

CONDUCTING AND EVALUATING ANTIBIOTIC STEWARDSHIP: COMMERCIAL PRODUCTS VERSUS DIY

Jessina C. McGregor, PhD

Dept. Pharmacy Practice

College of Pharmacy

Oregon State University/Oregon Health & Science University

DISCLOSURES

- No current financial or other potential conflicts of interest to report
 - Not receiving any financial or other incentives from any commercial product discussed
- Currently funded by NIH KL2RR024141
- Previously involved in evaluation of beta version of Cereplex's PharmWatch (now Premier's Safety Surveillor)
 - No affiliation with Premier
- This presentation is for informational purposes; not an endorsement of any product

OBJECTIVES

- Understand how an EMR works behind the scenes
- Identify the challenges in the use of data to facilitate stewardship
- Overview of commercial products
- What is needed to implement home-grown tool

BEHIND THE SCENES OF AN EMR

The screenshot shows a web-based EMR interface for a preadmission form. The patient's name is SMITH, GABRIEL JE. The form is titled "Preadmission" and includes a navigation pane on the left with sections like "Reservation Info (Pre Ad)", "Demographics", "Guarantor Accounts", and "Insurance Coverages". The main content area displays "Patient Information" with fields for Name, Address, Sex, Birth Date, and Registration Status (NEW). Below this is a table for "Guarantor Accounts" and "Insurance Coverages".

Patient Information

Name:	SMITH,GABRIEL,JEFFR*	MRN:	<E2124196>
Address:		Sex:	Male
Home Phone:		Birth Date:	3/20/1974 (33yrs)
Work Phone:		E-mail Address:	
Patient Ethnicity:		Patient Race:	
Registration Status:	NEW	Current PCP:	
Referring Clinic:		PCP Clinic:	
Date Last Verified:		Employer:	
Next Review Date:		Notice:	

Guarantor Accounts

Account ID - Guarantor	Service Area	Active?	Guarantor Acct Type	Guar Acct Status	Ver Status
------------------------	--------------	---------	---------------------	------------------	------------

Insurance Coverages

ED	Plan/Plan	Subscriber Name	ED From	ED To	Ver Status
----	-----------	-----------------	---------	-------	------------

FLAT VS. RELATIONAL

- Flat tables
 - Large & inefficient

MRN	Sex	Encounter #	Culture Accession #	Culture Result	Organism
1001	M	3001	001	POS	S. aureus
1001	M	3001	002	NEG	
1002	F	4001	001	POS	E. coli
1002	F	5002	001	POS	Enterococcus spp.

FLAT VS. RELATIONAL

- Relational tables
 - Multiple tables linked by “primary key” fields
 - Similar to MS Access
 - Allows for efficient data storage
 - Thousands of tables associated with an EMR system
 - Documentation/data dictionary

RELATIONAL TABLES

MRN	Sex	MRN	Encounter #	Admit Date	Discharge Date
1001	M	1001	3001	1/1/10	1/7/10
1002	F	1002	4001	2/3/10	2/5/10
		1002	5002	3/11/10	3/28/10

Encounter #	Culture Accession #	Culture Result	Organism
3001	001	POS	S. aureus
3001	002	NEG	
4001	001	POS	E. coli
5002	001	POS	Enterococcus spp.

DATA FORMATS

- Discrete fields
 - Table-type format
 - Fields always ordered the same
 - Each field/variable has a specific format and length
 - Missing data clearly identifiable
- Limited options vs. open/free text

HL7

- Health Level Seven (HL7)
 - Non-profit organization that is involved in the development of healthcare informatics interoperability standards
 - Name also commonly used to refer to the standard
- HL7 standard
 - Widely used format for healthcare data
 - Federally required format/architecture for certain EMR modules
 - CDC NHSN uses this structure
 - Data transfer protocol tags the different data fields
 - Data *not* transferred as a discrete table
 - Allows data to be more easily shared between systems

IMPLEMENTING A HOME-GROWN PRODUCT

- At least 10 FTE of data programmers/analysts initially
- Clinical content experts needed
- Support from administration needed
- Time
- Validation/evaluation

COMMERCIAL PRODUCTS

- Vendors are EMR system agnostic
 - Systems are so customized by location that experience with one system doesn't transfer to another, etc.
- Pricing plans vary in structure
- Need to make them pitch to you to compare
- They will have data from other institutions to help you justify costs to the administration
- Antimicrobial stewardship tools often integrated with infection control tools

COMMERCIAL PRODUCTS

- All products can identify the major stewardship concerns
 - IV to PO switches
 - Double coverage
 - Dosage adjustments
 - Optimization of therapy
 - Resistance/susceptibility
 - Drug-bug mismatches
- Customizable alerts
- Alerts generally higher sensitivity and imperfect specificity

MEDMINED™, CAREFUSION

- MedMined™ modules
 - Patient Event Advisor
 - Pharmacy-based system
 - Antibiotic monitoring alerts
 - Virtual Surveillance Infection
 - Supports infection control activities
- Clinical experts support team available
- Generates antibiograms
- Evidence-based alerts pre-programmed
- Customizable alerts by user
- Email alerts to users
- Pyxis is a CareFusion product—can work directly dispensing information
 - Alerts at the dispensing unit
- Also supports non-ID areas



