

25 - Minute Primer:

STRUCTURING ANTIMICROBIAL STEWARDSHIP

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Antimicrobial Stewardship

"...the optimal selection, dose, & duration of an antimicrobial

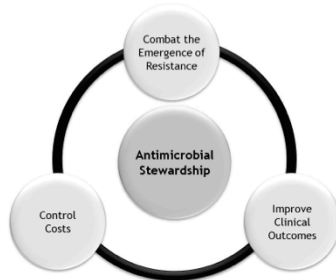


that results in:

the best clinical outcome for the treatment or prevention of infection, with minimal toxicity to the patient & minimal impact on subsequent resistance."

- Dale Gerding

Goals of Antimicrobial Stewardship



[Adapted] Lawrence KL, Kollef MH. Am J Respir Crit Care Med. 2009;179:434-438.

Goals of Antimicrobial Stewardship

Improving Clinical Outcomes

IMPROVEMENT MEASURES

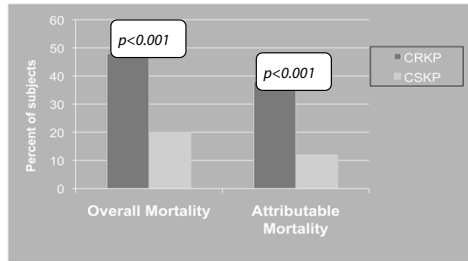
- Decrease LOS
- Improve Organism : ABX match
 - Accuracy empiric regimens
 - Decrease Organism : ABX mismatch
 - Rapid correction of mismatches
- Proper dosing (including PK / PD)
- Proper DOT
- Facilitate IV to PO
- Appropriate ABX/D/C as indicated



AVOIDANCE MANEUVERS

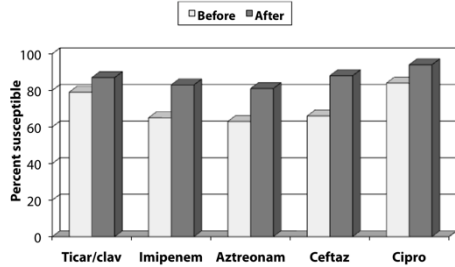
- Minimize "Collateral Damage"
 - Bacterial Superinfection
 - Clostridium difficile*
 - Stenotrophomonas sp.*
 - Fungal superinfection
- Waning activity per antibiogram
- Hospital-Acquired Infection, other
- Increase LOS

Mortality associated with carbapenem resistant (CR) vs susceptible (CS) *Klebsiella pneumoniae* (KP)



Patel G et al. *Infect Control Hosp Epidemiol* 2008;29:1099-1106

P. aeruginosa susceptibilities before and after implementation of antibiotic restrictions



White AC Jr, et. al. *CID* 1997;25:230-239.

ASI Program – Key Players

- Administration, C-Suite “Buy-in”
- Formal Committee Structure
- Physician Champion(s)
 - ID, Hospitalists, Hem/Onc
 - Surgery – rare, but if willing ➡ very useful
- Pharmacy, specialty training preferred
- IP (formerly IC) – nursing, microbiology
- QI
- Other – informatics, SS/UR

ASI Program – Components

- Education
- Prospective audit – intervention & feedback
- ABX restriction, authorization
- ABX order-sets, Tx guidelines/pathways/CDSS
- ABX optimization
- Streamlining / de-escalation
- IV to PO
- Monitoring – processes ➡ outcomes

1. Owens Jr, RC, Ambrose PG, Nightingale CH (Eds). *Antibiotic Optimization*. 2005
2. Dellit TH, et. al. *Clin Infect Dis* 2007;44:159-177

“But, I Don’t Have Time & the C-Suite Won’t Give Me \$\$\$”

- Find, prioritize time – it might be done to you
 - Results are justification
 - “Low-hanging fruit”
- Find, gather, collaborate: data / outcomes
 - Often already exists
 - Seek QI, IP services:
 - *C. difficile* rates & corresponding “precautions” (ie, isolation beds)
- Don’t duplicate efforts – especially with incorrect methodology



Centers for Disease Control and Prevention
 CDC 24/7: Saving Lives. Protecting People. Saving Money Through Prevention.



