

**Antibiotic Use and Antibiotic Resistance:
Just the Facts**

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**Antibiotic Use and Antibiotic
Resistance Objectives**

- Define the term “antimicrobials”
- Define the term “antibiotic resistance”
- Define the term “antibiotic stewardship”
- Define the term “diagnostic stewardship”

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**Antibiotic Use and Antibiotic
Resistance Objectives**

- Describe mechanisms of the development of antibiotic resistance
- Define factors that contribute to antibiotic resistance
- Describe action steps that one can take to prevent antibiotic resistance and the spread of antibiotic-resistant organisms

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What are Antimicrobials?

- Antimicrobials are a large group of medications that include:
 - Antibiotics –to treat bacterial infections
 - Antivirals –to treat viral infections
 - Antifungals –to treat fungal infections
 - Anti-parasitics–to treat infections caused by parasites



<https://www.medicinenet.com/script/main/art.asp?articlekey=10204>

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Background: Antibiotics Past, Present



“In such a case the thoughtless person Playing with penicillin treatment is morally responsible for the death of the man who finally succumbs to infection with the penicillin-resistant organism. I hope the evil can be averted.”

Alexander Fleming;1945 New York Times

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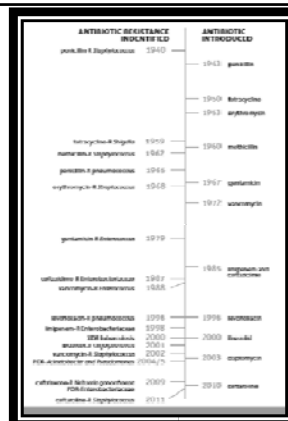
Background: Antibiotics Past, Present



"If we are not careful, we will soon be in a post-antibiotic era."

Dr. Thomas Frieden, past Director of CDC; 2013

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Antibiotic Resistance Affects Everyone

- Antibiotic resistance threatens the use of antibiotics for people of all ages
- Antibiotics are essential treatment for some infections, but also can produce harmful side effects
 - Upset stomach
 - Rashes
 - Interactions with other medications
 - Diarrhea (e.g., Clostridium difficile)

<https://www.americansusetoday.com/antibiotic-stewardship-staff-nurses/>

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Antibiotic Resistance Affects Everyone

- 1 out of 5 visits to EDs are related to adverse events to antibiotics and # 1 for ED visits for children < 18 years of age

<https://www.americansusetoday.com/antibiotic-stewardship-staff-nurses/>

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Big pharma backs off superbug: Why 5 drugmakers bailed on antibiotic research

Written by Aislinn Frawley | August 06, 2018 | Print | Email

Several major pharmaceutical companies recently shut down their antibiotic and antiviral research projects, backing away from the growing threat of superbugs, which may kill more than 10 million people a year by 2050.

There are several reasons big pharma is retreating from its promise to find cures for these antibiotic-resistant infections – the most prominent being a lack of profit.

"The costs to develop a new antibiotic drug are no less expensive compared to development of drugs for other therapeutic areas, yet the commercial potential and return on investment for companies developing new antibiotics are significantly lower than drugs to treat chronic conditions such as diabetes or heart disease," Gary Dishow, deputy director of the Biomedical Advanced Research and Development Authority, which is part of HHS, said in a *Business Insider* article.

The lack of research poses a problem as at least 2 million people in the U.S. become infected with antibiotic-resistant bacteria per year and 23,000 people die each year as a result, according to the CDC.

Antibiotics were once a lucrative business, however, keeping up with the new antibiotic-resistant strains became taxing.

<https://www.beckershospitalreview.com/pharmacy/big-pharma-backs-off-superbug-why-5-drugmakers-bailed-on-antibiotic-research.html>

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What is Antibiotic Resistance?

- Antibiotic resistance happens when germs like bacteria and fungi develop the ability to defeat the drugs designed to kill them.
- Resistant germs are not killed and continue to grow.

<https://www.cdc.gov/drugresistance/about.html>

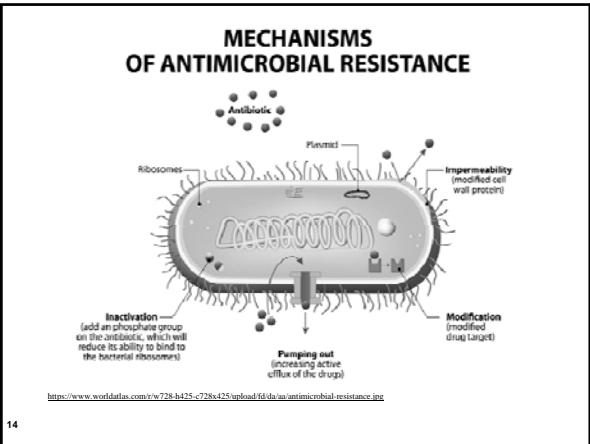
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What is Antibiotic Resistance?

