

Practical Pearls for Effective Sustainable Stewardship Programs

Promoting Antimicrobial Stewardship Programs in
Minnesota

Oct. 24th, 2013

MOA Bloomington, MN

Susan Kline, MD, MPH

Introduction

- Lead Physician Champion for Antimicrobial Stewardship at the University of Minnesota Medical Center, Fairview
- Medical Director for Infection Control , University of Minnesota Medical Center, Fairview
- Infectious Disease Physician, University of Minnesota Physicians
- Associate Professor of Medicine, University of Minnesota Medical School

Disclosures

- Research funded by Pfizer Pharmaceuticals
- Previously served as member of speaker's bureau for Pfizer's Pharmaceutical

Practical Pearls for Effective Sustainable Stewardship Programs: Top Ten List

- (1) Be helpful
- (2) Be respectful
- (3) Show your value
- (4) Work on issues important to your institution
- (5) Measure important process measures and
- (6) Measure important outcomes
- (7) Get a single win and demonstrate the value of that win
- (8) Changing provider behavior is a key factor
- (9) Stewardship is a collaborative process
- (10) Improve patient outcomes!

Antimicrobial Stewardship

- Overarching goals
 - Decrease unneeded antibiotic use while improving patient outcomes
 - Minimize unintended consequences
- Optimize antimicrobial use
 - Right drug
 - Right dose
 - Right timing
 - Right length of therapy

Unintended effects of antibiotics

- Allergic reaction
- Acute kidney injury
- Liver injury
- Bone marrow suppression
- Antibiotic resistance
- Antibiotic associated diarrhea
 - *C. difficile* diarrhea, colitis, toxic megacolon

Influence Prescriber Behavior (8)

- Be helpful (1)
 - Make your provider's work easier and better
 - Give them good advice
 - Work on issues that providers care about
 - Everyone's goal is a good patient outcome
 - Fit into provider's daily work flow

Influence Prescriber Behavior (8)

- Be respectful (2)
 - Be diplomatic
 - Acknowledge provider's knowledge and expertise
 - Avoid disparaging comments
 - Take a team approach

Antimicrobial stewardship notes

- Develop a good communication process
- Determine best methods to communicate your guidance
- Show examples of our AMT notes

Sample AMT note

University of Minnesota Medical Center, Fairview

Antimicrobial Management Team (AMT) Note

Antimicrobial Management Program Clinical Note-- *A joint venture between Fairview Pharmacy Services and UM Physicians to optimize antibiotic management*
NOT a formal Consult-Restricted Antibiotic Review

To: Internal Medicine Team X

Patient:

Unit:

Allergies: NKA

Influence Prescriber Behavior

- Physicians and surgeons want their patient to have a good outcome
- Help them achieve a good patient outcome
- Use evidence based guidelines
- Collect data to show effects of intervention
- Above all do no harm

Evidence Based Medicine

- ASP should be supported by:
 - Clinical data
 - Clinical studies
 - Expert and Local Guidelines
- Be evidence based!
 - IDSA guidelines
 - Studies supporting length of therapy
 - Shorter courses supported by data (give example)

Evidence to support shorter length of therapy

- A multi-center, randomized, controlled trial demonstrated that patients who receive appropriate initial empiric therapy for VAP for 8 days had similar outcomes to those who got 14 days.

Chastre J, et al. Comparison of 8 versus 15 days of antibiotic therapy for ventilator associated pneumonia in adults: a randomized trial. JAMA 2003; 290:2588-2598.



University of Minnesota Medical Center, Fairview (UMMC) & University of Minnesota Amplatz Children's Hospital

Antimicrobial and Disease State Guidelines

Second Edition 2011

Edited by

Kimberly Boeser, ID PharmD

Susan Kline, MD

Reviewed and Approved by the Fairview Antibiotic Subcommittee and
Pharmacy and Therapeutics Committee



Click the link for these Antimicrobials

Amikacin
Amphotericin B Ambisome
Amphotericin B Abelcet
Aztreonam
Caspofungin
Cefepime – coming soon
Ceftaroline
Ceftazidime
Cidofovir
CMV IgG
Daptomycin
Doripenem
Fidaxomicin –coming soon
Foscarnet
Imipenem
Linezolid
Meropenem
Micafungin
Quinopristin
Ribavirin
Synagis – added April 2013
Telavancin – coming soon
Tigecycline
Vancomycin
Voriconazole

and for these Disease States

C difficile
Candidemia
Invasive Aspergillosis
Blood Stream Infections
Pneumonia
Diabetic foot infections

