Antimicrobial Stewardship

Preventing the Spread of Antibiotic Resistance and Improving Patient Care

(Adapted from the Centers for Disease Control and Prevention)
The CDC found 43 cases between 2010 and 2015. Instances of a threatening superbug that scientists are calling the "phantom menace" are rising in the U.S., officials reported Thursday.

This particular strain of bacteria is a type of Carbapenem-resistant Enterobacteriaceae (CRE), which are dangerous because they typically are highly antibiotic-resistant and have steep mortality rates, the Centers for Disease Control and Prevention (CDC) said. According to the CDC, this CRE carries a plasmid with an enzyme that can break down certain antibiotics, which it can transfer to other bacteria in the body, the Washington Post explains.

'C'Main Event' Linked to Antibiotic Nearly 15,000 Annually
Feo 18, 2019, 10:27 AM ET
By LIZ NEPRENT via GOOD MORNING AMERICA

The report predicts that the world's GDP would be 0.5% smaller by 2020 and 1.4% smaller by 2030 with over 100 million premature deaths. The Review on Antimicrobial Resistance, chaired by Jim O'Neil, is significant in that it is a global review that seeks to quantify financial costs.

This issue goes beyond health policy and, on a strictly macroeconomic basis, it makes sense for governments to act now, the report argues. "One of the things that has been lacking is putting some pound signs in front of this problem," says Michael Head at the Farr Institute, University College London, UK, who sees hope in how a response to HIV came about. "The world was slow to respond [to HIV]." When the costs were calculated the world leapt into action.

He recently talked up R&D for infectious diseases in the UK and found gross underinvestment in antibacterial research: £102 million compared to a total of £2.6 billion. Other research shows that less than 1% of available research funds in the UK and Europe were spent on antibiotic research in 2008-2013.
What is “Stewardship”?

“Antimicrobial stewardship refers to coordinated interventions designed to improve and measure the appropriate use of antimicrobials by promoting the selection of the optimal antimicrobial drug regimen, dose, duration of therapy, and route of administration.” – Infectious Diseases Society of America

- A report from the Centers for Disease Control and Prevention (CDC) released in May 2016 reported that at least 30% of antibiotics prescribed in the US are unnecessary.
- One of the goals of a stewardship program is to curb inappropriate antibiotic prescribing.
What is Resistance?

- Antimicrobial resistance is the ability of microbes to resist the effects of drugs
  - Germs are not killed = growth is not stopped
- Infections with resistant bacteria are harder to treat and can require more expensive and toxic medications
**Antibiotic resistance is a **PUBLIC HEALTH** issue**
## How Can We Fight Resistance?

### Prevent Infections
- Avoiding infections in the first place reduces the amount of antibiotics that have to be used and reduces the likelihood that resistance will then develop.
- Immunization, safe food preparation, handwashing.

### Tracking
- Gathering data on antibiotic-resistant infections, causes of infections, and whether there are particular reasons some people got a resistant infection.

### Developing New Drugs and Diagnostic Tests
- Because antibiotic resistance occurs as part of a natural process in which bacteria evolve, it can be slowed but not stopped; we will always need new antibiotics.

### Improving Antibiotic Prescribing
- Perhaps the single most important action needed is to change the way antibiotics are used via antibiotic stewardship.
Protect every patient every time.

**Actions to prevent antibiotic-resistant infections in healthcare.**

**Prevent infections from catheters and after surgery.**
- Use catheters only when needed.
- Follow recommendations for safer surgery and catheter insertion and care.
- Remove catheters from patients as soon as they are no longer needed.

**Prevent bacteria from spreading.**
- Improve hand hygiene.
- Use gloves, gowns, and dedicated equipment for patients who have resistant bacteria.
- Know about antibiotic-resistant HAI outbreaks in your hospital and region (e.g., promote coordinated action for prevention).

**Improve antibiotic use.**
- Get cultures and start antibiotics promptly, especially in the case of sepsis.
- Use cultures to reassess the need for antibiotics and stop antibiotic treatment as soon as they are no longer needed.
- When antibiotics are necessary, use the appropriate antibiotic in the proper dosage, frequency, and duration.
What Does Antibiotic Stewardship Entail?

<table>
<thead>
<tr>
<th>Leadership Commitment</th>
<th>• Dedicating necessary human, financial, and information technology resources</th>
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</thead>
<tbody>
<tr>
<td>Accountability</td>
<td>• Appointing a single (physician) leader responsible for program outcomes</td>
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<tr>
<td>Drug Expertise</td>
<td>• Appointing a single pharmacist leader responsible for working to improve antibiotic use</td>
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<tr>
<td>Action</td>
<td>• Implementing at least one recommended action (e.g. “antibiotic time out” after 48 hours)</td>
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<tr>
<td>Tracking</td>
<td>• Monitoring antibiotic prescribing and resistance patterns</td>
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<tr>
<td>Reporting</td>
<td>• Regular reporting information on antibiotic use and resistance to doctors, nurses, and relevant staff</td>
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<tr>
<td>Education</td>
<td>• Educating clinicians about resistance and optimal prescribing</td>
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### Who is Involved?