- Infections caused by antibiotic-resistant germs are difficult, and sometimes impossible, to treat.
- Increased follow-up doctor visits, more lengthy recovery times and costly and toxic alternatives
- Resistance depends on organism
 - Mutations
 - Gene transfer

<https://www.cdc.gov/drugresistance/about.html>

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Antibiotic Stewardship

- *CDC has identified antibiotic resistance has one of the most important public health threats*
- Antibiotic use is the biggest driving factor in the development of antibiotic-resistant organisms (MDROs)

<https://www.cdc.gov/drugresistance/solutions>

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Antibiotic Stewardship

- Infections caused by antibiotic-resistant organisms require treatment with more toxic and expensive antibiotics
- Antibiotic resistance is of concern in all healthcare settings---hospitals, LTCF, physician offices and home care
- In order to be effective, must include all levels of healthcare workers

<https://www.cdc.gov/drugresistance/solutions>

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Antibiotic Stewardship

- The appropriate use of antibiotics — often called antibiotic stewardship — can help to:
 - Preserve the effectiveness of current antibiotics
 - Extend the life span of current antibiotics

Antibiotics: Are you misusing them? <https://www.mayoclinic.org/healthy-lifestyle/consumer-health/in-depth/antibiotics/art-20045720>

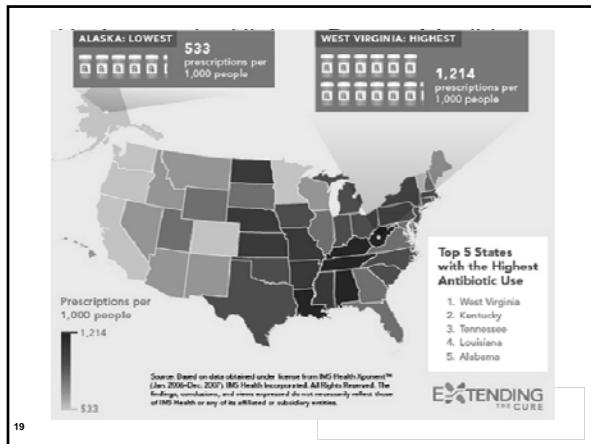
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Antibiotic Stewardship

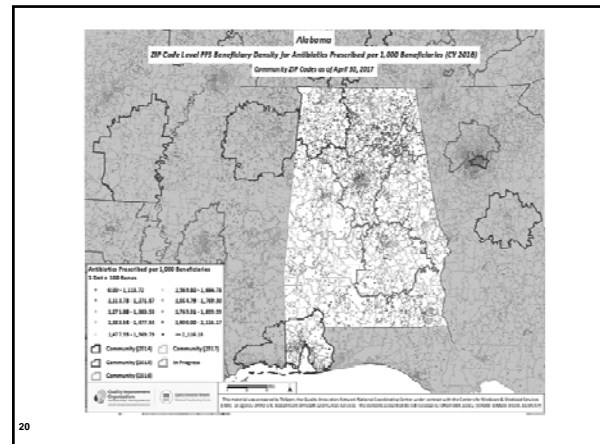
- Protect people from antibiotic-resistant infections
- Avoid side effects from using antibiotics inappropriately

Antibiotics: Are you misusing them? <https://www.mayoclinic.org/healthy-lifestyle/consumer-health/in-depth/antibiotics/art-20045720>

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Antibiotics Prescribed per 1,000 Beneficiaries

Group	Subgroup	Name	Start Date	End Date	Eligible Beneficiaries	Antibiotic Prescriptions	Antibiotic Prescriptions per 1,000 Beneficiaries
National	Nation	Nation	1/1/2016	12/31/2016	20,128,247	30,728,507	1,533.7
National	Nation	Cohort A	1/1/2016	12/31/2016	4,191,365	6,167,205	1,471.4
National	Nation	Cohort B	1/1/2016	12/31/2016	5,513,072	7,990,033	1,449.5
National	Nation	Cohort C	1/1/2016	12/31/2016	4,863,527	7,448,181	1,531.9
State	AL	State	1/1/2016	12/31/2016	454,516	675,179	1,485.8
State	AL	Cohort A	1/1/2016	12/31/2016	81,877	128,938	1,563.2
State	AL	Cohort B	1/1/2016	12/31/2016	139,144	202,448	1,454.4
State	AL	Cohort C	1/1/2016	12/31/2016	48,566	64,575	1,338.7

National and state antibiotics prescribed per 1,000 beneficiaries. The data shows that Community Group A's prescribing rate (1.9102) is significantly higher (17%) than the national rate (1,583.7). All Alabama Cohort communities are prescribing at a higher rate than national cohorts.

