Management of antibiotic-resistant organisms

Vicky Hickson – Nurse Consultant in Health Protection, North West London Health Protection Team
vicky.hickson@phe.gov.uk
Outline

• Public Health England (PHE) and Health Protection teams (HPTs) – who we are and what we do

• Managing carbapenamase-producing Enterobacteriaceae (CRE) in non-acute and community settings –
  Antimicrobial resistance
  Why is resistance important?
  Issues in community settings
  Incidents and outbreaks
  Strategies for prevention and control
Core functions of PHE

Protecting the public’s health from infectious diseases and other hazards to health

Improving the public’s health and wellbeing and reducing health inequalities

Improving population health through sustainable health and care services

Building the capability and capacity of the public health system
Health Protection Teams - London (HPTs)

SE & SW HPTs will become one team from Jan 2016
HPTs main functions

1. **Response** - NOIDS, incidents & outbreaks, non-infectious environmental hazards (24/7 on call service).

2. **Surveillance** – proper officer function (NOIDS)

3. **Strategic and partnership work** - TB Control Boards, Local Resilience Forums, Trust Infection Prevention & Control Committees

4. **Research and Development (R&D)**

5. **Teaching and Training**
### Notifiable diseases - NOIDS

Diseases notifiable (to Local Authority Proper Officers) under the Health Protection (Notification) Regulations 2010

<table>
<thead>
<tr>
<th>Disease</th>
<th>Whether likely to be Routine or Urgent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute encephalitis</td>
<td>Routine</td>
</tr>
<tr>
<td>Acute meningitis</td>
<td>Urgent if suspected bacterial infection, otherwise routine</td>
</tr>
<tr>
<td>Acute poliomyelitis</td>
<td>Urgent</td>
</tr>
<tr>
<td>Acute infectious hepatitis (A, B, C)</td>
<td>Urgent</td>
</tr>
<tr>
<td>Anthrax</td>
<td>Urgent</td>
</tr>
<tr>
<td>Botulism</td>
<td>Urgent</td>
</tr>
<tr>
<td>Brucellosis</td>
<td>Routine, urgent if UK acquired</td>
</tr>
<tr>
<td>Cholera</td>
<td>Urgent</td>
</tr>
<tr>
<td>Diphtheria</td>
<td>Urgent</td>
</tr>
<tr>
<td>Enteric fever (typhoid/ paratyphoid)</td>
<td>Urgent</td>
</tr>
<tr>
<td>Food poisoning</td>
<td>Routine, urgent, if as part of a cluster or outbreak</td>
</tr>
<tr>
<td>Haemolytic Uraemic Syndrome</td>
<td>Urgent</td>
</tr>
<tr>
<td>Infectious bloody diarrhoea</td>
<td>Urgent</td>
</tr>
<tr>
<td>Invasive group A streptococcal disease</td>
<td>Urgent</td>
</tr>
<tr>
<td>Scarlet fever</td>
<td>Routine</td>
</tr>
<tr>
<td>Legionnaire’s disease</td>
<td>Urgent</td>
</tr>
<tr>
<td>Leprosy</td>
<td>Routine</td>
</tr>
<tr>
<td>Malaria</td>
<td>Routine; urgent if UK acquired</td>
</tr>
<tr>
<td>Measles</td>
<td>Urgent</td>
</tr>
<tr>
<td>Meningococcal septicaemia</td>
<td>Urgent</td>
</tr>
<tr>
<td>Mumps</td>
<td>Routine</td>
</tr>
<tr>
<td>Plague</td>
<td>Urgent</td>
</tr>
<tr>
<td>Rabies</td>
<td>Routine</td>
</tr>
<tr>
<td>Rubella</td>
<td>Routine</td>
</tr>
<tr>
<td>SARS</td>
<td>Urgent</td>
</tr>
<tr>
<td>Smallpox</td>
<td>Urgent</td>
</tr>
<tr>
<td>Tetanus</td>
<td>Routine; urgent if associated with injecting drug use</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>Routine; urgent if healthcare worker or suspected cluster or multi drug resistant</td>
</tr>
<tr>
<td>Typhus</td>
<td>Routine</td>
</tr>
<tr>
<td>Viral haemorrhagic fever</td>
<td>Urgent if diagnosed in acute phase; routine if later diagnosis</td>
</tr>
<tr>
<td>Whooping cough</td>
<td>Urgent if UK acquired</td>
</tr>
<tr>
<td>Yellow fever</td>
<td>Urgent if diagnosed in acute phase; routine if later diagnosis</td>
</tr>
</tbody>
</table>

**ALL OTHER HAZARDS:** Cases with potential public health implications - To be notified URGENTLY

1. Chemical exposure e.g. Carbon monoxide, lead, mercury
2. Radiation exposure
3. New and emerging infections (e.g. new strains of influenza)
4. Cases that occur as part of an outbreak/ cluster e.g. clostridium difficile, norovirus
5. Other infections where vulnerable contacts are at risk: e.g. infection in a healthcare worker, varicella zoster exposure in pregnant or immunocompromised people

This list is not exhaustive. If in doubt please telephone your local HPT.
How do we do it?

