

Prevention & Reporting of Healthcare Associated Infections (HAIs) in Kentucky Conference For Healthcare Transparency & Patient Safety

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Objectives

After this presentation, participants will be able to:

- Explain the importance of reporting HAIs
- Describe the characteristics of HAI outbreaks historically reported in Kentucky
- Understand changes in disease reporting in Kentucky
- Identify antibiotic stewardship as a strategy in the fight against antibiotic resistance



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No disclosures of conflicts of interest



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Population Health Surveillance for Communicable Diseases

- From the French: “to watch over”
- Surveillance helps to call attention to unusual events or numbers of events.
- Awareness of a potential public health problem from the outset allows more time for a thoughtful, considered response and more strategic use of limited resources.
- Surveillance also helps us understand the depth and breadth of a health event: the “who,” “what,” “where,” “when,” and possibly “why” and “how.”



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Ultimate Goal

Control and reduce diseases of public health importance and impact



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Reportable Disease Laws

- Kentucky Revised Statute 214.010
 - “Every physician and advanced practice registered nurse shall report all diseases designated by administrative regulation of the Cabinet for Health and Family Services as reportable”
- 902 Kentucky Administrative Regulation 2:020
 - Delineates who should report, the diseases and outbreaks to be reported, and how they are to be reported



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Traditional Passive Surveillance

Relies on timely **recognition and reporting** of certain types of disease or clusters of illness.

- Presumes thorough knowledge and correct diagnosis of illness by clinician
- Presumes that all reportable diseases or unusual disease groupings will be reported to the health department
- Presumes reporting will occur promptly



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What does Public Health do with the reports?

- Assists in determining whether outbreak is occurring, case investigation, and prevention/control of other cases
- In the case of healthcare facilities, can assist in providing guidance for control and with more detailed testing
- Can help determine if facility outbreaks are interrelated across county and state lines

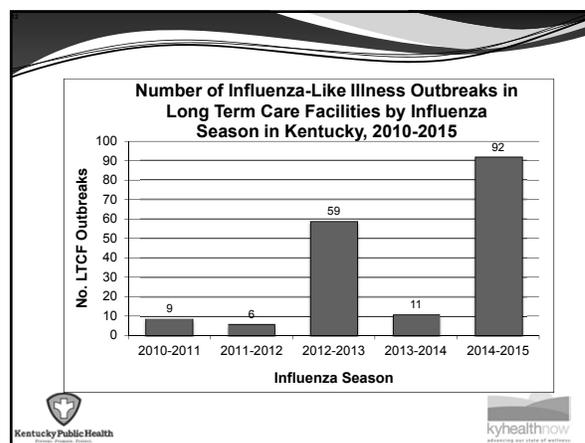
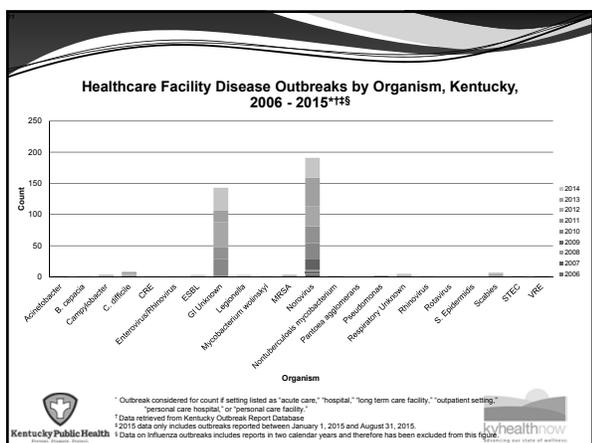
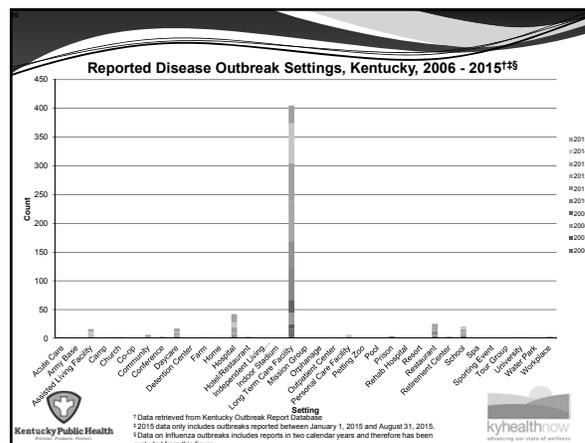
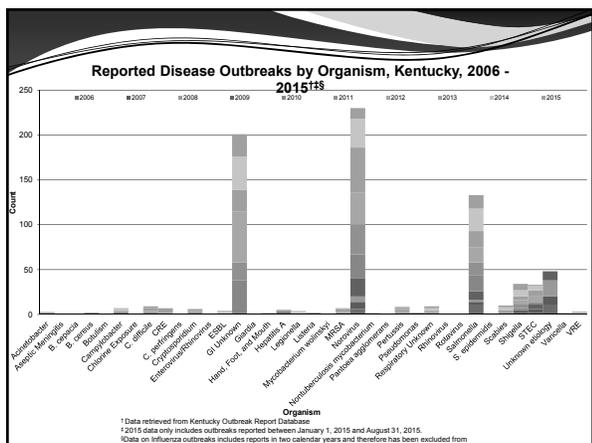



