

Inpatient Antimicrobial Stewardship Program Implementation

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Objectives

- ❑ Define antimicrobial stewardship
- ❑ **Cite reasons why inpatient antibiotic stewardship programs (ASP) are important**
- ❑ **Recall time-line and key milestones for implementation of I.H.S. ASP for inpatient**
- ❑ **Compare & contrast examples of ASP elements**
- ❑ **List potential starting points for ASP implementation for your site**
- ❑ **List some resources available**

Stewardship

“The management or care for something, particularly the kind that is successful”

The Goal

Prospective optimization of antibiotic therapy – period.

Antimicrobial Stewardship

- **Strategic efforts to optimize antimicrobial prescribing**
 - *Drug*
 - *Dose*
 - *Duration*
 - *De-escalation*
 - *Indication - recognize when not needed*

Something To Ponder

- ❑ Antibiotic stewardship asks us to think about the community, not only the patient being treated**
- ❑ The adverse effects of antibiotic overuse and misuse have implications beyond the patient and outside of your facility**

Why Implement ASP?

“If best infection control practices and antibiotic stewardship were nationally adopted, more than 600,000 infections and 37,000 deaths could be prevented over 5 years.”

CDC Emerging Infections Program (EIP) Assessment of Prescribing in 36 Hospitals

- ❑ **Antibiotic prescribing could potentially be improved in over one third (37%) of common prescription scenarios**

- ❑ **Examples:**
 - **“UTI”** – Asymptomatic bacteria accounted for 21% of patients receiving treatment with antibiotics
 - **Vancomycin use**
 - No Gram (+) bacterial growth, but still treated >3 days: 22%
 - Culture grew only oxacillin-susceptible *Staphylococcus aureus*, but patient still treated >3 days : 5%

Rationale For Antibiotic Stewardship

- Improve Patient Care and Safety
 - **Prevent *C. Difficile* infections**
 - **Minimize Adverse Events**

- Reduce Resistance
 - **Preserve antimicrobial effectiveness**
 - **Decrease excess deaths**

REPORT TO THE PRESIDENT ON
COMBATING ANTIBIOTIC RESISTANCE

Executive Office of the President
President's Council of Advisors on
Science and Technology

September 2014



Recommends that a
regulatory
requirement for
antibiotic
stewardship be in
place by 2017

As California Goes....

“Starting July 1 (2015), acute care hospitals in California must put into effect antimicrobial stewardship programs.....”

Section 1.C. Systems to Prevent Transmission of MDROs and Promote Antimicrobial Stewardship

Elements to be assessed		Surveyor Notes
1.C.1 The hospital has policies and procedures to minimize the risk of development and transmission of multidrug-resistant organisms (MDROs) within the hospital (applicable to all persons in the hospital).	☐ Yes ☐ No	
1.C.2 Systems are in place to designate patients known to be colonized or infected with a targeted MDRO and to notify receiving units and personnel prior to movement of such patients within the hospital.	☐ Yes ☐ No	
1.C.3 Systems are in place to designate patients known to be colonized or infected with a targeted MDRO and to notify receiving healthcare facilities and personnel prior to transfer of such patient between facilities.	☐ Yes ☐ No	
If no to any part of 1.C.1 through 1.C.3, cite at 42 CFR 482.42(a) (Tag A-0749)		
1.C.4 The hospital can provide a list of target MDROs. Note: Hospitals should provide a list of MDROs that are targeted for infection control because they are epidemiologically important (e.g., MRSA, VRE). Please refer to CDC's Guideline for Isolation Precautions for criteria that may be used to define epidemiology important organisms: http://www.cdc.gov/hicpac/pdf/isolation/Isolation2007.pdf	☐ Yes ☐ No	
1.C.5 The hospital can demonstrate the criteria used to determine epidemiologically important MDROs on their list.	☐ Yes ☐ No	
1.C.6 The hospital can provide justification for any epidemiologically important organisms not on their list and otherwise not targeted in their hospital.	☐ Yes ☐ No ☐ N/A	
No citation risk for questions 1.C.4 through 1.C.6; for information only.		