**HPZone**

- Web-based management tool
- Database of cases & incidents being managed by HPTs across England
- Contains all case information & a record of all actions taken
- Supports HPTs to deliver an effective acute service
- Provides surveillance data
- Can mass distribute alerts from other HPTs
Find your local health protection team [www.phe.gov.uk](https://www.gov.uk/health-protection-team)
Antimicrobial resistance (AMR) – what is the problem?
Antimicrobial resistance (AMR) is a global issue.

Meat sold in China is found to be infected with E.coli resistant to powerful antibiotics and able to transfer its immunity.
Globalisation of resistance

Travel

Last year the number of international tourist arrivals across the globe each year broke through the one billion barrier for the first time ever. We carry drug resistant pathogens everywhere we go. One recent study of Swedish world travellers found one in four young men were returning with antibiotic resistant bacteria present in their guts.

Strategies to control AMR

• **Preventing infections to prevent spread of resistance** – immunisation, safe food preparation, handwashing and using antibiotics as directed and only when necessary are all ways of reducing both the spread and the development of resistance.

• **Improving antibiotic prescribing/stewardship** – up to half of antibiotic use in humans, and much of use in animals is unnecessary.

• **Surveillance** – mandatory and voluntary reporting of certain organisms (eg MRSA, clostridium difficile). Can track causes and risk factors for people who are infected/colonised.

• **Developing new drugs and diagnostic tests** - resistance is a natural evolutionary process, it can be slowed but not stopped.
70% of *E-Coli* bacteraemias in hospitals originate in the community.
Ageing population

- Community Setting
  - Care Homes (nursing & residential)
  - Rehabilitation Centres
- Long Term Facilities
  - Neurodisability Units
  - Primary Care Settings
  - Patients own home

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### Age group

<table>
<thead>
<tr>
<th>Age group</th>
<th>Numbers by mid-2012</th>
<th>Numbers by mid-2032</th>
<th>Percentage change</th>
<th>2011 census</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–14</td>
<td>9,332,300</td>
<td>10,399,600</td>
<td>11</td>
<td>9,386,200</td>
</tr>
<tr>
<td>15–64</td>
<td>34,697,300</td>
<td>37,182,000</td>
<td>7</td>
<td>34,991,400</td>
</tr>
<tr>
<td>65–84</td>
<td>7,812,500</td>
<td>10,896,600</td>
<td>39</td>
<td>7,536,300</td>
</tr>
<tr>
<td>85+</td>
<td>1,264,400</td>
<td>2,609,700</td>
<td>106</td>
<td>1,193,300</td>
</tr>
<tr>
<td>Overall population</td>
<td>53,106,500</td>
<td>61,087,900</td>
<td>15</td>
<td>53,107,200</td>
</tr>
</tbody>
</table>

http://www.kingsfund.org.uk/time-to-think-differently/trends/demography/ageing-population

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Carbapenam-resistant enterobacteriaceae (CRE)

Enterobacteriaceae – family of gram-negative bacilli that are part of normal gut flora colony in humans and animals

Common cause of community and health-care acquired infections

Most common reported infections include *klebsiella* species, *enterobacter* species, *Escherichia coli*.

Gradual resistance to broad-spectrum antibiotics over last few decades – treated with carbapenems successfully

Bacteria develops resistance via several mechanisms, including production of an enzyme (carbapenamase) that inactivates the carbapenems
Common terms used

CPO – Carbapenemase producing organism
CPC – Carbapenemase producing coliform
CPE – Carbapenemase producing Enterobacteriaceae
CRO – Carbapenem resistant organism
CRE – Carbapenem resistant Enterobacteriaceae

VIM – Verona integron-encoded metallo beta lactamase
NDM – New Delhi Metallobetalactamase
OXA – oxacillin-hydrolysing
KPC – Klebsiella pneumoniae carbapenemase
Headlines for care homes

- PREPARATION and PLANNING is key
- While uncommon now, CPE may not stay that way. Routine management of residents with antibiotic resistant organisms will be needed (think about MRSA)
- Ensure managers and all staff are familiar with the toolkit
- Ensure staff understand the difference between COLONISATION and INFECTION
- Communication is key – use the inter-healthcare transfer forms
- RISK ASSESSMENT of residents once CPE status known. DOCUMENTATION of rationale for isolation or not
- Staff should have access to infection control advice
- Staff should receive IC training – link practitioner for each care home ideally
- Compliance with Hygiene Code a condition for CQC registration
- Up to date IC policies essential
What should Care facilities do?
What should care homes do?