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- Antimicrobial Stewardship**
- Prevents misuse, enabling the benefits of antimicrobials to outweigh the risks
 - Ingredients for successful stewardship include:
 - Education for nurses and providers
 - Evidence-based guidelines for clinical assessment, testing for and treating infections
 - Use antibiotics only when clinically indicated

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- Antimicrobial Stewardship**
- Accurate assessment of changes in condition
 - Accurate, timely communication and documentation of signs/symptoms and laboratory results
 - Assist patients in managing symptoms of non-bacterial infections

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- Examples of Antibiotic Misuse**
- Taking antibiotics when not indicated
 - Drug-drug interactions
 - Medication side effects
 - Increased health costs
 - Not finishing an antibiotic prescription
 - Inappropriate prescribing
 - Use of broad-spectrum antibiotics when a narrow-spectrum antibiotic would be effective

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Step 1: Prevent the Spread of MDROs

- Use nursing assessment skills to accurately evaluate symptoms and communicate changes in condition
- Encourage the discontinuation the use of invasive devices when clinically appropriate


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Step 1: Prevent the Spread of MDROs

- Use infection control practices – especially hand hygiene
- Always use Standard Precautions – gowns, gloves, masks, etc. as indicated according to symptoms (coughing, incontinence) and the care given (e.g. change a dressing or perform tracheostomy care)

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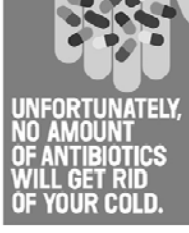
Step 2: Effective Diagnosis and Treatment



- Obtain microbiology cultures whenever possible to guide appropriate antibiotic use
- Collect specimens prior to initiating antibiotic therapy

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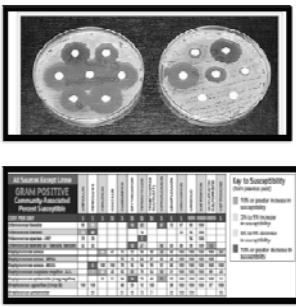
Step 2: Effective Diagnosis and Treatment



- Do not request antibiotics for:
 - Viral infections
 - Asymptomatic bacteriuria
 - Change in condition not likely due to bacterial infection (e.g. falls, confusion)

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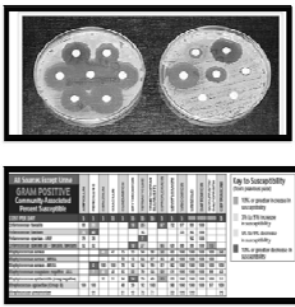
Step 3: Optimize Antibiotic Use



- Perform an antibiotic susceptibility test on bacteria identified in a lab specimen (blood, urine, etc.)

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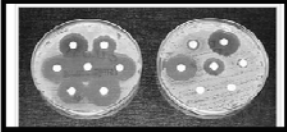
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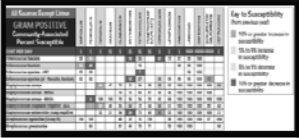
- Antibiotic susceptibility tests are important to determine which antibiotic should be prescribed to effectively treat the infection

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Step 3: Optimize Antibiotic Use



- Obtain and use antibiogram to guide empirical therapy



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Step 3: Optimize Antibiotic Use

- Assist with Optimizing Antibiotic Use
 - Upon receiving laboratory results, notify the prescriber and facilitate an “antibiotic time-out” (re-assessment of the antibiotic prescribed).
 - If culture results are negative:
 - Recommend discontinuation of antibiotics

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Step 3: Optimize Antibiotic Use

- If culture results are positive:
 - Provide susceptibility report to encourage use of a narrower spectrum antibiotic, if available
 - Assess for de-escalation opportunities (e.g., from IV to P.O.)