“No Citation Risk – Information Only”

- ❑ 1.C.9 -The hospital has written policies...**
- ❑ 1.C.10 – The hospital has designated a leader...**
- ❑ 1.C.11 – Requires an indication for all antibiotic orders**
- ❑ 1.C.12 – Formal requirement of antibiotic “time out’ at 48h**
- ❑ 1.C.13 – Monitors consumption of antibiotics...**

2012 Pilot by CMS

- ❑ **1.C.2.a Facility has a multidisciplinary process in place to review antimicrobial utilization, local susceptibility patterns, and antimicrobial agents in the formulary...**
- ❑ **1.C.2.b Systems are in place to prompt clinicians to use appropriate antimicrobial agents....**
- ❑ **1.C.2.e. The facility has a system in place to identify.....(Patients eligible for IV to PO)**

Current Regulatory Need

- ❑ CMS lack of payment for hospital acquired infections – these are deemed preventable
- ❑ The Joint Commission
 - Reduce risk of HAI's
 - Implement strategies to reduce transmission of MDROs
- ❑ NHSN event reporting for *C. difficile*

Proposed Timeline

“Rome was not built in a day”

Implementation Timeline

- Goal is full implementation within 3 years
- Follow the Core Elements of Hospital Antibiotic Stewardship Programs outlined by the CDC as a guide

Available at:

<http://www.cdc.gov/getsmart/healthcare/implementation/core-elements.html>

- Goals for each year are flexible

Year 1 Goals

- Leadership Support
- Physician & Pharmacist Champions
- Policies & Procedures
- Antibigram Development
- Antimicrobial Stewardship Education Program

Year 1 – Leadership Support

- Critical for success of ASP
- Formal statements of support
- Addition of stewardship activities on PMAPs and COERs
- Supporting training and education
- Ensuring participation from the various different departments involved in ASP
 - Form an ASP workgroup/committee
- Obtaining financial support

Year 1 – Physician/Pharmacy Champions

- Identify physician champion
 - Training in infectious diseases/ASP beneficial
 - Can leverage telemedicine
 - Hospitalists may be ideal secondary to increasing presence in inpatient care
- Identify pharmacist champion
 - Training in infectious diseases/ASP beneficial
- The Pharmacy and Therapeutics committee should **NOT** be considered the stewardship team

Year 1 (cont.)

- **Policies & Procedures (Examples)**
 - Define the ASP Committee as a required committee for the hospital
 - Identify required members
 - Outline committee charges
 - Identify frequency of meetings
 - Document dose, duration, and indication
 - Facility specific treatment recommendations
 - Identify reporting requirements
 - Ex. Reports to P&T and/or medical staff
 - Avoid implementing too many policies and interventions simultaneously

Year 1 (cont.)

- **Antibiogram Development**
 - Done at least yearly for facility
 - Can be done more often if need identified
 - Can be done for individual hospital units if need identified
 - Ex. ICU, Burn Ward
- Follow best practices
 - Discussed later

Year 1 cont.

- **Antimicrobial Stewardship Education Program**
 - Include reasons for starting ASP
 - Describe increasing resistance
 - Describe best practices in treatment of infectious diseases
- View as a process, not an event
 - Continuous
 - Multiple approaches

Year 2 Goals

- Guideline development
- Implementation of Interventions
- Development of Tracking Measures
- Continue ASP Education

Year 2 cont.

- Guideline development
 - For specific indications/disease states
 - EHR indication specific order sets
 - CAP/HCAP
 - MDROs
 - UTI
 - Cellulitis/Diabetic Foot
 - MDROs
 - C. Diff
 - Treatment of culture proven invasive infections

Year 2 cont.

- Implementation of Interventions
 - Broad Interventions
 - Antibiotic “time outs”
 - Prior authorization
 - Prospective audit and feedback
 - Pharmacy-driven Interventions
 - Auto IV to PO conversions
 - Dose adjustments (ex. Renal adjustment)
 - Dose optimization
 - Automatic alerts where therapy might be unnecessarily duplicative
 - Auto-stop orders
 - Detection and prevention of ABX-related DDI

Year 2 cont.

