Antimicrobial Stewardship in the Emergency Department

Erica Wales
AMS Pharmacist
Wollongong Hospital
Learning Objectives

Identify the challenges of antibiotic prescribing in the Emergency Department

Describe the barriers to good antibiotic prescribing in the Emergency Department

Outline the role of the AMS team in the Emergency Department

Discuss Emergency Department management approaches to common infections
Conflicts of Interest

In relation to this presentation, I declare the following, real or perceived conflicts of interest:

NIL

A conflict of interest is any situation in which a speaker or immediate family members have interests, and those may cause a conflict with the current presentation. Conflicts of interest do not preclude the delivery of the talk, but should be explicitly declared. These may include financial interests (eg. owning stocks of a related company, having received honoraria, consultancy fees), research interests (research support by grants or otherwise) or organisational interests.
Challenges

- Rapid patient turnover
- Speed of decision making
- Incomplete diagnostic data
- Patient expectations
- Lack of access to follow-up
- Prescribing patterns
ED PROBLEM: rapid decisions with incomplete diagnostic information

- Rapid Tests & PCR
- Procalcitonin
- Decision Support Tools
- ED Specific Guidelines
Antimicrobial Stewardship

- **Antibiotic hotlines for instant advice 9 to 5, Monday to Friday**
  - Wollongong, Shellharbour, Shoalhaven and Coledale (ext 3838)
  - Bulli and Milton (#2828); Pt. Kembla (ext 3535)

- Restricted antimicrobials list (ISLHD, October 2016)
- HITH referral process

**Helpful links for antibiotic prescribing**

- Creatinine clearance calculator
- Adult febrile neutropenia and neutropenic sepsis guidelines
- Gentamicin dosing
- MIMS drug interactions
- Pathology (MedCouRieR)
- Pneumonia: SMART-COP / CORB / Mild / Mod / Severe Rx
- Renal impairment: Dosage adjustment (eTG)
- **Sepsis Kills:** Adult antibiotic guideline and admin guide / pathway
- **Sepsis Kills:** Paediatric antibiotic guideline / admin guide (p.21) / pathway
- **Sepsis Kills:** Neonate Sepsis antibiotic guideline
- Therapeutic guidelines (eTG)
- Vancomycin interactive / Vancomycin dosing and monitoring
- Respiratory Virus Swab (Nasopharyngeal) / Video of procedure
Select an indication:

If you do not see the indication that you are looking for, you may select Other. This requires you to enter your reason for wanting to prescribe the drug and may generate a review by the Infectious Diseases service.

- Please Choose
- Campylobacter enteritis - severe or prolonged
- Crohns disease: Perianal and fistulising disease
- Gastroenteritis - acute (empirical therapy)
- Salmonella enteritis - if meeting criteria in table on right
- Shigella enteritis
- Travellers diarrhoea - if moderate/severe or alternate therapy has failed
- Yersinia enterocolitis - if meeting criteria in table on right
- Other

A bacterial infection is suspected

AND

The patient has clinical features suggesting severe disease (such as high fever, tachycardia, leucocytosis, abdomen, tenderness or severe abdominal pain, high-volume diarrhoea with hypovolaemia, blood in the stool)

OR

The patient does not have clinical features suggesting severe disease but is immunocompromised

Does this patient's presentation meet this criteria?

- Please Choose

This patient meets the criteria for approval for ciprofloxacin use.

In adults, the recommended dose is CIPROFLOXACIN 500 mg orally, 12-hourly.

Use the link on the right to view this topic in the Therapeutic Guidelines: Antibiotic.

The approval number is valid for 3 days.

Consider whether the patient has risk factors of Clostridium difficile infection prior to starting ciprofloxacin.

Note: Dose adjustment is needed for renal impairment. Please refer to the Therapeutic Guidelines or contact the pharmacy department for information on drug use in pregnancy and breastfeeding.

Click 'Get Approval' or press 'Enter' to get an approval number.

--- END OF GUIDELINE ---
ED PROBLEM: rapid decisions with incomplete diagnostic information

- Rapid Tests & PCR
- Procalcitonin
- Decision Support Tools
- ED Specific Guidelines
Challenges

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- Prescribing patterns
ED PROBLEM: patient expectations

- Public Health Education
- Healthcare Worker Education
- Community Group Education
- Patient Education
Green snot doesn’t mean you need antibiotics

Coloured mucus or phlegm isn’t always a sign of a bacterial infection, and that also goes for other symptoms including cough, sore throat, earaches and fever. While some people with these symptoms will need antibiotics, most people won’t and will get better without antibiotics.

