



The Antibiotic Timeout: Can Providers Be Self-Stewards?

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Outline of Presentation

- Strategization of antimicrobial stewardship: why a focus on de-escalation is important
- Components of the Antibiotic Timeout as implemented at the VA Greater Los Angeles Healthcare System
 - Educational efforts
 - Clinical dashboard rounding reports
 - Timeout documentation and automatic approval for continuation via renewal template
- Qualitative and quantitative analyses of our timeout program

Types of stewardship interventions

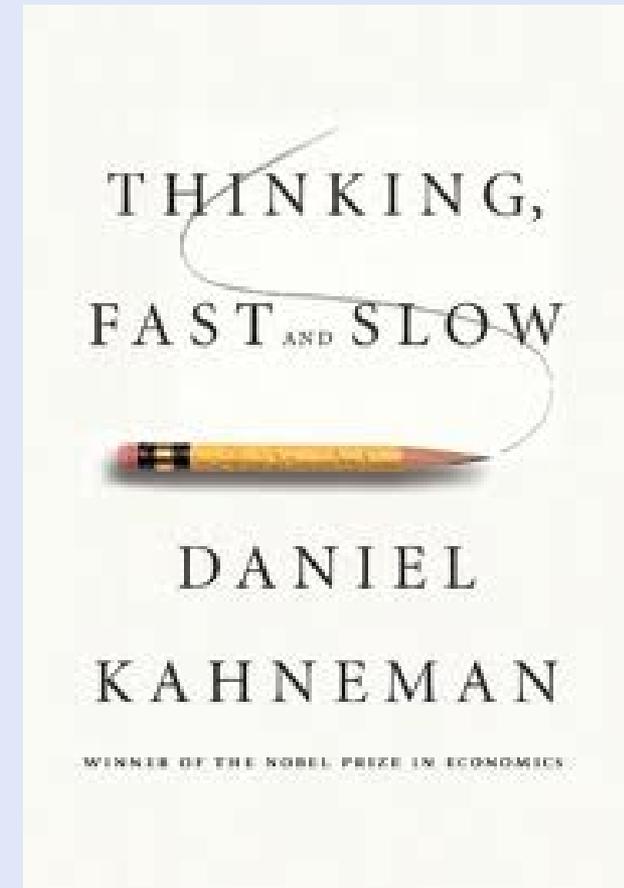
		Resistance effect	Cost effectiveness
Choice	<p>Day 1 Trade one broad-spectrum regimen for another</p>	Little effect	Little effect
Change	<p>Days 2-3 Narrow the spectrum based on culture and susceptibility results</p>	Large effect	Large effect
	<p>Days 4-5 Patients doing well; change to po and/or discharge</p>	Large effect	Large effect
Completion	<p>Days 7-14 Patient cured; discontinue therapy</p>	Large effect	Large effect

Proposed Solutions

- Force prioritization of decision-making with regard to the most commonly prescribed broad-spectrum antibiotics at GLA (vancomycin, piperacillin-tazobactam)
 - Impose mandatory renewal of therapy, but allow for automatic approval within appropriate parameters
 - Require explicit rationale for continuing antibiotic therapy and the use of the selected agent
- Provide cognitive support
 - Patient-specific clinical and microbiological information
 - Links to facility-specific antimicrobial guidelines and other educational materials
- Education and championship by clinical leadership

Antimicrobial Stewardship and Cognitive Support: Dual Process Theory

- Two modes of cognition:
 - System 1: Intuitive, associative, reflexive, fast, requires little effort
 - System 2: Analytical, deductive, deliberate, requires much more effort
- Goal is for stewards to make information normally searched for in system 2 thinking much more readily available
- “Make it easier for the provider to make the correct decision”