- Development of Tracking Measures
 - Monitoring Antibiotic Prescribing
 - Monitor adherence to documentation policy (dose, duration, and indication)
 - Monitor adherence to facility-specific treatment recommendations
 - Monitor compliance with one or more of the specific interventions
 - Antibiotic Use and Outcome Measures
 - Track *C. difficile* infections
 - Produce an antibiogram report
 - Monitor use by Days of Therapy, Defined Daily Dose, and/or direct expenditure

Implementation Timeline

Year 3

- Year 3 Goals
 - Reporting of Intervention Results
 - Reporting Information to Staff on Improving Antibiotic Use and Resistance
 - Continue ASP Education

Year 1 – Foundational Project

- Create an antibiogram if none exists
- Update existing antibiogram
- Review “best practices” checklist

Obtain Raw Data

- Work with microbiology lab supervisor
- Obtain report of susceptibility results for a given time frame, usually 1 calendar year
- Use “best practices” check list at this stage to eliminate duplicate isolates and validate data

Present Data

- Will usually need to transcribe data into a more user friendly format
 - PDF – posted in E.H.R.
 - Pocket Card
- Review “best practices” check list at this stage to validate/present data appropriately

ANTIMICROBIAL SUSCEPTIBILITY CHART (% Sensitive)

Northern Navajo Medical Center

July 1, 2014 – June 30, 2015

Prepared by: Kendall Van Tyle, PharmD, BCPS, NCPS, M(ASCP); Joyanna Wendt, MD MPH; Olivia Hodgins, MSA, MSN; Pierrette Montanez, MT(ASCP)

Bacterium (total isolates)	<i>Citrobacter freundii</i> (15)	<i>Enterobacter aerogenes</i> (63)	<i>Escherichia coli</i> (1345)	<i>Klebsiella oxytoca</i> (26)	<i>Klebsiella pneumoniae</i> (215)	<i>Proteus mirabilis</i> (70)	<i>Pseudomonas aeruginosa</i> (57)	<i>Enterococcus faecalis</i> (81)	<i>Enterococcus faecium</i> (24)	<i>Staph aureus</i> (477)	<i>Staph epidermitis</i> (73)	<i>Strep pneumoniae</i> (47)
Amikacin	100	100	100	100	100	100	98					100
Amoxicillin												
Ampicillin												
Ampicillin/S												
Benzylpenic												
Beta-Lactam												
Cefazolin												
Cefepime												
Cefotaxime												
Cefotaxime												
Cefoxitin												
Ceftazidime												
Ceftazidime												
Ceftriaxone												
Ceftriaxone												
Ciprofloxacin												
Clindamycin												
ESBL (negati												
Erythromycin												
Gentamicin												
Imipenem	100	100	100			98						
Levofloxacin												
Nitrofurantoin												
Oxacillin												
Piperacillin/N												
Rifampin												
Tetracycline	0	0	87					96		21		
Tobramycin												
TMP/SMX												
Vancomycin	73	92	93									
								96		17		0
								99		100		0

- Gram (+) organisms no longer tested against first-generation cephalosporin – use Oxacillin as guide (If sensitive to Oxacillin, cefazolin/cephalexin are first-line agents)
- All species with 10 or less isolates for date range have been removed - *Morganella morganii* (7) & *Serratia marcescens* (8).

