ashp MIDYEAR 2017
Clinical Meeting & Exhibition

(Management Case Study)

Meeting Joint Commission Antimicrobial Stewardship Requirements with Limited Resources

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Disclosure

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

Learning Objectives

- List antimicrobial stewardship activities developed for a successful stewardship program based on consensus guidelines.
- Describe specific outcomes as a result of focused antimicrobial stewardship efforts.
- Discuss different reporting strategies of stewardship metrics.

Self-Assessment Questions

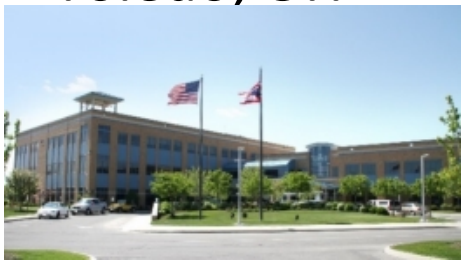
1. (True or False) Education and policy development as well as direct patient interventions are both are effective approaches to antimicrobial stewardship.
2. (True or False) Strategies to report antimicrobial stewardship program interventions are well defined in the literature.
3. (True or False) Reporting positive outcomes improves support for antimicrobial stewardship efforts.

Hospitals & Clinical Staff

Mercy Health - St. Anne Hospital - Toledo, OH

Beds = 98 (~65)

Daily Clinical = 0-4 hrs



Mercy Health -St. Charles Hospital - Oregon, OH

Beds = 250 (~150)

Daily clinical = 16 hrs

Residents = 1

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Joint Commission MM.09.01.01

ELEMENTS OF PERFORMANCE

1. Leadership
2. Education (Staff/LIP)
3. Education (Patients/families)
4. Multidisciplinary team
5. Core elements
6. Protocols, policies & procedures
7. Collects, analyses & reports data
8. Act on improvement opportunities

CORE ELEMENTS

- Leadership commitment
- Accountability to a multidisciplinary team
- Drug Expertise
- Action
- Tracking
- Reporting
- Education

www.jointcommission.org/assets/1/6/HAP-CAH_Antimicrobial_Prepub.pdf

“Action”

- Policies/Protocols
  - IV to PO, pharmacokinetic dosing, renal dosing, formulary interchanges
- Surgical prophylaxis (2 doses to 1)
- Medical Informatics
  - Formulary, antimicrobial time-outs, end-dates, culture notification, order sets
- Microbiology Products
  - BioFire (FilmArray panels) vs. PNA FISH

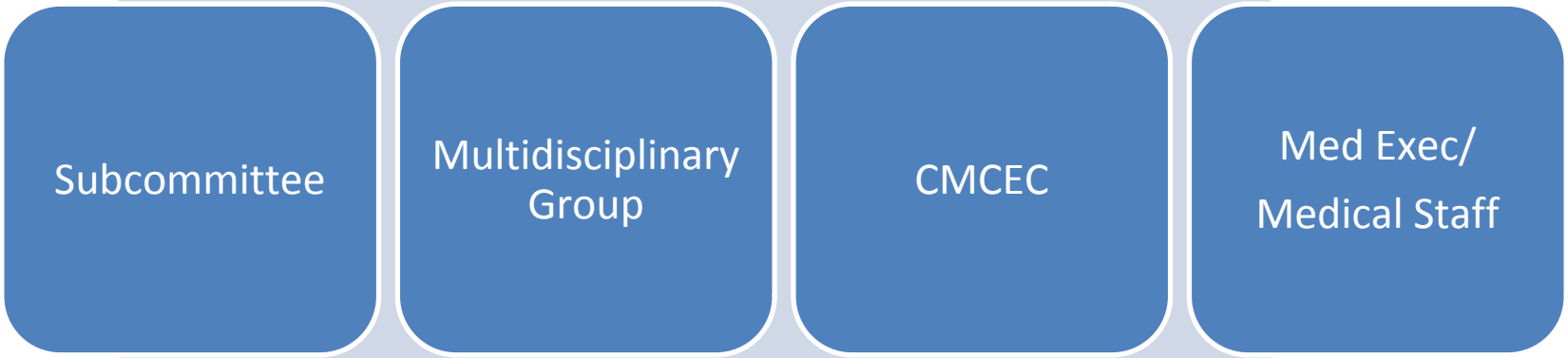
Where to put your efforts? (STC)

- ED Pharmacist (Prospective)
- Antibiotic review (Concurrent)
  - Daily chart review
  - Twice weekly targeted antibiotic review
    - CMO, ID Specialist, Pharmacy
- Targeted lab/microbiology review
  - Positive blood cultures, C Diff, Procalcitonin
- DUEs
  - Retrospective feedback to providers

Where to put your efforts? (STA)

- Emergency Department
  - Dear Provider Program
  - Culture reviews
- Disease: Pulmonary
  - Reviews
  - MD recruitment
- Targeted antibiotic
  - Carbapenems & broad spectrum
- Positive cultures
- DUEs