Reportable Disease Investigations, 2012-2014^{††}

2012	2013	2014
8,466 total investigations	9,689 total investigations	9,330 total investigations
<ul style="list-style-type: none"> Lab report Morbidity report from hospital Faxed EPID 200 Form 	<ul style="list-style-type: none"> Lab report Morbidity report from hospital Faxed EPID 200 Form 	<ul style="list-style-type: none"> Lab report Morbidity report from hospital Faxed EPID 200 Form
<ul style="list-style-type: none"> Campylobacteriosis= 552 Salmonellosis = 757 STEC = 120 HAV, acute = 83 HBV, acute = 275 (509 chronic[‡]) HCV, acute = 344 (2,573 chronic or resolved[‡]) Pertussis = 741 	<ul style="list-style-type: none"> Campylobacteriosis= 683 Salmonellosis = 562 STEC = 177 HAV, acute = 84 HBV, acute = 289 (589 chronic[‡]) HCV, acute = 321 (3,222 chronic or resolved[‡]) Pertussis = 499 	<ul style="list-style-type: none"> Campylobacteriosis= 679 Salmonellosis = 645 STEC = 182 HAV, acute = 125 HBV, acute = 232 (616 chronic[‡]) HCV, acute = 322 (3,092 chronic or resolved[‡]) Pertussis = 530

† Data retrieved from the National Electronic Disease Surveillance System (NEDSS)
 †† Investigations of Chlamydia, Gonorrhea, HIV/AIDS, Influenza and Tuberculosis are not included.
 ‡ Reporting of Chronic Hepatitis B and Chronic Hepatitis C is voluntary. Investigations created for Chronic Hepatitis do not represent the true burden of chronic hepatitis.





Influenza Vaccination Coverage in U.S., Healthcare Personnel, 2014-2015 Season



- Pharmacists 95.3%
- Nurses 89.0%
- Physicians 88.9%
- Assistants/Aides 64.4%

Reference:
<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6436a1.htm>



Summary of New Regulation

- Defines HAIs and HAI outbreaks
- Mandates simultaneous reporting of HAI data to both Centers for Medicare and Medicaid Services (CMS) and the Kentucky Department for Public Health (KDPH) after regulation goes into effect
- Mandates electronic reporting of positive laboratory tests for certain Multidrug Resistant Organisms (MDROs) via the Kentucky Health Information Exchange beginning in October 2016



New Definitions and Reporting Requirements

- Healthcare-Associated Infection (HAI): An infection acquired by a person while receiving treatment for a separate condition in a healthcare setting
- Under the new regulation, certain HAIs are now reportable by facility through the National Healthcare Safety Network (NHSN)
- Cases of specific multidrug resistant organisms will be reported electronically beginning in October 2016.



New Definitions

- Healthcare-Associated Infection (HAI) Outbreak:
 - two or more HAIs that are epidemiologically linked or connected by person, place or time
- OR*
- a single case of an HAI not commonly diagnosed (for example, legionellosis acquired in a healthcare facility)



National Healthcare Safety Network (NHSN)

CDC's National Healthcare Safety Network (NHSN) is the nation's most widely used healthcare-associated infection tracking system. NHSN provides facilities, states, regions, and the nation with data needed to identify problem areas, measure progress of prevention efforts, and ultimately eliminate healthcare-associated infections.

