

Louisiana Antibiotic Stewardship Summit 2019

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WORLD-CLASS HEALTHCARE. CLOSE TO HOME.



- Provide insight on how to link Antibiotic Stewardship to Quality.
- Discuss key methods to gain support from the C suite in order to make necessary investments and how to continue to get buy in to sustain the program.
- Describe how to expand the Antibiotic Stewardship Program outside of traditional stewardship activities.



### ST. TAMMANY PARISH HOSPITAL (STPH)

- 233 Bed Community Hospital in Covington, La
- STPH is a self-supporting not-for-profit community hospital
- 30 Hospitalists
- 3 ID Physicians
- Services:
  - Chest Pain Center
  - Trauma Center
  - Stroke Center
  - Neurosciences & Rehab







## ST. TAMMANY PARISH HOSPITAL (STPH) ANTIBIOTIC STEWARDSHIP PROGRAM





### ST. TAMMANY PARISH HOSPITAL (STPH) ANTIBIOTIC STEWARDSHIP PROGRAM

- Results:
  - Quality
    - Defined Daily Doses (DDD)
    - Targeted Therapy
    - Reduced Infection Rate
      - Surgical Site
      - C.diff
  - Return on Investment
    - Cost per Adjusted Patient Day



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## TOP BARRIERS TO STEWARDSHIP IN COMMUNITY HOSPITALS

- Lack of:
  - Funding
  - Personnel
  - Time
  - IT support
  - Physician Support



https://talking is a gift. files. word press. com/2014/12/economist-using-tech-to-overcome-barriers-to-entry. product of the state of



#### GAINING SUPPORT & BUY-IN

- C-Suite & Physicians:
  - Education
  - Establish Goals
  - Collateral Benefits
    - Reduction in Adverse Drug Reactions from Antibiotics
    - Cost Per Patient Day



# ANTIBIOTIC RESISTANCE.... IT IS ONLY A MATTER OF TIME





## THREE BASIC QUESTIONS

- What objective (not subjective) data is available that indicates that there is an issue with inappropriate antibiotic use?
- How will the impact of antibiotic stewardship be measured?
- •What personnel will comprise your team?



## MULTIDISCIPLINARY ANTIMICROBIAL STEWARDSHIP TEAM

- Core Members
  - Infectious diseases physician
  - Administration/Medical staff leadership
  - Clinical pharmacist with infectious diseases training
  - Infection prevention professional
  - Clinical microbiologist
  - Hospitalist member
  - Information systems specialist
- Dedicated Personnel
  - 1.5 FTE Pharmacists
  - 0.25 FTE ID Physician





# CABC SURGICAL SITE INFECTION PROJECT 2007

Problem Identified: Multiple Hospitals in Region Experiencing Higher than Desired Surgical Site Infections in CABG Patients

- Multidisciplinary approach involving five hospitals
  - Infectious Disease Physicians
  - Cardiovascular Surgeons
  - Clinical Pharmacists
  - Infection Preventionists
- Collaborative approach to implementation of evidence-based best practices for infection prevention
- Lesson learned:
  - Positive results helped turn initial facility and physician competition into collaboration
  - Order sets should be interwoven into individual physician order sets for better compliance



# RESULTS: RATES SIGNIFICANTLY DECREASED 2009 & MAINTAINED



#### **IMPLEMENTATION OF BEST PRACTICES**

- MRSA screening of all patients prior to cardiac surgery
- Decolonization protocols for patients positive for MRSA
- Weight based dosing for prophylactic antibiotics cefazolin and vancomycin
- Prophylactic antibiotics for patients positive for MRSA
- Prophylactic antibiotics for patients allergic to penicillin or cephalosporins
  - Penicillin allergy skin testing implemented
- SCIP guidelines



# SLOW & STEADY ...

- STPH Initial Focus:
  - Patients on more than 2 antimicrobials
  - Patients on any MRSA agent
  - Reviewed daily culture and sensitivity reports
  - Extended Infusion of Beta-lactams