Green or yellow coloured snot can in fact be a sign that your immune system is fighting your infection, and not that your illness is getting worse.
ED PROBLEM: patient expectations

- Public Health Education
- Healthcare Worker Education
- Community Group Education
- Patient Education
Antibiotics are only needed for treating certain infections caused by bacteria. Viral illnesses cannot be treated with antibiotics. When an antibiotic is not prescribed, ask your healthcare professional for tips on how to relieve symptoms and feel better.

<table>
<thead>
<tr>
<th>Common Condition</th>
<th>Common Cause</th>
<th>Are Antibiotics Needed?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bacteria</td>
<td>Bacteria or Virus</td>
</tr>
<tr>
<td>Strep throat</td>
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<td></td>
</tr>
<tr>
<td>Whooping cough</td>
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<td></td>
</tr>
<tr>
<td>Urinary tract infection</td>
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</tr>
<tr>
<td>Sinus infection</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Middle ear infection</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Bronchitis/chest cold (in otherwise healthy children and adults)*</td>
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<td></td>
</tr>
<tr>
<td>Common cold/runny nose</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Sore throat (except strep)</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Flu</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

* Studies show that in otherwise healthy children and adults, antibiotics for bronchitis won't help you feel better.
Symptom Relief for Viral Illnesses

1. DIAGNOSIS
- Cold or cough
- Middle ear fluid (Otitis Media with Effusion, OME)
- Flu
- Viral sore throat
- Bronchitis
- Other:

You have been diagnosed with an illness caused by a virus. Antibiotics do not work on viruses. When antibiotics aren’t needed, they won’t help you, and the side effects could still hurt you. The treatments prescribed below will help you feel better while your body fights off the virus.

2. GENERAL INSTRUCTIONS
- Drink extra water and fluids.
- Use a cool mist vaporizer or saline nasal spray to relieve congestion.
- For sore throats in older children and adults, use ice chips, sore throat spray, or lozenges.
- Use honey to relieve cough. Do not give honey to an infant younger than 1.

3. SPECIFIC MEDICINES
- Fever or aches:
- Ear pain:
- Sore throat and congestion:

Use medicines according to the package instructions or as directed by your healthcare professional. Stop the medication when the symptoms get better.

Signed:

To learn more about antibiotic prescribing and use, visit www.cdc.gov/antibiotic-use.

4. FOLLOW UP
- If not improved in ___ days/hours, if new symptoms occur, or if you have other concerns, please call or return to the office for a recheck.
- Phone:
- Other:

Why does taking antibiotics lead to antibiotic resistance?

Any time antibiotics are used, they can cause side effects and lead to antibiotic resistance. Antibiotic resistance is one of the most urgent threats to the public’s health. Always remember:

1. Antibiotic resistance does not mean the body is becoming resistant to antibiotics; it is that bacteria have become resistant to the antibiotics designed to kill them.
2. When bacteria become resistant, antibiotics cannot fight them, and the bacteria multiply.
3. Some resistant bacteria can be harder to treat and can spread to other people.

Each year in the United States, at least 2 million people get infected with antibiotic-resistant bacteria. At least 23,000 people die as a result.

What is the right way to take antibiotics?

If you need antibiotics, take them exactly as prescribed.

Improving the way healthcare professionals prescribe antibiotics, and the way we take antibiotics, helps keep us healthy now, helps fight antibiotic resistance, and ensures that these life-saving drugs will be available for future generations.

Talk with your doctor if you have any questions about your antibiotics, or if you develop any side effects, especially diarrhea, since that could be Clostridium difficile infection also called C. diff or C. dif, which needs to be treated. C. diff can lead to severe colon damage and death.

What are the side effects?

Common side effects range from minor to very severe health problems and can include:
- Rash
- Diarrhea
- Nausea
- Vomiting
- Headache

More serious side effects can include:
- Clostridium difficile infection
- Severe and life-threatening allergic reactions

To learn more about antibiotic prescribing and use, visit www.cdc.gov/antibiotic-use.

Why is it important to Be Antibiotics Aware?

Antibiotics save lives. When a patient needs antibiotics, the benefits outweigh the risks of side effects or antibiotic resistance.

When antibiotics aren’t needed, they won’t help you, and the side effects could still hurt you. Reactions from antibiotics cause 1 out of 5 medication-related visits to the emergency department.

What do antibiotics treat?

Antibiotics are only needed for treating certain infections caused by bacteria. Antibiotics are critical tools for treating common infections, such as pneumonia, and for life-threatening conditions including sepsis, the body’s extreme response to an infection.

What don’t antibiotics treat?

Antibiotics do not work on viruses, such as colds and flu, or on fungi, even if the mucus is thick, yellow or green. Antibiotics also won’t help some common bacterial infections, including most cases of bronchitis, many sinus infections, and some ear infections.