Routine Reporting- STA



Tracking/Quarterly Reporting

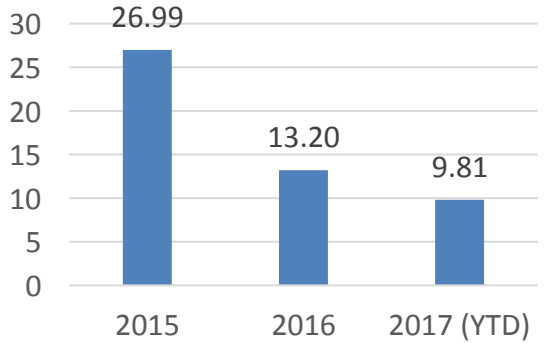
- Blood Culture Contamination Rates
- Antimicrobial Dashboard
  - DOT, DDD, spend, broad spectrum antibiotics
- DUEs
- Intervention reports
  - % Agreement with ID Specialist
- Antibiograms
- Policy Changes
  - Restricted antimicrobials, end dates

Tracking/Reporting (STC)

- Surgical site infections
  - Infection control, Surgery
- C Diff Infection rates
  - Infection control, Pharmacy

Stewardship Dashboard

- Pharmacy interventions and other metrics
- Antimicrobial spend/WEIPA
  - 2015: $ 26.99
  - 2016: $ 13.20
  - 2017: $ 9.81 (as of July 2017)



Pharmacy Interventions								
Total (2016 Avg: 9)	15	26	25					66
Bug-drug Mismatch (2016 Avg: 0.08)	1	2	0					3
De-escalation (2016 Avg: 4)	8	17	15					40
Duration of Therapy (2016 Avg: 0.5)	0	1	0					1
IV to PO (2016 Avg: 0.3)	3	2	6					11
AMS Metrics								
Injectable Antimicrobials								
DDD/1000 pt days (2016 Avg: 649.7)	589.5	621.8	542.2					584.5
DOT/1000 pt days (2016 Avg: 702.4)	667.5	698.1	568.4					644.7
Oral Antimicrobials								
DDD/1000 pt days (2016 Avg: 153.1)	196.5	167.1	114.4					159.3
DOT/1000 pt days (2016 Avg: 174)	210.7	198.4	141.7					183.6
Total								
DDD/1000 pt days (2016 Avg: 802.9)	786	788.9	656.6					743.8
DOT/1000 pt days (2016 Avg: 876.4)	878.2	896.5	710.1					828.3
Select Broad Spectrum Antibiotic Metrics								
Daptomycin								
DDD/1000 pt days (2016 Avg: 1.6)	1.7	0	0.5					0.7
DOT/1000 pt days (2016 Avg: 0.8)	1.3	0	0.3					0.5
Ertapenem								
DDD/1000 pt days (2016 Avg: 4.6)	3	1.5	1					1.8
DOT/1000 pt days (2016 Avg: 4.7)	3	1.5	1					1.8
Meropenem								
DDD/1000 pt days (2016 Avg: 22.9)	29.3	14.5	11.2					18.3
DOT/1000 pt days (2016 Avg: 21.4)	29.4	13.7	8.7					17.3
Piperacillin/Tazobactam								
DDD/1000 pt days (2016 Avg: 37.8)	33.2	41.8	29.3					34.8
DOT/1000 pt days (2016 Avg: 67.6)	58.8	74.8	52.5					62.0
Vancomycin Inj.								
DDD/1000 pt days (2016 Avg: 85.6)	82.3	95.8	85.6					87.9
DOT/1000 pt days (2016 Avg: 91.9)	89.1	96.2	79.7					88.3