Dashboard

Alerts

Reports

Rounding List

Patient Search

Alert Search

Admin Console

MRN OR Patient Name

Locations

< 24 hrs

Location	Total	<input checked="" type="checkbox"/>
2GJX	1	<input checked="" type="checkbox"/>
9QJX	1	<input checked="" type="checkbox"/>
1QJX	1	<input checked="" type="checkbox"/>
4QJX	3	<input checked="" type="checkbox"/>
CQFM	1	<input checked="" type="checkbox"/>
CQJY	0	<input checked="" type="checkbox"/>

Alert Type

	Total	<input type="checkbox"/>
<input checked="" type="checkbox"/> Antimicrobial	14	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Drug Levels	1	<input checked="" type="checkbox"/>

Patients

FRGKRWQ, CATVZTG AI VVZP	<input type="checkbox"/>
MRSA - RESPIRATORY - resp;	
VANCOMYCIN (SYSTEMIC);	
CFEFG, SVFQAZKQ F	<input type="checkbox"/>
ESCHERICHIA GENUS - URINE - urine:	
CIPRO	
CFEFG, SVFQAZKQ F	
MRN# 6081029	
Age: 78Y	
Gender: M	
Locations: 60Q Wvcx, 6070:F	
QUQO	<input type="checkbox"/>
VANC	
RT77	<input type="checkbox"/>

Alert Type: De-escalation

Full Description:
>100,000 cfu/ml Escherichia coli collected from Urine:Catheterized on 10/9/2010 11:00:00 AM resulted on 10/11/2010 12:00:00 AM using Urine Culture. Cipro tab 500 mg (PO) is active as of 10/12/2010 10:04:00 AM.

Action
[View Patient Detail](#)
[View All Alerts for this Patient \(65\)](#)

Reports

Report Title	Last Run	Run Now
Targeted ABX @ 72 hours	10/12/2010 9:13 AM	
ip_abx @ 8 days	10/08/2010 8:13 AM	
JP QUINOLONES @ 72 HRS	10/04/2010 10:12 AM	

Rounding List

Patient Name	MRN
<input type="checkbox"/> LVFPZTO, IFVDFVTJ X	40010
<input checked="" type="checkbox"/> LUVGT, LKZZO P	67925
<input type="checkbox"/> CWQOTV, VWLTVJ DTWVDI	26770



[Dashboard](#)

[Alerts](#)

[Reports](#)

[Rounding List](#)

[Patient Search](#)

[Alert Search](#)

[Admin Console](#)

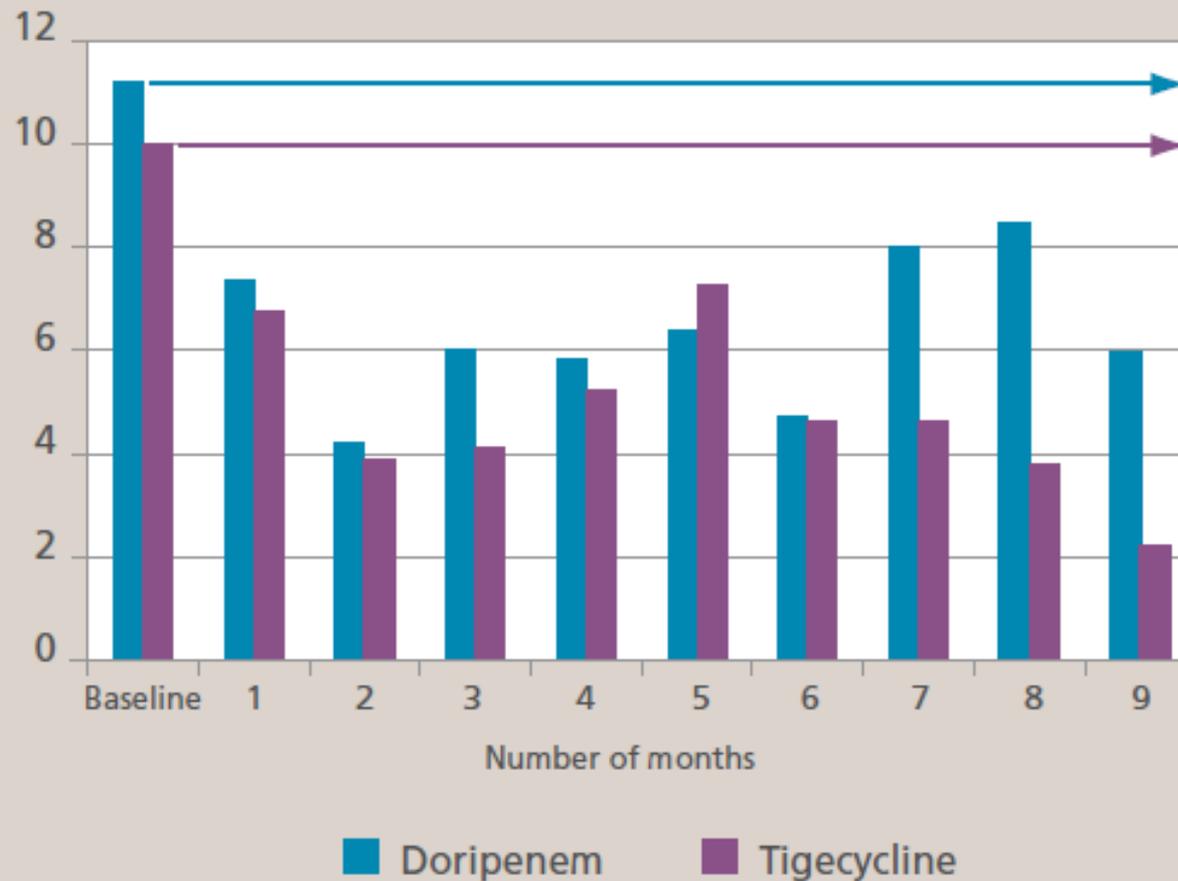


[View Current Alerts](#) | [Manage Alert Templates](#) | [Manage Custom Alerts](#)