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Amikacin	100	100	100	100	100	100	96					
Amoxicillin												100
Ampicillin			56	0	0	87		96	21			
Ampicillin/Sulbactam			63^^	73	92	93						
Benzylpenicillin (Penicillin)								96	17	0	0	85^

Bacterium (total isolates)	<i>Citrobacter freundii</i> (15)	<i>Enterobacter aerogenes</i> (63)	<i>Escherichia coli</i> (1345)
Amikacin	100	100	100
Amoxicillin			
Ampicillin			56
Ampicillin/Sulbactam			63^^
Benzylpenicillin (Penicillin)			
Beta-Lactamase (negative)			
Cefazolin	0	0	96
Cefepime	100	100	99
Cefotaxime (meningitis)*			
Cefotaxime (non-meningitis)			
Cefoxitin			
Ceftazidime	73	95	99
Ceftriaxone (meningitis)*			
Ceftriaxone (non-meningitis)	87	95	99

Footnotes:

*S

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^U

Additional no

-

-

-

ANTIMICROBIAL SUSCEPTIBILITY CHART (% Sensitive)

Footnotes:

- **Streptococcus pneumoniae* only; **D-test for inducible clindamycin resistance performed on all isolates; ***Not to be used for monotherapy - synergy only
 ****Erythromycin only tested on PEN Resistant Strains (9 isolates); ^Uses meningitis breakpoints, likely overestimates resistance in non-meningitis infections;
 ^^Does not predict susceptibility to amox/clav (typically higher); it is unclear if in vivo response to amp/sulb is better than predicted by in vitro susceptibility testing.
 Trending over past 3 yrs has not substantially changed – 65%>64%>63%.

Additional notes:

- MRSA: 27% (non-duplicated, new cases – n=457); of MRSA Isolates (n=124) – 100% TMP/SMX, 98%Tetracycline, 85%Clindamycin (% Sensitive)
- Gram (+) organisms no longer tested against first-generation cephalosporin – use Oxacillin as guide (If sensitive to Oxacillin, cefazolin/cephalexin are first-line agents)
- All species with 10 or less isolates for date range have been removed - *Morganella morganii* (7) & *Serratia marcescens* (8).

Levofloxacin	100	98	88	100	95	90	79	94	17	71	70	96
Nitrofurantoin	93	11	96	85	30	0		99	29	100	100	
Oxacillin										68	41	
Piperacillin/tazobactam	86	95	97	100	97	100	96					
Rifampin										100***	97***	
Tetracycline								33	50	96	89	94
Tobramycin	100	100	96	100	97	97	96					
TMP/SMX	87	96	82	92	94	91				100	62	87
Vancomycin								99	46	100	100	100

Footnotes:

- **Streptococcus pneumoniae* only; **D-test for inducible clindamycin resistance performed on all isolates; ***Not to be used for monotherapy - synergy only
 ****Erythromycin only tested on PEN Resistant Strains (9 isolates); ^Uses meningitis breakpoints, likely overestimates resistance in non-meningitis infections;
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Indian Health Service Antibiotic Stewardship

Antibiogram Preparation Check-List

Facility Name: _____ Dates Data Collected¹: _____

+	Best Practice/Item for review	Y	N	N/A ²	Comments
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Indian Health Service Antibiotic Stewardship

Antibiogram Preparation Check-List

Facility Name: _____ Dates Data Collected¹: _____

Best Practice/Item for review	Y	N	N/A ²	Comments
Only organisms with at least 30 isolates reported ³				
Only diagnostic (not surveillance) isolates reported				
Duplicates excluded; describe how first isolate define				
Only final, verified results reported				
Percentage Susceptible reported (intermediate not reported)				

Nitrofurantoin reported for urine isolates only; not reported for
Proteus sp., *Pseudomonas sp.*, Or *Serratia sp.*

Footnotes and Guidance

1	Data for one calendar year; updated at least annually. Larger facilities may update every 6 mo
2	% Susceptibility not reported/Organism not reported
3	Smaller sites may report isolates with 10 or more; or may collect data for a longer period of time and properly note
4	Rifampin for <i>Staphylococcus sp.</i> ; aminoglycosides for <i>enterococcus sp.</i> , etc.
5	Trimethoprim/ <u>sulfamethoxazole</u>
6	<i>Serratia</i> , <i>Pseudomonas</i> , Indole-Positive protease (<i>P. vulgaris</i> , <i>Providencia sp.</i> , <i>Morganella sp.</i>), <i>Citrobacter</i> , <i>Enterobacter</i> , <i>Acinetobacter</i> – production of inducible amp-c beta-lactamase.