Antibiotic Timeout Project

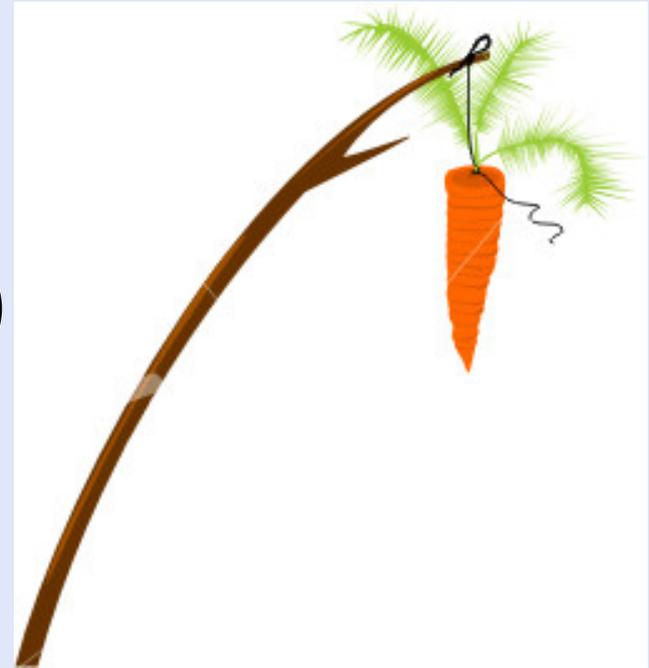
CDC-funded 14-month project at GLA

(with program support from Salt Lake City informatics group)

- Over-arching goal was to develop tools to guide decisions to continue, modify, or discontinue broad-spectrum antimicrobial Rx after 3-4 days
- Phased introduction of timeout program (starting with vancomycin on general medicine wards, then ICU, then pip-tazo on both general medicine wards and ICU)
- Educational program to emphasize proper indications for renewal of therapy
- Electronic and printed data summary reports to be distributed to inpatient teams

The Carrot...

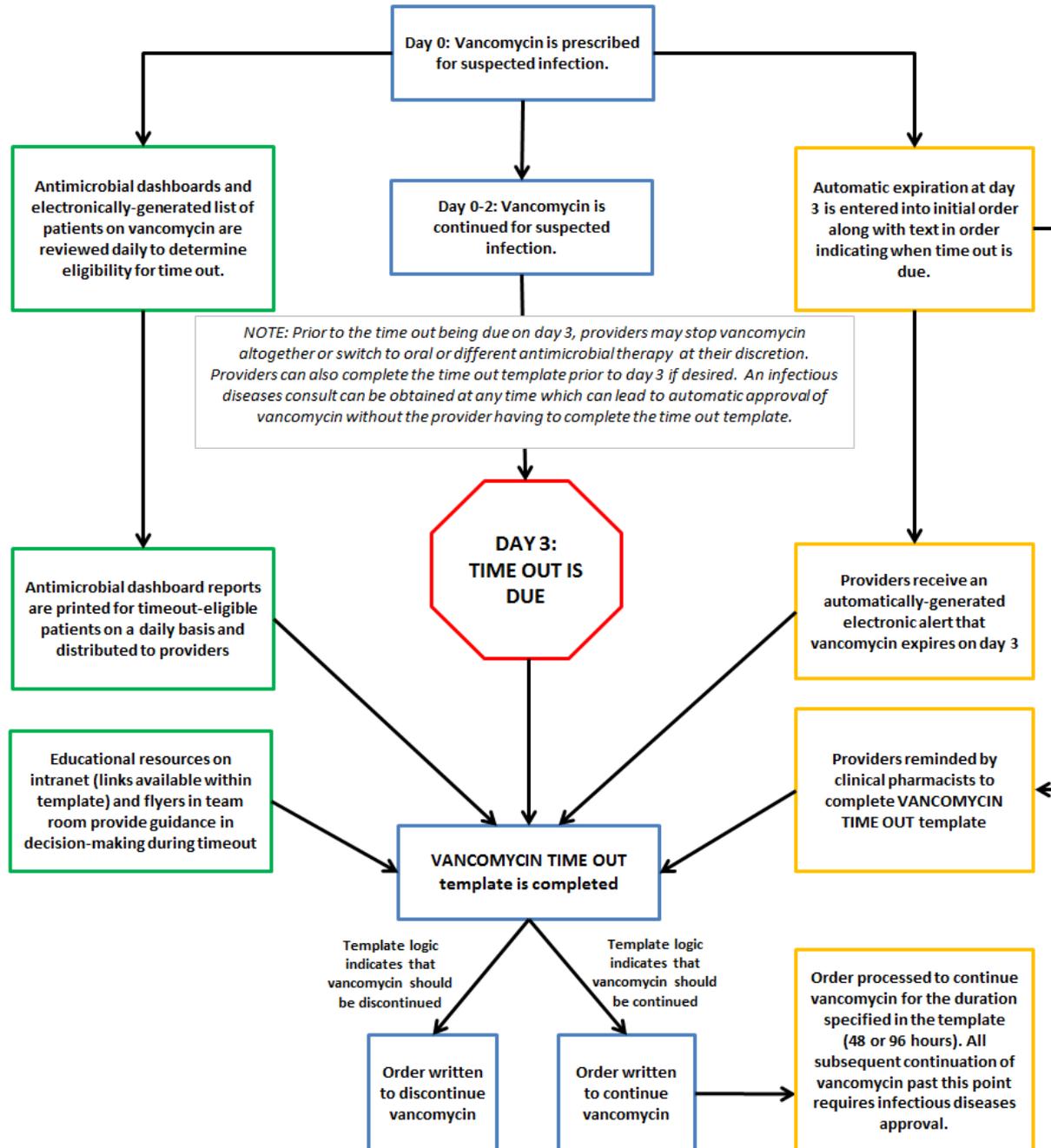
- Vancomycin and pip-tazo are typically subject to ID approval after 72 hours (housestaff have to call antibiotic approval pager that is usually held by our ID pharmacist)
- With the timeout, antibiotic therapy will be automatically approved upon completion of templated note documenting timeout is completed (no need to call ID for approval)