Active Alerts Resolved Alerts [Print All](#)

Alert Type	Description	Patient	Date/Time	Location	Rounding List								
De-escalation	ESCHERICHIA GENUS - URINE - urine; CIPROFLOXACIN;	CFEFG, SVFQAZKQ F 6081029 (2 open alerts)	10/12/2010 10:22:00 AM	60Q Wvcx, 6070:F	Add Alert								
<table border="1"> <thead> <tr> <th>Result Date</th> <th>Organism</th> <th>Source</th> <th>De-escalation Candidates</th> </tr> </thead> <tbody> <tr> <td>10/11/2010</td> <td>>100,000 cfu/ml Escherichia coli</td> <td>urine Test: Urine Culture</td> <td> 1:\$;AMPICILLIN; \$;NITROFURANTOIN; <hr/> 2: <hr/> 3:\$;SULFAMETHOXAZOLE/TRIMETHOPRIM; <hr/> 4:\$;CIPROFLOXACIN; </td> </tr> </tbody> </table> <p>View All Cultures</p> <p>Action View Patient Details Add Alert To Rounding List Snooze Hide</p>						Result Date	Organism	Source	De-escalation Candidates	10/11/2010	>100,000 cfu/ml Escherichia coli	urine Test: Urine Culture	1:\$;AMPICILLIN; \$;NITROFURANTOIN; <hr/> 2: <hr/> 3:\$;SULFAMETHOXAZOLE/TRIMETHOPRIM; <hr/> 4:\$;CIPROFLOXACIN;
Result Date	Organism	Source	De-escalation Candidates										
10/11/2010	>100,000 cfu/ml Escherichia coli	urine Test: Urine Culture	1:\$;AMPICILLIN; \$;NITROFURANTOIN; <hr/> 2: <hr/> 3:\$;SULFAMETHOXAZOLE/TRIMETHOPRIM; <hr/> 4:\$;CIPROFLOXACIN;										
Vancomycin Level	VANCOMYCIN TROUGH = 8.9 mg/l	QUQQ, CFVKQF X 892605 (4 open alerts)	10/12/2010 10:01:00 AM	CQJX KCU, CC67:F	Add Alert								
Non-infection marker with	GROUP B STREPTOCOCCUS -	GKIEGWO, ZFVVO XTQVO	10/12/2010 9:44:00 AM	CQJX KCU, CC67:F	Add								

Days of therapy per 1,000 patient days



SAFETY SURVEILLOR™, PREMIER, INC.

- Integrated stewardship and infection control module
- Available as an individual module
- Customizable work lists by user
- Can be used to generate antibiograms
 - Specific to user-designated time frames and units
- Includes some ability for evaluation
- Includes access to training modules, internal marketing, cost justification letters, etc.
 - For additional fee for access to training modules through DICON

SAFETY SURVEILLOR™

SafetySurveillor™
Rx Event Detection [\[Start \]](#)
[\[Help \]](#) [\[Help Desk \]](#)

Sub-menu:
User: Chris Marotta

- [Rx Event Detection](#)
- [IC Event Detection](#)
- [Line Listing](#)
- [Scheduled Reports](#)
- [Real-time Reports](#)
- [Utilities](#)
- [Administration](#)
- [Options](#)
- [Educational Resources](#)
- [FAQ](#)
- [What's New](#)
- [Sign Out](#)

Premier Links

- [Premier, Inc.](#)
- [Safety Institute](#)
- [Performance Improvement Portal](#)
- [Duke Infection Control Outreach Network \(DICON\)](#)
- [Connection Capsule Newsletter](#)

Premier Medical Center (Demo)

Last Session: Sep 16, 2010
 Session Count: 211
 Today's Date: Sep 17, 2010

Rx Event Detection Main

You are currently viewing the main SafetySurveillor Rx Event Detection page where you can review your events ([Drug Usage Events](#), [RT Drug Usage Events](#), [IV To PO Conversion Events](#), [Organism Coverage Events](#), [Open Rx Interventions](#)) and instantly view events placed on your [Favorites List](#).

Drug Use Events : [View [Drug Use Events Log](#)] [\[TOP \]](#)

There were no Drug Usage Event alerts since your last session.

Drug Usage Events							
Event Name	Patient ID	Patient Name	Current or Last Known Location	Drug	Event Date	Patient Viewed	Remove
No Alerts.							
<input type="button" value="Remove"/> Remove all Viewed items (items with Alert Viewed = Yes)							
<input type="button" value="Remove"/> Remove all items.							

Real Time Drug Usage Events : [View [RT Drug Usage Events Log](#)] [\[TOP \]](#)

There were no Real Time Drug Usage Event alerts since your last session.