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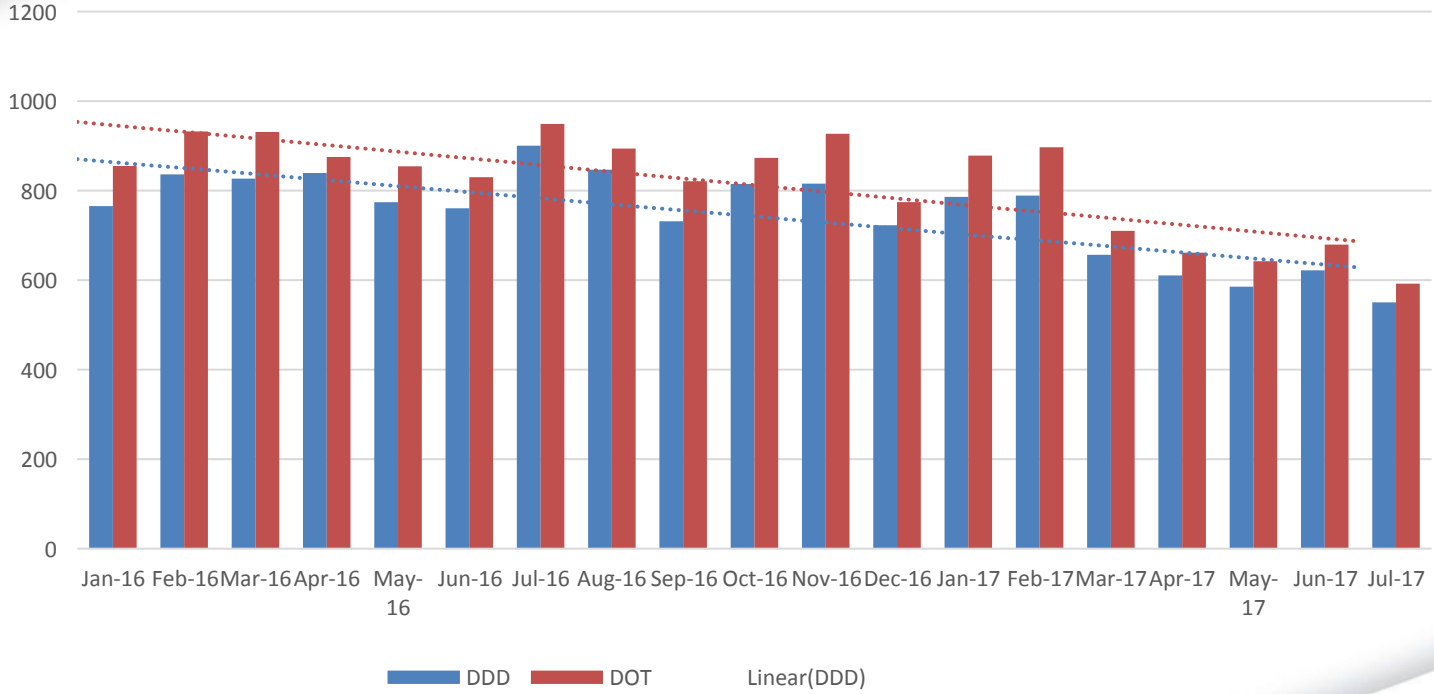
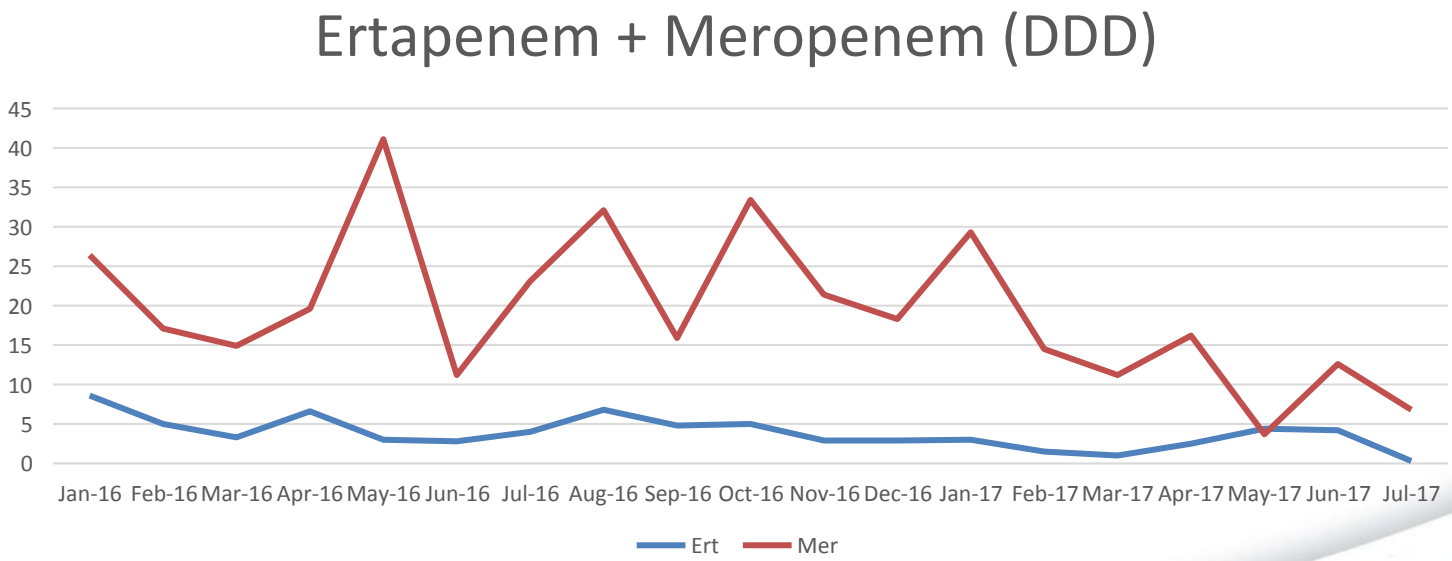
DDD and DOT/1000 Patient Days

