

## Getting Your Antimicrobial Stewardship Program Off the Ground in the Small and Rural Setting

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## **Disclosures**

All planners, presenters, reviewers, and ASHP staff of this session report no financial relationships relevant to this activity.



## **Learning Objectives**

- List the regulatory requirements that pertain to critical access hospitals in regard to antimicrobial stewardship.
- Identify key stakeholders necessary to implement an antimicrobial stewardship team at a rural facility.
- Discuss the antimicrobial stewardship gaps that may occur in the rural realm.
- Describe successful strategies used to educate staff and patients on antimicrobial stewardship.



## Self Assessment Question 1 – Polling Slide

Which of the following is NOT an element of performance listed under The Joint Commission's antimicrobial stewardship standard (MM.09.01.01)?

- a) Organizational leaders establish antimicrobial stewardship as a priority
- b) Education is provided to staff regarding antimicrobial stewardship
- c) The antimicrobial stewardship program identifies a list of restricted antibiotics
- d) An antimicrobial stewardship program is to involve a multidisciplinary team



## **Self Assessment Question 2 – Polling Slide**

Which of the following is a tool that can be used to educate staff on antimicrobial stewardship?

- a) Annual computer based training modules required by all staff
- b) In person training during new hire orientation
- c) News capsules or newsletters
- d) All of the above



## Self Assessment Question 3 – Polling Slide

Which of the following strategies can help overcome barriers of antimicrobial stewardship programs in the small and rural setting?

- a) Consultation services
- b) Telehealth
- c) Information technology
- d) All of the above



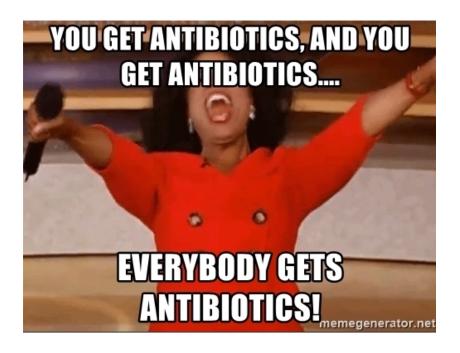
## **Antimicrobial Stewardship: Enough Already!**

- Hot topic for years
- Regulatory bodies requiring stewardship programs
  - CDC
  - CMS
  - States
  - Health Systems
- Easier said than done





## **Antimicrobial Stewardship: Enough Already!**



117 Years! World's Oldest Woman Says Piptaz 4.5g iv qid Is the Secret





## The Joint Commission Standards (MM.09.01.01)

- 1. Leadership commitment
- 2. Staff education
- 3. Education to patients and families (removed)
- Multidisciplinary team
- 5. Program encompasses the CDC core elements
- 6. Multidisciplinary protocols
- 7. Collects, analyzes and reports data
- 8. Takes action on improvement opportunities

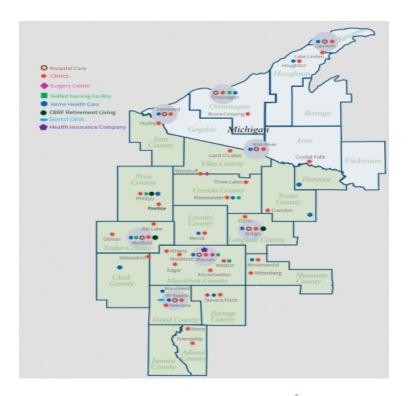






## **Practice Setting**

- 8 hospital health system serving WI and Upper MI
- 6 CAH
- 50+ clinics, home health, hospice, LTC, Critical Care Transport





- Identify core group
- Draft an organized layout of standards





#### **AMHC Antimicrobial Stewardship Charter**

The

Joint Commission - MM.09.01.01

 ${\bf 1.} \ \ Leadership\ establishes\ antimic robial\ stewardship\ as\ a\ priority.$ 

Examples:

Accountability documents

**Budget plans** 

Infection Prevention Plans

Performance Improvement plans

Strategic Plans

EMR use to collect AMS data

Task	Target completion date	Committee approvals needed	Committee communications needed	Professional resources needed	Tangible resources needed	Date of completion		
				Senior				
Modify IP Plan to include				Leadership for				
Antimicrobial Stewardship	July 30 17'	N/A	N/A	budgeting only	None	Complete		
	Due Date							
AMS charter progress updates	to leadership - Finis	hed intial charter	r to Rick N and Barb L			Completed		
Compensation budget for prov	ider and pharmacy	champions - Sen	ior leadership consider	ation		Tentative future Initiative		
FTE summary for AMS work to	leaders - Codee Mis	sty and I will do a	time study for next 3 n	nonths to present	to leadership			
as basis to determine FTE need	ds for AMS needs at	AMHC				Tentative future Initiative		
Misty to add AMS needs to IP r	risk assessment and	plan				Completed August 2017		
Pt days on antibiotics and use	by antibiotic reports	from EMR for da	ata tracking - collecting	,		Completed		

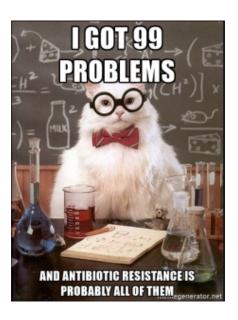


Initiative	MOS	Implementation plan	Hospital 1	Hospital 2	Hospita 3	Hospital 4	Hospital S	Hospital 6	Hospital 7	Hospital 8	Hospital 9	Hospital 10	Hospital 11
to Sharana ad	MM.09.01.01, EP2 Educate staff and licensed independent practitioners involved in antimicrobial ordering, dispensing, administration, and monitoring about antimicrobial resistance and antimicrobial stewardship practices. Education occurs upon hire and annually thereafter.	5.4.16-> Education subgroup was formed to address this topic> CPS has pharmacy portal for pharmacist to complete> Pharmacist Competencies were completed in PY15> Antibiogram orientation occurs upon hire and annually. ACTION PLAN 1. Develop CBT for provider- Hire and annually Antibiogram, system policy,							Pharmacis will have competen this fall. Providers need education RNs need education				All pharmacists have training. Have opportunities for LIPs/Physicians
		ACTION PLAN  1. Develop CBT for provider - Hire and annually Antibiogram, system policy Notes:  - 9.19.15> Education subteam has draft of CBT. Q/S council provided feedback to ensure we work with credentialing department of implement required education											
		Assign CBT to all Licenses Independent practicioners Notes								Request sent to local credentialing department for cascading			030

EP1 EP2 EP3 EP4 EP5 EP6 EP7 EP8 Reveal Hidden Columns



- Recruitment of committee members
- Education/certification if feasible for providers/RPHs
- Leadership engagement





## **Recruiting The A-Team**

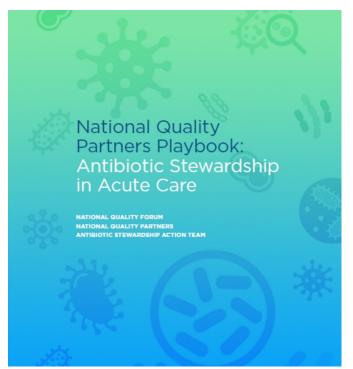
- Outlined by TJC (EP4)
  - ID physician
  - Infection preventionist
  - Pharmacist
  - Practitioner
- Also highly recommend:
  - IT
  - Front line staff (RN/CNA/Medical Assistants)
  - Quality
  - Leadership
  - Lab





## **Now That Everyone Has Arrived**

- Review the tools
- Establish goals
- Develop a policy outlining objectives and goals of your program

