

Using Data to Track Antibiotic Use and Outcomes

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Objectives

- ▶ Describe the Antibiotic Stewardship Core Element of tracking and the specific interventions and outcomes that can be monitored.
- ▶ Understand how the pharmacy (not just the consultant pharmacist) can be included in antibiotic stewardship policies.

Outline

- ▶ Antibiotic Stewardship: Definition and Importance
- ▶ Antibiotic Stewardship: Core Elements
 - ▶ Tracking Data
- ▶ Tracking Interventions and Outcomes
- ▶ Pharmacy Interventions
- ▶ Antibiotic Stewardship during Transitions of Care
 - ▶ How to Involve the Pharmacy

Thrifty White Pharmacy

- ▶ Duluth location
 - ▶ Provides services for patients in various facilities:
 - ▶ Skilled nursing (SNFs)
 - ▶ Assisted living
 - ▶ Correctional
 - ▶ Group homes
- ▶ Pharmacy used when patients transition from hospital to nursing facility

Antibiotic Stewardship

“...a set of commitments and actions designed to optimize the treatment of infections while reducing the adverse events associated with antibiotic use.”

-Centers for Disease Control and Prevention

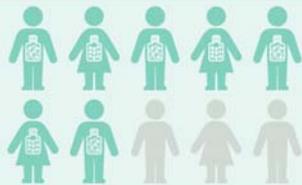
Antibiotic Stewardship

- ▶ Goals:
 - ▶ Prevent antibiotic overuse
 - ▶ Decrease the incidence of multi-drug resistant organism (MDRO) infections

Most common types of infection

- ▶ Urinary tract infections
- ▶ Lower respiratory tract infections
- ▶ Skin and soft tissue infections
- ▶ Gastroenteritis

Why is it important?



UP TO **70%**
of nursing home residents
received antibiotics during a year



UP TO **75%**
of antibiotics are
prescribed incorrectly



Why is it important?

Reduce Risk

- ▶ Prevent drug-resistant infections
- ▶ *C. difficile* related diarrhea
- ▶ Drug interactions
- ▶ Medication side effects

Antibiotic Stewardship Core Elements



1. Leadership commitment

2. Accountability

3. Drug expertise

4. Action



5. Tracking

6. Reporting

7. Education

Antibiotic Stewardship Core Elements

- ▶ 5. Tracking
 - ▶ Monitor at least:
 - ▶ One process measure
 - ▶ One outcome measure

Tracking Interventions and Outcomes

- ▶ Process Measures: How and why antibiotics are prescribed
- ▶ Antibiotic Use Measures: How often and how many antibiotics are prescribed
- ▶ Antibiotic Outcome Measures: Adverse outcomes and costs from antibiotics

Tracking Interventions and Outcomes

- ▶ Process Measures: How and why antibiotics are prescribed
 - ▶ Review antibiotic starts to determine if facility is following prescribing policies
 - ▶ Clinical assessment
 - ▶ Prescription documentation
 - ▶ Antibiotic selection

Tracking Interventions and Outcomes

- ▶ Antibiotic Use Measures: How often and how many antibiotics are prescribed
 - ▶ Nursing home initiated antibiotic starts
 - ▶ Days of therapy
- ▶ Choose measure to track based on what intervention is being used
 - ▶ “Antibiotic time out” (discontinuing antibiotic based on post prescription review) would decrease the days of therapy but not number of starts

Tracking Interventions and Outcomes

- ▶ Antibiotics outcome measures: Adverse outcomes and costs from antibiotics
- ▶ Clinical outcomes:
 - ▶ *C. difficile* infections
 - ▶ Multi-drug resistant organisms
 - ▶ Adverse events
- ▶ Reporting to CDC's National Healthcare Safety Network

CDC National Healthcare Safety Network

- ▶ Healthcare associated infection tracking system
- ▶ Facilities register with network and provide infection data
- ▶ Provides regions, states, and facilities with data to:
 - ▶ Identify problem areas
 - ▶ Measure progress of prevention efforts
 - ▶ Reduce healthcare associated infections

Pharmacy Interventions

- ▶ Review of antibiotic prescriptions
- ▶ Establish standards on laboratory testing
- ▶ Review of microbiology culture results

- ▶ Proper documentation and instruction for nurses:
 - ▶ Changing an antibiotic following culture results
 - ▶ Clear discontinuation orders of the first antibiotic are needed
 - ▶ Prevents the patient from receiving both antibiotics at the same time