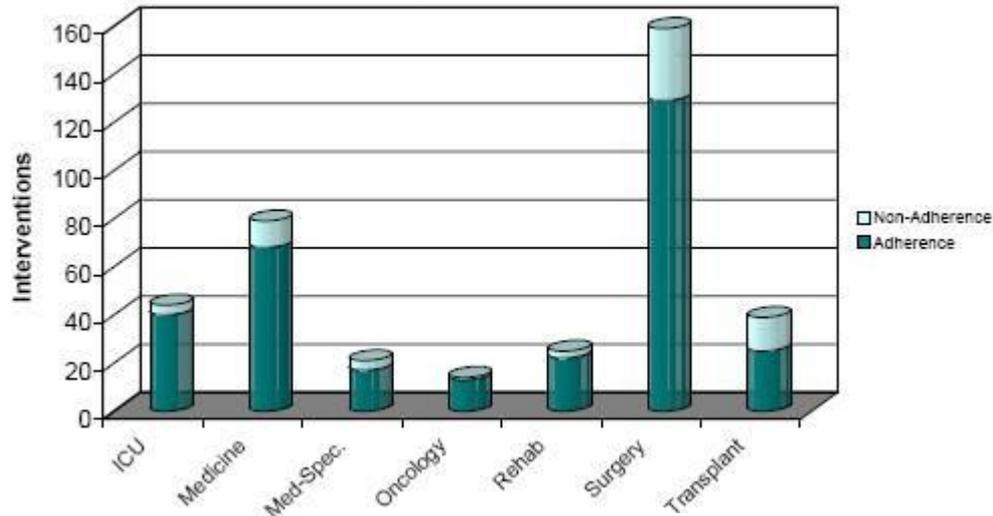
Real Time Drug Usage Events							
Event Name	Patient ID	Patient Name	Current or Last Known Location	Drug	Event Date	Patient Viewed	Remove
No Alerts.							
<input type="button" value="Remove"/> Remove all Viewed items (items with Alert Viewed = Yes)							
<input type="button" value="Remove"/> Remove all items.							

Organism Coverage Events : [View [Organism Coverage Events Log](#)] [\[TOP \]](#)

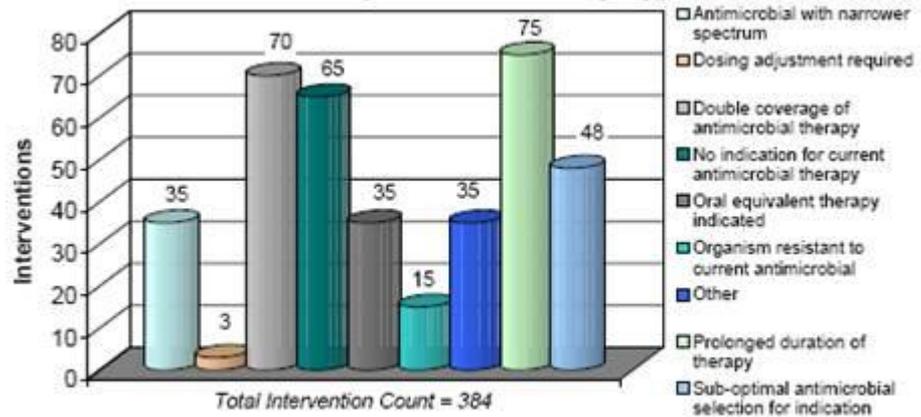
There were no Organism Coverage Event alerts since your last session.

Organism Coverage Events								
Event Name	Patient ID	Patient Name	Current or Last Known Location	Organism	Specimen Source	Event Date	Patient Viewed	Remove
No Alerts.								
<input type="button" value="Remove"/> Remove all Viewed items (items with Alert Viewed = Yes)								
<input type="button" value="Remove"/> Remove all items.								

Pharmacy Intervention Adherence



Pharmacy Interventions by Type



SENTRI7™, PHARMACY ONESOURCE

○ Sentri7™

- Started as a tool for documenting pharmacy interventions
- Now expanded: supports stewardship, infection control, and others
- Relies on user-specified queries/reports
- Institution can specify recommended actions
- Creates institution-specific, rolling annual antibiograms
- Web-based, data stored on off-site server

Carbapenems, Vancomycin or Linezolid & Final Cult. (1)

Rule is current

Patient Id	Name	Location	Events in Last 7 Days	Culture-Blood	Culture-Wound, Deep	Drug Matches
XY07461	Smith, John J	540 - 02		Specimen Source Blood...	Specimen Source Foot...	VANCOMYCIN

Suggested Action:
Convert to narrower spectrum antibiotic if appropriate.
See antimicrobial de-escalation guide [HERE](#).

1 of 1 ADR AE INT Review

MDRO Culture Positive (MRSA, C.Dif, VRE, KPC) (1)

Rule is current

Patient Id	Name	Location	Events in Last 7 Days
XY08364	Doe, Jane B	120 - 01	

Suggested Action:
See C. Diff treatment algorithm [HERE](#).

1 of 1 ADR AE INT Review

EnterOCOCCUS Positive, Vanco Sens, on ZYVOX (1)

Rule is current

Patient Id	Name	Location	Events in Last 7 Days	Drug Matches
XY07461	Smith, John J	540 - 02		

Suggested Action:
Convert to narrower spectrum antibiotic if appropriate.
See antimicrobial dosing guide [HERE](#).