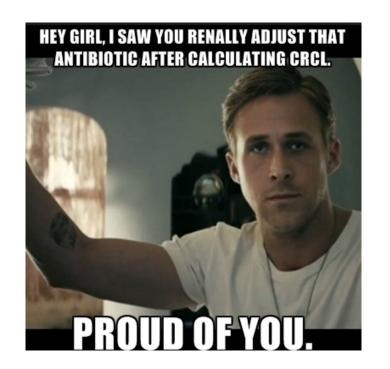


https://www.cdc.gov/antibiotic-use/healthcare/implementation/core-elements.html



## **Now That Everyone Has Arrived**

- Tackle low hanging fruit
- Identify opportunities feasible with current resources available
  - IV to PO, renal dosing,
     PK/PD dosing, pharmacy
     driven vanco/AG
     protocol





## The Wheels Are Turning

- Some education examples
  - Computer based training
  - Orientation education for all new employees
  - Education in after visit summary/discharge
     instructions to patients sent home on an antibiotic
  - News capsules
  - Community education
  - Intranet site



## The Wheels Are Turning

- Tracking and measuring (involve IP, IT)
  - Track trends and meaningful information
  - Provider prescribing trends/scorecard
  - Utilizing information IP is already reporting





## **Health System Resources**

- ID physician(s)
- ID pharmacist(s)
- IT resources
- Lab





## **Examples Utilizing Health Systems**

- Best Practice Alerts
- Indication "buttons" when ordering antibiotics
- "Blue Card"
- System Scorecard





## **Examples Utilizing Health Systems – "Blue Card"**

HISOATES	ASPIRUS REFERENCE LAB ANTI- BIOGRAM REPORTED AS & SUSCEPTIBLE JAN 2017-DEC 2017 GRAM-POSITIVE COCCI	Ampidille	tradin	Periolin	Ceftianne	Cindanycin	Bythnych	Levelouscin	Gertamon	Montantin	Manph"	Tetracycline	THE SAC	Vanomycin
69	Enterococcus faecium	29		26					SYN 88	35		36		57
1120	Enterococcus faecalis	100		99					SYN 69	966		21		100
2.432	Staphylococcus aureus		67			74	52	69	99	90	100	92	97	100
1628	MSSA (67% of Staph aureus)		100			81	70	89	100	99	100	9.5	9.8	100
904	MRSA(33% of Staph aureus)					50	36	29	96	96	99	97	94	100
208	Staphylococcus coagnegative		71	2.5		67	49	76	96	99	99	79	8.9	100
493	Staphyl oco ccus e pi dermidis		49	10		70	41	59	90	99	99	88	59	100
20.0	Stap hylococcus i ugdune nsis		91	8.8		83	194	99	100	100	100	96	99	100
261	Staphyloco acus saprophyticus		56			71	39	100	100	100	100	91	95	100
114	Streptococcus agalactiae (GrpB)			100		41						1.3		100
72	Strepto co ccus prie um on las					77	44	100				80		100
	71 Non-meningitis			9.8	94									
	1 Meningitis^			100	100									
	CY 2017 Haemophilus influenzae n=1 *Should not be used al one to treat stap SYN: Synergy with Ampicill in or Vanco	hylacace mycin	al Infect	Veras	e pesiti									

+80,415	ASPIRUS REPERENCE LAS ANTIBIOGRAM R BPORTED AS % SUSCEPTIBLE JAN 2017-DEC.2017 GRAM-NEGATIVE BACILLI	Ampidin	Ampisal	Piplano	Athenan	Cétaniin	Cefrizone	Ceftsudine	Odepine	TAPISME	Levelinacin	Gentamicia	Tobranych	Profession	Ettperen	Neroperan
242	Citrobacter freundii			88	88		88	86	99	84	91	90	94	90	90	99
16.0	Enterobacteraerogenes			94	94		96	93	99	98	96	9.8	9.9	29	99	100
345	Entero baster ci oacae com plex			87	90		89	89	9.8	89	97	99	100	41	97	988
8232	Escherichia coli	65	69	97	96	90	95	95	96	85	85	94	95	97	100	100
303	Kiebsiella oxytoca		62	94	9.5	62	97	9.8	9.8	96	9.8	97	97	89	100	100
1334	Klebalella pneumoniae		00	97	98	96	98	98	9.8	93	98	9.8	99	40	100	100
604	Proteus mirabilis	78	84	100	98	91	98	98	98	69	65	77	78		100	100
575	Pseudomonas aeruginosa			96				95	96		81	97	100			97
91	Se rratia marces cens				99		99	99	99	99	99	98	8.8		99	90
32	Acinetobaderbaumannii		97					76		97	97	97	97			100



## Examples Utilizing Health Systems – "Blue Card"

#### I. ANTIMICROBIAL STEWARDSHIP

- Before initiating empiric therapy or changing antibiotics (abx) due to lack of response to a current regimen, <u>make certain that all relevant</u>, <u>cultures have been obtained or repeated.</u>
- Switch & De-escalate: "switch" IV to PO, and change to narrowerspectrum agent(s) ("de-escalate") based on microbiology results.
  - Consider discontinuing Vancomycin if: cultures are negative for MRSA, MRSE, or penicillin-resistant Enterococcus; and, no Hx of MRSA colonization; and, no Type I allergy to penicillins (PCNs).
  - Combination therapy with [Ciprofloxacin OR Levofloxacin] PLUS [Pip-tazo, Cefepime, OR Aztreonam] is not beneficial beyond 48h -[Cipro or Levo] should be discontinued.
- ESBL Ertapenem is the drug of choice for infections due to ESBLproducing Gram-negative rods, except for Pseudomorias, which would require Meropenem.
- Bioavaitability, Levofloxacin, TMP/SMX, Clindamycin, Azithromycin, Fluconazole, and Metronidazole are highly bioavaitable (90-100% GI absorption). They should be given PO if the GI tract is functional.
- 5) <u>Use of Cephalosporins in Patients with Penicillin (PCN) Allergy:</u> After taking a careful history, cephalosporins may be given safely to any patient <u>without a history of a Type I</u> with DPN (immediate hypersensitivity – anaphylaxis, hives, angloedema).
- Empiric antimicrobial choices in EPIC order set: -AWH Blue Card -Empiric Antibiotics

#### II. SEPSIS OF UNKNOWN ETIOLOGY

- Community-Acquired/Normal Host: Ceftriaxone 2g q 24h PLUS Vancomycin
  - ± Tobramycin x1 (if septic shock)
- Health Care Associated/Compromised Host,
  [Plp-Tazo 3.375g q8h (x4h) PLUS Vancomycin]
   R [Cefepime 1g q8h PLUS Vancomycin]± Tobramycin x1 with above options (if septic shock)
- Type I PCN Allergy: Aztreonam 2g q8h PLUS Vancomycin PLUS Tobramycin 7mg/kg q24h

#### III. SKIN AND SOFT TISSUE INFECTIONS

- Nonpurulent/Moderate Severity (Cellulitis):
   Preferred: Penicillin-G 4 million units q6h
   (Alternative: Cefazolin 1-2g q8h)
- Type I PCN Allergy: Vancomycin
- Punient (Abscess): I&D + C&S.
   TMP/SMX: 1-2DS q12h OR Davycycline 100mg q12h (if severe: Vancomycin). Switch to Natcillin or Cefazolin if MSSA in C&S.
- Nonpurulent/Severe (Necrotizing): Surgical intervention (C&S). Pip-Tazo 3.375g q8h (x4h) PLUS Clindamycin 600mg q8h PLUS Vancomycin
- Type I PCN Allergy: Aztreonam 2g q8h
   PLUS Metronidszole 500mg q8h PLUS Linezolid 600mg q12h
- <u>Diabetic or Ischemic Foot Infection</u> (AFTER deep tissue, or bone biopsy culture):

[Pip-tazo 3.375g q8h (x4h) PLUS Vancomycin] OR [Cefepime 1g q6h PLUS Vancomycin PLUS Metronidazole 500mg a8h]