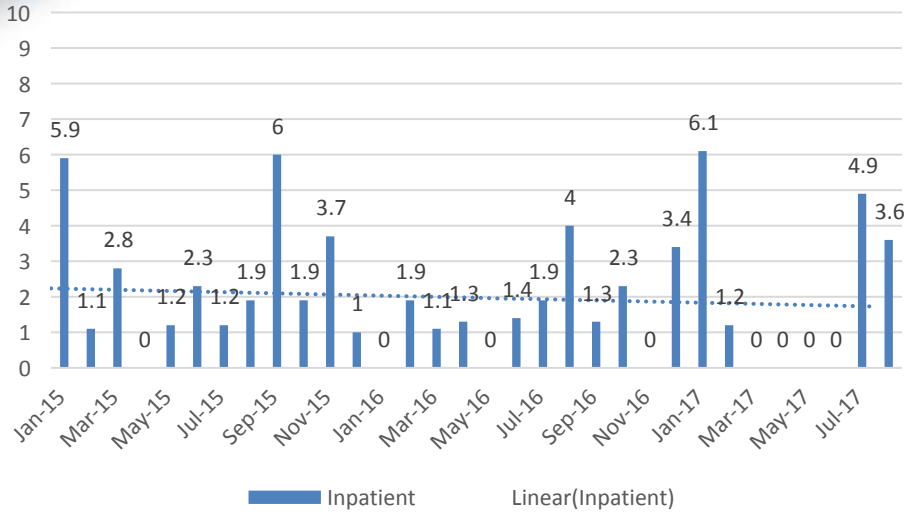


Carbapenems

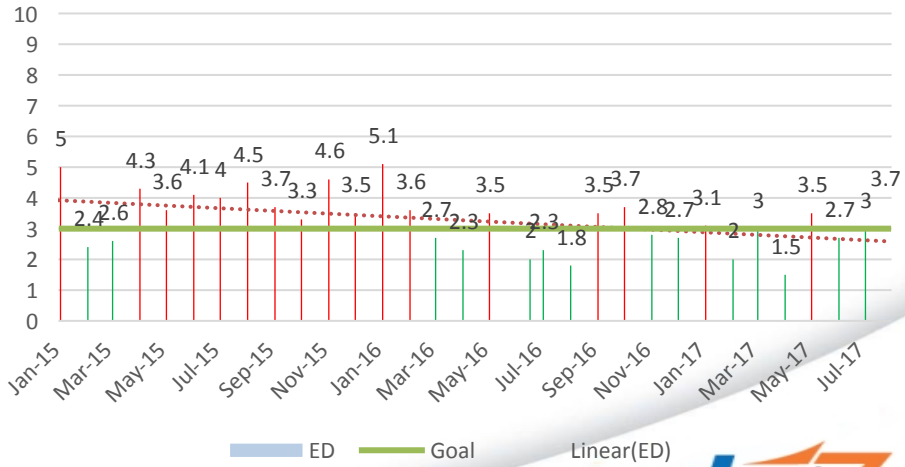


Contaminated Blood Cultures- IP& ED

INPATIENT



ED



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Why track contaminated blood cultures?

	2015	2016	2017
Vanco patients (n=)	4	1	
Vanco doses	17	3	
Revisits to the ED	--	17	
Unnecessary admissions	--	1	

Meropenem Review
Jan 1- Feb 28, 2017.

Findings:

- 64% use could potentially have been avoided

- 7/17 cases were prescribed by ID
  - 59% non-specialist

Stewardship interventions

Chart Review and Recommendations Summary

Intervention Type	Number
De-escalation	12
Bug-drug mismatch	4
IV to PO	3
Total	19

Prescriber Response	Number (%)	Number (%)	Number (%)	Number (%)
	7/3/16-8/4/1	23/16-11/15/1	1/23/16-1/10/1	1/24/17-3/21/17
Accepted	10 (62%)	11(65%)	10(48%)	15 (79%)
Rejected	6 (38%)	6 (35%)	11(52%)	4 (21%)
Total	16 (100%)	17 (100%)	21 (100%)	19 (100%)

ID Specialist Response	
Agree	66 (90%)
Disagree	7 (10%)
Total	73 (100%)

- Respiratory & UTI
- ID specialist agrees with pharmacist recommendations approximately 90% of time.