1 of 1 ADR AE INT Review

Drug Bug Mismatch: Vanc Resistant, on Vancomycin (1)

Rule is current

Patient Id	Name	Location	Events in Last 7 Days	Drug Matches
XY00012	Carlson, Mike P	360 - 01		

Suggested Action: Patients have documented resistance to Vancomycin on Final C&S AND have a current active order for IV Vancomycin.
Consider switching to alternative such as Tigecycline.
Document intervention in Quantifi

1 of 1 ADR AE INT Review

E. Coli Streamlining (1)

Rule is current

Patient Id	Name	Location	Events in Last 7 Days	Drug Matches
XY08364	Doe, Jane B	120 - 01		

Suggested Action: E. Coli in blood or urine that is sensitive to Cefazolin and patient is on broad spectrum therapy like a carbapenam, Zosyn, Unasyn, Timentin, quinolone should be converted to cefazolin per policy

1 of 1 ADR AE INT Review

MSSA Streamlining (1)

Rule is current

Patient Id	Name	Location	Events in Last 7 Days	Drug Matches
XY08364	Doe, Jane B	120 - 01		

Suggested Action: Final culture positive for MSSA and patient is on MRSA drug (Vanco, Zyvox, Cubicin, Tygacil, Synercid) Potential to convert to formulary anti-staph penicillin should be considered.

1 of 1 ADR AE INT Review

VRE and on Vancomycin (1)

Rule is current

Patient Id	Name	Location	Events in Last 7 Days	Drug Matches

Jackson, Joe T

< Prev Jackson, Joe Next >

XY00365

Last Updated: 3/27/2011 4:10 AM

Demographics

Most Recent Account: A006 Age: 77 years
 Admit Date Time: 3/24/2011 4:51:00 PM Weight: 130.63 kilos
 Service Area: MED Height: 190.5 centimeter
 Location: 410 - 01 Sex: M

Diagnosis

ENTERITIS, PROBABLE C-DIFF

Allergies

19991001, 20060926, BANANA,TOMATO,CUCUMBER,
 DOESNT LIKE, MRSA, No to Iodine, No to Latex, NONE,
 RASH, SULFA, SULFAMETHOXAZOLE TRIMETHOPRIM
 SULFONAMIDES (SYSTEMIC), SULFONYL;LOOP;TZ;CAI;DIA
 (DO NOT USE RETIRED, Yes, BACTRIM, FULL, Unknown

- + Account History (3) All
- + Documented Clinical Activities Last 7 Days
- + Pending Follow Up Last 7 Days

Rule Matches

Rule Matches are current

- Absence of DVT Prophylaxis: Patients not on Heparin
 Drug Order: ALLOPURINOL, AT... PLT: 361 [Review](#)
- Case Mgt: Pneumovax Assessment [Review](#)
- Diabetic Nurses: Insulins with a BG > 120
 GLU: 163 Drug Matches: undefined, un... [Review](#)
- EPOETIN/DARBOPOETIN and HGB>12
 HGB: 14.3 [Review](#)
- Warfarin Nutrition Services Consult
 Drug Matches: undefined [Review](#)

Current Medications 03/29/2011

Rx Order #	Drug Name	Strength	Dose	Form	Route	Frequency	PRN	Start	Stop Note
4450	ALLOPURINOL	--	150 MG	TABLET	ORAL	.QD	False	3/24/2011	
4454	ATENOLOL	--	25 MG	TABLET	ORAL	.DAILY	False	3/24/2011	
4455	CITALOPRAM	--	20 MG	TABLET	ORAL	.QD	False	3/24/2011	
6513	D5-1/2NS + KCL 20MEQ/L	-	ML	1000 ML	INJECTION INTRAVEN.	.Q12H30M	False	3/25/2011	
4188	IMIPENEM CILASTATIN	-	MG	500 MG	INJECTION INTRAVEN.	Q8	False	3/24/2011	
4187	INSULIN GLARGINE	100 UNIT	15 UNIT	INJECTION	SUBCUT	HS	False	3/24/2011	
4193	INSULIN, HUMAN - REGULAR	--	0 UNIT	DEVICE	SUBCUT	AC	False	3/24/2011	
4194	INSULIN, HUMAN - REGULAR	--	0 UNIT	DEVICE	SUBCUT	HS	False	3/24/2011	
4172	KETOCONAZOLE TOPICAL	--	0 %	CREAM	TOPICALLY	BID	False	3/24/2011	
4367	MethylPREDNISolone	--	40 MG	INJECTION	INTRAVEN.	Q12	False	3/24/2011	
4181	METRONIDAZOLE	-	MG	500 MG	INJECTION INTRAVEN.	Q6	False	3/24/2011	
	MINI BAG DRUG CONTAINER	-	ML	100 ML	INJECTION INTRAVEN.				
4184	PANTOPRAZOLE	--	40 MG	INJECTION	INTRAVEN.	0800	False	3/24/2011	
4457	POLYCARBOPHIL	625 MG	625 MG	TABLET	ORAL	.BID	False	3/24/2011	
4188	SODIUM CHLORIDE 0.9%	-	ML	100 ML	INJECTION INTRAVEN.	Q8	False	3/24/2011	
4458	VANCOMYCIN	-	MG	125 MG	INJECTION ORAL	.QID	False	3/24/2011	
4183	WARFARIN	-	MG	5 MG	TABLET ORAL	DAILY@2100	False	3/24/2011	
4196	DEXTROSE 50%	--	25 ML	INJECTION	INTRAVEN.	.	True	3/24/2011	
4195	GLUCAGON	--	1 MG	INJECTION	SUBCUT	.	True	3/24/2011	
4168	GUAIFENESIN DEXTROMETHORPHAN	--	10 ML	SYRUP	ORAL	.Q6HP	True	3/24/2011	
4169	HYDROCODONE 5MG/APAP 500MG	--	1 TAB	TABLET	ORAL	.Q4HP	True	3/24/2011	
4197	ROUTINE ORDERS IN USE	--	0 MISC	MISC.	FOR INFORMATION ONLY	.	True	3/24/2011	