Adapted from:

Indian Health Service Antibiotic Stewardship

Antibiogram Preparation Check-List

Facility Name: _____ Dates Data Collected¹: _____

Do not report susceptibility to 1st/2nd/3rd Gen <u>Cephalosporins</u> (except <u>ceftazidime</u> for pseudomonas)				
For <u>Staphylococcus aureus</u>/Coag-neg staph:				
100% Susceptibility to Vancomycin				
% Susceptible to <u>Oxacillin</u> = % Susceptible to other beta-lactams				
Provide subset of MRSA % Susceptible to appropriate drugs (<u>Clindamycin</u>, <u>Tetracyclines</u>, <u>TMP/SMX</u>)				
For <u>Streptococcus pneumoniae</u>:				
<u>Cefotaxime</u> and Ceftriaxone reported separately for meningitis and non-meningitis breakpoints				
It is clear that only a subset of isolates thought to be non-susceptible to penicillin are tested against other drugs (e.g. erythromycin, ceftriaxone, levofloxacin)				
100% Susceptibility to Linezolid/Vancomycin				
Nitrofurantoin reported for urine isolates only; not reported for <u>Proteus sp</u>, <u>Pseudomonas sp</u>. Or <u>Serratia sp</u>.				

Provide subset of MRSA % Susceptible to appropriate drugs (<u>Clindamycin</u>, <u>Tetracyclines</u>, <u>TMP/SMX</u>)				
For <u>Streptococcus pneumoniae</u>:				
<u>Cefotaxime</u> and Ceftriaxone reported separately for meningitis and non-meningitis breakpoints				
It is clear that only a subset of isolates thought to be non-susceptible to penicillin are tested against other drugs (e.g. erythromycin, ceftriaxone, levofloxacin)				
100% Susceptibility to Linezolid/Vancomycin				
Nitrofurantoin reported for urine isolates only; not reported for <u>Proteus sp</u>, <u>Pseudomonas sp</u>. Or <u>Serratia sp</u>.				
Footnotes and Guidance				
1 Data for one calendar year; updated at least annually. Larger facilities may update every 6 mo				
2 % Susceptibility not reported/Organism not reported				
3 Smaller sites may report isolates with 10 or more; or may collect data for a longer period of time and properly note				
4 Rifampin for <u>Staphylococcus sp.</u> ; aminoglycosides for <u>enterococcus sp.</u> , etc.				
5 Trimethoprim/ <u>sulfamethoxazole</u>				
6 <u>Serratia</u> , <u>Pseudomonas</u> , Indole-Positive protease (<u>P. vulgaris</u> , <u>Providencia sp</u> , <u>Morganella sp</u>), <u>Citrobacter</u> , <u>Enterobacter</u> , <u>Acinetobacter</u> – production of inducible amp-c beta-lactamase.				

Adapted from:

Antibiogram Checklist

Adapted from:

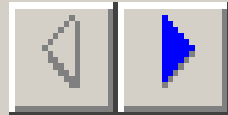
- Hindler JR, Stelling J. Analysis and presentation of cumulative antibiograms: a consensus guideline from the Clinical and Laboratory Standards Institute. CID. 2007;44:867-73.
- Boehme MS, Somsel PA, Downes FP. Systematic review of antibiograms: a national laboratory systems approach for improving antimicrobial susceptibility testing practices in Michigan. Pub H Rep. 2010;125(sup. 2):63-72.

Year 1 - Suggestions

- Consider simply documenting what pharmacy already does/sees
 - Can be used for hypothesis generation
 - Might reveal some “low-hanging fruit”
 - Lead to ASP interventions/policies in year 2 and beyond
- Find those in your organization already involved in quality measures

Year 2 – Foundational Project

- Creation of local antibiotic use guidelines
 - Focus on common indications for facility
 - Use antibiogram data and national guidelines
- Highly recommended to adapt these to Electronic Health Record, if possible



Pain Medications...