<http://www.cdc.gov/nhsn/about.html>



NHSN (Continued)

NHSN provides medical facilities, states, regions, and the nation with data collection and reporting capabilities needed to:

- Identify infection prevention problems by facility, state, or specific quality improvement project
- Benchmark progress of infection prevention efforts
- Comply with state and federal public reporting mandates, and
- Ultimately, drive national progress toward elimination of HAIs.



<http://www.cdc.gov/nhsn/about.html>



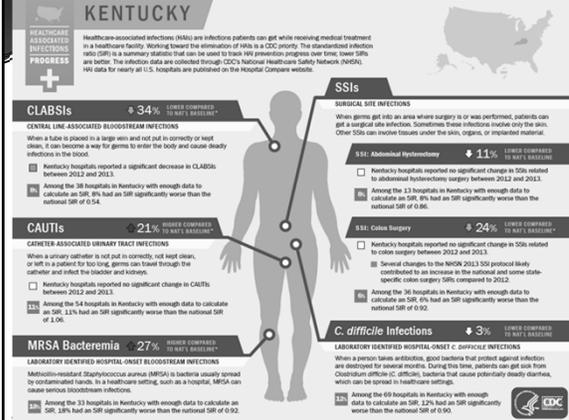
Simultaneous Reporting to Both CMS and KDPH

- HAIs are mandated to be reported routinely for hospitals that participate in the Centers for Medicare and Medicaid Services (CMS) Hospital Inpatient Quality Review (IQR) Program.
- Similar requirements exist for long term care facilities, outpatient dialysis centers, rehabilitation centers and others.
- Under new regulation, data submitted to CMS through NHSN are required to be submitted at same time to the KDPH.




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HEALTHCARE ASSOCIATED INFECTIONS (HAIs) are infections patients can get while receiving medical treatment in a healthcare facility. Working toward the elimination of HAIs is a CDC priority. The standardized infection ratio (SIR) is a summary statistic that can be used to track HAI prevention progress over time. Lower SIRs are better. The infection data are collected through CDC's National Healthcare Safety Network (NHSN). HAI data for nearly all U.S. hospitals are published on the Hospital Compare website.



CLABSIs $\uparrow 34\%$ LOWER COMPARED TO NAT'L BENCHMARK*

CAUTIs $\uparrow 21\%$ LOWER COMPARED TO NAT'L BENCHMARK*

MRSA Bacteremia $\uparrow 27\%$ LOWER COMPARED TO NAT'L BENCHMARK*

SSIs $\uparrow 11\%$ LOWER COMPARED TO NAT'L BENCHMARK*

C. difficile Infections $\uparrow 3\%$ LOWER COMPARED TO NAT'L BENCHMARK*

SSI: Colon Surgery $\uparrow 24\%$ LOWER COMPARED TO NAT'L BENCHMARK*

LABORATORY IDENTIFIED HOSPITAL ONSET BLOODSTREAM INFECTIONS

LABORATORY IDENTIFIED HOSPITAL ONSET C. DIFFICILE INFECTIONS

*Statistically significant.

THIS REPORT IS BASED ON 2013 DATA, PUBLISHED JANUARY 2015

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HEALTHCARE ASSOCIATED INFECTION (HAI) DATA give healthcare facilities and public health agencies knowledge to design, implement, and evaluate HAI prevention efforts.

Learn how your hospital is performing: www.medicare.gov/hospitalcompare

For additional information:

- 2013 HAI Progress Report: www.cdc.gov/hai/progress-report/
- NHSN: www.cdc.gov/nhsn
- HAI and prevention activities in Kentucky: hais.ky.gov/09hainrpt.html
- Kentucky validation efforts: www.cdc.gov/hai/pdfs/state-program-validation.pdf

HAI TYPE	# OF KENTUCKY HOSPITALS THAT REPORTED DATA TO CDC'S NHSN, 2013	2013 STATE SIR	2013 STATE SIR %	2013 NAT'L SIR	2013 STATE SIR	2013 NAT'L SIR
CLABSIs Nat'l Benchmark: 2008	72	0.67	34%	0.67	0.67	0.54
CAUTIs Nat'l Benchmark: 2009	73	1.21	21%	1.21	1.21	1.06
SSI: Abdominal Hysterectomy Nat'l Benchmark: 2008	60	0.90	11%	0.90	0.90	0.86
SSI: Colon Surgery Nat'l Benchmark: 2008	46	0.76	24%	0.76	0.76	0.92
MRSA Bacteremia Nat'l Benchmark: 2011	71	1.27	27%	1.27	1.27	0.92
C. difficile Infections Nat'l Benchmark: 2011	71	0.97	3%	0.97	0.97	0.90