- D/C Vanco if no MRSA/MRSE/Enterococcus.
- Type I PCN Allergy: Aztreonam 2g q8h PLUS Metronidazole 500mg q8h PLUS Vancomycin

#### IV. COMMUNITY-ACQUIRED PNEUMONIA (CAP)

- Ceftriaxone 1g q 24h
- PLUS [Azithromycin 500mg q 24h OR Doxycycline 100mg q12h]
- Type I PCN Allergy: Levofloxacin 750mg q 24h
- If aspiration, add Metronidazole to above regimens

#### V. HOSPITAL-ACQUIRED/VENTILATOR-ASSOCIATED PNEUMONIA (HAP/VAP)

- [Cefepime 1g q6h OR Pip-Tazo 3.375g q8h (x4h)] PLUS Vancomycin (D/C Vancomycin at 48h if no MRSA in a quality respiratory culture)
- Type I PCN Allergy: Aztreonam 2g q8h PLUS Tobramycin 7mg/kg q24h PLUS Vancomycin
- Consider addition of inhaled Tobramycin
- . If aspiration, add Metronidazole to [Cefepime OR Aztreonam] above
- Duration = 7 days (including Pseudomonas)



## **Examples Utilizing Health Systems – "Blue Card"**

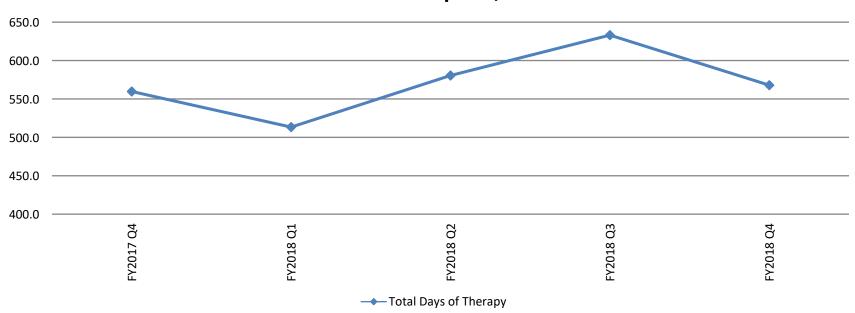
	Intraven	ous Antimicrobi	al Renal Dose A	djustments					
Antimicrobial	Usual Dose	CrCl 50-30mL/min	CrCl 30-10mL/min	CrCl < 10mL/min	MD*				
Ampicillin	1-2g q4-6h	1-2g	q6-8h	1-2g q8-12h	HD: 1-2g q8-12h				
Ampicillin/Sulbactam	1.5-3g q6h	1.5-3g q6-8h	1.5-3g q12h	(<15 mL/min) 1.5-3g q24h	HD: 1.5-3g q24h (post HD)				
Aztreonam	1-2g q8h	1-2g q8h	1-2g q12h	1-2g q12h 1-2g q24h HD: 1-2					
Cefazolin	1-2	g qah	(<25 mL/min) 0.5-1g q12h	1 g q24h	HD: 1g q24h (post HD)				
Cefepime	1g q6h	(60-30mL/min) 1g q8h	1g q12h		1g q24h (post HD)				
Cefepime (Neutropenic fever)	2g q8h	(60-30mL/min) 2g q12h	1g q12h		1g q24h (post HD)				
Ciprofloxacin	400m	ng q12h	400 mg	q24h	HD: 400mg q24h (post HD)				
Ciprofloxacin (Pseudomonos, critically ill)	400r	ng qsh	400 mg q12h	400 mg q24h	HD: 400mg q24h (post HD)				
Ertapenem	1g	q24h	500mg	q24h	HD: 500mg q24h (post HD)				
Fluconazole	100-400mg q24h		50% of dose q24h		HD: 50% of dose q24h (post HD)				
Levofloxacin	500mg q24h	(50-20mL/min) 500mg x1, then 250mg q24h	(20-10ml/min) 500mg x1, then 250mg q48h	500mg x1, then 500mg x1, then 250mg q48h					
Levofloxacin (Nosocomial PNA, skin, intraabdominal, pyelo)	750mg q24h	(50-20mL/min) 750mg q48h	(20-10ml/min) 750mg x1, then 500mg qash	750	img x1, then 500mg q48h				
Meropenem	500mg q6h	(50-26 mL/min) 500mg q8h	(25-10 mL/min) 500mg q12h	500mg q24h	HD: 500mg q24h (post HD)				
Penicillin G	2-4 mU q4	1-3 m	U q4h	1-2 mU q6h	HD: 1-2 mU q6h				
Piperacillin/Tazobactam (Extended-infusion)	3.375g q8h	3.375g q8h	(<20mL/min) 3.375g q12h		3.375g q12h				
TMP/SMX (Dose based on TMP)	Smg/	kg q12h		Smg/kg q24h	(post HD)				
TMP/SMX (Dose based on TMP, PCP treatment)	5 mg/l	kg q6-8h	2.5 mg/kg q6-8h	2.5 mg/kg q8h	HD: 2.5 mg/kg q8h				
Amikacin, Gentamicin Tobramycin, Vancomycin  Dosing per pharmacy									
-*For antimicrob	ials dosed every 24 hou	urs in patients on hemod	ialysis, doses should be a	dministered after dialy nistration after dialysis					



	FY2017 Q4	FY 2017	FY2018 Q1	FY2018 Q2	FY2018 Q3	FY2018 Q4	FY 2018	% Change From Baseline	% Change FY2018 Q4 vs FY2017 Q4	% Change FY2018 vs FY2017
АМН	Apr-June 17	July 16 - June 17	July-Sep 17	Oct-Dec 17	Jan-Mar 18	Apr-June 18	July 17 - June 18			
AMH ASP FY2018										
Total Days of Therapy	559.7	544.2	513.3	580.5	633.1	567.9	577.6	4.3%	1.5%	6.1%
Numerator - Days of antibiotics	375	1,218	250	310	402	322	1,284			
Denominator - 1,000 Days Present Baseline Goal	670 505	2,238	487 544	534 544	635 544	567 544	2,223			
Clostridium difficile rate (SIR)										
Numerator - Number of Cases Baseline Goal										
Intervention Acceptance Rate										
Numerator - Accepted iVents										
Denominator - Total Actionable iVents										
Baseline										
Goal										
Specific Utilization										
Fluorquinolones IV/PO	77.6	75.1	61.6	54.3	77.2		70.6	15.1%	11.3%	-5.9%
Numerator - Days of antibiotics	52	168	30	29	49	49	157			
Denominator - 1,000 Days Present	670	2,238	487	534	635	567	2,223			
Baseline Goal	99		75	75	75	75				
B-lactam + FQ	26.9	17.0	14.4	3.7	23.6	19.4	15.7	14.3%	-27.8%	-7.3%
Numerator - Days of antibiotics	18	38	7	2.7	15	11	35	14.570	27.070	7.570
Denominator - 1,000 Days Present	670		487	534	635	567	2,223			
Piperacillin/Tazobactam	122.4	88.9	55.4	56.2	91.3	72.3	70.2	-18.7%	-40.9%	-21.1%
Numerator - Days of antibiotics	82	199	27	30	58	41	156			
Denominator - 1,000 Days Present	670	2,238	487	534	635	567	2,223			
Cefepime	10.4	15.2	24.6	15.0	17.3	10.6	16.6	-30.3%	1.3%	9.6%
Numerator - Days of antibiotics	7	34	12	8	11	6	37			
Denominator - 1,000 Days Present	670	2,238	487	534	635	567	2,223			