- Daily review with pharmacists & ID physician to focus on de-escalation, discontinuation, and drug-bug mismatches, discharge culture reviews
- Report identified issues to committee



### INITIAL IMPACT OF IMPLEMENTING AN ANTIBIOTIC STEWARDSHIP PROGRAM



Lower Risk of C-Diff Infection



Average Cost of Antibiotics per

# \$1.3 million

11/10.00

\$URLER

101.01

101.01

\$70,00

\$50,01

150,00

HUN

\$31,01

13U.0

10.00

Decreasing Defined Daily Doses (DDD) of Targeted Antibiotics





# **OBJECTIVE DATA: PACEMAKER POST OP ANTIBIOTICS**



#### Pacemaker Implantation

Postoperative Use of Antibiotics 2012-2013 Study

Appropriate Care: No postoperative Antibiotics

> 72 Patients -56 Received post-op Abx

**Compliance to Best Practice:** 

23% Before

68% After



### DATA COLLECTION

- Defined daily doses (DDD/1000 patient days) for top anti-infectives (initially)
- Days of Therapy (DOT/1000 patient days)
- Stewardship scorecard
  - Physician Specific trends
- Cost per adjusted patient day
- Updated antibiogram annually
  - Readily accessed through Electronic Health Record (EHR)
- Pharmacy intervention rates
- Surveillance software





#### SUCCESSFUL COMPONENTS: STPH PROGRAM

- Automatic dosing protocols
  - Renal dosing
  - Aminoglycoside and vancomycin dosing by pharmacists
  - Pharmacists given ordering privileges for lab values needed to monitor drug therapy
  - IV to PO
- Mini-rounding
  - Clinical pharmacist evaluates antibiotic regimens
  - Discuss complex patients with ID physician
- Harness IT capabilities: Surveillance Software



## NEW POLICIES AND EDUCATION

- Antimicrobial Stewardship Policy and Procedure
  - Defines an antimicrobial stewardship program
  - Outlines the procedure of the pharmacist's ASP activities that involves a multidisciplinary effort

#### Formulary Restriction Policy

- Formulary restrictions for antibiotics requiring an Infectious Diseases consultation in the effort to control usage, decrease resistance, and control overall costs
- IV to PO Policy—auto-conversions approved by Medical Services
- Featured articles in the medical staff newsletter
- Measure improvement in Physician acceptance



#### COMMON CHARACTERISTICS OF SUCCESSFUL STEWARDSHIP PROGRAMS

- Evidence based guidelines incorporated into order sets
  - Community acquired pneumonia
  - Surgical prophylaxis
  - Sepsis
- Administrative support:
  - Recognizes the clinical and quality benefits of stewardship
- Good interdisciplinary communication/support
- Embedded in culture
- Tied to other quality programs



# STEPS TO IMPLEMENTATION

- Establish a baseline
  - Utilize a scorecard
  - Use data that is already available as much as possible
- Measure antibiotic utilization on a monthly basis
  Focus on top 10 antibiotics initially
- Implement IV to PO policy
- Expand renal dosing protocols
- Education
- Antibiotic Timeout
  - Leverage Electronic Medical Record for Best Practice Advisory (BPA)
  - Surveillance Software





- Establish Baseline Data:
  - Baseline measurement of antibiotics
  - Target patients eligible for streamlining
- Develop "Roll-Out" Plan
- Implement Pharmacy Renal Dosing Policy
- Document Interventions



## IMPACT OF THE IMPLEMENTATION OF AN ANTIBIOTIC STEWARDSHIP TEAM

**Decreased Clostridium difficile** 

**Decreased Defined Daily Doses of Targeted Antibiotics** 

cyclin

ezolid





Decreased cost of Antibiotics per Adjusted Patient Day

#### Median Cost of Antibiotics per Adjusted Patient Day 2013 - 2015



#### Decreased cost of Antibiotics per Adjusted Patient Day 2013 - 2016



# **EXPANDING STEWARDSHIP**

- Penicillin Allergy Skin Testing
  - Available inpatient & outpatient
    - Nurse administered & evaluated per protocol
  - 100+ patients: 90% negative
- Outpatient Collaboration
   Community Physicians, Nursing Homes, LTAC/SNF Facilities
- Rapid Diagnostic Testing
- MRSA Nasal Swab: Negative Predictive Value for Pneumonia
- Antibiotic Timeout
  - Education to physicians