Pharmacy Interventions

- ▶ Information given to pharmacy every time an antibiotic is prescribed:
 - ▶ Drug
 - ▶ Dose
 - ▶ Duration (specific start/end date)
 - ▶ Specific indication (prophylaxis or therapy)
 - ▶ Specific organism (if known)

- ▶ Allows pharmacist to clinically interpret antibiotic appropriateness
- ▶ Consistent documentation allows for tracking trends within facility

Sample Antibiogram

GRAM-POSITIVE AEROBES (% susceptibility)

Organism	# isolates tested	Penicillins/Cephalosporins						Fluoroquinolones/Aminoglycosides (synergy)/Other Antibiotics										
		Ampicillin	Ampicillin-sulbactam	Doxiflin	Penicillin	Ceftazidime	Levofloxacin	Moxifloxacin	Gen-500 (b)	Strept-2000 (c)	Chloramphenicol	Cladribin	Erythromycin	Linezolid	Nicotianin (d)	Ritampin (e)	Tremethoprim-sulf	Vancomycin
E faecium	10	0*			0*		0*		70*	50*				10*	100*	0*		10*
Enterococcus sp	14	100*			100*		29*		43*	57*				0*	100*	86*		86*
S aureus	55			52	0		36	40			57	29	100*	100*	98	98	100	100
S epidermidis	42			10	0						36	24	100	100	93	45	100	100
S hominis	10			0*			70*	70*			60*	10*	100*	90*	100*		100*	100*

GRAM-NEGATIVE AEROBES (% susceptibility)

Organism	# isolates tested	Penicillins/Cephalosporins						Aminoglycosides				Fluoroquinolones/Other Antibiotics						
		Ampicillin	Ampicillin-sulb	Piperacillin-tazo	Ceftazidime	Cefepime	Ceftazidime	Ceftazidime	Amikacin	Gentamicin	Tobramycin	Capreomycin	Levofloxacin	Axeloxacin	Nicotianin (d)	Erigonem	Imipenem	Mergonem (e)
E cloacae	11		55*	0*	73*	55*	55*	100*	73*	73*	73*	64*	60*	18*		91*		55*
E coli (c)	34	32	47	60	60	65	65	100	62	79	59	59	65	60	100	100	100*	62
K pneumoniae (c)	14	0*	83*	83*	83*	100*	100*	100*	100*	100*	100*	100*	100*	29*	100*	100*	100*	83*
P aeruginosa	27	0	0	78	0	91	74	0	100	70	89	56	44	0	100*	63	71*	0

Stanford School of Medicine. Palo Alta VA Antibiogram.
<http://errolzodajga.com/medicine/pages/OtherPages/PAVAAntibiogram.html>

Transitions of Care

The coordination and continuity of health care as patients move from one care setting to another



<http://healthy-transitions-colorado.org>
 Accessed 8/14/16

Transitions Example: Hospital to Skilled Nursing Facility

- ▶ Patients orders include antibiotics
- ▶ Generally, the pharmacy has no information other than:
 - ▶ Name of drug
 - ▶ Dose
 - ▶ Directions
 - ▶ Length of therapy
- ▶ Missing:
 - ▶ Indication!!
 - ▶ Cultures
 - ▶ Patient history

Transition Example: Hospital to Skilled Nursing Facility

- ▶ Pharmacy receives orders for vancomycin IV therapy
- ▶ Information pharmacy does not have:
 - ▶ Diagnosis
 - ▶ Culture results (have they been done?)
 - ▶ Trough date
 - ▶ Trough goal range
 - ▶ Following ID prescriber

IV Therapy: Improving Communication

- ▶ Vancomycin communication forms shared with SNFs and ID
 - ▶ Ensure appropriate therapy monitoring
 - ▶ Dosing adjustments are timely
- ▶ New vancomycin order form:
 - ▶ Following ID prescriber
 - ▶ Diagnosis
 - ▶ Trough date
 - ▶ Goal range
 - ▶ Stop date or next ID appointment
- ▶ Trough date reminder

Guiding Principles and Results of Stewardship

- ▶ Prompt initiation of therapy
- ▶ Better empiric coverage of pathogen; streamlined coverage of known pathogen
- ▶ Optimally dosed and timed antibiotics
- ▶ Reduced adverse events and complications

Help keep your patients from falling through the cracks!