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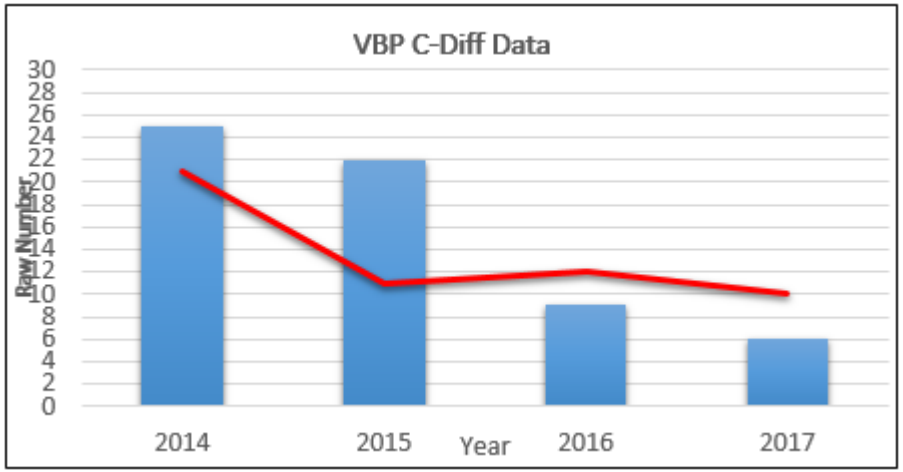
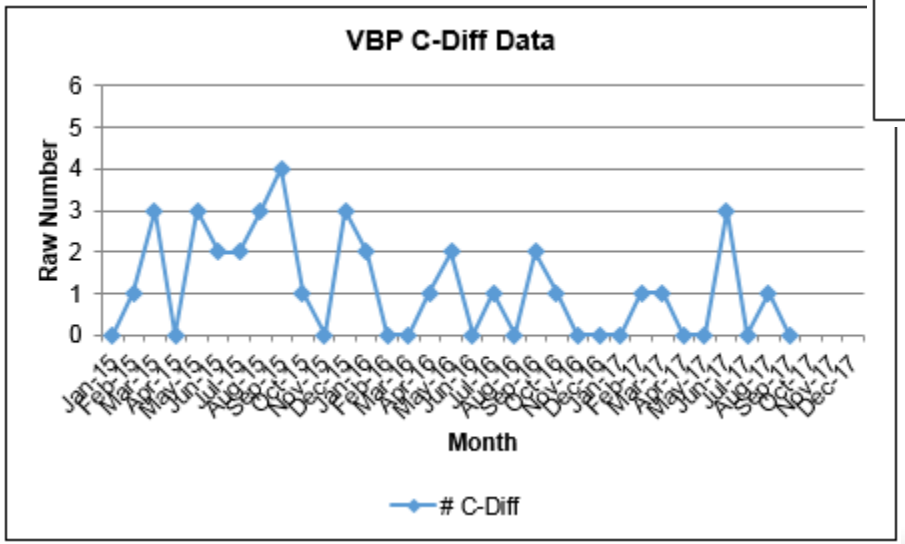
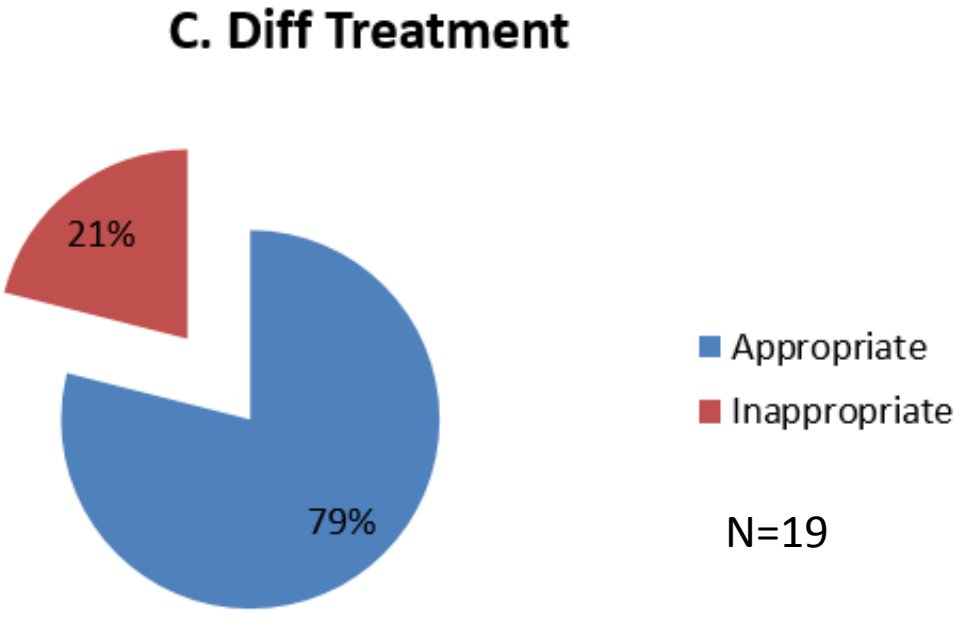
C-Diff Data


VBP C-Diff Data
Raw Number
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
2014
2015
Year
2016
2017


VBP C-Diff Data
Raw Number
6
5
4
3
2
1
0
Month
C-Diff

C.Diff Treatment Review

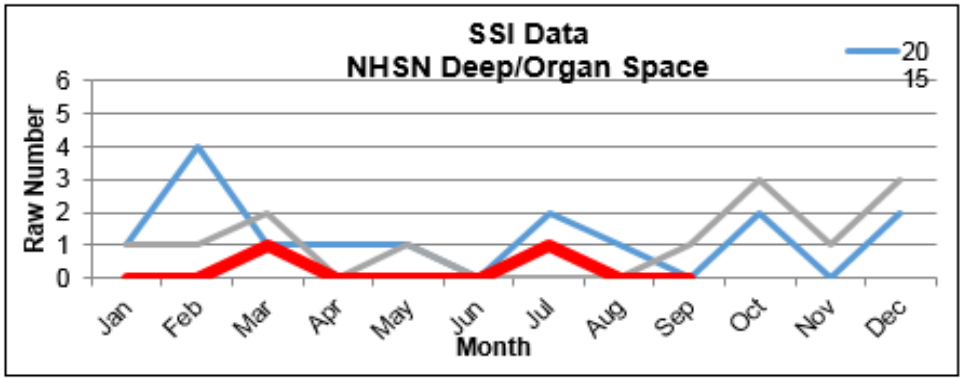
Mercy Health - St. Charles Hospital
Q1 2017 C. Difficile Reports