Stewardship Team Actions

Provider Actions

Clinical Pharmacist Actions



Educational Materials

- General principles for adjusting antimicrobial therapy during an antibiotic timeout
- Instructions on how to access clinical dashboard data and how to complete antibiotic renewal templates
- Educational documents on de-escalation

<http://www.infectiousdiseases-ucla-affiliated.org/Intranet/>

Educational Flyers

Know when to say...

No to Vanco!



Consider stopping vancomycin in the following clinical situations:

- Patient is identified as low-risk for MRSA infection:
 - Skin and soft tissue or joint infection not present
 - No recent surgery or hemodialysis
 - No recent homelessness, incarceration or nursing home residence
- Patient has no surveillance or clinical culture positive for MRSA within the past 12 months, AND
- Clinical cultures obtained during the admission are negative for MRSA 48-72 hours after collection OR a cause of infection other than MRSA has been identified

Can you go PO?

Criteria for IV-to-PO conversion of antibiotics:

1. Patient has received IV antibiotic(s) for at least 24 hours;
2. Patient's GI tract is functioning (i.e. tolerating medications via oral or enteral route for 24 hours and tolerating food or enteral feeds for 24 hours);
3. Severe infection is not present*; and
4. Patient is hemodynamically stable, and shows clinical improvement for 24 hours

IV to Oral options, according to underlying infection:

Condition	Initial IV therapy	Potential oral options
Acute exacerbation of chronic bronchitis	Amp/sulbactam, ceftriaxone	Amox-clav, amoxicillin, azithromycin or TMP/SMX
Community-acquired pneumonia	Ceftriaxone & azithromycin	Azithromycin or doxycycline
Hospital-acquired pneumonia Ward patient ICU patient (not intubated) VAP	Ertapenem Piperacillin/tazobactam Vancomycin & imipenem	Moxifloxacin Moxifloxacin Moxifloxacin
Complicated skin infection No purulence or abscess Purulence or abscess Diabetic foot infection:	Cefazolin Vancomycin Ertapenem & vancomycin	Cephalexin or clindamycin Doxycycline or TMP/SMX Cephalexin & metronidazole
Urinary tract infection: Community-acquired Hospital-acquired	Ceftriaxone Cefepime	TMP/SMX TMP/SMX