IVPB Antibiotics

[\[\] Inpatient Guideline Based Menu](#)

PO/IM Antibiotics...

Pediatric Antibiotics (liquids etc)...

Cardiovascular Meds...

Dermatology Meds...



Inp

ALTERNATIVE OPTIONS FOR PIPERACILLIN/TAZOBACTAM (ON SHORTAGE)

- ☐ Abdominal Infections
- ☐ Cellulitis (No Break in Skin or Ulcer)
- ☐ Diabetic Foot Wounds
- ☐ Pneumonia

Diabetic Foot Wounds

CLINICAL NOTES:

~MILD

~Purulence

~One or more signs of inflammation

~Cellulitis (if present) 2cm or less around ulcer

~Limited to superficial

~MODERATE

~Any of the above w at least one:

~2cm or more cellulitis

~Lymphangitic streaking

~Beneath superficial fascia

~Deep tissue abscess

~Gangrene

~Muscle bone tendon or joint involvement

~SEVERE

~Any above with systemic toxicity or metabolic instability

TREATMENT (MILD AND MODERATE)

☐ Ampicillin/Sulbactam 3GM IV Q6H

~OR~

☐ Ceftriaxone 2GM IV Q24H PLUS Metronidazole 500MG IV Q8H

~IF MRSA SUSPECT ADD~

☐ Vancomycin (Pharmacy To Dose)

TREATMENT (SEVERE)

☐ Cefepime 2GM IV Q24H PLUS Metronidazole 500MG IV Q8H PLUS Vanco

Year 2 Suggestions

- Consider your guidelines/E.H.R menus as an intervention
- Define and collect some baseline measures/data
 - Orders for XX drug for YY indication
 - Survey prescriber use of guidelines/menus
- Recollect data at some point post intervention
- Repeat this process for every intervention identified and implemented

Year 3 - Suggestions

- Review what worked and what didn't
- Develop a process for continuous quality improvement
 - If an intervention succeeded, how to sustain it
 - If it didn't – why?
 - Evaluate variables defined and measured; methods
 - Evaluate process
- PDSA cycles
 - Plan, Do, Study, Act – repeat.

Metrics

Options

Type	Metric	Definition
Consumption	Defined Daily Doses (DDD)	Total Grams antibiotics used divided by WHO approved DDD values
	Grams	Total Grams used from administered, dispensed, or purchased data sources/reports
	Days of Therapy (DOT)	Number of days that the patient receives at least one dose of an antibiotic
	Length of Therapy (LOT)	Number of days that the patient receives therapy regardless of number of drugs or doses received
	Expenditures	Dollars spent

Options

Type	Metric	Definition
Patient Outcomes	Health Care Associated Infections	- Rate of disease-specific infections (e.g. <i>C. Diff</i>, MRSA, VAP) - ASP Intervention rates - ASP Intervention Acceptance rates
Resistance	Antibiotic Resistant Organisms	% of patients with resistant organism(s) - Antibiogram data % of isolates of a pathogen with antibiotic resistance

Advantages vs Disadvantages

Metric	Advantage(s)	Disadvantage(s)
Defined Daily Dose (DDD)	• Easy to calculate • Can be utilized as a “benchmark” between hospitals, regions, and countries	• Never intended to be used as a metric to study ASP impact • Biases against combination therapy, even when that therapy might be a narrower spectrum • Assumes routine dosing – “penalized” if using clinically appropriate higher or lower dosing • Not applicable to pediatrics
Grams	• Purchase data easy to obtain • Not affected by price fluctuations • Can be used to calculate DDD	• Purchase data is the least accurate

Advantages vs Disadvantages

Metric	Advantage(s)	Disadvantage(s)
Days of Therapy (DOT)	• Offers more clinical relevance than DDD • Applicable to pediatrics • Recommended by CDC, US National Healthcare Safety Network	• Difficult to obtain data • Not applicable to renal population • Incentivizes the use of broad spectrum monotherapy • A patient receiving 2 antibiotics for 7 days = 14 DOTs
Length of Therapy (LOT) “Treatment Period”	• Most reflective of actual treatment duration • Accounts for dosing intervals beyond 1 day (i.e. Q48H Vancomycin) • Does not penalize programs for changing antibiotics based upon C&S results	• Cannot be used to compare the use of specific drugs
Expenditures (Cost of Therapy)	• “Easiest” metric to calculate and obtain data for • Easily understood by all	• Affected by cost variations; natural or otherwise • Affected by changes in formulary • Should not be used for benchmarking purposes due to cost variability