Clostridium difficile Associated Diarrhea (CDAD) Guidelines

Definitions

Mild to Moderate Disease:

- Presence of diarrhea
 - Confirmed positive culture and toxin A and/or B
 - WBC < 15,000 cells/mm³ or unchanged
 - Normal Serum creatinine (SCr < 1)
- Severe, Uncomplicated Disease
 - Presence of diarrhea
 - Confirmed positive culture and toxin A and/or B
 - WBC > 15,000 cells/mm³ or unchanged
 - Increasing Serum creatinine-50% higher than the level prior to infection
 - Severe, Complicated Disease
 - Same criteria as severe, uncomplicated *plus*
 - Hypotension or shock
 - Evidence of megacolon, colonic perforation or severe colitis on CT

Empiric treatment/Initial Treatment:

If patient develops diarrhea and meets risk factors (see above), send stool specimen to microbiology lab for culture and immunoassay for toxin A and B.

Metronidazole 500 mg PO TID for 10-14 days

- It is not recommended to use beyond 14 days

Relapse post-treatment/Relapse #1:

Of note: relapse occurs in 10-20% of patients

Send Cdiff Toxin B PCR

Re-initiate Metronidazole 500 mg PO TID for 10-14 days

Relapse post-treatment/Relapse #2:

Vancomycin 125 mg PO QID for 10-14 days

Relapse post-treatment/ Relapse #3:

Vancomycin taper + pulse dosing:

- Week 1: 125 mg PO QID
- Week 2: 125 mg PO BID
- Week 3: 125 mg PO Daily
- Week 4: 125 mg PO Q 48 hours
- Week 5 & 6: 125 mg PO Q3 days
- Pulse: 125 mg Q2-3 days for 2-8 weeks in addition to taper

Severe, Complicated Treatment

Immediate surgical consultation

- Colectomy may be life saving
- Total abdominal colectomy with end ileostomy is procedure of choice

Metronidazole 500 mg IV Q6 hours *plus*

Vancomycin 250-500 mg PO QID +

Vancomycin enema 500 mg in 1 liter NS perfused 1-3 ml/min x 2-3 days

***Do not exceed 2 gm Vancomycin/ 24 hours

For Isolation Policy

Barrier Precautions

- Glove and gown use when examining/providing patient care
- Hand washing
 - Alcohol based hand rubs do not kill *C. difficile* spores
- Private rooms for those patients with CDAD and fecal incontinence

Environmental disinfection with bleach

Dedicated equipment if possible, if not ensure equipment is cleaned and disinfected between patients

Clinical Pearls

It takes ~ 2-4 days for diarrhea to resolve once treatment is initiated

Anti-motility agents should NOT be used

Lactobacillus and saccharomyces little evidence

Reference

Cohen SH, Gerding DN, et al. Clinical practice guidelines for *Clostridium difficile* infections in adults: 2010 update by SHEA and IDSA. *Infection Control and Hospital Epidemiology*.2010: 31(5).