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How Nurses Can Influence Antibiotic Management

1. Ensure pertinent information about antibiotics is available
2. Ensure the appropriate antibiotic administration route
3. Reassess antibiotic therapy in 2 to 3 days

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How Nurses Can Influence Antibiotic Management

4. Reassess antibiotic therapy in 2 to 3 days
5. Review antibiotic therapy when your patient develops a new C. difficile infection
6. Reconcile antibiotics during all patient-care transitions

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Everyone’s Role in Stewardship

- Use antibiotics only when clinically indicated; Avoid asking your provider for antibiotics
- Practice excellent hand hygiene
- Follow recommended infection prevention and control practices
- Use antibiotics only as prescribed by your doctor including taking the full prescription

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<https://www.mayoclinic.org/healthy-lifestyle/consumer-health/in-depth/antibiotics/art-20045720>

Everyone's Role in Stewardship

- Never take leftover antibiotics for a later illness.
- Never take antibiotics prescribed for another person
- Stay home from work when you're sick
- Get a flu shot every year
- Cover your cough or sneeze with a tissue or use your sleeve (near the shoulder or elbow)

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<https://www.mayoclinic.org/healthy-lifestyle/consumer-health/in-depth/antibiotics/art-20045720>

Improving the Use of Antibiotics in Bacteriuria for the Elderly

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Increased Risk for Infections

6 Reasons the elderly are more susceptible to infection:

1. Their immune system has aged and is not as effective
2. The skin is the first line of defense against infection and the aging skin is thinner
3. The elderly are usually less hydrated – especially their skin

<http://nursevirginiablog.com/2010/11/02/elderly-at-increased-risk-for-infection-really-depend-on-their-caregiver/>

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Increased Risk for Infections

4. Many elderly retain urine – increasing the likelihood of urinary track infection
5. The elderly have decreased ability to cough up secretions
6. The use of medications that can suppress the elder's ability to fight infection

<http://nursevirginiablog.com/2010/11/02/elderly-at-increased-risk-for-infection-really-depend-on-their-caregiver/>

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Urinary Tract Infections

- Facts
 - UTIs are the second most commonly reported infection in community dwelling and hospitalized adults over the age of 65 (preceded only by respiratory infection)
 - They account for over 1/3 of all infections reported in long-term care residents

Urinary Tract Infections in Older Adults Published online in Aging Health by NCBI

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Urinary Tract Infections


- Treatment should be reserved for symptomatic UTI (SUTI) only

Urinary Tract Infections in Older Adults Published online in Aging Health by NCBI

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Prevalence of ASB in the Elderly

- Rate of Asymptomatic Bacteremic (ASB) increases 1-2% per decade of life
- In the community:
 - Men- up to 19%
 - Women - up to 16%
 - Men over the age of 80 – 20% or more




Urinary Tract Infections in Older Adults Published in Aging Health online by NCBI
Infectious Diseases Society of America Guidelines for the Treatment of Asymptomatic Bacteriuria

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Prevalence of ASB in the Elderly

- In long-term care
 - Women- 25-50%
 - Men- 15-40%



Urinary Tract Infections in Older Adults Published in Aging Health online by NCBI
Infectious Diseases Society of America Guidelines for the Treatment of Asymptomatic Bacteriuria

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Presence of WBCs in the urine---- does it differentiate ASB from SUTI?

- Presence of pyuria is not a reliable indicator of infection
- Asymptomatic bacteremic urinary tract infections (ASB) and Symptomatic bacteremic urinary tract infections (SUTI) both provoke an immune response
 - Increased inflammatory markers in the urine including pyuria

Urinary Tract Infections in Older Adults Published in Aging Health online by NCBI
Infectious Diseases Society of America Guidelines for the Treatment of Asymptomatic Bacteriuria

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Presence of WBCs in the urine---- does it differentiate ASB from SUTI?

- WBCs are present in the urine in 78% of people with diabetes
- Up to 90% of elderly nursing home residents have pyuria with or without bacteriuria

Urinary Tract Infections in Older Adults Published in Aging Health online by NCBI
Infectious Diseases Society of America Guidelines for the Treatment of Asymptomatic Bacteriuria

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Why is ASB so prevalent in the elderly?

- Decrease in estrogen leads to a change in the vaginal flora
- Anatomical changes such as prolapsed bladder or enlarged prostate make it difficult to empty the bladder
- Increased incidence of diabetes

Urinary Tract Infections in Older Adults Published online in Aging Health by NCBI

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Why is ASB so prevalent in the elderly?