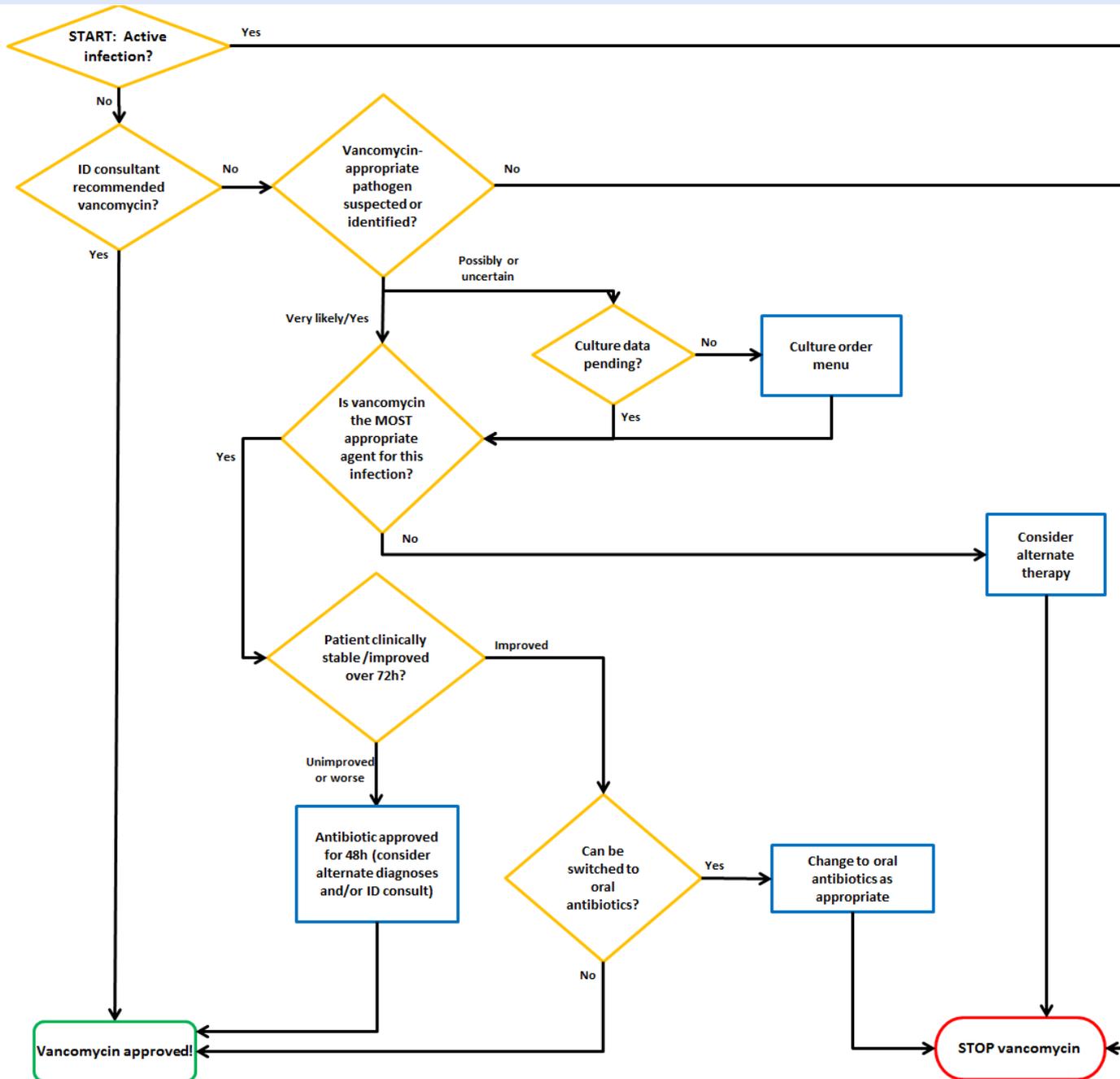
*: Examples of severe infections may include but are not limited to: neutropenic fever (absolute neutrophil count < 500 cells/mm³ or decreasing after receiving chemotherapy), central nervous system (CNS) infections (e.g., meningitis), endocarditis, fungemia or *Staphylococcus aureus* bacteremia, and/or undrained abscesses or empyema