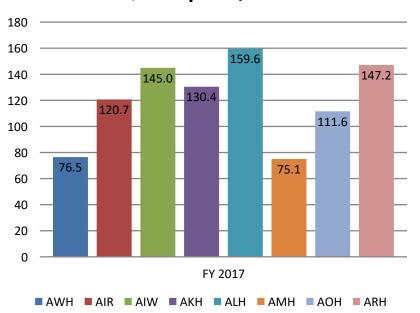


#### Total Abx DOT per 1,000 DP

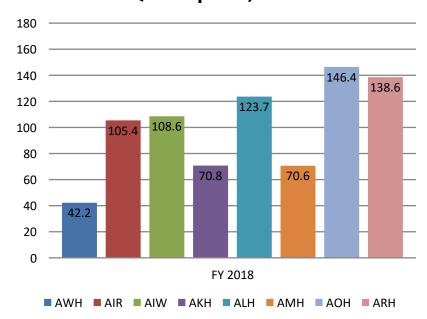






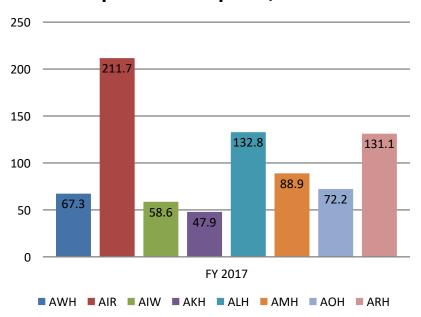


#### FQ DOT per 1,000 DP

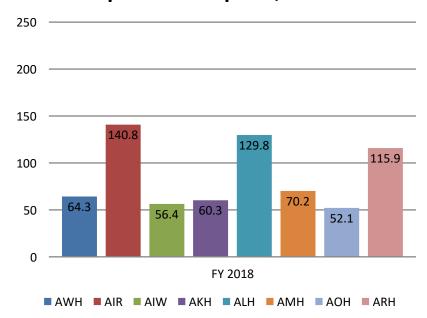








#### Pip-tazo DOT per 1,000 DP





## Our 2018 TJC Visit

#### CDC Core Element Utilization at AMHC

#### 1. Leadership Commitment

 Formal statement signed by senior leadership attesting support and commitment to antimicrobial stewardship at AMHC (appendix A).

#### 2. Accountability

- Dr. Keith Bratulich, MD (AMHC hospital and clinic provider) and Codee Peterson, PharmD, RPH (inpatient RPH) appointed co-chairs to AMHC Antimicrobial Stewardship Committee.
- Dr. Troy Sennholz, MD (AMHC emergency department provider) sits on AMHC AMS committee.
- Access to system ID resources including Dr. William Bowler, MD, infectious disease specialist, who practices at Aspirus Wausau Hospital and co-chairs the Aspirus Antimicrobial Stewardship Subcommittee.
- Additional AMHC AMS committee comprised of multidisciplinary team including quality director, front line nursing staff, lab director, infection prevention RN.
- All core members of the AMHC AMS committee are responsible for communicating information, initiatives, and antibiotic improvement efforts to their corresponding departments and colleagues.
- Several members of the AMHC AMS committee also attend the Aspirus Wausau Antimicrobial Stewardship Subcommittee.
- The AMHC antimicrobial stewardship committee has established and is responsible for the following outcomes for FY18:
  - 1% overall reduction in inpatient antibiotic use as measured by the Aspirus system scorecard (see "Tracking and Monitoring Antibiotic Prescribing, Use and Resistance" for specific work).
  - Implementation of antibiotic time outs (see "Actions to Support Optimal Antibiotic Use" for specific work).
  - Staff education (see "Education of Clinicians and Patients and Families" for specific work).

#### 3. Drug Expertise

- Codee Peterson, PharmD completed the Society of Infectious Disease Pharmacists' Antimicrobial Stewardship Certificate Program in October 2016. Past professional experience includes involvement in a health-system antimicrobial stewardship team as local site lead responsible for implementation of system initiative antimicrobial stewardship efforts.
- Access and close collaboration with Tristan O'Driscoll, PharmD, MPH, BCPS, clinical pharmacy specialist – infectious disease/antimicrobial stewardship currently leading

Aspirus system efforts in antimicrobial stewardship. Tristan received his PharmD and MPH degrees concurrently from the University of Wisconsin-Madison. He completed his PGY1 pharmacy practice residency and PGY2 specialty practice residency in Infectious Diseases at Rush University Medical Center in Chicago, IL. He worked as an Antimicrobial Stewardship Pharmacist at Carolinas Medical Center in Charlotte, NC before coming to Aspirus to lead the Aspirus System Antimicrobial Stewardship Program.

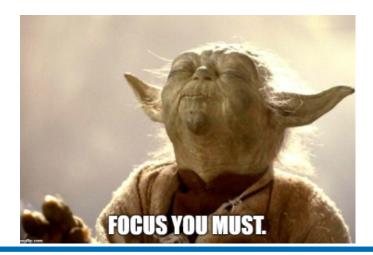
#### 4. Actions to Support Optimal Antibiotic Use

- 2018-2020 Aspirus "Blue Card" outlining guidance in treatment recommendations, renal dosing, antibiogram and beta-lactam cross-reactivity table (allergy assessment) to guide appropriate antimicrobial therapy (appendix B). This card is accessible on the Aspirus intranet and has been distributed to AMHC providers.
- Inpatient CPOE standardized ordersets in EPIC have been updated and empiric medications available for ordering are based off of Aspirus Blue Card.
- A 48hr antibiotic time out "Best Practice Alert (BPA)" will be implemented in the
  electronic health record for inpatient antibiotic orders. After 48 hours of antibiotic
  therapy, a "pop up" will alert the provider of current antibiotics and recent culture
  results. The provider will be asked to acknowledge the BPA and choose an action in
  order to proceed: "will de-escalate", "discontinue", or "will continue current
  orders". The BPA will reappear again 72 hours later.
- IV to PO policy is currently in place outlining criteria for IV to PO transition.
   Interventions recommended by pharmacists are being tracked for acceptance rates.
- Renal dosing policy currently in place outlining procedures on when and how to adjust medications for renal dysfunction.
- Policy and protocol in place for pharmacists to dose and order levels and labs for vancomycin upon consult. Consults are highly recommended and are routinely used.
- Protocol in place for automatic change to extended infusion piperacillin/tazobactam by pharmacy.
- System and local sepsis workgroup formed to review sepsis guidelines, ordersets, and workflow.
- Daily (M-F) patient engagement rounds occur by a multidisciplinary team including hospitalist, pharmacist, nurse, RT, PT/OT, discharge planner and the patient.
   Antibiotic therapy, goals and recommendations are discussed during patient engagement rounding. Pharmacy is able to suggest interventions based on culture and sensitivity data, clinical presentation, lab values, etc. at this time.
- Culture and sensitivity data for inpatients are reviewed daily by pharmacist via utilization of a report sent daily with the prior day's culture collections. In house lab facilitates timely culture collection upon provider order.
- In April 2018, Codee Peterson and Tristan O'Driscoll will be participating in the AboutHealth antimicrobial stewardship collaborative which will include representatives from the 6 Wisconsin health systems that make up this accountable



## Our 2018 TJC Visit

- 2 MDs, 2 RNs
  - Stewardship discussed in leadership, IP, potential for MM
  - Surveyors were very complimentary towards our efforts thus far
- Just because the visit is over, don't lose focus!