- Cognitive defects
- Functional impairments
- FOLEY CATHETER USE

Urinary Tract Infections in Older Adults Published online in Aging Health by NCBI

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No Benefit for Treating ASB

(Exceptions- Pregnancy, Surgery Involving the Urinary System, Renal Transplant)

- Cochrane meta-analysis
 - Looked at 9 RCTs (randomized clinical trials) with 1,614 participants
 - Compared outcomes in adult patients with ASB who were treated to those that weren't treated

Antibiotics for Asymptomatic Bacteriuria". Published 2015. Cochrane Database of Systematic Reviews

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No Benefit for Treating ASB

(Exceptions- Pregnancy, Surgery Involving the Urinary System, Renal Transplant)

- Findings
 - No differences in:
 - Subsequent development of SUTI
 - Complications including pyelonephritis and bacteremia
 - Death
 - *Those treated suffered more adverse events*

Antibiotics for Asymptomatic Bacteriuria". Published 2015. Cochrane Database of Systematic Reviews

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MDROs in UTI

- Repeated exposure to antibiotics increases the chance of subsequent infections with MDROs
- Cohort study of long term care residents (Journal of Critical Care, 2016)
 - 26% of all urine isolates were resistant to Bactrim
 - 40% were resistant to Levaquin

"Antibiotic Strategies in the Era of Antibiotic Resistance". Published 2016. Journal of Critical Care.

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Consequences of Treating ASB



- C diff
- MDROs
- Side Effects
- Cost

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Hazards of Misdiagnosis




- Complicated UTI (extended beyond the bladder) is the most common cause of sepsis in adults over 65 years of age

"Risk Factors for Urrosepsis in Older Adults". Published 2016 Gerontology and Geriatric Medicine
<https://www.123rf.com/stock-photo/sepsis.html?imgtype=0&start=300&st>

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Hazards of Misdiagnosis



- UTIs cause approximately 10% to 30% of all severe sepsis or septic shock

"Risk Factors for Urrosepsis in Older Adults". Published 2016 Gerontology and Geriatric Medicine
<https://www.123rf.com/stock-photo/sepsis.html?imgtype=0&start=300&st>

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Hazards of Misdiagnosis



- 28% to 50% of elderly patients with septic shock will die

"Risk Factors for Urroseps in Older Adults". Published 2016 Gerontology and Geriatric Medicine
<https://www.123rf.com/stock-photo/sepsis.html?imgtype=0&start=300&su>

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Balancing Act



- Prevention
- Reducing Foley Catheter Use
- CAUTI Bundle
- Treat only SUTI
- Diagnostic Stewardship
- Unintended Consequences

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If you must use a Foley....

- Insert using aseptic technique only for appropriate indications and leave only as long as needed
- Securement device
- Bag below the level of the bladder at all times
 - Maintain a closed drainage system
 - Leg bags in long-term care – no consensus. Have a policy.

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CDC CAUTI prevention guidelines

If you must use a Foley....

- Avoid irrigation
- Maintain unobstructed urine flow
 - Free from kinks and dependent loops
 - Empty bag regularly using a separate clean container for each patient

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CDC CAUTI prevention guidelines

If you must use a Foley....(con't)

- Consider alternatives – condom catheters or external female catheter
- Do not change catheters or bags at routine intervals
- Perform audits and provide feedback to staff
- Change out long-term catheters prior to culture collection
 - Catheter in place for 2 weeks



Images from CDC
 CDC CAUTI prevention guidelines

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Things you can do

- Teach patient and family to practice good hand hygiene
- Promote adequate hydration
- Encourage prompted voiding
- Encourage proper hygiene – Don't leave them wet or dirty!!

Diagnosis and Management of Urinary Tract Infection in Older Adults. Published Infections Disease Clinics of North America 2013.
 "Old Randomized Controlled Trial of Cranberry Capsules for Reduction of Bacteriuria Plus Pyuria in Female Nursing Home Residents". Published 2012 Journal of American Geriatrics Society.
 "Effect of Cranberry Capsules on Pyuria and Bacteriuria among Older Women in Nursing Homes". JAMA 2016;316(18):1879-1887

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Things you can do

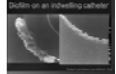
- Encourage mobility as such as possible
- Use of cranberry capsules remains controversial
 - RCT in 2012 showed a decrease in bacteriuria and pyuria in female nursing home residents
 - RCT in 2016 showed no statistically significant difference when compared to placebo

Diagnosis and Management of Urinary Tract Infections in Older Adults. Published Infectious Disease Clinics of North America 2013.
 "One Randomized Controlled Group Study of Cranberry Capsules for Reduction of Bacteriuria Plus Pyuria in Female Nursing Home Residents". Published 2012 Journal of American Geriatrics Society.
 "Effect of Cranberry Capsules on Pyuria and Bacteriuria among Older Women in Nursing Homes". JAMA 2016;316(11):1379-1387