- + Basic Metabolic Panel 3/26/2011 5:45:00 AM
- + C-Reactive Protein 3/25/2011 5:45:00 AM
- + Comprehensive Metabolic Panel 3/24/2011 1:50:00 PM
- + Differential 3/26/2011 5:45:00 AM
- + Glycohemoglobin 3/24/2011 8:03:00 PM
- + Hemogram with Plt 3/26/2011 5:45:00 AM
- + Prothrombin Time 3/26/2011 5:45:00 AM
- + Uric Acid 3/24/2011 8:03:00 PM
- + Culture-Lower Respiratory 3/24/2011 7:00:00 PM

PATIENT LIST

THERADOC, HOSPIRA

- Part of Clinical Intelligence Platform™
- Antibiotic Assistant™
 - Integrated ability to track trends, document interventions
 - Resource for evidence based recommendations
 - Out of box evidence-based alerts included
 - Customizable by individual user
- Infection Control Assistant™
- Pager/Email alerts
- Generates antibiograms
 - Unit, source, time frame specific
 - Users with permission can drill-down for more data
- Data stored in on-site server
- Other, non infectious disease specific modules available

THERADOC

GUYMON, ASHLEY MRN: 10307039 Location: 6S 640S 01 Attending: LIVINGSTON, STANLEY Account #: 76474899

Alert Time	Alert																																							
02/25/2008 18:32	<p>TAM Alert: 7 Admit Diagnosis: DIABETES RENAL FAILURE ▶ Demographics & renal function</p> <p>Organism not covered by current antimicrobial therapy</p> <p>Alert organism(s): URINE CULTURE: Enterobacter cloacae</p> <p>Current antimicrobial therapy: GATIFLOXACIN 200 MG IV 24H (02/20/2008 21:00)</p> <p>Specimen source: Urinary catheter specimen <i>Collected: 02/17/2008 14:50:00</i></p> <p>Enterobacter cloacae (Acc#: 9391195340) ▼ Susceptibility results</p> <table border="1"> <thead> <tr> <th colspan="3">MIC WITH INTERPRETATION</th> </tr> <tr> <th>Tested</th> <th>Interpretation</th> <th>Result</th> </tr> </thead> <tbody> <tr><td>* amoxicillin-clavulanate</td><td>RESIST</td><td>>= 32</td></tr> <tr><td>* ampicillin</td><td>RESIST</td><td>>= 32</td></tr> <tr><td>* cefazolin</td><td>RESIST</td><td>>= 32</td></tr> <tr><td>* ceftiofloxacin</td><td>RESIST</td><td>>= 32</td></tr> <tr><td>* ciprofloxacin</td><td>RESIST</td><td>>= 4</td></tr> <tr><td>gentamicin</td><td>SUSCEPT</td><td><= 0.5</td></tr> <tr><td>* levofloxacin</td><td>RESIST</td><td>>= 8</td></tr> <tr><td>nitrofurantoin</td><td>SUSCEPT</td><td><= 32</td></tr> <tr><td>sulfamethoxazole-trimethoprim</td><td>SUSCEPT</td><td><= 10</td></tr> <tr><td>ticarcillin</td><td>SUSCEPT</td><td><= 16</td></tr> <tr><td>tobramycin</td><td>SUSCEPT</td><td><= 10</td></tr> </tbody> </table>	MIC WITH INTERPRETATION			Tested	Interpretation	Result	* amoxicillin-clavulanate	RESIST	>= 32	* ampicillin	RESIST	>= 32	* cefazolin	RESIST	>= 32	* ceftiofloxacin	RESIST	>= 32	* ciprofloxacin	RESIST	>= 4	gentamicin	SUSCEPT	<= 0.5	* levofloxacin	RESIST	>= 8	nitrofurantoin	SUSCEPT	<= 32	sulfamethoxazole-trimethoprim	SUSCEPT	<= 10	ticarcillin	SUSCEPT	<= 16	tobramycin	SUSCEPT	<= 10
MIC WITH INTERPRETATION																																								
Tested	Interpretation	Result																																						
* amoxicillin-clavulanate	RESIST	>= 32																																						
* ampicillin	RESIST	>= 32																																						
* cefazolin	RESIST	>= 32																																						
* ceftiofloxacin	RESIST	>= 32																																						
* ciprofloxacin	RESIST	>= 4																																						
gentamicin	SUSCEPT	<= 0.5																																						
* levofloxacin	RESIST	>= 8																																						
nitrofurantoin	SUSCEPT	<= 32																																						
sulfamethoxazole-trimethoprim	SUSCEPT	<= 10																																						
ticarcillin	SUSCEPT	<= 16																																						
tobramycin	SUSCEPT	<= 10																																						
<p>Document</p> <p>Dismiss</p> <p>Suppress</p>	<p>Microbiology Review Laboratory Review Consult Abx Wizard</p> <p>Medication Profile Urinalysis Review Radiology Review</p>																																							