Get Smart for Healthcare

Topics:

- Why inpatient stewardship?
- Improving stewardship efforts – tools/resources
- Evidence to support stewardship efforts
- Resource library

The C-Suite

Type: Administrator, MBA

Type: MD, MPH, RN, RPh

\$\$\$\$-Oriented

- Revenue Generation
 - MTM programs
 - Retail
- Cost-savings
 - ABX Class
 - Overall ABX Budget
 - Unpaid Beds

More Clinically-Oriented

- Outcomes
 - 30-day Re-Admits
 - LOS
 - Medication Safety
 - Meet, Exceed Core Measures

Must attach, align with task groups that aim to improve organization initiatives. Good results – especially those viewed publicly usually well-received by all C-Suite types

Case...

A cardiothoracic surgeon “is interested” in using ceftriaxone for AMP in open-heart cases.

Is this appropriate; can CTS start using it?

- CTX use detected in ABX surveillance reports

Wellens F, et. al. *Eur J Cardiothorac Surg* 1995;9:325-329.
 Kernoodle DS, et. al. *JAMA* 1990;263:961-966.

The Society of Thoracic Surgeons Practice Guideline Series: Antibiotic Prophylaxis in Cardiac Surgery, Part II: Antibiotic Choice*

Richard Engelman, MD, David Shahian, MD, Richard Shemin, MD, T. Sloane Guy, MD, Dale Bratzler, DO, MPH, Fred Edwards, MD, Marshall Jacobs, MD, Hiran Fernando, MD, and Charles Bridges, MD, ScD

Baystate Medical Center, Springfield, Massachusetts; Tufts University School of Medicine, Boston, Massachusetts; Boston Medical Center, Boston, Massachusetts; University of California, San Francisco, California; Oklahoma Foundation for Medical Quality, Oklahoma City, Oklahoma; University of Florida, Shands Jacksonville, Jacksonville, Florida; St. Christopher's Hospital for Children, Philadelphia, Pennsylvania; and University of Pennsylvania Medical Center, Philadelphia, Pennsylvania

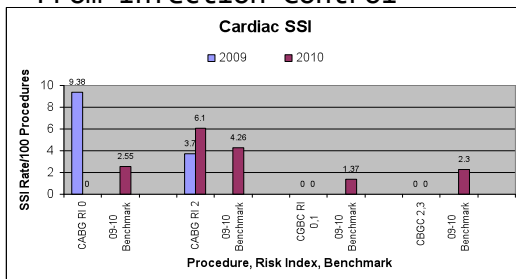
- "...our predominant organism for cardiac surgical infections is a *Staphylococcus* sp.;"
- "...earlier generation cephalosporins are...preferred for prophylaxis;"
- "In fact, published data would support that conclusion."

Ann Thorac Surg 2007;83:1569-1576.

The Nordic Lady Sings...



From Infection Control



From QI Services

Examples of Intra- and Extramural Benchmarking

Core Measures	Apr-Jun 2009	Jul-Sep 2009	Oct-Dec 2009	Jan-Mar 2010	Apr-Jun 2010	Jul-Sep 2010
Prophylactic ABX Received Within One Hour Prior to Surgical Incision-Cardiac Sx	100%	100%	100%	100%	100%	100%
	15	12	16	13	17	13
Prophylactic ABX Selection For Surgical Patients-Cardiac Sx	100%	100%	100%	86%	100%	100%
	14	10	15	14	16	17
Prophylactic ABX Discontinued Within 48 hours after Surgery End Time-Cardiac Sx	100%	100%	100%	100%	92%	93%
	13	14	14	14	13	15
UHC Top 10 Percent	100%	100%	100%	100%	100%	100%

Effecting Change

Key Elements:

- Face-to-face education of prescribing MDs
- Use of key opinion leaders (ie Dept. Chairs)
- Implementing instantaneous reminders to prevent prescribing mishaps *before* they occur

Everitt DE, et. al. *Infect Control Hosp Epidemiol* 1990;11:578-583
 Editorial: John McGowan, Jr. 575-577

