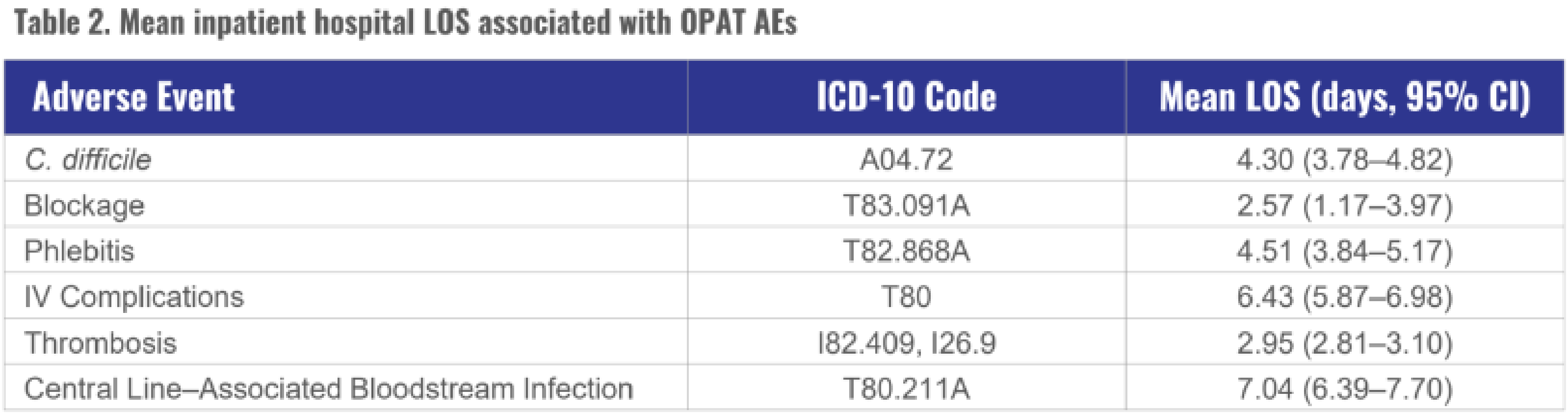


Table 2. Mean inpatient hospital LOS associated with OPAT AEs

Adverse Event	ICD-10 Code	Mean LOS (days, 95% CI)
C. difficile	A04.72	4.30 (3.78–4.82)
Blockage	T83.091A	2.57 (1.17–3.97)
Phlebitis	T82.868A	4.51 (3.84–5.17)
IV Complications	T80	6.43 (5.87–6.98)
Thrombosis	I82.409, I26.9	2.95 (2.81–3.10)
Central Line–Associated Bloodstream Infection	T80.211A	7.04 (6.39–7.70)

1488 – The Economic Burden of AEs on OPAT

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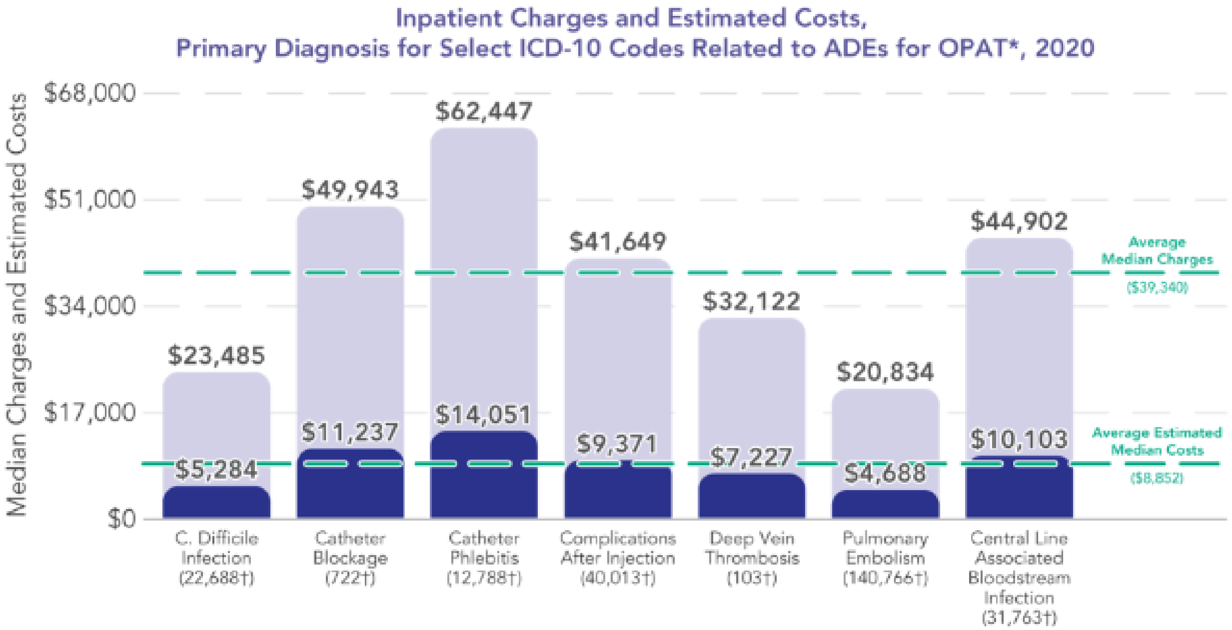
e(s): Spero Therapeutics:

Figure 1.



* OPAT is outpatient parenteral antimicrobial therapy.
† Numbers in parentheses represent projected U.S. counts based on actual values in Utah.

- Multicenter retrospective claims analysis from UT, 2020
- 248,843 patients met criteria for an OPAT AE

QUESTIONS?

UWTASP tele-antimicrobial stewardship program | echo

Next Dayth, 2022

Agenda

- Will
- Rupali
- John

Project ECHO

Implt. Compendium I, WED, Schafzin

- Guidance is to help move info from science to practice
- Successful implementation matched to orgs context (resources)
- Every chapter has an implementation section
- Dedicated chapter on implementation
- Education is not sufficient
- Regulatory expectation is to implement EB interventions

Implt. Compendium 2, WED, Schafzin

- 4Es approach (engage, educate, execute, evaluate)
  - Think big and small, engage and envision, additional steps
- SSI prevention: since takes time, process measures play larger role
  - QI tools
  - HFE(automated reminders for example)
  - Multidisciplinary
- Eating an elephant, tackle one thing at a time, test and learn and change and repeat, 30K level

Implt. Compendium 3, WED, Schafzin

- Leadership engagement
- Frontline engagement
- Technical work vs adaptive work
    - Tech: the evidence, clear needs to be done
    - Adaptive: how work gets done in context, req learning, conscious and unconscious barriers, attitudes, beliefs, values, feedback, culture
- Process observation, gemba walk
- Purposeful design

TMP for SSTI, Fri, Dornberg

- Historically it was believed that GAS was intrinsically resistant to TMP-SMX
- No CLSI bp for TMP-SMX GAS
- Can use EUCAST data, ~1.5% resistance, higher in India (12-78%)
- In studies of clinical use, lots of confounders
- Thymidine issue (didn't understand this part, need to review)
- Clinda vs TMP/SMX NEJM RCT

SHEA Compendium, Wed

- CA-MRSA (USA300) has invaded the hospital
- Epi and Recent Trends MRSA MMWR, more MRSA infections
- 2014 unresolved issues that remain unresolved:
  - Decolonization outside the ICU
  - Mupirocin/chlorhexadine resistant
  - MRSA+ HCW
  - Universal MRSA decolonization

JBL, late to talk

VAP Prevention I, Wed, Klompas

- Many strategies to prevent? List is long
- Build a framework? The VAP prevention paradox: VAP rates go down, but LOS, vent days, death don't change. Problem: VAP subjective
- Focus rec: impact objective outcomes like duration, VAE, mortality, etc
- See essential practices, includes oral care with tooth brushing, **w/o chlorhexidine**
- Selective oral/digestive decon: good studies w/ improved mortality, no assoc w/ drug resistance, may not generalize to high DR settings

VAP Prevention 2, Wed, Klompas

- Subglottic secretion drainage, rec not sustained

JBL

Polio update -RJ