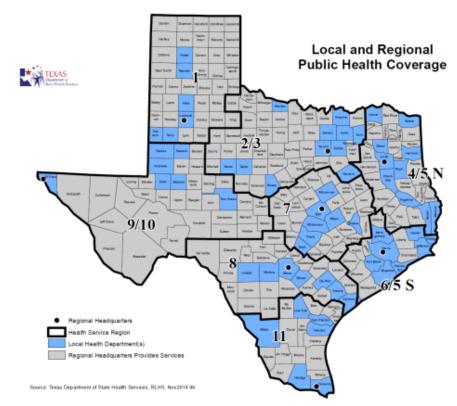


# Getting Your Antimicrobial Stewardship Program Off the Ground in the Small and Rural Setting

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Clinical Assistant Professor
The University of Texas at Tyler

## **Practice Setting**

- East Texas (Public Health Service Region 4/5N) is a region of approximately 1.5 million residents
- 29 out of 35 counties are classified as rural
- Four major health systems
- Two ID physician groups
- Two ID-trained pharmacists
- Two pharmacy residency programs
- 230-bed facility
- No clinical pharmacist





## **Background**

- 20-50% of antimicrobial use is inappropriate
  - 30% is considered unnecessary
- 1 out of 5 emergency department visits are for ADRs due to antibiotic use
- >\$10 billion spent on antibiotics; >3.5\$ billion among hospitalized patients
- >70% of all United States hospitals have <200 beds</li>
  - ~10% have <25 beds → critical access hospitals</p>
- Median hospital size = 160 beds
- Lack of antimicrobial stewardship (AS) and antibiotic use data in small community and rural settings



## Truth vs. Myth – Polling Slide

Antimicrobial usage rates differ between small and larger hospital.

- a) Truth
- b) Myth



## Truth vs. Myth

### Setting

- Utah; National Healthcare and Safety Network Reports from 2011-2013
- 15 small-community hospitals (SCHs) vs. 4 large-community hospitals (LCHs)

#### Results

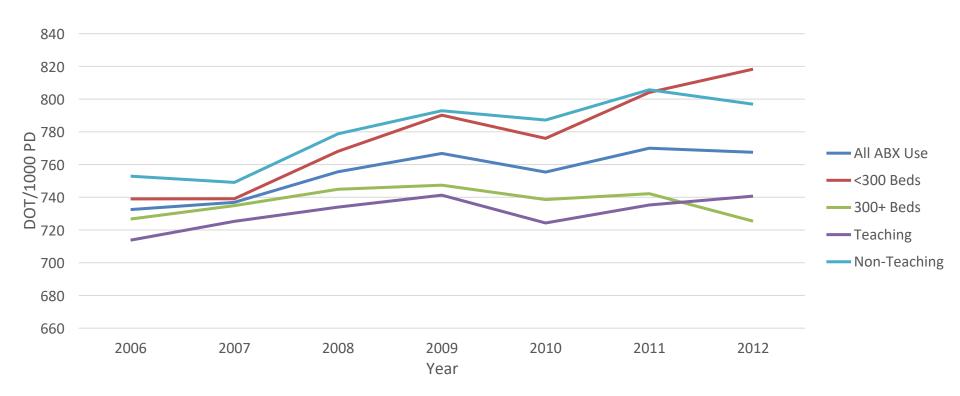
- SCHs (median, 436 DOT/1000PD) vs. LCHs (509 DOT/1000PD)
- Broad-spectrum antibiotics accounted for 26% of use in SCHs and 32% in LCHs

## **Key Points**

- Antibiotic usage rates did not differ between SCHs and LCHs
- Spectrum of antibiotics used did not differ between SCHs and LCHs



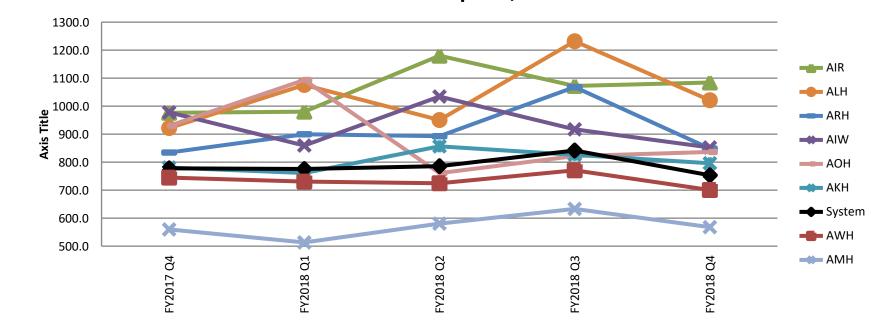
## **Estimates of Antibiotic Usage Trends**





## **Estimates of Antibiotic Usage Trends**

#### Total Abx DOT per 1,000 PD





### **Antibiotic Usage**

#### **Hospital Locations**

- Medical unit
- Surgical unit
- Critical care unit
- Orthopedic ward
- Postpartum ward
- Specialty areas
- Neonatal units

#### **Common Antibiotics Used**

- Vancomycin
- Ceftriaxone
- Levofloxacin
- Piperacillin-tazobactam
- Gentamicin
- Azithromycin
- Metronidazole



# Truth vs. Myth – Polling Slide

Antimicrobial resistance rates are lower in smaller hospitals.

- a) Truth
- b) Myth



# Truth vs. Myth – Polling Slide

Smaller hospitals are less likely to have an active ASP.

- a) Truth
- b) Myth



# Truth vs. Myth

#### **7 Core Elements**

Increase of hospital ASP practices from 40.9% to 48.1% in 2014-2015.

#### Small vs. Large

Hospitals with >200 beds were more likely to have an established ASP.

#### **Conclusion**

Comprehensive ASPs can be established in all facilities/sizes with leadership support.





#### What is the Problem?

Level of support from hospital administration Availability of ID/ASP-trained personnel Barriers Lack of involvement from other team members Educational resources available to hospital staff Lack of information technology resources Need more AS data in small and rural settings!

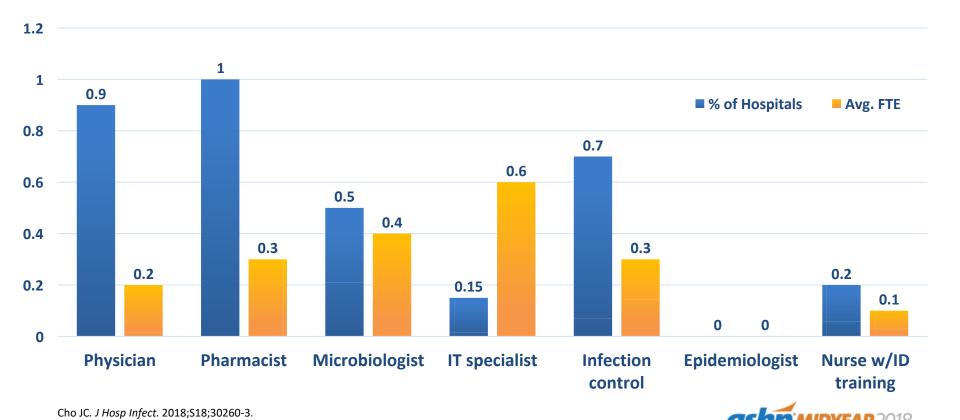


#### **East Texas Data**

Demographics	N=20 (%)				
Institution setting					
Academic medical center	0				
Community teaching hospital	5 (25)				
Community non-teaching hospital	15 (75)				
Average daily census					
0-199	19 (95)				
≥200	1 (5)				
Length of ASP program					
<6 months	8 (40)				
6-11 months	4 (20)				
≥1 years	8 (40)				