N=19

Surgical antibiotics

- Pre-op antibiotic order set updated
- Pre-op antibiotics entered prior to procedure
  - review and dose adjustment
- Removal of ertapenem from order set
- Morning surgery huddles



Education

Educates staff and licensed independent practitioners…

…Education occurs upon hire or granting of initial privileges and periodically thereafter, based on organizational need.

- Residents' Orientation Presentation
- Practitioner Orientation packet
- Antibiogram distribution
- Quarterly reports to medical staff
- Dear Provider Letter Program

- Required i-Learns

Antibiogram - St. Charles

Community-acquired pneumonia (CAP) in hospitalized patients

Empiric Treatment

Patient NOT in ICU
- Ceftriaxone 1G IV Q24h **PLUS** Azithromycin 500mg IV/PO Q24h
- Levofloxacin 750mg IV/PO Q24h
- Duration of treatment 7-8 days[1]

Patient in ICU
- Ceftriaxone 1G IV Q24h **PLUS** Azithromycin 500mg IV Q24h
- Ceftriaxone 1G IV Q24h **PLUS** Levofloxacin 750mg IV Q24h
- (If Allergy to Beta-Lactam antibiotics) Meropenem 1G IV Q8h **PLUS** Azithromycin 500mg IV Q24h **PLUS** Tobramycin 5mg/kg IV Q24h
- Duration of treatment 7-8 days[1]

Patient in ICU with risk of pseudomonas
(structural lung disease (i.e. bronchiectasis), corticosteroid use, broad-spectrum antibiotics for > 7 days in the past month, COPD)
- Ciprofloxacin 400mg IV Q12h **PLUS** Piperacillin/Tazobactam 3.375G IV Q8h
- Azithromycin 500mg IV Q24h **PLUS** Tobramycin 5mg/kg IV Q24h **PLUS** Piperacillin/Tazobactam 3.375G IV Q8h
- Azithromycin 500mg IV Q24h **PLUS** Tobramycin 5mg/kg IV Q24h **PLUS** Meropenem 1G IV Q8h
- Duration of treatment 10-14 days[1]

[1]Depending on patient response/symptoms

Bacterial urinary tract infections (UTI)

Asymptomatic bacteruria
(Positive urine culture ≥ 100,000 CFU/ml with no Signs or symptoms)
NO treatment unless the patient is:
- Pregnant
- Scheduled to have an urologic procedure
- Post renal transplant
- Neutropenic

Acute cystitis
(Signs and symptoms (e.g. dysuria, urgency, frequency, suprapubic pain AND positive urine culture ≥100,000 CFU/ml AND pyuria (> 10 WBC/hpf)

Uncomplicated:
- Nitrofurantoin 100mg PO Q12h x 5 days
- TMP/SMX 1 DS tab PO Q12h x 3 days
- Cephalexin 500mg PO Q6h x 5-7 days
- Cefazolin 1G IV Q8h x 5-7 days
- Duration of treatment 3-7 days[1]

Complicated:
- Ciprofloxacin 400mg IV Q12h
- Ceftriaxone 1G IV Q24h
- Duration of treatment 7 days[1]

Cellulitis

Non-purulent
(Moderate to Severe)
- Cefazolin 1G IV Q8h
- (PCN allergy) Clindamycin 600mg IV Q8h (History of MRSA or high risk for MRSA)
- Vancomycin 15mg/kg IV Q12h (Pharmacy to dose)
- Duration of treatment 5-7 days[1]

Clostridium Difficile (C. Diff)

- 3 loose stools within 24hr w/symptoms
- Consider alternative cause of diarrhea
- No solid stool samples tested
- Do not test patients with history of C. Diff if loose stools and symptoms are not present or after only one loose stool
- Do not test to confirm eradication
- Duration of treatment 10-14 days with at least 7 days post other antibiotics[1]

Mild/Moderate
(WBC ≤ 15,000 cells/mm³ **AND** SCr < 1.5 x baseline)
- Metronidazole 500mg IV/PO Q8h
- Vancomycin 125mg PO Q6h

Mod/Severe
(WBC > 15,000 cells/mm³ **OR** SCr ≥ 1.5 x baseline)
- Vancomycin 125mg PO Q6h

Severe, complicated
(Hypotension, Shock, Ileus, or Megacolon)
- Vancomycin 500mg PO Q6h AND Metronidazole 500mg IV Q8h

Recurrence
1st recurrence •repeat initial therapy
2nd or more recurrence •Vancomycin oral taper