- Transfer form
- Training of staff
- Cleaning the environment
- Cleaning toilet
- Toilet use
- Diarrhoea management
- Hand hygiene
- Personal protective equipment
- Visitors
Transfer forms
Inter-healthcare infection control transfer

Inter-healthcare infection control transfer form

Patient/client details: [insert label if available]
Name:
Address:

Consultant:
GR
Current patient/client location:

Transferring facility – hospital, ward, care home, etc.
Contact no:
Is the ICU aware of transfer? (Yes/No)

NHS number
Date of birth

Receiving facility – hospital, ward, care home, district nurse

Is the patient/client an infection risk?
Please list most appropriate box and give confirmed or suspected organism

Confirmed risk Organism:

Confirmed risk Organism:

Suspected risk Organism:

No known risk

Patient/client exposed to others with infection (Yes/No)

If patient/client has diarrhoea illness, please indicate bowel history for last week:
(based on Bristol stool form scale, see previous page)

Is the diarrhoea thought to be of an infectious nature? (Yes/No)

Relevant specimen results (including admission screen – MRSA, glycopeptide-resistant
Staphylococcus aureus, methicillin-resistant Staphylococcus aureus, Streptococcus pneumoniae,
multi-resistant Acinetobacter spp) and treatment information, including antimicrobial therapy:

Specimen:
Date:
Result:

Treatment information:

Other information:

Is the patient/client aware of their diagnosis/risk of infection? (Yes/No)
Does the patient/client require isolation? (Yes/No)
Should the patient/client require isolation, please phone the receiving unit in advance.

Name of staff member completing form: ..................................................
Print name:
Contact number:

For further advice, please contact your Infection control team/advisor.
Carriage of organisms

Skin is not the normal habitat

If it's a wet area Gram negatives will survive

Colonisation precedes infection
Non diarrhoeal resident

Group activity

Sitting on a sofa
Cleanliness in care homes
Toilet facilities

The national specifications for cleanliness:
Guidance on setting and measuring performance outcomes in care homes

http://www.nrls.npsa.nhs.uk/resources/?entryid45=75240

Specification for Cleanliness in Care Homes
Identifying opportunities to enhance environmental cleaning in 23 acute care hospitals

Infection control and hospital epidemiology

Carling P et al January 2008 Vol 29 No 1 p1-7
Hand Hygiene

Your 5 moments for hand hygiene at the point of care

1. **Before patient contact**
   - **Before aseptic task**
   - **After body fluid exposure risk**
   - **After contact with patient surroundings**

2. **Before an aseptic task**
   - **Why?** To protect the patient against harmful germs, including the patient’s own, from entering his/her body.

3. **After patient contact**
   - **After an aseptic task**
   - **After body fluid exposure risk**

4. **After patient contact**
   - **Why?** To protect yourself and the healthcare environment from harmful patient germs.

5. **After contact with patient surroundings**
   - **Why?** To protect yourself and the healthcare environment from harmful patient germs.

Adapted from WHO World Alliance for Patient Safety 2006.
Handling of Waste
Urinary & Enteric waste & Environment

- Incontinence
- Incontinence pads
- Washroom facilities
- What do people actually do?
- How can it be better managed in a safe way?
- Management of diarrhoea (care & cleaning staff)
- Management of norovirus (care & cleaning staff)
- Care & cleaning staff – how can the system be responsive to IPC need
Quality standard covers the prevention and control of infection for people receiving healthcare in primary, community and secondary care settings.
Compliance criteria 1-10

1. Systems to manage and monitor the prevention and control of infection. These systems use risk assessments and consider the susceptibility of service users and any risks that their environment and other users may pose to them.

2. Provide and maintain a clean and appropriate environment in managed premises that facilitates the prevention and control of infections.

3. Ensure appropriate antimicrobial use to optimise patient outcomes and to reduce the risk of adverse events and antimicrobial resistance.

4. Provide suitable accurate information on infections to service users, their visitors and any person concerned with providing further support or nursing/medical care in a timely fashion.

5. Ensure prompt identification of people who have or are at risk of developing an infection so that they receive timely and appropriate treatment to reduce the risk of transmitting infection to other people.
6. Systems to ensure that all care workers (including contractors and volunteers) are aware of and discharge their responsibilities in the process of preventing and controlling infection.

7. Provide or secure adequate isolation facilities.

8. Secure adequate access to laboratory support as appropriate.

9. Have and adhere to policies, designed for the individual’s care and provider organisations that will help to prevent and control infections.

10. Providers have a system in place to manage the occupational health needs and obligations of staff in relation to infection.

For all providers of healthcare and adult social care on the prevention of infections under The Health and Social Care Act 2008. This sets out the 10 criteria against which a registered provider will be judged on how it complies with the registration requirements related to infection prevention. Not all criteria will apply to every regulated activity.

The CQC is responsible for judging compliance with the registration requirements set out in regulations.