Promoting Appropriate Antimicrobial Prescribing in Secondary Care

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NHS England
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Introduction

- Background
- ESPAUR 2014
- Antimicrobial Stewardship
- Antimicrobial Management Team (AMT)
  - Audit
  - Consumption
  - Education and Training
- Summary
The burden of infectious disease in England

- In 2010 infectious disease in England accounted for:
  - 8% hospital admissions
  - 7% of all deaths

- Economic impact estimated at £30 billion per year

Annual report from the Chief Medical Officer (CMO), 2013
Antibiotic use in hospital

“Patients who are hospitalised have a high probability of receiving an antibiotic and 50% of all antibiotic use in hospitals can be inappropriate.

Misuse of antibiotics in hospitals is one of the main factors that drive development of antibiotic resistance.”

Key messages for hospital prescribers. European Centre for Disease Prevention and Control (ECDC) 2005-2013 www.ecdc.europa.eu
Inappropriate Antimicrobial Use

- Risks to patients
  - Resistant infections
  - Healthcare-associated infections (HCAIs)
    - *Clostridium difficile*
    - MRSA
    - Others
- Financial cost
  - Cost of inappropriate antibiotics
  - Cost of treating resistant infections/HCAIs
ESPAUR 2014

- Antimicrobial
- Resistance
- Consumption
- Stewardship
Antimicrobial Consumption
Antimicrobial Consumption

• Antibiotic prescribing has increased in England year on year
  • Total antibiotic use increased by 6%

• Inpatient antibiotic use increased by 12% which includes:
  • 12% increase in Co-amoxiclav
  • 49% increase in Piperacillin/Tazobactam
  • 36% increase in Meropenem
Table 3.3 Ranks and relative consumption of the top 15 consumed agents in general practice and hospitals in England, 2013.

<table>
<thead>
<tr>
<th>Community consumption in 2013</th>
<th>Hospital Consumption in 2013</th>
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<tbody>
<tr>
<td>Rank</td>
<td>Proportion of all antibiotics</td>
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<tr>
<td>Amoxicillin</td>
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<td>Clarithromycin</td>
<td>2</td>
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<td>Doxycycline</td>
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<tr>
<td>Lymecycline</td>
<td>4</td>
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<td>Flucloxacillin</td>
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<td>Trimethoprim</td>
<td>6</td>
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<td>Erythromycin</td>
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<tr>
<td>Co-amoxiclav</td>
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<td>Phenoxy methylpenicillin</td>
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<td>Oxytetracycline</td>
<td>10</td>
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<tr>
<td>Nitrofurantoin</td>
<td>11</td>
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<td>Azithromycin</td>
<td>12</td>
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<tr>
<td>Ciprofloxacin</td>
<td>13</td>
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<tr>
<td>Cephalixin</td>
<td>14</td>
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<tr>
<td>Metronidazole</td>
<td>15</td>
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</table>
Antimicrobial Stewardship
Antimicrobial Stewardship Programme (ASP)

- An ASP describes a bundle of measures that can be adopted to promote the appropriate use of antibiotics, including:
  - optimising outcomes for patients who receive antibiotics
  - evidence-based optimal standards for routine antibiotic use, e.g. correct selection of agent, dose, route of administration and duration of therapy
  - ensuring competency and educational programmes for all staff that use antibiotics
  - communicating antibiotic issues to all stakeholders
  - auditing the impact and uptake of these processes
Antimicrobial Stewardship – Secondary Care Resource

Start Smart – Then Focus
Antimicrobial Stewardship Toolkit for English Hospitals

Revised February 2015
Start Smart Then Focus

ANTIMICROBIAL STEWARDSHIP
Treatment algorithm

Start Smart —> Then Focus

DO NOT START ANTIBIOTICS IN THE ABSENCE OF CLINICAL EVIDENCE OF BACTERIAL INFECTION

1. Take thorough drug allergy history
2. Initiate prompt effective antibiotic treatment within one hour of diagnosis (or as soon as possible) in patients with severe sepsis or life-threatening infections
3. Comply with local antimicrobial prescribing guidance
4. Document clinical indication (and disease severity if appropriate), dose and route on drug chart and in clinical notes
5. Include review/stop date or duration
6. Obtain cultures prior to commencing therapy where possible (but do not delay therapy)

CLINICAL REVIEW & DECISION AT 48-72 HOURS

Clinical review, check microbiology and make a clear plan. Document this decision

1. STOP
2. IV to oral switch
3. Change antibiotic
4. Continue
5. OPAT*

Document Decision & Next Review Date or Stop Date

DOCUMENT ALL DECISIONS

*In accordance with surviving sepsis patient safety alert
*According to weight/age in children refer to local formulary or BNFc
*Use appropriate route in line with severity/patient factors
*Outpatient Parenteral Antibiotic Therapy

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Implementation of an ASP

What should I expect from a provider?