<table>
<thead>
<tr>
<th>Clinicians and Department Heads</th>
<th>Infection Preventionists</th>
<th>Quality Improvement Staff</th>
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</table>
| • Prescribers must be fully engaged in and supportive of efforts | • Coordinate facility-wide monitoring of HAIs  
• Assist in analyzing and reporting data  
• Help educate staff on importance of appropriate antibiotic use and laboratory testing | • Optimizing antibiotic use is a medical quality and patient safety issue |

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<tr>
<th>Laboratory Staff</th>
<th>IT Staff</th>
<th>Nurses/Pharmacists</th>
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| • Guide proper use of tests and flow of results  
• Assist with development of antibiogram  
• Present data in a way that supports optimal antibiotic use | • Critical to integrating new protocols into existing work flow (e.g. EPIC changes)  
• Collection and reporting of antibiotic use data | • Help assure cultures are performed before starting antibiotics  
• Review medications daily and prompt discussion of antibiotic treatment, indication, duration |
Why is Antibiotic Stewardship Important?

*It is a matter of life and death*

Estimated minimum number of illnesses and deaths caused annually by antibiotic resistance*:

- At least **2,049,442** illnesses,
- **23,000** deaths

* bacteria and fungus included in this report
What is *C. difficile*?

- Gram positive, spore-forming bacterium that causes inflammation of the colon
- Estimated to cause approximately half a million infections in the US in 2011
- Poor antibiotic prescribing practices put patients at risk for *C. difficile* infection (CDI)
  - Patients on antibiotics are 7-10 times more likely to get CDI
IMPACT

Caused close to half a million illnesses in one year.

comes back at least once in about 1 in 5 patients who get C. difficile.

1 in 11 people 65 and older died within a month of C. difficile infection diagnosis.

RISK

People on antibiotics are 7-10 times more likely to get C. difficile while on the drugs and during the month after.

Being in healthcare settings, especially hospitals or nursing homes.

More than 80% of C. difficile deaths occurred in people 65 and older.

SPREAD

Touching unclean surfaces, especially those in healthcare settings, contaminated with feces from an infected person.

Dirty hands.

Failing to notify other healthcare facilities when patients with C. difficile transfer from one facility to another.

PREVENT

Improve prescribing of antibiotics.

Use best tests for accurate results to prevent spread.

Rapidly identify and isolate patients with C. difficile.

Wear gloves and gowns when treating patient with C. difficile. Remember that hand sanitizer doesn’t kill C. difficile.

Clean rooms surfaces with EPA-approved, spore-killing disinfectant (such as bleach), where C. difficile patients are treated.
What can I expect?

- You may be contacted by the Stewardship team to discuss antibiotics your patient is receiving.
- The Stewardship team is here to help you determine whether treatment is still needed and whether it’s appropriate.
What can I do to help?

- Evaluate your patient’s antibiotics every day
  - What am I treating?
  - Are they still needed?
  - Can they be narrowed or modified?
  - Is an oral option appropriate?
  - How long does my patient need to be on them?
- Discuss cases with the Stewardship team or consult Infectious Diseases
How does this help me, my patients or the hospital?

- Reduces the risk of adverse events related to antibiotics such as C. difficile or IV issues
- Length of stay may be shortened
- Avoid excessive exposure to antibiotics
- Prevents development of resistant bacteria
Remember!

Every time antibiotics are prescribed:

1. Order recommended cultures before antibiotics are given and start drugs promptly.

2. Make sure indication, dose, and expected duration are specified in the patient record.

3. Reassess within 48 hours and adjust Rx if necessary or stop Rx if indicated.

Specific recommendations for common prescribing situations:

**Rx for urinary tract infections**
- Make sure that culture results represent true infection and not just colonization.
  - Assess patient for signs and symptoms of UTI.
  - Make sure that urinalysis is obtained with every urine culture.
  - Treat for recommended length of time and ensure that planned post-discharge treatment takes into account the antibiotics given in the hospital.

**Rx for pneumonia**
- Make sure that symptoms truly represent pneumonia and not an alternate, non-infectious diagnosis.
- Treat for the recommended length of time and ensure that planned post-discharge treatment takes into account the antibiotics given in the hospital.

**Rx for MRSA infections**
- Verify that MRSA is growing in clinically relevant cultures. Do not use vancomycin to treat infections caused by methicillin-susceptible staph (and not MRSA).

SOURCE: CDC Vital Signs, 2014
What Everyone Should Know

- Antibiotics can cause more harm than good!
  - Taking antibiotics increases your risk of getting an antibiotic-resistant infection later
  - Antibiotics kill the health bacteria in the gut
  - Antibiotics cause 1 out of 5 emergency department visits for adverse drug events

- Do NOT use antibiotics when a viral infection is suspected