Cellulitis

Purulent
(Mild to Moderate)
- Doxycycline 100mg po BID
- Clindamycin 300mg PO Q8h
- Clindamycin 600mg IV Q8h (Severe)
- Vancomycin 15mg/kg IV Q12h (Pharmacy to dose)
- •••Duration of treatment 7-14 days[1]

Interpreting the microbiology report

Gram-positive cocci

Aerobic
In clusters
- Coagulase (+): *S. aureus*
- Coagulase (-): *S. epidermidis, S. lugdunensis*

In pairs / chains
- Diplococcus, Quellung positive: S. pneumoniae
- Alpha-hemolytic: Viridins group *Streptococci, Enterococcus (faecalis and faecium)*
- Beta-hemolytic: Group A strep (*S. pyogenes*) Group B strep (*S. agalactiae*) Group C, D, G strep

Anaerobic: *Peptostreptococcus spp.*

Gram-negative cocci

Aerobic
Diplococcus: *N. meningiditis, N. Gonorrhoeae, Moraxella catarrhalis*
Cocco-bacillus: *H. flu, Acinetobacter Spp.*, HACEK organisms

Anaerobic: *Veillonella spp.*

Gram-positive rods

Aerobic
Large: *Bacillus spp.*
Cocco-bacillus: *Listeria monocytogenes, Lactobacillus spp.*
Small, pleomorphic: *Corynebacterium spp.*
Branching filaments: *Nocardia spp, Streptomyces spp.*

Anaerobic
Large: *Clostridium spp.*
Small: pleomorphic: *P. acnes, Actinomyces spp.*

Gram-negative rods

Aerobic
Lactose fermenting: *Citrobacter spp., Enterobacter spp., E. coli, Klebsiella spp., Serratia app.*
Non-lactose fermenting
- Oxidase (-): *Acinetobacter spp., Burkholderia spp.,E. coli (rare), Proteus spp., Salmonella spp., Shigella spp., Serratia spp., Stenotrophomonas maltophilia*
- Oxidase (+): *P. aeruginosa, Aeromonas spp., Vibrio spp., Campylobacter spp. (curved)*

Anaerobic: *Bacteroides spp., Fusobacterium spp., Prevotella spp.*

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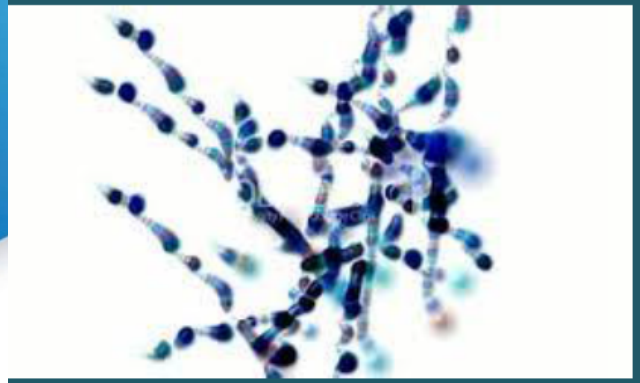


BUG BEAT

APRIL 2017

Mercy Health - St. Anne Hospital
Antimicrobial Stewardship Program Newsletter

*NEWSLETTER NOT FOR GENERAL PUBLIC DISTRIBUTION

Editors: Jen Richardson, PharmD, BCPS, CACP, Susan J. Lewis, PharmD, BCPS, Tanyanyiwa Chinyadza, MD, Lisa Beauch, BSN, RN, CAPA, CPAN, CIC, Mikayla Rader, PharmD Candidate 2017

PROTECTING CARBAPENEMS: Why is it important?

Antibiotic resistance is a global health concern that continues to grow with no solution in sight. According to the CDC, an estimated 2 million people in the United States become infected with antibiotic-resistant bacteria each year, with 23,000 of those cases ending in death due to the infection.[4] Carbapenems are our most potent beta-lactam antibiotic in regards to gram-negative and gram-positive coverage and have the broadest spectrum of activity when comparted to the other beta-lactams. Due to these unique features, carbapenems should be used as a **last-line option** when all other possible antibiotic choices have been exhausted.

Unfortunately, we have already seen an increase in carbapenem-resistant bacteria in the United States. The CDC reports that Carbapenem-resistant *Enterobacteriaceae* (CRE), such as carbapenem-resistant *Klebsiella* spp., can contribute to death

