

## [ET-33] A Visual Analytics Antibigram Dashboard As Part of a Comprehensive Approach to Perioperative Antibiotic Administration

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**Background:** Many hospitals routinely perform antimicrobial susceptibility testing for bacterial pathogens; the results are often organized into a summary table, or antibiogram, which may be used by clinicians as a reference guide to antimicrobial resistance patterns. Antibiograms lend information that can be used to raise awareness of resistance problems, support the use of optimal empiric therapy, and identify opportunities to reduce inappropriate antibiotic usage. At many hospitals, antibiograms are static documents that are generated from laboratory data and distributed to house staff once per year. Pediatric anesthesiologists are often tasked with administering perioperative antibiotics either for prophylaxis or to treat an active systemic infection.

**Objectives:** To develop a secure, Web-based, institution-specific, user-friendly visual analytics antibiogram dashboard using EHR data in near real-time that can be accessed in the operating room setting using the anesthesia information management system computer workstation.

**Methods:** We created a visual analytics antibiogram dashboard using both SQL queries of our EHR database and enterprise analytical software to track bacterial pathogens and their antimicrobial sensitivity at The Children's Hospital of Philadelphia. The antibiogram dashboard provides a user interface to explore our hospital's laboratory EHR data in near-real time and facilitates the rapid assessment of susceptibilities and resistances of microorganisms of interest to various antibiotics.

**Results:** A visual analytics antibiogram dashboard specific to our institution was designed and implemented as described in the methods. The dashboard allows the user to display up-to-date, hospital-specific antibiotic sensitivity data for a particular organism using a variety of filters and drop down menus.

**Conclusion:** Pediatric anesthesiologists are often given the task of administering perioperative antibiotic prophylaxis. While the antibiotic choices and dosages are usually guided by infectious disease specialists, there remains a dearth of information at the time of antibiotic administration in the operating room regarding the susceptibility of organisms to the chosen antibiotic medication. This data and dashboard will be an integral part of a project to optimize perioperative antibiotic treatment based on our hospital's EHR data.

Numbers are % Susceptible

Organisms	ERYTHROMYCN BETA STREP			FLUCONAZOLE			GENTAMICIN			HIGH LEVEL GENTAMYCN			HIGH LEVEL STREPTOMYCN			MPENEM			LINEZOLID			MEROPEM			MNOCYCLINE		
	Sensitive	All	%	Sensitive	All	%	Sensitive	All	%	Sensitive	All	%	Sensitive	All	%	Sensitive	All	%	Sensitive	All	%	Sensitive	All	%			
ACHROMOBACTER XYLOSOXDANS								1						1	1	100%					1	1	100%				
ACINETOBACTER BAUMANNII								10	10	100%					9	10	90%										
ACINETOBACTER LWOFFI								1	1	100%					1	1	100%										
ALCALIGENES FAECALIS								1	1	100%					1	1	100%					1	1	100%			
ALPHA HEMO STREP-VIRIDANS GRP																					1	1	100%				
ALPHA HEMOLYTIC STREP																					1	1	100%				
BETA HEMO STREP GROUP B	1	1	100%																								
CANDIDA TROPICALIS					1	1	100%																				
CEDECEA DAVISAE									1	1	100%				1	1	100%					1	1	100%			
CITROBACTER AMALONATICUS								2	2	100%					1	2	50%					2	2	100%			
CITROBACTER BRAAKI								1	1	100%					1	1	100%					1	1	100%			
CITROBACTER FREUNDII								12	13	92%					13	13	100%					13	13	100%			
CITROBACTER KOSERI								19	19	100%					19	19	100%					19	19	100%			
CITROBACTER SEDLAKI								1	1	100%					1	1	100%					1	1	100%			
CITROBACTER SP								6	6	100%					6	6	100%					6	6	100%			
CITROBACTER YOUNGAE								1	1	100%					1	1	100%					1	1	100%			

Data Source System: CDW

Contact:XXXXXXXXXX

Next Update: Dec/1/2013

Organism	Age Group	Procedure	Specimen Name Source	Gram Stain
ESCHERICHIA COLI	1. Neonborn < 1mo	CULTURE - URINE	Clean Catch, Urine	neg
ENTEROCOCCUS SP	2. Young Infant 1-3 mo	CULTURE AND OS...	Catheter, Urine	pos
KLEBSIELLA PNEUMONIAE	3. Infant	CULTURE WOUND...	Madder, Urine	Special Morphology
PSEUDOMONAS AERUGINOSA	4. Child	CULTURE - RESPI...	Kidney, Urine	pairs/chains
PROTEUS MIRABILIS	5. School Age Child	CULTURE - RESPI...	Urine	branching
STAPHYLOCOCCUS EPIDERMIDICUS	6. School Age Child	CULTURE - BLOOD	Midstream, Urine	clusters, tetrads, irregular
STAPHYLOCOCCUS SAPROPHILUS	9. Unknown	CULTURE - RESPI...	Specimen	diplococci
ENTEROBACTER CLOACAE		Susceptibility	Encounter Type	curved
STAPHYLOCOCCUS AUREUS		Sensitive	Inpatient	intracellular
KLEBSIELLA OXYTOCA		Resistant	Emergency	pleomorphic
ESCHERICHIA COLI 2		Intermedia	Outpatient	clusters
ENTEROBACTER CLOACAE		NEGATIVE	Observation	beaded
ENTEROBACTER CLOACAE		POSITIVE	Recurring Outpatient	spirochete clusters/tetrads
Drug Class	Cost Category	Sensitivity Value	Encounter Department	Special Testing Summary
Aminoglycosides	1	<=1MIC	UNKNOWN	aerobic, nonlactose-fermenting
Aminopenicillins	2	<=0.25MIC	S PHILA CARE NTWK	alpha-hemolytic
Antifungal	3	<=2MIC	CHOP CAMP MARKET ST	beta-hemolytic
Anthelmintic	4	<=4MIC	CARE NTWK	lactose-fermenting
Antimalarial	5	<=20MIC	CC PC ADOL FAMILY PLAN	lactose-fermenting, oxidase-pos...
Antimetabolite		<=16MIC	KARABOTS CARE NTWK	non-hemolytic
Antiprotozoal		<=32MIC	CC CARE NTWK	non-hemolytic/alpha-hemolytic/...
Antipseudomonas		<=129MIC	UC CARE	nonlactose-fermenting
Antiretroviral				nonlactose-fermenting, oxidase-...
Antistaphylococcal				nonlactose-fermenting, oxidase-...
Antitubercular				nonlactose-fermenting, oxidase-...
Antiviral				nonlactose-fermenting, oxidase-...
Carbapenem				nonlactose-fermenting, oxidase-...
Cephalosporin				nonlactose-fermenting, oxidase-...
Cephalosporin				nonlactose-fermenting, oxidase-...
Cephalosporin				nonlactose-fermenting, oxidase-...
Drug Name				Genus
Abacavir Sulfate-Lamivudine				Rhizothia
Aceclovir Sodium, IV				Achromobacter
Aceclovir, oral				Acinetobacter
Amikacin Sulfate				Actinobacillus
Amoxicillin				Actinonadura
Amoxicillin-Pot. Clavulanate				Actinomycetes
Amphotericin B				Peroococcus
Amphotericin B Lipid (Abelcet)				Aeromonas
Amphotericin B Liposome (AmBisome)				
Amphotericin B Substantin				
				Species
				acidovorans
				adecarboxylat
				adhaerens
				aerogenes
				aeruginosa
				agalactiae
				agglomerans
				anatum

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