Dr. Z: 3 SSI Cases Over 20 Months

MRN

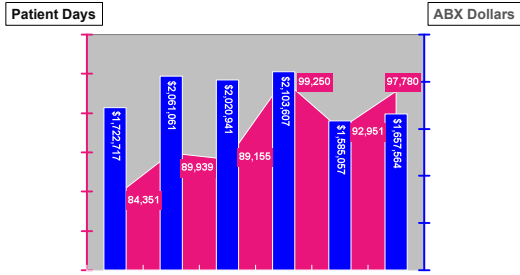
Pt Demo	Procedure	SSI Site	Cx Result	Sensi's
1839583 M 31y	Aor Root replace; St. J mech valve conduit; replace ascending aorta	Sternum Organ / Space		
1479291 F 71y	CABG x 3; L leg SV graft	LLE graft Superficial		
345212 M 72y	CABG x 4; R leg SV graft	Sternum Organ / Space		

Summary

Stewardship services review events:

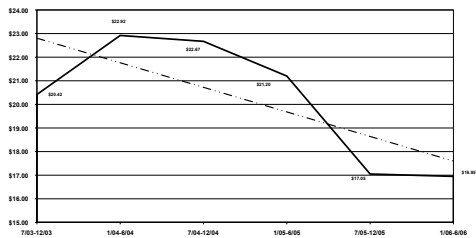
- Pharmacy: ID, OR RPhs detect aberrant pattern
- IC: clusters, SSI rates, unusual CTS cases, onset
- Micro: organism sensi's, antibiogram
- QI: quarterly ABX selection, timing
- **IC MD & RPh contact, review cases w/ CTS surgeon**
 - Among SSI cases, there is no pathogen isolated that CTX would have provided > coverage than cefazolin
- CTS Surgery resumes using cefazolin

Biannual Patient Days & ABX \$\$\$



Barber, GR: Lakeland Reg Med Ctr, ~800 beds

ABX \$\$\$ per Patient Day



Barber, GR: Lakeland Reg Med Ctr, ~800 beds

The Family...

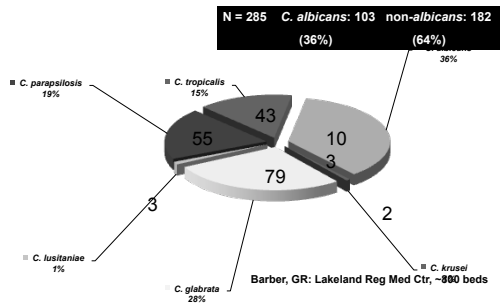
Candida species

- *C. albicans*
- *C. glabrata*
- *C. guilliermondii*
- *C. krusei*
- *C. lusitanae*
- *C. parapsilosis*
- *C. rugosa*
- *C. tropicalis*

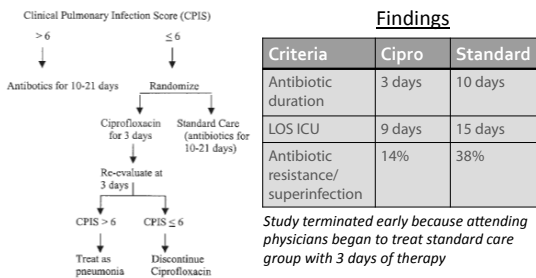


Distribution

All *Candida sp* BSI
LRMC 2000 – 2005



Stewardship optimizes patient safety: decreased patient-level resistance



Singh N et al. *Am J Respir Crit Care Med.* 2000;162:505-11.

Conclusion

Structuring Stewardship Services:

- AMS: coming to your neighborhood
 - Participate, help institution move forward - *or*
 - Be left behind...
- Look first for existing data, existing resources
 - Collaboration is essential
 - Garner formal organization & committee support of formulary principles & AMSP directives
 - Repetitive education, feedback, AMSP evaluation

Conclusion (cont'd)

Structuring Stewardship Services:

- Approach, proposals to C-suite – vary
 - Gather support of other services
 - Clinically minded C-suite: clinical successes
 - Admin-minded: \$\$\$-savings, bed turnover
- Visibility, performance measures:
 - Own department
 - Floor services – all, any relevant, *all share success*
 - Med Staff
 - C-suite
 - Community

**I was getting sick, and you came at once,
Together with a hundred students,
O Symmachus;
A hundred frosty fingers probed me;
I had no fever, O Symmachus; now I have.**

**Wash These
Frequently**