In children, reactions from antibiotics are the most common cause of medication-related emergency department visits.

How can I stay healthy?

You can stay healthy and keep others healthy by:
- Cleaning hands
- Covering coughs
- Staying home when sick
- Getting recommended vaccines, for the flu, for example

Talk to your doctor or nurse about steps you can take to prevent infections.
Challenges

- Rapid patient turnover
- Speed of decision making
- Incomplete diagnostic data
- Patient expectations
- Lack of access to follow-up
- Prescribing patterns
ED PROBLEM: access to follow-up care

- Drug-Bug Mismatch
- Drug Interactions
- Post-Prescription Review
- Order Modification
- Allergy Check
Challenges

- Rapid patient turnover
- Speed of decision making
- Incomplete diagnostic data
- Patient expectations
- Lack of access to follow-up
- Prescribing patterns
ED PROBLEM: antimicrobial prescribing behaviour

AMS Champion within ED

Quality Improvement Projects

Prescriber Feedback

Monitoring Antimicrobial Usage
Common Emergency Department Presentations
Respiratory Tract Infections

- Rapid Diagnostic Tests
- Paediatrics & Carer Education
- Pneumonia Guideline Adherence
- Decision Support Tools
Runny Nose from a Cold: Does your child need antibiotics?

Q&A Guide for Parents
Your child has a cold and a runny nose. You might think this means your child needs an antibiotic. A runny nose, even if you're seeing thick yellow or green mucus, is normal when you begin to get better from a cold.

What causes a runny nose during a cold?
When germs that cause colds first infect the nose and sinuses, the nose makes clear mucus. This helps wash the germs from the nose and sinuses. After two or three days, the body's immune system fights back, changing the mucus to a white or yellow color. When bacteria that normally live in the nose grow back during the recovery phase, they then change the mucus to a greenish color. This is all normal and does not mean your child needs antibiotics.

What should I do?
- Try using a cool mist vaporizer or saltwater nose drops.
- Watch your child. Runny nose, cough, and symptoms like fever, headache, and muscle aches may be unpleasant, but antibiotics will not help and the symptoms won't go away any faster. When antibiotics aren't needed, they won't help and could even hurt you.

Are antibiotics needed for a runny nose?
A runny nose is a normal part of a cold. Antibiotics do not work on viruses like colds or runny noses (even if the mucus is thick yellow or green). Your child's doctor or nurse may prescribe other medicine or give you tips to help with symptoms like fever and cough.

Why not just try antibiotics?
When antibiotics aren't needed, they won't help and could even hurt you. Taking antibiotics creates resistant bacteria. Antibiotic resistance occurs when bacteria change and adapt to defeat the killing power of antibiotics. Any time antibiotics are used, they can cause side effects and lead to antibiotic resistance. Side effects of antibiotics can include rash, dizziness, stomach problems, or yeast infections.
Acute bronchitis: should I take antibiotics?

- This decision aid can help you decide whether to use antibiotics when you or your child has acute bronchitis (acute cough).
- It is designed to be used with your doctor to help you make a shared decision about what is best for you or your child.

What causes acute bronchitis?
- It can be caused by a viral or bacterial infection. It is hard for your doctor to tell which it is.
- The infection is in the airway (bronchi) leading to the lungs. Acute means it is a short-term infection.

How long does the cough last?
The cough will usually get better by about 10-20 days, without needing to take antibiotics.

What are the treatment options?
There are 2 options that you can discuss with your doctor:

1. Not taking antibiotics
   This means letting the infection get better by itself.
   Symptoms, such as fever, can be treated with over-the-counter medicines. They can be used with either option.

2. Taking antibiotics

What are the likely benefits and risks of each option?

People who take antibiotics have the cough for only about 12 hours less than people who do not.

- Average time with a cough
  - With antibiotics: cough lasts about 156 hours (6.5 days)
  - Without antibiotics: cough lasts about 168 hours (7 days)

These figures show what is likely to happen to people with acute cough who do not take antibiotics and those who do. Each circle is one person. We can’t predict who will get better sooner or who will have problems.

Possible benefits
- gets better by 1-2 weeks
- gets better by 1-2 weeks due to antibiotics
- not better by 1-2 weeks

100 people who don’t take antibiotics
- 68 will be better after 1-2 weeks
- 32 will not be better after 1-2 weeks

With antibiotics, 18 more people will be better after 1-2 weeks.