Establish an Antimicrobial Management Team / Committee (AMT)
AMT or Equivalent

- Multidisciplinary Group including;
  - Microbiologists/Infectious disease specialist
  - Antimicrobial pharmacist
  - Acute care physician
  - Surgeon
  - Anaesthetist
  - Paediatrician
  - Senior nurse
  - Primary care representative

- Report to the Trust Board

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Key Roles of AMT

- Evidence based local antimicrobial guidelines
- Audit
- Antibiotic Consumption Data
- Control of High Risk Antibiotics
- Ward based activities
- Education and Training
Antibiotic Guidelines

- Guided by evidence
- Based on local susceptibility data
- Empirical recommendations
- Duration of therapy
- Prophylaxis
- Advice on monitoring
- Should be reviewed regularly
- Access

www.england.nhs.uk
Antibiotic Guidelines

• Improved access in recent years, move from paper to
  • Web based versions
  • Apps

• Smartphone Apps
  • Microguide
  • Rx-Guidelines – PharmaMix
  • Imperial AMS App
  • Ignaz
## LRTI / Infective Exacerbation of COPD or Asthma

<table>
<thead>
<tr>
<th>INFECTION</th>
<th>PROBABLE ORGANISMS</th>
<th>ANTIBIOTICS</th>
<th>DOSE</th>
<th>FREQ</th>
<th>ROUTE</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Respiratory Tract Infection NOT pneumonia OR Infective Exacerbation COPD</td>
<td><em>Pneumococcus</em></td>
<td>Amoxicillin or Doxycycline</td>
<td>500mg</td>
<td>8 hourly</td>
<td>Oral</td>
<td>Ciprofloxacin is NOT appropriate for empirical treatment of a chest infection. Doxycycline is effective against resistant M. catarrhalis. May increase Doxycycline dose to 100mg 12 hourly short term COPD: send sputum cultures. Co-amoxiclav is NOT recommended for the empirical treatment of a lower respiratory tract infection or an infective exacerbation of COPD.</td>
</tr>
<tr>
<td>2 out of 3 of: Increased sputum volume</td>
<td><em>Haemophilus influenzae</em></td>
<td></td>
<td>200mg then 100mg</td>
<td>first day then daily</td>
<td>Oral</td>
<td></td>
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<tr>
<td>Or increased breathlessness OR arterial pH &lt; 7.35 Treated for 5 to 7 days</td>
<td><em>Moraxella catarrhalis</em></td>
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<tr>
<td>Severe</td>
<td>Aminocillin</td>
<td>1g</td>
<td>8 hourly</td>
<td>IV</td>
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</table>

*LRTI: NICE guidelines in Respiratory Tract Infections is antibiotics should generally only be used in patients who are systematically unwell or with symptoms or signs of serious complications or those at high risk of serious complications due to pre-existing comorbidity such as significant heart, lung, renal, liver or neuromuscular disease, immunosuppression, cystic fibrosis and young children who were born prematurely. In addition antibiotics may be indicated in patients over 65 years of age with two or more of, or if older than 80 years one or more of hospitalisation in the previous year, type 1 or 2 diabetes, history of congestive heart failure, current use of glucocorticoids.*
Audits

- Point prevalence
  - Indication
  - Choice in line with guidelines
  - Stop / Review Date

- IV Route appropriate
- Course length
- Antibiotic Course Review
  - Indication, Choice, Route, Cultures, Course length
Audits – patient outcomes

• Surgical prophylaxis
  • Indication for prophylaxis
  • Choice of agent
  • Timing

• Sepsis
  • Time to first dose

• Clinical audits
  • Treatment of Community Acquired Pneumonia
  • Sepsis six
Audits - Feedback

• Feedback to prescribers
  • Promote learning
  • Improve practice
CDDFT Audit Experience

- Audit program commenced Dec 2008
- Most acute wards audited monthly
- Initially struggled with feedback
- Improved feedback
  - Consultants
- Better reporting
Antibiotic Prescribing Oct 11-Aug 14

- Average of % Compliant Choice
- Average of % Rx with Stop or Review date
# Antimicrobial Medication

**Pre and post flush with Sodium Chloride 0.9% must be given with all medication administered via the intravenous route.**

<table>
<thead>
<tr>
<th>Drug (approved name)</th>
<th>Dose</th>
<th>IV Antibiotics</th>
<th>IV Review (please tick)</th>
<th>Date</th>
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<td>Micro Results and additional Information</td>
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**Oral Antibiotic Prescription < 7 days**

Review by day 7 and rewrite if continuation of antimicrobial.