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Reduce Foley Catheter Use

- Bacteriuria risk increases 3-10% per day
- 100% of patients with long-term catheters will have urine that is colonized with bacteria
- Biofilm can form in as little as 3 ½ days
- Biofilm organisms can ascend the catheter in 1-3 days



Bacterial biofilm-based catheter-associated urinary tract infections: Causative pathogens and antibiotic resistance. Published 2017 in American Journal of Infection Control

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Treat only Symptomatic UTI

- Symptom detection in the elderly is difficult!
 - Significant cognitive deficits
 - Chronic genitourinary symptoms such as incontinence, urgency, and frequency unrelated to infection
 - Nonspecific symptoms such as anorexia, confusion, and a decline in their abilities to perform ADLs
 - Fever is often absent or diminished

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Treat only Symptomatic UTI

- Detailed history
- Objective pain scale – palpate the bladder
- Involve your PCAs and family. They spend the most time with the patients and can detect subtle changes.


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***Clostridium difficile* Infection- CDI**

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CDI

- Almost always related to antibiotic exposure
- 2015 study- half a million infections/year
- 15,000 deaths directly attributable to C diff
- \$3,800,000,000 in medical costs could be saved over 5 years if C diff infections can be curtailed




CDC Antibiotic/Antimicrobial Resistance. <https://www.cdc.gov/drugresistance/basics-about.html> "Prevalence and impact of Clostridium difficile infection in elderly residents of long-term care facilities, 2011 nationwide study". Published in the journal Medicine.

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CDI

- Most common cause of acute infectious diarrhea in long-term care
- More likely to be admitted to an acute care hospital
- Significant increase in 3-month mortality



CDC Antibiotic/Antimicrobial Resistance. <https://www.cdc.gov/drugresistance/about.html> "Prevalence and Impact of Clostridium difficile Infection in elderly residents of long-term care facilities, 2011 nationwide study". Published in the journal Medicine.

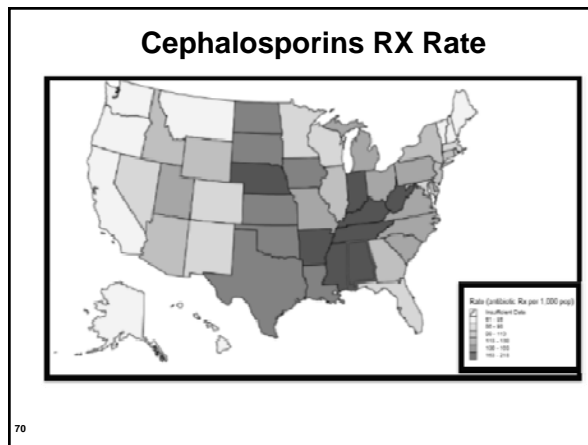
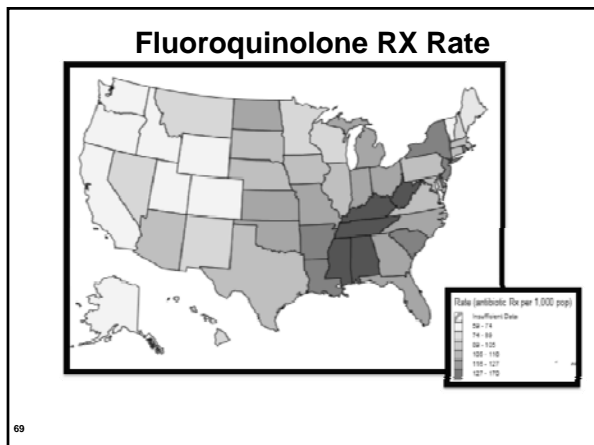
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Antibiotics: A Risk Factor for CDiff