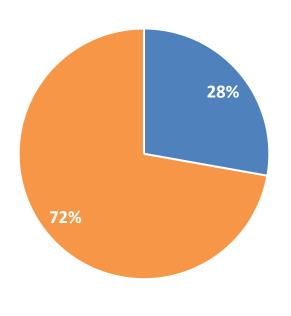


#### **ASP Team Members and Resource Allocation**

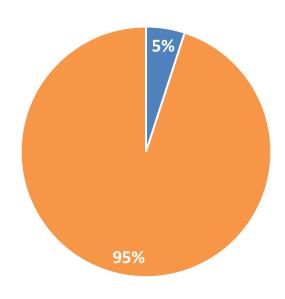


# **Formalized ID Training**









■ Formal ID Training ■ No ID Training

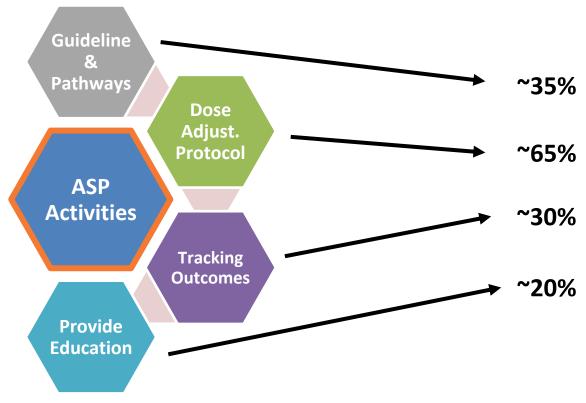


# **Available Support Documents**

ASP Characteristics	All Hospitals N=20 (%)
ASP committee involvement	
Collaboration with infection control committee	14 (70)
Collaboration with pharmacy & therapeutics committee	18 (90)
Written statement of support from hospital leadership	14 (70)
Available support documents	
Leadership accountability documents	9 (45)
Budgeted financial support for ASP activities	5 (25)
Performance improvement plans	8 (40)
Strategic planning documents	7 (35)
Using electronic health record to collect ASP data	13 (65)



# **Stewardship Initiatives**





## Strategies: Leadership and Financial Support

- ASP is not just a requirement!
- Need to understand why ASP is important:
  - Improves patient outcomes
  - Optimizes antimicrobial resources
  - Mitigates development of antimicrobial resistar
- Present ASP plans, activities, and goals
- Present ASP needs and wants with justification
  - Aid in establishing ASP budget
- Share ASP interventions and outcomes!
  - Written letter of support is not enough

#### **Antimicrobial Stewardship Program**

#### . POLICY:

The policy of \_\_\_\_\_v is to implement a comprehensive Antimicrobial Stewardship (AS) program to evaluate the judicious use of antimicrobial agents. This policy establishes key directives for antimicrobial prescribing and management at \_\_\_\_\_ using evidence-based practices and consultation from clinicians with infectious diseases training.

#### . PURPOSE:

Antimicrobial Stewardship Program (ASP) will optimize the use of antimicrobial therapy and clinical outcomes while minimizing the unintended consequences of antimicrobial use, including toxicity and emergence of resistance. The ASP will also improve antimicrobial use and expenditures, and support initiatives to address regulatory requirements.

#### DEFINITIONS:

ASP Physician Co-Director: physician responsible for overall direction of the program, education, and goal development. He/she will be available for direct or indirect discussion to assist physicians with antibiotic education, selection, or discontinuation, attend antimicrobial rounds, and perform duties in conjunction with the ASP Pharmacist Co-Director.

ASP Pharmacist Co-Director: pharmacist responsible for overall direction of the program, education, and goal development. He/she will attend antimicrobial rounds, consults with physicians, and perform duties in conjunction with the ASP Physician Co-Director.

Empirie: antimicrobials given based on suspicion of infection but the infective pathogen is not known.

Directed: antimicrobials given that specifically targets a known pathogen. Prophylactic: antimicrobials given to prevent acquisition or development of infection.

#### IV. TEAM MEMBERS

ASP structure is displayed under Appendix A. Core members of this multidisciplinary ASP include providers, pharmacists and nurses functioning within their scope of provider and job description to manage patients with infectious diseases. Other ancillary members include infection preventionist, clinical microbiologist and information system specialist.



## Strategies: Leadership and Financial Support

January 4, 2018

To succeed, antimicrobial stewardship programs (ASP) need clear support from facility leadership. Aspirus Medford Hospital's leadership is committed in many ways, as the board, executive team, leadership and professional staff clearly supports this commitment. We understand that dedicating necessary human, financial and information technology to resources is a key part of demonstrating our organization's commitment to effective stewardship.

The following statements below demonstrate leadership commitment at this organization:

- · Antibiotic stewardship targets and goals have been established.
- · Aspirus System resources will be utilized for consultative services on an as needed basis.
- The importance of improving antibiotic use and AMHC/ACR's commitment to ASP is communicated to key stakeholders.
- Stories, speakers and other resources that highlight how ASP can improve patient outcomes are shared across the system.
- ASP activity is integrated into quality improvement and/or patient safety initiatives and is reported to the Pharmacy and Therapeutics Committee (P&T) and Medical Staff Committee.
- · Ongoing provider education programs are provided and tracked.
- Access to and availability of microbiology data and laboratory resources for ASP efforts has been supported.
- Necessary support from other disciplines (quality improvement staff, laboratory staff, IT and nurses) and specifics of their responsibilities to support the ASP will be established.
- Efforts and policies/procedures/protocols to hold providers accountable for improving antibiotic
  use will be established.

Bick Loyevers	1/4/18
Executive Signature	Date
Antinycrobial Stewardship Co Chair-Signature	1-8-18
Antinycrobiai Stewardship Co Chair-signature	Date
W-	1-18.18
Antimicrobial Stewardship Co Chair Signature	Date



## **Strategies: Financial Support**

- AS grant funding opportunities
  - ASP development
    - Industry grants
  - Infectious diseases research
    - Infectious Diseases Society of America (IDSA)
    - Centers for Diseases Control and Prevention (CDC)
    - Society of Infectious Diseases Pharmacists (SIDP)
  - State/local AS initiatives
    - Texas Health and Human Services
  - Pharmacy practice advancement
    - ASHP Foundation



## Strategies: Availability of ID-Trained Personnel

- <u>Ideal:</u> ASP co-led by ID trained physicians and pharmacists
- Recruit existing non-ID trained physicians and pharmacists
  - Should have protected time to perform AS-related activities
- Employ part-time ID physicians and pharmacists
- Utilize consultative ID/ASP networks

Setting	Intervention	Outcomes
155-bed	ASP led by non-ID trained	• 74% intervention acceptance
community	pharmacist; other non-	• ↓ 26% in ABX expenditure
hospital	residency trained	<ul> <li>\$145,000+ direct savings</li> </ul>
	pharmacist contributed	• IV to PO conversion ↑ >600%



### **Strategies: ASP Action**

- Integrate other staff to ASP activities
  - Nurse practitioners/physician assistants: serve as antimicrobial stewards
  - Infection preventionists: optimize surgical prophylaxis
  - Microbiologists: facilitate timely pathogen results
  - Information technology personnel: assist with data collection
  - Nurses: provide education to patients
  - Pharmacy technicians: obtain patient medication records
  - Students, residents, fellows: assist in AS-related activities



### **Strategies: ASP Action**

- Establish a health-system level ASP
  - Pool resources related to protocols and guidelines
- Utilize national and state collaborative efforts
- Initiate AS activities on a small number of units
- Limit AS activity days based on amount of resources available
  - 3x weekly
- Track and monitor antimicrobial prescribing <u>and</u> guideline compliance
  - Invest in information technology and clinical decision support systems
  - Use CDC National Healthcare Safety Network Antimicrobial Use and Resistance module
- Create an antimicrobial stewardship checklist