ACTIVE

Context: Infection Reports

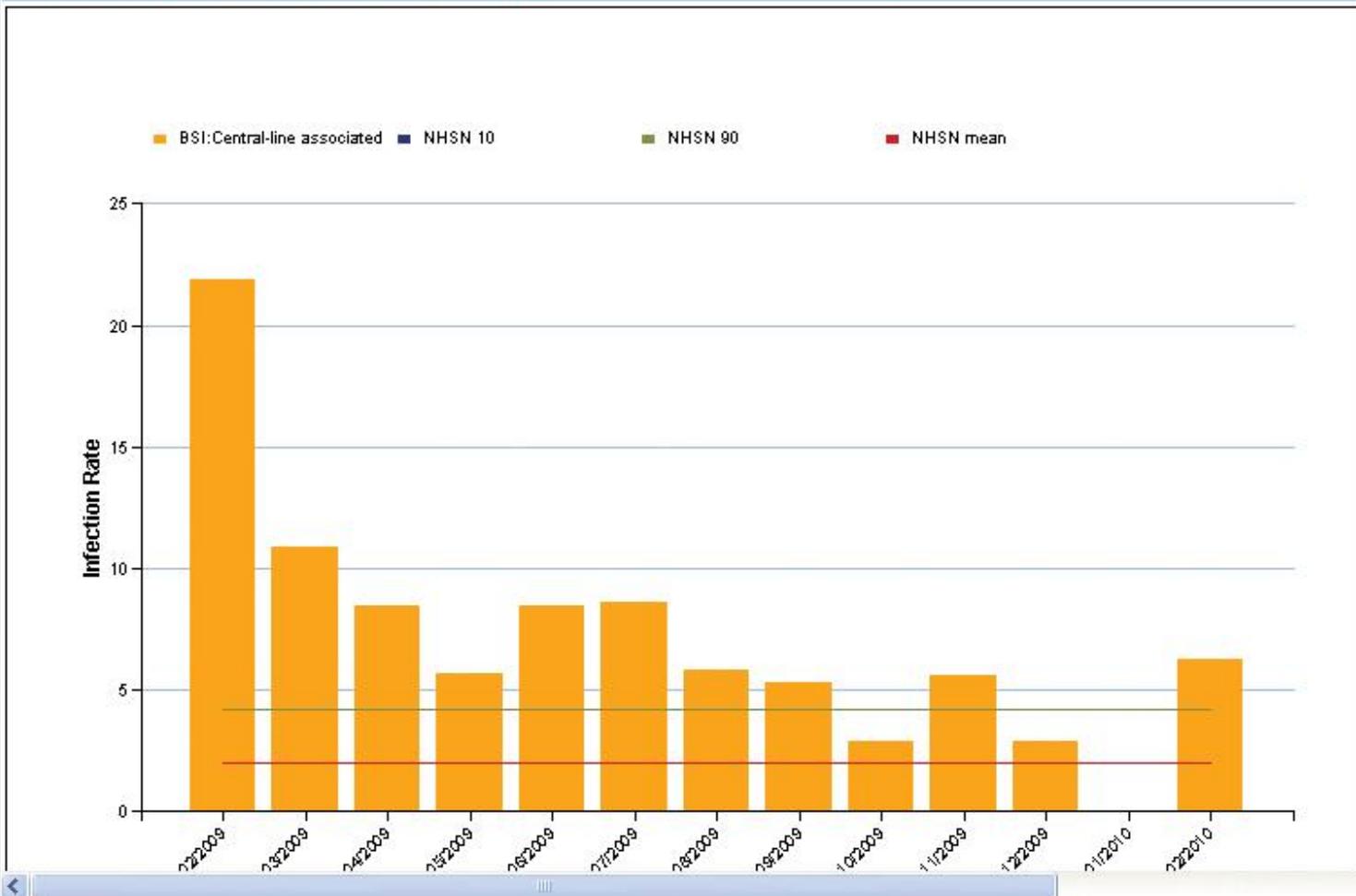
View: BSI Rate w/benchmarks



Multi-Doc Cluster Patient Trace Add to Roster

Combined Medical-Surgical major teaching

CRITERIA



VECNA, QC PATHFINDER

- Pharmacy and Infection Control component
 - Typically bundled
- Pricing based on number of data feeds, facilities, etc.
 - Unlimited number of users allowed
- Can store data on remote or on-site server
- Includes pre-programmed alerts and customizable
- Reports can be created by tech support or user
 - Convertible to alert
- E-mail alerts (can be sent to pagers)
- Support includes technical, functional, and clinical
- Customizable, real-time antibiograms
- Rolling out into VA healthcare system starting Fall 2011
- Future development
 - Advanced reporting capabilities using additional “logical” algorithms
 - Mobile interface—some users now using an iPad version

<input type="checkbox"/>	MDRO Alert	New	03/25/2011 07:57	MDRO Alert	N/A	Anonymous MDRO Inbox Entry	OBSOLETE
--------------------------	------------	------------	---------------------	------------	-----	----------------------------	----------

SELECT ALL OBSOLETE SELECTED

Pharmacy Interventions Requiring Action ?

Intervention(s) Performed	Medical Record Number	Name	Date Created	Latest Activity Type	Latest Date Updated	Latest Intervening User	Total Time Spent	Estimated Cost Saving	Latest Comment	Actions
Drug-disease interaction	MRN 42782432	Harris, Cooper	06/07/2011 15:25	Initiated replacement therapy	06/07/2011 15:25	Practitioner, Infection Control	0	0	Pharmacy Orders Added: Prescription number Prescription 42792274 for drug lansoprazole 30 mg EC capsule Lab Tests Added: Lab Test 11079001142-2011-03-20, Specimen Type Stool Ordered Test Ag C diff Organism Clostridium difficile	VOID INTERVENTION
Adverse Drug Event	MRN 2319638	Simpson, Caden	06/17/2011 11:53	Administered antidote/reversal or rescue drug	06/29/2011 15:59	Duncan, Kendall	0	0		VOID INTERVENTION

Pharmacy Interventions Requiring Analysis ?