Possible risks
- has problems
- has problems due to antibiotics
- no problems

100 people who don’t take antibiotics
- 19 will have problems, such as vomiting, diarrhea or rash
- 81 will not have problems

100 people who do take antibiotics
- 23 will have problems
- 77 will not have problems

With antibiotics, 4 more people will have problems like vomiting and diarrhea. Other antibiotic downsides are:
- the cost of buying them
- remembering to take them
- the risk of antibiotic resistance (see next page)

Where do these estimates of benefits and risks come from?
- They come from the most up-to-date medical evidence of benefits and risks about what works best. This is a review of 17 studies, and over 5000 people, that looked at antibiotic use in people with acute bronchitis.
- The quality of this research evidence is ranked as high. This means that further research is very unlikely to change these estimates.

Why might antibiotics be used?
- If the infection is in the lung, it is called pneumonia. This is not common, however if you have pneumonia, it can be serious. Your doctor may also talk with you about why antibiotics might be needed, such as if you have a chronic disease. Coughing up coloured phlegm (spit) is not a sign that antibiotics are needed.

What is antibiotic resistance?
- Using antibiotics means the bacteria can develop resistance to the antibiotics. This means the antibiotics may not work if you or your child needs them in the future to treat a bacterial infection.
- A person who has recently used antibiotics is more likely to have resistant bacteria in their body.

Are there other things I can do to manage acute bronchitis?
- Fever is best treated with over-the-counter paracetamol and/or ibuprofen. Do not give more than the maximum recommended dose. Read the dose information on the packet.
- Aspirin should NOT be used with children who are younger than 16 years.

When should you see a doctor and get further help?
If the person with the cough has any of these signs:
- Very drowsy
- Fast or difficult breathing, wheezing, or shortness of breath
- Cold or discoloured hands and/or feet with a warm body
- Pain in the arms and/or legs
- Coughing blood
- Unusual skin colour (pale or blue) around the lips
- A rash that does not fade when the skin is pressed

Questions to consider when talking with your doctor:
- Do I need antibiotics?
- What happens if I don’t take antibiotics?
- Do I know enough about the benefits and risks of:
  - taking antibiotics?
  - not taking antibiotics?
- Am I clear about which benefits and risks matter most to me?
- Do I have enough information and support to decide?

References
- An evidence-based guide to the decision aid. This is an information only guide and should not be relied upon as a substitute for consultation with a qualified health professional who can determine you or your child’s individual medical needs.
- Reviewed: November 2016. Updated due to November 2018. Decision Aids funded by the Australian Commission on Safety and Quality in Health Care and developed by Associate Professor Timmy Hoffmann, Professor Chris Del Mar, and Mr Peter Coates - Centre for Research in Evidence-Based Practice, Bond University.
Respiratory Tract Infections

- Rapid Diagnostic Tests
- Pneumonia Guideline Adherence
- Paediatrics & Carer Education
- Decision Support Tools
Please note, ceftriaxone is a cephalosporin (beta-lactam) antibiotic and should not be administered to patients with a history of immediate hypersensitivity to penicillins (e.g., anaphylaxis, angioedema, wheeze etc.).

Before proceeding, you may review the list of accepted indications at the right.

If you do not see the indication that you are looking for, you may select Other. This requires you to enter your reason for wanting to prescribe the drug and will generate an automatic review by the Infectious Diseases service.

Select a system/site of infection:

- Please Choose
  - Please Choose
  - Cardiovascular system
    - Central nervous system / Eye
    - Gastrointestinal / Intra-abdominal system
    - Genital tract and sexually transmitted infections
    - Prophylaxis
    - **Respiratory system**
      - Septicaemia / Systemic sepsis
      - Skin and soft tissue / Bone and joint
      - Urinary tract
      - **PAEDIATRIC INDICATIONS**
      - Other

Pneumonia: Community acquired - severe

Click 'Next' or press 'Enter' to continue

Severe pneumonia implies that:

A chest x-ray infiltrate is present

**AND**

The patient's presentation is with "severe pneumonia" based on the clinical assessment, and/or the severity score

**Does this patient's presentation meet these criteria?**

- Please Choose
  - Please Choose
  - **Yes**
  - No

'Enter' to continue
Respiratory Tract Infections

- Rapid Diagnostic Tests
- Paediatrics & Carer Education
- Pneumonia Guideline Adherence
- Decision Support Tools
Urinary Tract Infections

Who to Test?
Asymptomatic Bacteriuria Education

What to Treat With?
Antibiograms & ED Specific Guidelines

Antibiotic Duration

Post-prescription Review
<table>
<thead>
<tr>
<th>Organism</th>
<th>Amoxicillin</th>
<th>Amoxicillin and enzyme inhibitor</th>
<th>Cefalexin</th>
<th>Trimethoprim</th>
<th>Nitrofurantoin</th>
<th>Gentamicin</th>
<th>Amikacin</th>
<th>Ceftriaxone</th>
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<tbody>
<tr>
<td>Escherichia coli</td>
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<td>90.90</td>
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Urinary Tract Infections

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Education

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Thank you