WHAT IS THE STANDARDIZED INFECTION RATIO? The standardized infection ratio (SIR) is a summary statistic that can be used to track HAI prevention progress over time. Lower SIRs are better. The SIR for a facility or state is adjusted to account for factors that might cause infection rates to be higher or lower, such as hospital size, teaching status, the type of patients a hospital serves, and surgery and patient characteristics.

WHAT IS KENTUCKY DOING TO PREVENT HEALTHCARE ASSOCIATED INFECTIONS? Prevention efforts to reduce specific HAIs:

- Central line-associated bloodstream infections
- Catheter-associated urinary tract infections
- Surgical site infections
- Multidrug-resistant infections (MRSA, C. difficile, CRE, and others)
- Long-term care facilities

THIS REPORT IS BASED ON 2013 DATA, PUBLISHED JANUARY 2015

Electronic Multidrug Resistant Organism (MDRO) Reporting

- Officially begins October 2016
- Can be used by facilities to demonstrate "meaningful use," in order for facilities to continue to receive meaningful use payments
- Involves electronic reporting of positive laboratory results of certain MDROs as defined in the regulation, via the Kentucky Health Information Exchange




Kentucky Health Information Exchange (KHIE)

- Enables safe, secure electronic exchange of patient health information among participating providers and organizations throughout the state
- Participation fulfills meaningful use objectives of the Medicare and Medicaid Electronic Health Record Incentive Program

<http://khie.ky.gov>



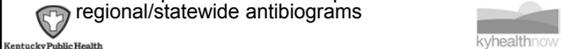

State Mandate for HAI Reporting

- NHSN Surveillance data
- Allows KDPH to see how facilities are doing based on national benchmarks and in comparison with each other
- Facilities that report in the highest or lowest tertiles may be highlighted for data validation or consultation
- Individual patient level data is protected
- Hospital level data may be reported once finalized
- Also available on <https://data.medicare.gov/data/hospital-compare>




Advantages of MDRO Reporting

- Allows KDPH to have an understanding of “strains” or emerging important pathogens that may be present in our state
- Opportunity for quicker recognition and intervention in the event of a cluster or outbreak of an organism
- Allows KDPH to offer assistance with evaluating Infection Prevention activities, laboratory assistance with PFGE analysis, outbreak investigation expertise and on-site consultation
- Aids in understanding resistance patterns that may affect antimicrobial treatment limitations that could be more widespread than previously known
- Provides potential for development of regional/statewide antibiograms



Definition

ANTIBIOTIC RESISTANCE IS THE ABILITY OF BACTERIA OR OTHER MICROBES TO RESIST THE EFFECTS OF AN ANTIBIOTIC. ANTIBIOTIC RESISTANCE OCCURS WHEN BACTERIA CHANGE IN SOME WAY THAT REDUCES OR ELIMINATES THE EFFECTIVENESS OF DRUGS, CHEMICALS, OR OTHER AGENTS DESIGNED TO CURE OR PREVENT INFECTIONS. THE BACTERIA SURVIVE AND CONTINUE TO MULTIPLY CAUSING MORE HARM.

HTTP://WWW.CDC.GOV/GETSMART/ANTIBIOTIC-USE/ANTIBIOTIC-RESISTANCE-FAQS.HTML



Did you know?

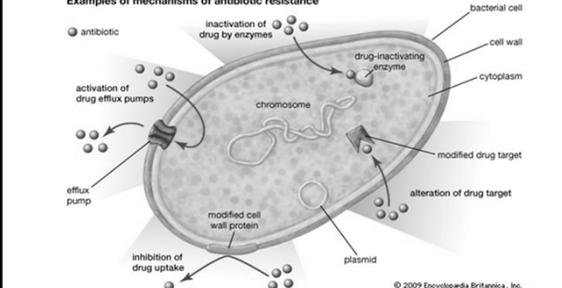
- Antibiotic Resistance is one of the world’s most pressing public health threats
- Antibiotics are the most important tool to combat life-threatening bacterial infections....however, they come with side effects
- Antibiotic overuse increases the development of drug-resistant bacteria