Intervention(s) Performed	Medical Record Number	Name	Date Created	Latest Activity Type	Latest Date Updated	Latest Intervening User	Total Time Spent	Estimated Cost Saving	Latest Comment	Actions
Drug Bug Mismatch	MRN 4930445	Vasquez, Cayden	04/14/2011 15:17	Initiated replacement therapy	06/29/2011 16:09	Sullivan, Lucas	0	0	Pharmacy Orders Added: Prescription number Prescription 43223451 for drug piperacillin-tazobactam 3.375gm/NS 50mL (Acudose) Lab Tests Added: Lab Test 11086000967-2011-03-29, Specimen Type Trach Asp Ordered Test Cul Resp + Gm Organism Escherichia coli	VOID INTERVENTION

My Surveillance ?

[Options](#) ▶

Monitor	From	To	Type	Description	Created by	Created on	Actions
---------	------	----	------	-------------	------------	------------	---------

SELECT ALL DELETE SELECTED

To create a new monitor, first specify the parameters by using the "Create Report" feature or by editing an existing report. Next, select a chart to monitor, and click "Save or Update Report/Monitor" at the bottom of the chart. Finally, name the report, check "enable monitoring" checkbox, and select the users to notify when a new alert is generated.

My Saved Microbiology Reports ?

[Options](#) ▶

SAVE & PRINT

SAVE

CANCEL

Patient

Name: Harris, Cooper Medical Record number: MRN 42782432

Date of Birth: Current Location: loc1104050

Gender: Female Race:

Admission Date: 03/20/2011 17:30 Discharge Date:

Intervention Details

Drug-disease interaction

Created by icp on 06/07/2011 15:25

Last updated by icp on 06/07/2011 15:25

Status: * ?

Requires Action → Complete → Requires Analysis → Complete and Analyzed

Monitors: ? EDIT USERS EDIT GROUPS

TPRF Report Users

Total time spent: 0 minutes Estimated cost saving: 0 dollars

Time spent on activities: 0 minutes

Summary of Associated Clinical Results

Pharmacy Orders

This list contains a beginning pharmacy order and any medication changes that were made as a result of Pharmacy Intervention Activities.

Description	Prescription #	Order Date	Drug	Dosage Size	Dosage Unit	Route	Provider	Last Order Control	Details
Beginning Pharmacy Order	Prescription 42792274	03/20/2011 18:24	lansoprazole 30 mg EC capsule	30.00	mg	PO	Webb, Damian	New order	Details

Lab Tests

This list contains all lab results that are associated with the Pharmacy Intervention.

Specimen ID	Collection Date	Organism	Ordered Test	Additional Info	Details
11079001142-2011-03-20	03/20/2011 12:30	Clostridium difficile	Ag C diff		Details

Intervention History

Edit Triggering Clinical Results

Add or remove pharmacy orders and lab tests that initiated this intervention

SELECT PHARMACY ORDERS

SELECT LAB TESTS

Log Intervention Progress

Record new activities or comments as you perform work on the intervention. New activities and comments will be added to the Intervention Activity Log.

ADD NEW ACTIVITY

ADD NEW COMMENT

Activity

by icp
on 06/07/2011 15:25

Initiated replacement therapy (Intervention Accepted)

Intervening user: Practitioner, Infection Control Time of Intervention Activity: 06/07/2011 15:24

Time spent: 0 minutes

Provider: Webb, Damian

Comment: replaced by another drug

Resulting Pharmacy Orders: None specified

ERROR OUT ACTIVITY

Comment

by icp
on 06/07/2011 15:25

Pharmacy Orders Added: Prescription number Prescription 42792274 for drug lansoprazole 30 mg EC capsule

Lab Tests Added: Lab Test 11079001142-2011-03-20, Specimen Type Stool Ordered Test Ag C diff Organism Clostridium difficile

SAVE & PRINT

SAVE

CANCEL

POINTS IN WHICH PRODUCTS VARY

- Pricing
- Underlying knowledge base used in alerts
- Specificity of alerts
- Amount of historical/patient-level data directly accessible
- Availability of other ID/non-ID products
- Training & Support
 - IT
 - Clinical
- Pre-programmed queries
- Pager/Email alerts
- Reports for evaluation and tracking
- Documentation for internal “marketing”

EVALUATION IS KEY

- Evaluation is important
 - Justifies expense
 - Ensures positive impact on patient care
 - May identify areas for improvement
- Need to understand the data structure/availability to perform meaningful evaluations
 - Limitations in your data
 - How changes in microbiology systems, pharmacy systems, etc., may change the data
 - Source of data for clinical support tool
 - Is it really real time?
 - May want to evaluate things other than pharmacy/microbiology data
 - FTE, \$, clinical outcomes, etc.

EVALUATION IS KEY

- Plan ahead
 - Randomization?
 - Quasi-experimental? (before and after)
- What analysis you want to perform will guide data collection
- Just quality assessment? Or is it research?
 - Generalizability is key