If less than 7 days is required please annotate prescription with an appropriate stop date.

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<th>Dose</th>
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**Prolonged Antibiotics (> 10 days)** i.e. Sepsis, Osteomyelitis, Bone and Joint infections, Meningitis, Bronchopneumonia or if 3rd antibiotic is required

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<thead>
<tr>
<th>Drug (approved name)</th>
<th>Dose</th>
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### Medicine - DMH 2013/14

#### Ward
- **DMH AMU**: % Compliant Choice: 88, % Rx with Stop or Review date: 99
- **DMH 41**: % Compliant Choice: 91, % Rx with Stop or Review date: 83
- **DMH 42**: % Compliant Choice: 89, % Rx with Stop or Review date: 98
- **DMH 43**: % Compliant Choice: 92, % Rx with Stop or Review date: 98
- **DMH 44**: % Compliant Choice: 89, % Rx with Stop or Review date: 98
- **DMH CCU**: % Compliant Choice: 100, % Rx with Stop or Review date: 86
- **DMH 52**: % Compliant Choice: 94, % Rx with Stop or Review date: 98

#### Grand Total
- % Compliant Choice: 92, % Rx with Stop or Review date: 94

#### % Compliant Choice

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#### % Rx with Stop or Review date

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</table>
Antibiotic Consumption

- Review consumption data
- Highlighting broad-spectrum prescribing e.g. piperacillin/tazobactam, co-amoxiclav
- Presented at AMT and results discussed
- Identify areas for review
Antibiotic Consumption Data
Antibiotic Consumption Data

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Control of High Risk Antibiotics

- Use of consumption data
- Comparison with other organisations
- Restriction of broad spectrum / high risk antibiotics
  - Meropenem
  - Co-amoxiclav
  - Quinolones
  - Cephalosporins
Ward Based Interventions

- Establishment of ‘Microbiology / Infection ward rounds’
- Improve patient care and antimicrobial use
  - Blood culture round
  - Referrals from Healthcare professionals
  - Visit to admissions unit
- Individual face to face education
Education and Training

- Extensive teaching programme
  - Doctors
  - Nurses
  - Pharmacists
  - Other Health Care Professionals
- European Antibiotic Awareness Day (EAAD)
- Antibiotic Guardian
- E-learning
Antimicrobial Stewardship - ESPAUR

- Survey sent to 146 Acute NHS Trusts with 99 responses

**Table 4.1 Antimicrobial Policy key elements, 2011 and 2014 surveys, n=99**

<table>
<thead>
<tr>
<th>Antimicrobial Policy: key elements reported by Trusts</th>
<th>2011</th>
<th>2014</th>
<th>Change</th>
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</thead>
<tbody>
<tr>
<td>Antimicrobial formulary</td>
<td>96%</td>
<td>93%</td>
<td>-3%</td>
</tr>
<tr>
<td>Empiric usage guidance</td>
<td>99%</td>
<td>93%</td>
<td>-6%</td>
</tr>
<tr>
<td>Reserved antibiotic list</td>
<td>91%</td>
<td>85%</td>
<td>-6%</td>
</tr>
<tr>
<td>IV-Oral switch</td>
<td>87%</td>
<td>81%</td>
<td>-6%</td>
</tr>
<tr>
<td>Surgical antibiotic prophylaxis</td>
<td>100%</td>
<td>98%</td>
<td>-2%</td>
</tr>
<tr>
<td>Automatic stop policy</td>
<td>36%</td>
<td>21%</td>
<td>-14%</td>
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<tr>
<td>Separate antibiotic drug chart/section</td>
<td>32%</td>
<td>58%</td>
<td>+26%</td>
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<tr>
<td>Restricted antibiotics list</td>
<td>90%</td>
<td>90%</td>
<td>0%</td>
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What assurance should commissioners seek?

- Audit Work – evidence of audits and compliance
- Consumption – consumption reports, broad spectrum usage
- Education and Training – evidence of ongoing education, possibly agree % educated
- Be involved in providers Antimicrobial Management Team
Summary

• Lots of good work has already taken place in secondary care
• 94% of Trusts have established an AMT
• More than 90% of Trusts have an Antibiotic Formulary
• Regular audit work undertaken with feedback
• Infection ward rounds in operation
• Extensive Education and Training
Any Questions?