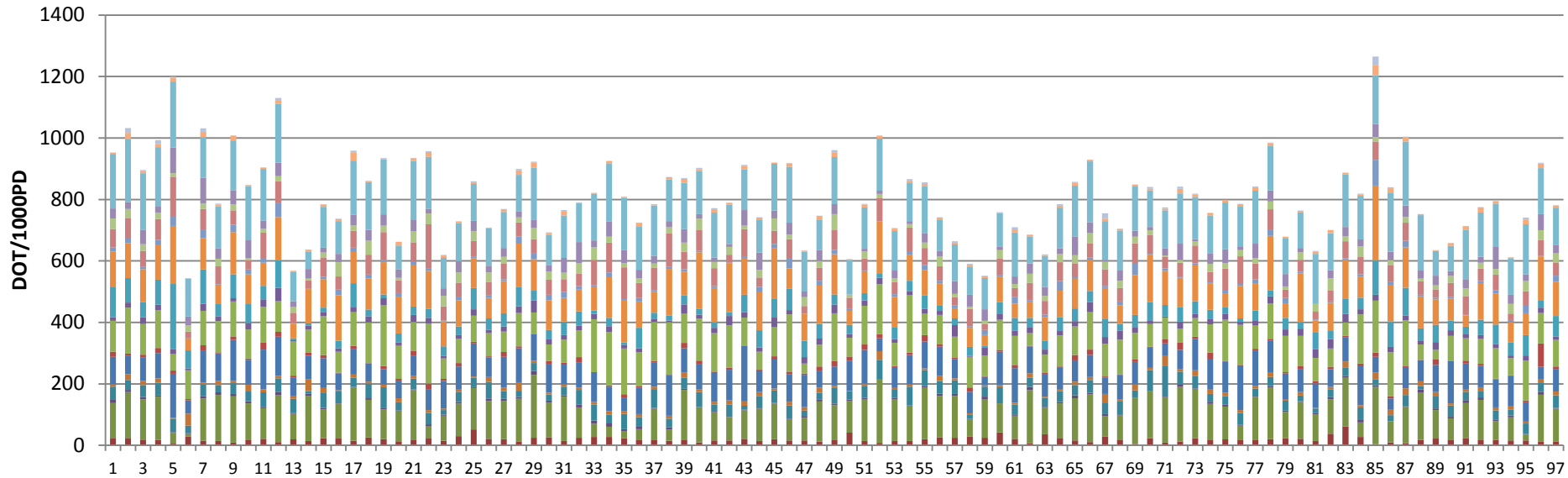
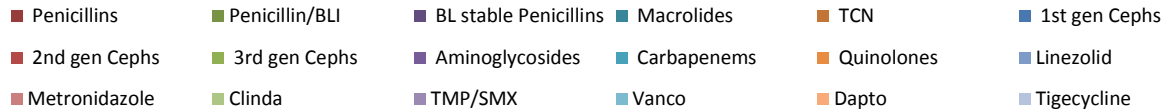
Influence Prescriber Behavior

- Look for benchmarking measures
- Provide feedback to prescribers-private
- One on one peer feedback on prescribing practices
- Low prescribers explain what they do to high prescribers
- (Give example)

Benchmarking

- Show some of Ron Polk's data
- Show U of MN data
- Risk adjustment to be developed
- Bench mark against yourself or other national norms (new CDC module)
- DOT vs. DDD

Antimicrobial Use Benchmarking



Courtesy of Ron Polk, PharmD
AMCs, UHC 2012 data

Show your value (3)

- Focus on value
 - Better quality
 - For less money
- Get a single win and demonstrate your value
 - Decreased antimicrobial expenditures
 - Decreased days of therapy

Targeted use of newer antifungal agents

- Developed guidelines for use of the newer antifungal agents
- Reviewed prescriptions to see if they met these guidelines
- In cases where guidelines were not followed notes were left explaining why alternatives were recommended
- Literature was searched to aid in writing antifungal use guidelines (give examples of effects of this intervention)

What metrics can be used to measure impact of ASP?

- Decreased C. difficile diarrhea rates
- Decreased MDROs
- Decreased DDD or DOT
- Decreased antimicrobial resistance on antibiogram
- Decreased Length of Stay
- Increased cure rate
- Decreased readmissions
- Decreased unintended consequences
- Decreased mortality or no increase in mortality (show examples of all of the above)

Work on issues important to your institution (4)

- If antibiotic costs are important then address this issue
- Where are excess costs occurring?
- Are the antibiotics being used appropriate?
- Which are the problem antibiotics?
- For which indications are they being used?
- Discuss how to address potential prescribing problems

Determine what your institution is interested in

- Collect data on that measure
- Determine if your ASP is impacting that measure
- If it isn't determine what else needs to be done

Develop restricted antibiotic guidelines to address problem antibiotics

- Are MDROs important to your institution?
- What problems are you having?
- Example of vancomycin prescribing
- Developed guidelines for appropriate indications for use
- Auto stop at 48 hours if guidelines not followed
- Need to take a close look at the patient to determine if the use is indicated or warranted or justifiable or not
- Not an expensive antibiotic but selects for VRE
- Additional adverse side effects nephrotoxicity

Current “problem” antibiotic

- Daptomycin
- Start with a drug use evaluation
- Is use appropriate?
- Where is it being prescribed?
- What are the indications?
- What is the data to support it's use?

Outcome Measures

- Measure important process measures (5)
 - What process measures should you measure?
- Measure important outcomes (6)
 - What outcome measures should you measure?