Antimicrobial Dashboard Reports

- Distributed by a research assistant or pharmacy resident or student to the teams that have patients for whom a timeout is indicated
- Housestaff can also request their own access to the dashboards

PATIENT NAME – Last4 Ward/Room-Bed: Ward 1 / Bed 1					
Antibiotics					
Antibiotic		Start/Stop Date		Day #	
DAPTOMYCIN		7/7 to Present		2	
VANCOMYCIN		7/3 to 7/5		3 - Inactive	
Recent Vitals/Labs					
Vitals			Labs		
Temp:	97.7	7/07 5:47 PM	WBC:	7.2	7/07 5:00 AM
Pulse:	58	7/07 5:47 PM	SCr:	5.42	7/07 5:00 AM
RR:	20	7/07 5:47 PM	CrCl:	16	7/07 5:00 AM
BP:	106/57	7/07 5:47 PM	Vancomycin:	12.6	7/05 5:00 AM
7 Day Lab/Vital Trends by Date					
<p>BP</p>		<p>Temp</p>		<p>WBC</p>	
				<p>S.Cr.</p>	
Microbiology					
Date: 7/3/2013 10:33:00 AM Collection Site: BLOOD			Organism ID Pending		
Date: 7/3/2013 11:04:00 AM Collection Site: BLOOD			STAPHYLOCOCCUS AUREUS METHICILLIN RESISTANT (MRSA): A/C:R, A/S:R, CFZ:R, CIP:R, CLI:R, DAP:S, EM:R, GEN:S, LVX:R, LZD:S, MXF:R, OXA:R, PEN:R, Q/D:S, RIF:S, T/S:S, TET:S, VAN:S		

Timeout Template Logic (with built-in links to educational resources)



Cognitive Task Analyses

- Two cognitive psychologists from U of Utah conducted focus groups with housestaff regarding decision-making in the context of the timeout process
- Sample questions included:
 - “Tell us about a case during the past week in which you prescribed vanco?”
 - “Explain the workflow now that the antibiotic timeout has been implemented.”

Themes Emerging from Focus Groups: Broad Categories

- Reasoning
 - How the timeout affected clinical reasoning with regard to antibiotic use
- Affective
 - How the timeout influenced feelings of autonomy and attitudes toward antimicrobial prescription
- Workflow
 - How the timeout directly influenced workflow

Particularly Relevant Quotes...

- *“it just makes you think more about like the real indication for the big gun”*
- *“part of the template is, how has this been discussed with the attending, with the team and all that so I think it forces the team who know the patient the best to sort of take a step back, think about it and decide”*
- *“It was like back in the day I would just not care as much because I would just ask ID but then I started to think about my patients and that they really needed it and a lot of times they didn’t”*
- *“When you have constant...when you have so many patients to manage, so many notes to write, nurses are coming forward every couple of minutes, and you’re jumping around from patient to patient, the huge sense is, every time a note pops up or some warning pops up with a big long paragraph to read, the eyes just start to glaze over and people just skip, skip, skip.”*

Review for Timeout Appropriateness

- Comparison of continuation rates for 1st 1 y of project vs. 6mo period 1 y prior
- Focus on timeouts in which a dashboard report was distributed
- For patients in which the template was completed AND medication was still active 24 hours later, chart review performed to determine appropriateness of auto-renewal

Timeout Outcomes

	Vancomycin (n=276)	Piperacillin- tazobactam (n=225)
Allowed to expire	128 (46%)	103 (45.7%)
Time-out template completed	127 (46%)	115 (51.1%)
Discontinued within 24 hour of time-out	34 (12%)	32 (14.2%)
Switched to oral agent	13 (4.7%)	2 (0.8%)
Antibiotic still active 24h following time-out	80 (28.9%)	81 (36%)
ID service consulted and agreed with continued use	12 (4.3%)	3 (1.3%)
Appropriate continuation per retrospective review	55 (19.9%)	56 (24.9%)
Inappropriate continuation per retrospective review	13 (4.7%)	22 (9.8%)
Antibiotic active 24h later without time-out	21 (7.6%)	7 (1.9%)
ID input requested in lieu of completing template	12 (4.3%)	6 (2.6%)
Discontinued then restarted	3 (1.1%)	1 (0.4%)
Pharmacy renewed in error	5 (1.8%)	1 (0.4%)