High Risk for CDiff	Medium Risk for CDiff	Low Risk for CDiff
<input type="checkbox"/> Clindamycin (Cleocin®)*	<input type="checkbox"/> Piperacillin/tazobactam (Zosyn®)*	<input type="checkbox"/> Amikacin (Amikin®)
<input type="checkbox"/> Ceftriaxone (Rocephin®)*	<input type="checkbox"/> Amoxicillin/clavulanic acid (Augmentin®)*	<input type="checkbox"/> Daptomycin (Cubicin®)
<input type="checkbox"/> Cliprofloxacin (Cipro®)*	<input type="checkbox"/> Ampicillin/sulbactam (Unasyn®)	<input type="checkbox"/> Doxycycline (Vibramycin®)
<input type="checkbox"/> Levofloxacin (Levaquin®)*	<input type="checkbox"/> Amoxicillin (Amoxil®)	<input type="checkbox"/> Fosfomycin (Monuro®)
<input type="checkbox"/> Cefepime (Maxipime®)	<input type="checkbox"/> Azithromax (Zithromax®)	<input type="checkbox"/> Gentamicin
<input type="checkbox"/> Ceftazidime (Fortaz®)	<input type="checkbox"/> Aztreonam (Azactam®)	<input type="checkbox"/> Linezolid (Zyvox®)
<input type="checkbox"/> Cefuroxime (Ceftin®)	<input type="checkbox"/> Cefazolin (Ancef®)	<input type="checkbox"/> Nitrofurantoin (Macrobid®)
<input type="checkbox"/> Ertapenem (Invanz®)	<input type="checkbox"/> Cephalosixin (Keflex®)	<input type="checkbox"/> Polymixin (Colistin®)
<input type="checkbox"/> Meropenem (Merrem®)	<input type="checkbox"/> Dalphopristin/quinupristin (Synercid®)	<input type="checkbox"/> Rifampin (Rifadin®)
		<input type="checkbox"/> Trimethoprim/sulfamethoxazole (Bactrim®)

*Strongest Association with CDiff Antibiotic classes by CDiff risk level, 2015

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Respiratory Tract Infections

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Respiratory Tract Infections (RTIs)

- Upper Respiratory tract infections (URTIs)
 - Common cold, laryngitis, pharyngitis/tonsillitis, acute rhinitis, acute rhinosinusitis and acute otitis media.
- Lower respiratory tract infections (LRTIs)
 - Acute bronchitis, bronchiolitis, pneumonia and tracheitis.

Respiratory Tract Infections - Antibiotic Prescribing Prescribing of Antibiotics for Self-Limiting Respiratory Tract Infections in Adults and Children in Primary Care NICE Clinical Guidelines, No. 69

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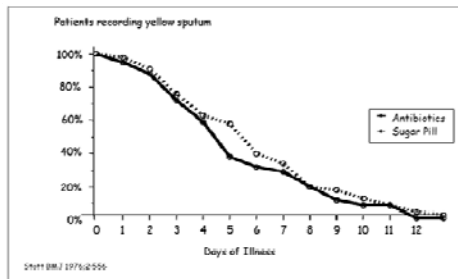
Respiratory Tract Infections (RTIs)

- 1/4 population will visit their GP because of a RTI each year
- 60% of all antibiotic prescribing in general practice is for RTIs
- At least 30% of these antibiotics are unnecessary
- 10% decrease in inappropriate prescribing in the community can result in a 17% reduction in Clostridium difficile infection

Respiratory Tract Infections - Antibiotic Prescribing Prescribing of Antibiotics for Self-Limiting Respiratory Tract Infections in Adults and Children in Primary Care NICE Clinical Guidelines, No. 99

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Effect of Antibiotics on Respiratory Symptoms



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Viruses or Bacteria What's got you sick?

Antibiotics are only available for bacterial infections. They cannot be used for viral infections. What illnesses are best treated with antibiotics? When an antibiotic is not prescribed, are your health care professionals not sure or how to reduce antibiotic use?

Common Infections	COMMON CAUSES		Are Antibiotics Prescribed?
	Bacteria	Virus	
Strep throat	✓		Yes
Whooping cough	✓		Yes
Urinary tract infection	✓		Yes
Sinus infection		✓	Maybe
Strep throat infection		✓	Maybe
Bronchitis/Influenza (the common respiratory viruses and cough)		✓	No
Common cold/flu/cold		✓	No
Nerve pain (nerve injury)		✓	No
Typhoid		✓	No

BE ANTIBIOTICS AWARE
To learn more about antibiotic stewardship and how this can help you, visit www.nhs.uk/antibiotic-awareness

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Educate Residents, Family and Visitors

- Infection prevention and control recommendations differ from those for patients in hospitals and nursing homes
- Contact Precautions are generally implemented for all patients known to have antibiotic-resistant organisms while they are in the hospital because:
 - People in hospitals are sicker, more vulnerable
 - Frequent presence of invasive devices

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Educate Residents, Family and Visitors

- Assure family members that you are providing appropriate care to their loved one

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7 Core Elements for Antimicrobial Stewardship



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What is Diagnostic Stewardship?

- Ordering of tests is guided by careful clinical evaluation, recognition of a clinical syndrome, and estimation of the pretest likelihood of the condition for which test is obtained. (JAMA 2017)
- Reconsidering current practices, as empiricism gives way to diagnostics-guided therapy

Diagnostic Stewardship – Leveraging the Laboratory to Improve Antimicrobial Use. JAMA 2017

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What is Diagnostic Stewardship?