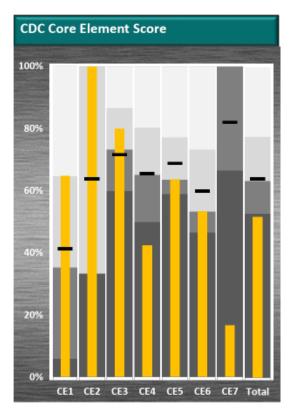


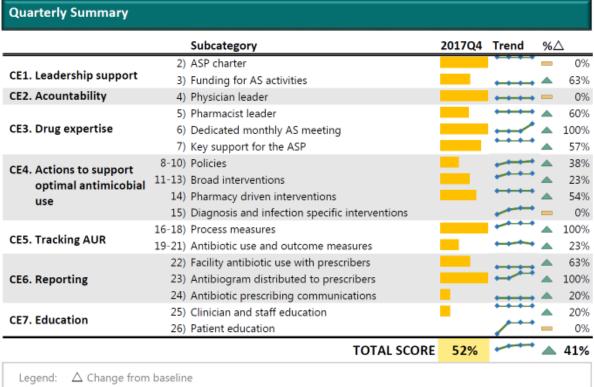
# **ASP Progress Report**

	Survey Response	Suggested Action Plan	Ease	Score (in %)			Utilize Sentri7 upgraded rules released in Spring			Does a physician or pharmacist review courses of			
				(in se)			2017 upgrade. Don't forget to follow-up with Rx			therapy for specified antibiotic agents (i.e.			
LEADERSHIP SUPPORT					Culture-proven invasive/bloodstream		Activity report to make sure staff are utilizing rule.			prospective audit with feedback) at your facility?			
Does your facility have a formal, written statement					infections	no	There are separate rules based on preliminary ID	Easy		13) (This is separate from an antibiotic timeout or pre-	yes Opecify process in comments)		
of support from leadership that supports efforts to							(Gram's stain) and final ID. These results are broken down by morphology (Gram positive cossi,			authorization: typically antimicrobials are identified that REQUERE review by a clinician			
ingrove antibiotic use? (This often is in the form	yes.			100%			Gram negative rods, etc.)			within a reasonable timeframe after prescribed)			
of an ASP charter signed by responsible parties							Utilize Sentri7 rules on CAP overtreatment, Don't						_
nd executive leadership)					Community-acquired preumonia		forget to follow-up with Rr Activity report to make	Easy		PHARMACY-DRIVEN INTERVENTIONS			
oes your facility receive any budgeted financial su	apport for autiliante etwapolishio artisi	See (a.g. support for salary training IT support()		63%	Commonly acquired prescribing	P	sure staff are utilizing rule.	Lany		34) Are the following actions implemented in your facil			
No salary support for A5		and the same of th	Easy							Antimicrobial IV to PO conversion	7 days/week		
no selecy support for no		Depending on your facility size and scope, an	Lany		CES. TRACKING: MONITORING ANTIBIOTIC PI	RESCRIBING, USE, AND RESISTA	NCE			Antimicrobial renal or hepatic adjustment	7 days/week		
					PROCESS MEASURES					Antimicrobial dose optimization (PK/PD) to			
		increase in AS pharmacist dedicated hours may be warranted at the facility. Review the documents on			Does your stewardship program monitor					optimize the treatment of organisms with	7 days/week		
	Conduct absence of the base toleron	cost justification of an AS pharmacist in the TSS.	1 1		351 adherence to a documentation policy (dose.	yes.			300%	reduced susceptibility			-
Funded pharmacist hours	Funded pharmacist hours (please				dutation, and indication)?							Utilize Sentri7 rules released Spring 2017 for	
	enter monthly FIE'S in comment box	toolkit and discuss with facility leadership.			Does your stewardship program monitor					Automatic alerts in situations where		easier identification of these incidences. Expand to	10
		Consider trending metrics and outcomes with AS			adherence to facility-specific treatment					antimicrobial therapy might be unnecessarily	Interventions not performed	weekend coverage for most important	East
		pharmacist involvement to cost-justify increased			recommendations? (Recommendations include	PART .			300%	duplicative	routinely	Interventions, Spring upgrade enhancements	
		hours.	_		facility-specific guidelines, pathways, order sets)							Include duplicate beta-lactams, duplicate	
	Funded physician hours (please enter				Does your stewardship program monitor							antianaerobics, duplicate atypical coverage.	+
Funded physician hours	monthly FTE's in comment body				compliance with one or more of the specific					Time-sensitive automatic stop orders for	7 days/week		
					treatment interventions in place? Interventions					specified antibiotic prescriptions			-
		Discuss IT resources available at facility in general			include active efforts to improve antimicrobial	Date:			200%	PK monitoring for aminophycesides	7 days/week		+-
Funded IT support hours		and what projects would require IT help. If no	Medium		prescribing. This includes electronic prompts.					PK monitoring for vancomycin	7 days/week		+-
Foreign 31 support, Hours		dedicated funding available, consider discussing	MACHINE TO		reminders, Sentri-7 alerts, etc)					Monitoring for voriconagole, collatin, & other		If you have dispensed either of these medications in last year, consider a policy and a Sentri7 slert to	
		ad hoc participation.			ANTIBIOTIC USE AND OUTCOME MEASU	RES				antimicrobials	startinely	in sat year, consider a policy and a sentric siert to involve pharmacy in oversight or consultation for	
					1% Does your facility track rates of the following infect		mantingial as a suffix diserted		3376	antimicropias	routiney	doing of these agents.	
		Investigate paid certification programs (MAD-ID.			Clostridium difficile	Clostridium difficile	revenionist or quality director)		200%			cosing of these agents.	_
		SIDP) located in TSS toolkit for designated AS			MRSA	MRIA				DIAGNOSIS AND INFECTION SPECIFIC INT	ERVENTIONS		
Funded for training programs related to AS		leaders at facility. Scholarships may be available	Easy		MORO	MDBO				Does your facility have specific interventions in			
		from programs for qualified participants. If			Plane concerting the State annahum and postilizing commit	1				place to ensure optimal use of antibiotics to treat			
		funding unavailable, consider free educational			20) some year racting produce an amonogram	yes			300%	15) the following common infections? (Interventions			
		programs located in TSS toolkit education section.			21) Does your facility monitor antibiotic use (consump	tion) at the unit or facility-wide level w	ith any of the following metrics?		11%	are active, not passive, and can include alerts built			
COLUMN TO SELECTION							Utilize upgraded DOT report within Sentri7 once			in Sentri-7 or other software. Order sets are not			
COUNTABILITY							released during second quarter 2018. Track and			intervention()			
there a physician leader responsible for	When the district for the day												
							trend and share with ASP team. Please closed and					Encourage use of upgraded Asymptomatic	
gram outcomes of stewardship activities at	yes. ID trained physician leader			190%			trend and share with ASP team. Please download the "ASP slide deck template" in the TSS toolkit			Unique tract infections		bacteriuria rule in Sentri7 Spring 2017 upgrade.	East
	(Enter name in comment box)			190%			trend and share with ASP team. Please download the "ASP slide deck template" in the TSS toolkit under question 6. It was created to assist you in			Uninary tract infections	no	bacterium rule in Sentri7 Spring 2017 upgrade. Don't forget to follow-up with Rx Activity report to	to Eas
ur facility?				100%	By duration of therapy or days on therapy		the "ASP slide deck template" in the TSS toolkit	Easy		Urinary tract infections	no	bacteriuria rule in SentriT Spring 2017 upgrade. Don't forget to follow-up with fix Activity report to make sure staff are utilizing rule.	20
r facility?				199%	By duration of therapy or days on therapy (DOT)		the "ASP slide deck template" in the TSS toolkit under question 6. It was created to assist you in	Easy		Urinary tract infections	10	bacteriuria rule in Sentri7 Spring 2017 upgrade. Don't forget to follow-up with Rx Activity report to make sure staff are utilizing rule. Discuss wound culturing with laboratory personne	20
ur facility?		Consider bending outcomes bosend, LOS DOT.		100%			the "ASP slide deck template" in the TSS toolkit under question 6. It was created to assist you in starting up an ASP. This slide deck explains the	Easy		Uninary tract infections	no	bacteriuria rule in SentriT Spring 2017 upgrade. Don't froget to follow-up with fix Activity report to make sure staff are utilizing rule. Discuss wound culturing with lationatory personne during ASP meetings and identify any	20
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ur facility! ISUG EXPERTISE	(Enter name in comment box)  yes, part time (< 1.0 FTE) declicated	DOD) while part time pharmacist has been	Medium	100%			the "ASP slide deck template" in the TSS toolkit under question 6. It was created to assist you in starting up an ASP. This slide deck explains the various data streams available and even has graphs that you can modify with your own facility	Easy		Uninary tract infections  Skin and soft tissue infections	no no	bacteriula rule in SentriT Spring 2017 upgrade. Don't Rieget to follow-puth Rx Activity report to make sure staff are utilizing rule. Discuss wound culturing with laboratory personne during ASP meetings and identify any interventions to improve quality of cultures. Options include suppressing results of improperly	el y Medi
risolity() IUG EXPERTISE	(Enter name in comment box)  yes, part time (< 1.0 FTE) declicated	DOD) while part time pharmacist has been employed to increase hours to full time, if	Medium	100%			the "ASP slide deck template" in the TSS toolkit under question 6. It was created to askir you in starting up an ASP. This side deck explains the various data streams available and even has graphs that you can modify with your own facility data to present to the group. It also has a	Easy			no no	bacteriulia nute in Servit' Spring 2017 upgrade. Don't forget to follow-up with Rx Activity report to make sure shelf are utilizing rule. Discuss wound culturing with laboratory personne during ASP restring and identify any interventions to improve quality of cultures. Options include suppressing results of improperly dissen "surface existed" or providing a specific son.	el y Medi
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## **ASP Progress Report**