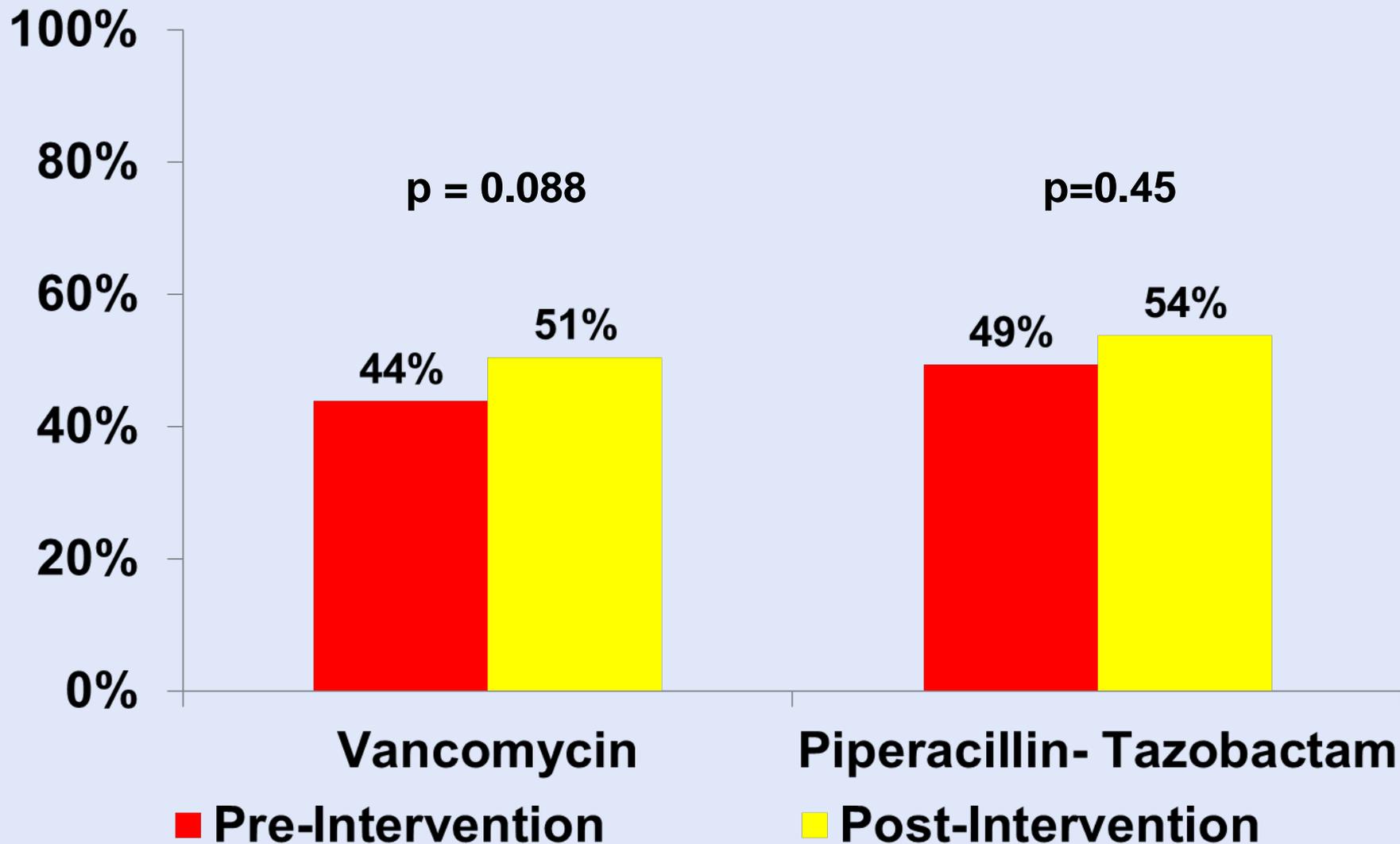
Comparison to Pre-Timeout

	Pre-Timeout	Timeout	p-value
<u>Vancomycin</u>			
Antibiotic courses eligible for renewal	199	276	
Inappropriate continuations	0 (0%)	13 (4.7%)	0.0010
Courses discontinued (through day 5)	96 (48%)	175 (63%)	0.0010
<u>Piperacillin-tazobactam</u>			
Antibiotic courses eligible for renewal	93	225	
Inappropriate continuations	2 (2%)	22 (9.8%)	0.019
Courses discontinued (through day 5)	58 (62%)	137 (61%)	0.90

Quantitative Results

- Examined trends in antimicrobial usage starting 15mos pre-timeout and extended through 6mos post-timeout implementation
- Pre-/post-intervention analyses based on implementation of program on different wards at different time points
- Various endpoints examined; will discuss:
 - Vanco/pip-tazo stops within 2 calendar days after timeout
 - Antibiotic use density trends
 - Other potential consequences (C. diff, readmission rates, 28d mortality, ICU days)