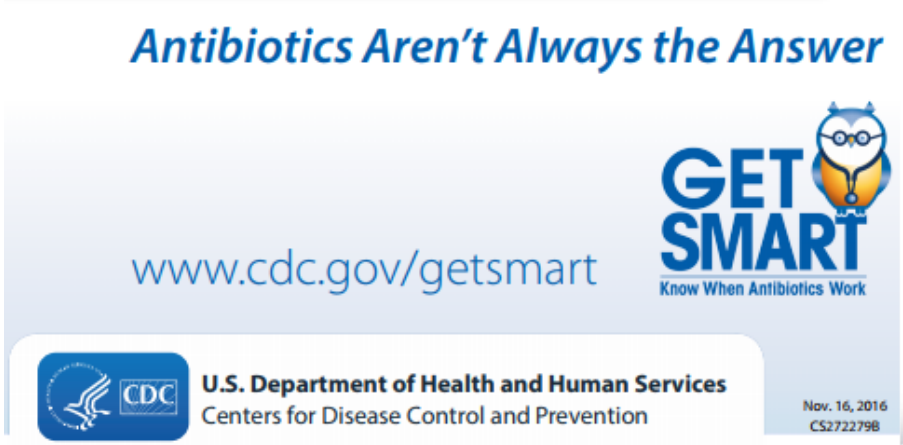
E.Coli susceptibilities 2016

	Cipro	Bactrim	Nitrofurantoin	Cefazolin	Ceftriaxone
St. V - ED	89	76	85	96	No data
St. V - IP	64	77	96	82	90
St. Anne - ED	79	76	97	94	95
St. Anne - IP	73	81	97	84	94
St. Charles – ED	79	75	96	93	94
St. Charles – IP	66	77	93	94	90
Tiffin	76	85	90	86	96
Willard	84	69	100	100	100

Education

Educates patients [and families]

- Discharge pamphlet
- Public postings …



You've Been Prescribed an Antibiotic
Now What?

GET SMART
Know When Antibiotics Work
www.cdc.gov/getsmart

Your healthcare team thinks that you or your loved one might have an infection. Some infections can be treated with antibiotics, which are powerful, life-saving drugs. Like all medications, antibiotics have side effects and should only be used when necessary. There are some important things you should know about your antibiotic treatment.

https://www.cdc.gov/getsmart/healthcare/pdfs/16_265926_antibioticfactsheet_v7_508-final.pdf

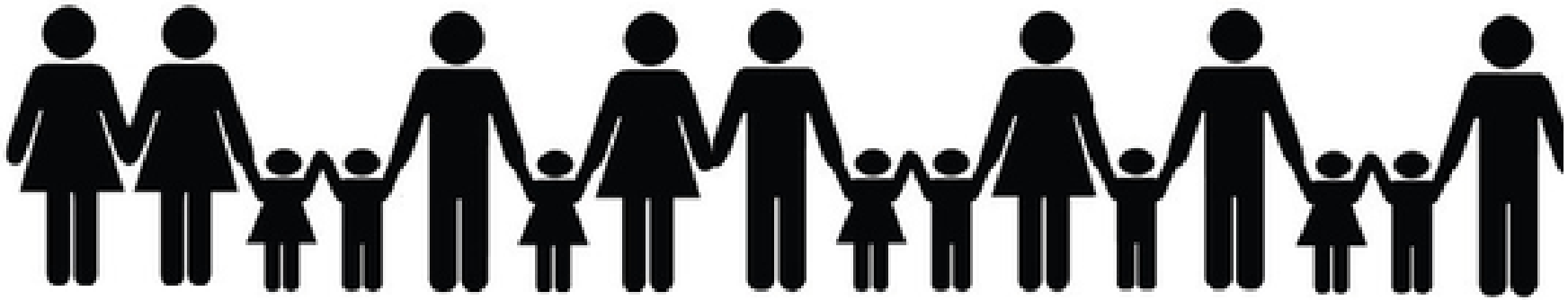
AMS Examples - St. Charles

- General Staff Education
  - Pneumonia, sepsis, cellulitis, UTI, stewardship
  - Physician Grand Rounds
  - Nursing Grand Rounds
  - Resident lectures
- Pharmacy Newsletters
- Educational Flyers

Key Takeaways

- A successful stewardship program is possible even with a limited staff.
- Small continual changes, regardless of initial approach, will have a positive impact.
- Reporting metrics are a challenge, but focusing on appropriate use will show positive changes.

It Takes A Village



Lab

Pharmacy

Administration

Nursing Education

ID Specialist

Med Staffing Services

Infection Control

Prescribers

Nursing

Quality

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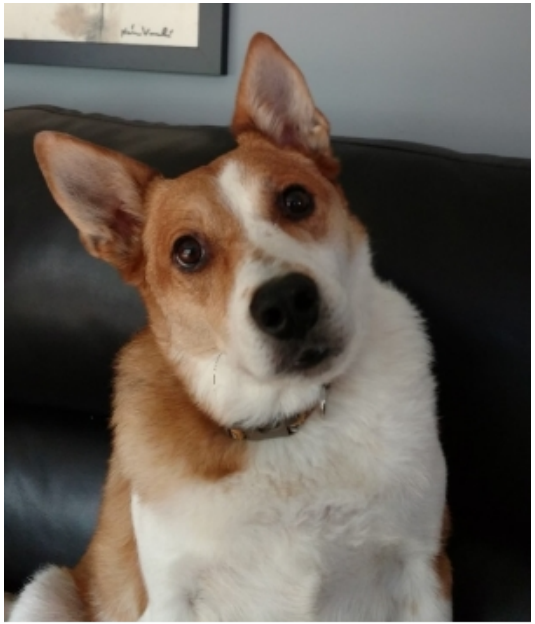

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