C. difficile as an outcome measure

- This is increasing being looked at as a good outcome measure to track effectiveness of antimicrobial stewardship
- Multi-factorial
- Ideally want to show impact of stewardship efforts such as decreased volume of antibiotic use associated with decreased C. difficile rates
- We know there are other things that effect C. difficile rates
- Infection Control, isolation, hand washing, cleaning of the environment
- Show effects at our institution, decrease in C. difficile rates over time

Get a single win (7)

- Demonstrate the value of that win (7)
- We decreased antibiotic costs or
- We decreased antibiotic doses or
- We decreased length of stay in the ICU
- We improved patient outcomes
- (show data from studies that support these issues)

Changing Provider Prescribing behavior is a key factor (8)

- Additional tactics to consider
 - Education
 - Order sets
 - Treatment algorithms
 - Limited formulary
 - Pre-authorization

Changing prescriber behavior

- Engage senior leadership (clinical and administrative) is critical
- Address stewardship message to the clinical leadership within the existing clinical groups (surgical, medical, pediatrics, transplant, heme/onc) rather than just the trainees or ID docs
- Understand local culture and patient population

Changing prescriber behavior

- Changing prescriber behavior is a key factor in improving antibiotic use in the long run
- But changing behavior is hard and the solution is likely multi-factorial
- Impact of consistent messages from ASP shows up over time in the prescribers' notes

Interventions to measure to determine success of ASP

- (1) Stopping antibiotics
- (2) Decreasing duration of antibiotics
- (3) Narrowing or otherwise improving therapy
- (4) IV to PO switch
- (5) Switching from one broad spectrum agent to another

Stewardship is a collaborative effort (9)

- To be successful ASP should be a collaborative partnership between:
 - Infection preventionists
 - Pharmacists
 - Health care epidemiologists
 - Microbiologists
 - Key physician champions (ID, hospitalists, FP, IM, ED, Peds, Surgeons and others)
 - Public health
 - Health care administrators

Improve patient outcomes! (10)

- Increase cures
- Decrease LOS
- Decrease mortality
- Decrease adverse events
- Improve quality of life
- The most important but the hardest to show
- Show example of study that has shown the effects of ASP on outcome measure

Clinical outcomes in a randomized controlled trial comparing the Hospital of the University of Pennsylvania (HUP)* program to usual practice

Outcome	HUP program (n = 96)	Usual practice (n = 95)	Relative risk (95% CI)
Antimicrobial appropriate	86 (90%)	30 (32%)	2.8 (2.1–3.8)
Cure	52/57 (91%)	34/62 (55%)	1.7 (1.3–2.1)
Failure [†]	5 (5%)	29 (31%)	0.2 (0.1–0.4)
Clinical	4 (4%)	10 (11%)	-
Microbiologic	0	10 (11%)	-
Superinfection	0	8 (8%)	-
Service changed antibiotic	0	8 (8%)	-
Adverse drug effect	0	5 (5%)	-
Recurrent infection	1 (1%)	2 (2%)	-
Resistance	1 (1%)	1 (1%)	0.13 (0.02–1.0)

Pearls for Effective Sustainable ASP

- Focus on value-better quality for less money
- Be supported by a physician champion
- Get a single win and demonstrate your value
- Be supported by clinical studies and expert guidelines that are evidence based
- Be diplomatic
- Make your providers' work easier and better
- Give them good clinical advice
- Ideally show benefits on patient outcomes or at a minimum show you saved money but caused no harms
- Pick an issue that administrators or IP or clinicians care about to work on
- Pick an issue important to your institution to work on
- Pick something that you think is important to work on
- Demonstrate your value towards improving quality of patient care!

Acknowledgements

- UMMC
 - Kim Boeser, Pharm D
 - Pam Phelps, Pharm D
 - Infection Prevention Department-Infection Preventionists, Chris Hendrickson, Anita Guelcher, Tessie Rackozy, Amanda Guspiel, Ginger Ward, Liz Niewinski, Peggy Bonnell
- IDWeek 2013
 - Drs. Neil Fishman, Sara Cosgove, James Musser

References and Resources

- IDSA Guidelines on line
 - www.idsociety.org/idsa_practice_guidelines
- MDH Resources on line
 - Minnesota Guide to a Comprehensive Antimicrobial Stewardship Program
 - Appendix A: ASP Resources page 14
 - <http://www.health.state.mn.us/divs/idepc/dtopics/antibioticresistance/mnasp.pdf>

Discussion/Questions?