- Modifying ordering, performing, and reporting diagnostic tests
 - Test only when symptoms suggest urinary tract infection or, if asymptomatic, in accordance with guidelines (pregnancy, urologic surgery, renal transplant)
- Include interpretive results such as “multiple organisms present indicating likely contamination”

Diagnostic Stewardship – Leveraging the Laboratory to Improve Antimicrobial Use. JAMA 2017

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Patient Safety First!

- As with any change in care delivery, a potential for unintended consequences and harm exists.
- Diagnoses may be missed.
- Close monitoring of diagnostic stewardship should be ongoing with changes made as needed.
- Tests targeted by stewardship should always be available to providers by special request or in certain circumstances

Diagnostic Stewardship – Leveraging the Laboratory to Improve Antimicrobial Use. JAMA 2017.

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Antibiotic Stewardship

Right Drug 



For the Right Bug

For the Right Duration 

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Questions?

U.S. Antibiotic Awareness Week is November 12-18, 2018.

U.S. Antibiotic Awareness Week (formerly “Get Smart About Antibiotics Week”) is an annual one-week observance to raise awareness of the threat of antibiotic resistance and the importance of appropriate antibiotic prescribing and use. Join CDC and partners as we celebrate the effort to combat the spread of antibiotic resistance and improve patient safety.



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Terms

- **Antibiotic-resistant bacteria** –Bacteria that have mutated, or changed, genetically so that they develop the ability to survive when exposed to antibiotics that are intended to kill them.
- **Bacteria** -(singular: bacterium) are single-celled life forms. Bacteria are present in soil, water, and all living organisms. Many disease-causing organisms are bacteria; however, not all bacteria cause disease. Some bacteria are necessary for essential functions like digestion.

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Terms

- **Broad-spectrum antibiotics – Antibiotics that target a wide range of bacteria. They are often more toxic and cause more side effects than narrow-spectrum antibiotics. Broad-spectrum antibiotics may be prescribed to treat an infection when the causative organism is not yet known; the antibiotic can be targeted to the organism once the lab results are available.**

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Terms

- **Colonization –The presence of bacteria, or other microorganism, without symptoms of disease.**
- **Infection -The presence and multiplication of microorganisms that are causing symptoms (i.e. fever, redness, wound drainage). Infection generally implies that the person has clinical signs or symptoms of a disease.**
- **Mutation -A permanent change in genetic make-up of an organism.**

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Terms

- **Narrow-spectrum antibiotics –Antibiotics that target a small, specific range of bacteria, such as gram-negative or gram-positive bacteria.**
- **Normal flora bacteria -Many bacteria are found in the body and provide useful and even essential functions to aid human survival. These bacteria, which under usual circumstances are present but do not cause disease, are called normal flora bacteria.**
- **Virus -A submicroscopic particle that can reproduce only if it is inside the cell of a**

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Terms

- **Virus -A submicroscopic particle that can reproduce only if it is inside the cell of a living organism. Viruses cannot be killed by antibiotics.**

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Resources

Special Thank You to Amy Stephens, CDC, Crestwood Medical Center, Huntsville, AL.

Antibiotic Use in Long-Term-Care Facilities (SHEA position paper)
<https://www.shea-online.org/images/guidelines/Abx-LTCF96.PDF>

Alliance for the Prudent Use of Antibiotics
www.tufts.edu/med/apua/

CDC Campaign to Prevent Antibiotic Resistance
<https://www.cdc.gov/antibiotic-use/week/index.html>

Core Elements of Antibiotic Stewardship for Nursing Homes- CDC
<https://www.cdc.gov/longtermcare/prevention/antibiotic-stewardship.html>
<https://www.cdc.gov/longtermcare/prevention/index.html>

National Nursing Home Quality Improvement C. difficile Infection Prevention Assessment Checklists
https://www.nhqualitycampaign.org/files/AntibioticStewardship_Assessment.pdf

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Resources

Field Guide to Antibiotic Stewardship in Outpatient Settings
<http://atomalliance.org/download/field-guide-to-antibiotic-stewardship/>

Nursing Home Antimicrobial Stewardship Guide;
<https://www.ahrq.gov/nhgguide/index.html>

Nurses in Long-term Care Facilities: Antibiotic Use and Antibiotic Resistance
<http://www.health.state.mn.us/divs/idepc/dtopics/antibioticresistance/hcp/asp/lc/modsli/denurseabx.pdf>

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