http://www.cdc.gov/getsmart/healthcare/factsheets/hc_providers.html



Mechanisms of Antibiotic Resistance

Examples of mechanisms of antibiotic resistance



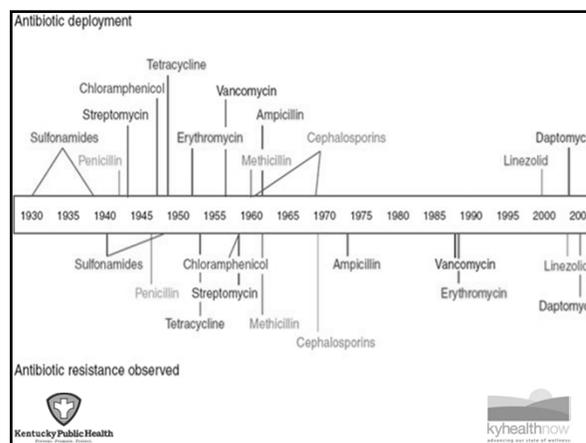
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Why does this happen?

- Antibiotic use promotes development of antibiotic resistant bacteria
 - Sensitive bacteria are killed
 - Resistant bacteria survive
 - Resistant bacteria grow and multiply
- Repeated and improper uses of antibiotics are primary causes of the increase in drug-resistant bacteria: “Use it and lose it”

HTTP://WWW.CDC.GOV/GETSMART/ANTIBIOTIC-USE/ANTIBIOTIC-RESISTANCE-FAQS.HTML

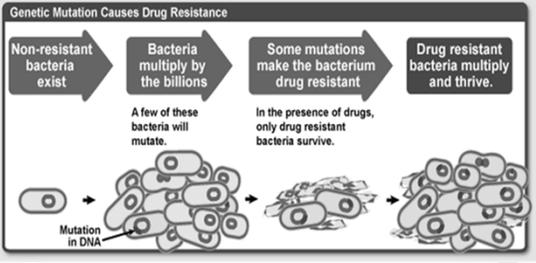
How do bacteria become resistant to antibiotics?

- Resistance occurs when bacteria change in some way that reduces or eliminates the effectiveness of drugs, chemicals or other agents designed to cure or prevent infections.
- Those bacteria that “escape” can multiply and replace all the susceptible bacteria that have been killed off providing “selective pressure” making the surviving bacteria more likely to be resistant




Development of Drug Resistant Bacteria

Genetic Mutation Causes Drug Resistance



Non-resistant bacteria exist → Bacteria multiply by the billions → Some mutations make the bacterium drug resistant → Drug resistant bacteria multiply and thrive.

A few of these bacteria will mutate. In the presence of drugs, only drug resistant bacteria survive.




Scope of the problem

- Antibiotic resistance is associated with:
 - Increased risk of hospitalization
 - Increased length of stay
 - Increased hospital costs
 - Increased risk of transfer to the intensive care unit
 - Increased risk of death

http://www.cdc.gov/getsmart/healthcare/factsheets/hc_providers.html




2015 Infection Prevention Statements

- Microbiome is increasingly resistant
- Environmental hardiness of organisms is increasing
- Lack of consistent application of preventive measures by patients and healthcare workers
- Existing organisms colonizing the patient and/or the environment are of critical importance




Infection Prevention and Control Core Practices

- Hand hygiene
- Aseptic technique
- Safe injection practices
- Standard and transmission-based precautions
- Training and education of healthcare personnel
- Patient and family education
- Environmental hygiene
- Leadership support
- Monitoring of practice
- Employee/Occupational health
- Early removal of invasive devices

Work currently occurring via HICPAC




Rex and June Morgan know....