Antibiotic Stop within Two Days of Timeout Eligibility



Total Antibiotic Use Before & After Intervention

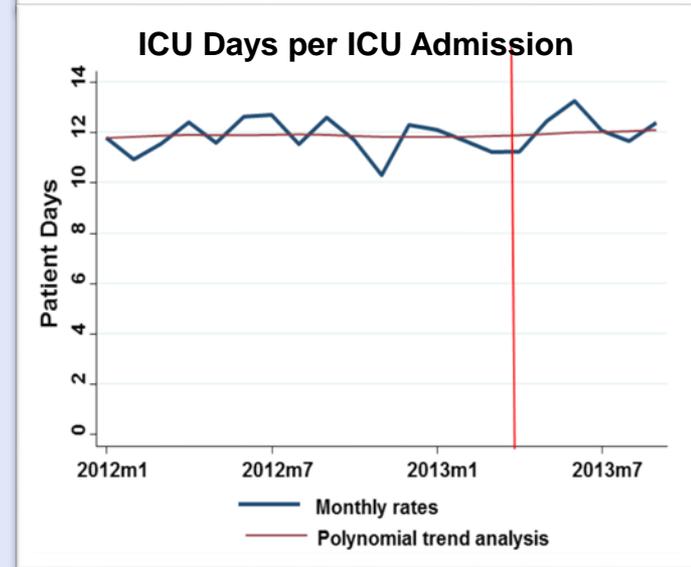
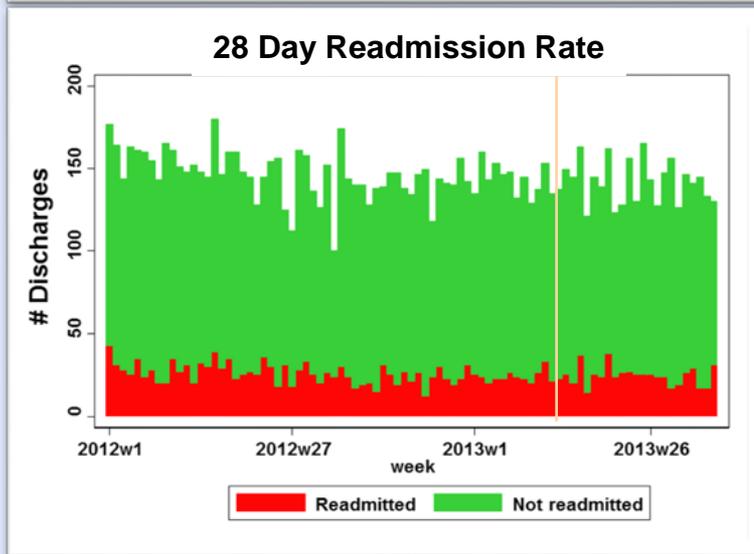
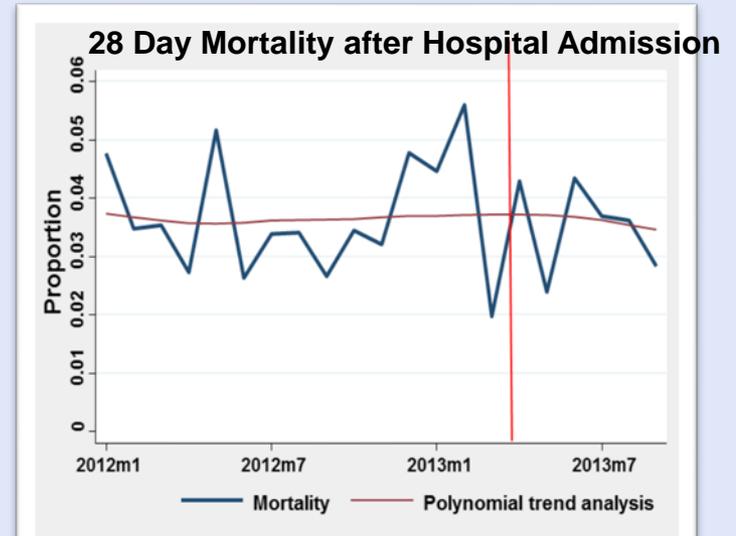
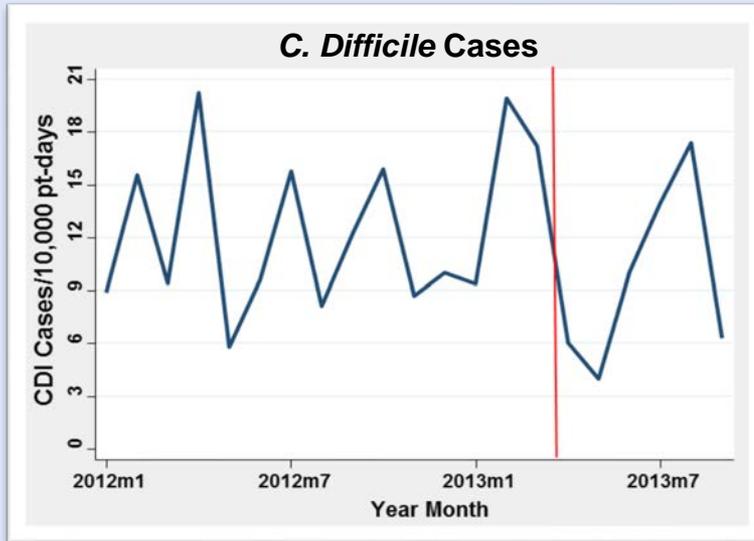
All use* Per 1,000 pt-days	Implementation Period		% change# (95%CI), p
	Pre-	Post-	
Vancomycin	102.7	76.4	-13% (-22%, -4%), 0.01
Piperacillin/tazo	52.6	49.3	0.2% (-13%, 16%), 0.98

- Days of therapy with vancomycin or piperacillin per 1,000 days among ALL hospitalized patients on the primary intervention areas

Adjusted for time since the intervention

The use of non-vancomycin, anti-MRSA antibiotics showed a non-significant decrease during the study period

Other Consequences



Conclusions of VA GLA Timeout Project (so far)

- Overall net modest impact of timeout on vancomycin utilization, perhaps more on overall usage than post-timeout usage
- No appreciable impact of timeout on piperacillin-tazobactam usage (but likely didn't significantly worsen)
- Inappropriate self-renewals do increase but account for a low overall percentage of overall timeout opportunities
- Most common timeout outcome is that medication is allowed to expire in lieu of completing template
- No overt evidence of adverse patient outcomes

Antibiotic Timeout Research Team

VA Greater Los Angeles

- Matthew Goetz, MD
- Peter Glassman, MBBS MSc
- Christopher Graber, MD MPH
- Thuong Tran, PharmD
- Barbara Serkuczewska
- Colletta Austin
- Christopher Foltz, MD
- Sean Yee

Clinical champions for timeouts:

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- Amir Nejad, MD
- Scott Oh, DO
- Aksone Nouvong, DPM

VA Salt Lake/Univ. of Utah

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