# **Strategies: Utilization of Telehealth**

- Telehealth resources
  - Advantages:
    - Allows access to IDtrained personnel
    - More convenient?
    - Potential cost savings
  - Disadvantages:
    - Technical training
    - Less frequent consultations
    - Regulations vary by state
    - Limited physical examination





# **Strategies: Utilization of Telehealth**

Setting	Intervention	Outcomes
Two rural VA medical centers	Telecommunications via videoconference; weekly discussion of ID cases and AS -related education	<ul> <li>Sites A and B discussed 3.5 and 3.1 cases weekly</li> <li>73% vs. 65% acceptance rate</li> </ul>
220-bed Brazill	Performed antimicrobial stewardship through telemedicine	<ul> <li>↑ 51.4% appropriate ABX</li> <li>↓ consumption broad- spectrum ABXs (FQs, vanc)</li> </ul>
Pediatric hospital Italy	ABX consultation per patient; biweekly discussion of cases	<ul><li>↓ MDRO isolation</li><li>↓ ABX cost &amp; packages/doses</li></ul>

Ceradini J. Ital J Pediatr. 2017;43:105.

Dos Santos RP. *J Telemed Telecare*. 2018;doi: 10.1177/1357633X18767702. [Epub ahead of print] Stevenson LD. *Infect Control Hosp Epidemiol*. 2018;doi: 10.1017/ice.2018.197. [Epub ahead of print].



## **Strategies: Education**

- Teaching hospital prescribers and staff
  - Continuing education presentations
  - Patient care rounds
- Written or e-mailed notification
  - Poster reminders
  - Institutional newsletter
  - AS annual competency
- Protocol and guideline development
  - Antibiograms
  - Treatment pathways
- Educate while making antibiotic recommendations



#### **Resources for ASP Education**

#### **Materials and Forms**

Contributed by Allina Regional Hospital Cardinal Health Pharmacy Solutions, Columbia University Medical Center, Intermountain Healthcare, the Johns Hopkins Hospital, and other members of SHEA's

Antimicrobial Stewardship Task Force

#### • Tools for Daily Activities of Stewardship:

- Emergency Department and Urgent Care Stew Toolkit
- Peri-Operative Antibiotic Prophylaxis Blank Po KB)
- Adult Inpatient Antibiotic Approval Form, PDF
- Antibiotic Recommendation Form, PDF (20 KB)
- Blank Order Set for Antifungal Therapy, PDF (2
- Antibiotic Stewardship 360: Optimizing Outcome
- Toolkit for Reduction of Clostridium difficile Inf

Join the "Stewardship" Listserv to connect with other experts in the field!

#### Policies, Procedures, and Guidelines:

- State Strategies to Address Antimicrobial Resistance Survey Results (ASTHO), PDF (538 KB)
- Sample Daily Pharmacist Checklist, PDF (268 KB)
- Drug Use Evaluation Form, PDF (99 KB)
- IV to PO Guidelines, PDF (380 KB)
- IV to PO Worksheet, PDF (24 KB)
- Justification and Protocol for Extended-Infusion Piperacillin/Tazobactam in Adult Patients, PDF (240 KB)
- Antibiotic Streamlining Sample Pharmacist's Daily Routine, PDF (76 KB)

#### · Business Case, Request for Proposal, and Job Description Examples:

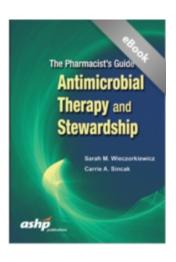
- Building a Business Case for ASP Presentation, PDF (982 KB)
- Antimicrobial Stewardship Program Proposal Sample 1, PDF (112 KB)
- Cost Analysis, PDF (14 KB)
- Antimicrobial Stewardship Program Proposal Sample 2, PDF (36 KB)
- RFP for ID Consultation and Post Prescription Antibiotic Rounding, Allina Regional Hospital, 2008, PDF (104 KB)
- Minnesota Guide to a Comprehensive Antimicrobial Stewardship Program, PDF (221 KB)



#### **Resources for ASP Education**

- Stewardship certificates programs (online/live courses)
  - Making a difference in infectious diseases (MAD-ID)
  - Society of Infectious Diseases Pharmacists (SIDP)
- ASP books, literature & guidelines
- Continuing education programs
  - CDC 4-part series (8 CEs)
- Institutional AS websites
  - Cleveland Clinic
  - Johns Hopkins
  - Nebraska Medicine
- Additional resources
  - Antibiotic dose calculator
  - Antibiotic spectrum tables







#### **KEY TAKEAWAYS**

#### 1) KEY TAKEAWAY

Antimicrobial stewardship programs are needed in all practice settings, including small and rural hospitals, to mitigate the development of antimicrobial resistance.

#### 2) KEY TAKEAWAY

Engaging administrators in the antimicrobial stewardship program's planning, goals, and activities can help obtain resources needed to optimize antimicrobial use.

#### 3) KEY TAKEAWAY

Development of a successful antimicrobial stewardship program takes the engagement of a multidisciplinary team to develop attainable goals based on the resources available.



## Self Assessment Question 1 – Polling Slide

Which of the following is NOT an element of performance listed under The Joint Commission's antimicrobial stewardship standard (MM.09.01.01)?

- a) Organizational leaders establish antimicrobial stewardship as a priority
- b) Education is provided to staff regarding antimicrobial stewardship
- c) The antimicrobial stewardship program identifies a list of restricted antibiotics
- d) An antimicrobial stewardship program is to involve a multidisciplinary team



## Self Assessment Question 2 – Polling Slide

Which of the following is a tool that can be used to educate staff on antimicrobial stewardship?

- a) Annual computer based training modules required by all staff
- b) In person training during new hire orientation
- c) News capsules or newsletters
- d) All of the above



## Self Assessment Question 3 – Polling Slide

Which of the following strategies can help overcome barriers of antimicrobial stewardship programs in the small and rural setting?

- a) Consultation services
- b) Telehealth
- c) Information technology
- d) All of the above



### **Questions, Answers, and Discussion**

Codee Peterson <a href="mailto:codee.peterson@aspirus.org">codee.peterson@aspirus.org</a>

Jonathan Cho jcho@uttyler.edu