REX MORGAN

Hand Hygiene

- #1 way to disrupt the transmission of organisms at key points of time
- Continues to be one of “the most significant compliance challenges” in modern healthcare
 - Work load/acuity of patients negatively affects compliance
 - Time elapsed within the work shift negatively affects compliance
 - Longer breaks between work shifts positively affects compliance

Kentucky Public Health | Journal of Applied Psychology. Hengchen D., et al. Online publ. 11/3/14 Accessed at <http://dx.doi.org/10.1037/a0038067> | kyhealthnow

5 moments for hand hygiene in healthcare

*Adapted from the WHO Alliance for Patient Safety 2005

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Antibiotic use can adversely impact patients- *C. difficile*

- Antibiotic exposure is the single most important risk factor for the development of *Clostridium difficile* associated disease (CDAD).
- Up to 85% of patients with CDAD have antibiotic exposure in the 28 days before infection

Chang HT et al. Infect Control Hosp Epidemiol 2007; 28:926-931. | Kentucky Public Health | kyhealthnow

http://www.cdc.gov/getsmart/campaign-materials/week/promotional-media.html?tab=6#TabbedPanel1 | Kentucky Public Health | kyhealthnow

Out-patient Settings

- Each year, tens of millions of antibiotics are prescribed unnecessarily for viral upper respiratory infections
- In states where there is more antibiotic use, there are more antibiotic-resistant pneumococcal infections
- The presence of antibiotic-resistant bacteria is greatest during the month following a patient’s antibiotic use and may persist for up to 12 months.

http://www.cdc.gov/getsmart/healthcare/factsheets/hc_providers.html | Kentucky Public Health | kyhealthnow

Antibiotic prescribing rates by state across the U.S. (2011/12)*

*Prescribing data from July 2011 through June 2012; population data from 2011 | Kentucky Public Health | kyhealthnow

Good News / Bad News

Antibiotics prescribed for acute respiratory infections in kids younger than 15 years of age

24% DECREASE in prescribing

Still account for **58%** of all antibiotics prescribed

Infection Type	Percentage of Total Prescriptions
Other Infections	~35%
Common Cold	~15%
Sinusitis	~10%
Bronchitis	~10%
Sore Throat	~10%
Ear Infection	~10%

Most of these acute respiratory infections do not require antibiotic treatment; patients may benefit from symptomatic therapy

*Comparing 1993-94 to 2007-08

<http://www.cdc.gov/getsmart/campaign-materials/week/promotional-media.html?tab=6#TabbedPanels>

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Improving antibiotic use saves money

- According to the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America Guidelines for Developing an Institutional Program to Enhance Antimicrobial Stewardship:

“Comprehensive programs have consistently demonstrated a decrease in antimicrobial use (22% -36%), with annual savings of \$200,000 - \$900,000...”
- <http://cid.oxfordjournals.org/content/44/2/159.full#sec-1>

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Total Number of New Antibacterial Agents

Period	Number of Agents
1983-1987	~15
1988-1992	~10
1993-1997	~6
1998-2002	~4
2003-2007	~3
2008-2012	~2

ANTIBIOTIC DEVELOPMENT IS DWINDLING

Source: *The Epidemic of Antibiotic-Resistant Infections*, CID 2008;46 (15 January): Clin Infect Dis. (2011) May 52 (suppl 5): S397-S428. doi: 10.1093/cid/cir153

<http://www.cdc.gov/getsmart/campaign-materials/week/images/anti-dev.png>

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Improving antibiotic use is a public health imperative

- Antibiotics are the only drug where use in one patient can impact the effectiveness in another
- Antibiotics are a shared resource, (and becoming a scarce resource)

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Core Elements of Antibiotic Stewardship programs – Outpatient settings

- Refrain from treating viral syndromes with antibiotics
- Prescribe: right antibiotic, right dose, right duration
- Include microbiology cultures when placing antibiotic orders
- Take an “antibiotic timeout” when a patient’s culture result comes back

http://www.cdc.gov/getsmart/healthcare/factsheets/hc_providers.html

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Core Elements of Antibiotic Stewardship programs – Outpatient settings

- Talk to patients about appropriate use of antibiotics
- Work with pharmacists to counsel patients on appropriate antibiotic use, resistance and adverse effects
- Consider delayed prescribing
- Utilize patient and provider resources offered by CDC and other professional organizations

http://www.cdc.gov/getsmart/healthcare/factsheets/hc_providers.html

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**GET SMART:
Know When Antibiotics Work**



GET SMART
Know When Antibiotics Work
www.cdc.gov/getsmart

GET SMART WEEK: November 16-22, 2015



Embrace antibiotic stewardship

Goal: Improve antibiotic use in in-patient facilities, out-patient offices and in the community, through stewardship interventions and programs, which will improve individual patient outcomes, reduce overall burden of antibiotic resistance and save healthcare dollars.



http://www.cdc.gov/getsmart/healthcare/factsheets/hc_providers.html



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