Advantages vs Disadvantages

Metric	Advantage(s)	Disadvantage(s)
Antimicrobial-free Days	• Avoids issues related to Broad vs Narrow spectrum therapy • Avoids issues related to Mono- vs Duo-Therapy • Focuses on whether patients are receiving an antibiotic or not	• Mostly used as a disease-specific consumption measure (i.e. ventilator-associated pneumonia)
Point Prevalence “Snapshot” Surveys	• Resource-efficient • Typically done at a single site on a single day • Data collected may include % patients prescribed antibiotics, % “restricted” antibiotics prescribed, # antibiotics per patient, duration of therapy, dosing and dosage interval, time for IV to PO switch • Can be used to measure and compare antibiotic use at multiple sites	• Can only provide feedback on limited elements of prescribing • May not consistently reflect typical practice within a Unit or Hospital

Using Bar Coded Medication Administration Data (BCMA)

- ❑ Paper published by the VA in 2012
- ❑ Compares BCMA vs. Orders data
- ❑ Used to help calculate some of the metrics described
- ❑ NHSN AU Module

<http://www.cdc.gov/nhsn/PDFs/training/AUR-training.pdf>

BCMA Log Output - RPMS

ADMINISTRATION MEDICATION	UNIT OF ADMINISTRATION	ORDER DOSAGE	DOSE GIVEN
IBUPROFEN	12	240MG/12ML	
CETIRIZINE	5	5MG/5ML	
TOBRAMYCIN	1 drop	1 DROP	
FLUOCINONIDE	a small amount	A SMALL AMOUNT	
LACTULOSE RETENTION	200	300ML IN 700ML WATER	
CLONIDINE	TAB	0.2MG	
LISINAPRIL	TAB		
	TAB	30MG	
FUROSEMIDE	TAB	20MG	
AMLODIPINE	TAB	2.5MG	
BISACODYL	0100351079299018	1 SUPPOSITORY	
ELECTROLYTES/PEG-3350	8oz	8 OZ GLASS AND DRINK	
FENTANYL 50MCG/HR	PATCH	1 PATCH	
LISINAPRIL	TAB		
	TAB	30MG	
BISACODYL	10mg	1 SUPPOSITORY	
INSULIN REGULAR	4 units	MEDIUM DOSE SLIDING	
AMLODIPINE	TAB	2.5MG	
ALBUTEROL 90MCG MDI	2 puffs	2 PUFFS	
ELECTROLYTES/PEG-3350	4000ml	8 OZ GLASS AND DRINK	
CEFTAZIDIME 2GM			2 GM
FUROSEMIDE	TAB	20MG	

“Crunched” Data –Days of Therapy

ASP Resources

- CDC
 - <http://www.cdc.gov/getsmart/healthcare/implementation.html>
- IDSA/SHEA
 - http://www.idsociety.org/Stewardship_Policy/#sthash.gZe2Eucl.dpuf
- ASHP
 - <http://www.ashp.org/menu/PracticePolicy/ResourceCenters/Inpatient-Care-Practitioners/Antimicrobial-Stewardship>

Additional Resources

- I.H.S. ASP Workgroup members
- I.H.S. ASP Listserv
- Antibigram Checklist
- Metric Databases (RPMS)
- PDSA forms
- Cited References

IHS NPC ASP Workgroup Members

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Conclusions/Pep Talk

- Implementation is important
 - Think “patient safety”
 - Think “public health”
- Implementation is easy
 - Take it one step at a time
 - One step will lead to the next
- Implementation is rewarding
 - Impact and positive change
- Do something today.