# RAPID DIAGNOSTICS: CEPHEID CASE 1

#### Ist STPH Patient Case = SUCCESS

- Empiric Antibiotics (started 9/10/2018 @ 0130):
  - Aztreonam lg IV
  - Levofloxacin 750mg IV
  - Vancomycin 15mg/kg IV q12h
- Gram stain resulted: 9/10/2018 @ 1150
- MRSA bacteremia resulted: 9/10/2018 @ 1335
- Time to de-escalation: 9/10/2018 @ 1357
  - Final antibiotic regimen: Vancomycin

Time to de-escalation		
From Admit	17 hours	
<b>From Result</b>	22 minutes	



# RAPID DIAGNOSTICS: CEPHEID CASE 2

#### STPH Patient Case = SUCCESS

- Empiric Antibiotics (started 10/12/2018 @ 0625):
  - Zosyn 4.5 g q8h
  - Vancomycin 15mg/kg IV q36h
  - Clindamycin 600mg q8h
- Gram stain resulted: 10/13/2018 @0438
- MSSA bacteremia resulted: 10/13/2018 @ 0553
- Time to de-escalation: 10/13/2018 @ 0923
  - Final antibiotic regimen: Zosyn

# Time to de-escalationFrom Admit1 day 2 hours<br/>58 minutes

From Result 3.5 hours



# RAPID DIAGNOSTICS: MRSA NASAL SWAB CASE

#### STPH Patient Case = SUCCESS

- Empiric Antibiotics (started 10/09/2018 @ 0625):
  - Azithromycin 500mg q24h
  - Zosyn 4.5g q8h
  - Vancomycin 1 g q12h
- MRSA nasal swab resulted: 10/09/18 @ 1547
- Time to de-escalation: 10/09/18 @ 1603
  - Final antibiotic regimen: Zosyn, Azithromycin

#### Time to de-escalation

From Admit	9 hours 38	
	minutes	
From Result	16 minutes	







# PROCALCITONIN

- Implemented Jan 31<sup>st</sup>
- Added as prechecked to the Sepsis, COPD, & Pneumonia order sets
- Used to discontinue antibiotics and determine appropriate duration of therapy



# PROCALCITONIN: CASES

- 1.) Discontinuation of antibiotics for Influenza Positive Patient
  - Flu A positive in ED. No hypoxia. Droplet precautions. Continue Tamiflu for 5-day course.
  - Low suspicion for superimposed bacterial infection. Procalcitonin <0.05 Hold ABX (as opposed to Just In Case)
- 2.) CHF Patient: It is unclear whether patient has a pneumonia versus all findings consistent with congestive heart failure. Procalcitonin level normal (<0.05). Continue IV antibiotics for now and consider stopping tomorrow after read of echo.
- 3.) Pip/tazo & Vancomycin for sepsis and pneumonia. Procalcitonin = 11.04
  - "Will continue to follow the procalcitonin to determine if we are treating the appropriate organism"



# SUSTAINING STEWARDSHIP

- Incorporate into the Culture
- Medical Services/Executive Committee
- CME
- Daily Interventions
- Expand Rapid Diagnostics
   STPH implemented
  - Phenotypic Diagnostics
    - Bacteremia

Sequence of Events	Result	Date/Time
Blood Cultures Drawn		3/25/19 @ 11:12
Empirically started pip/tazo		3/25/19 @ 11:41
Gram Stain	Gram negative rods	3/26/19 @ 00:05
Final Lab Results	Pan-sensitive E. Coli	3/26/19 @ 0817
Physician notified by pharmacy		3/26/19 @ 0931
De-escalation to ceftriaxone		3/26/19 @ 0936

Blood Cultures Resulted in less than 24 hours with identification/MIC



