Antimicrobial Stewardship and the Management of Catheter Associated Urinary Tract Infections

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Talk layout

• Antimicrobial Stewardship
• Scottish Antimicrobial Prescribing Group and Antimicrobial Management Teams
• Management of CA-UTI
  – Diagnosis
  – Treatment
  – Prophylaxis
• NHS Scotland UTI algorithm
• Summary
Why Antimicrobials?

• They are very effective, prone to abuse
• Resistance
  – Creates new resistant strains
  – Selects for current resistant strains
• Healthcare Associated Infections
  – MRSA, *C diff*, ESBLs, *Candida* sp.
• The wider social impact of resistance
Antimicrobial Stewardship

• ‘A marriage between infection control and antimicrobial management’ – Professor Dilip Nathwani, Chair, Scottish Antimicrobial Prescribing Group

• A series of interventions to manage antimicrobial use with the aim of maximising clinical efficacy whilst minimising associated risks such as toxicity and the development of resistance
Antimicrobial prescribing: What can go wrong?

- Mis-diagnosis / started unnecessarily
- Wrong drug – usually too broad-spectrum
- Wrong dose / frequency / route
- Wrong duration – usually too long

Leading to

- Reduced efficacy, toxicity, interactions, resistance, acquisition of HAIs, increased costs
HAIs and Resistance

- MRSA
- *Clostridium difficile* infection (CDI)
- Hospital acquired pneumonia (HAP / VAP)
- Vancomycin Resistant Enterococci (VRE)
- VISA / VRSA
- MDR-GNB / ESBLs
- NDM-1 / Carbapenemases
- MDR-TB
Stewardship in action

• Formulary Management
• **Education**
• Clinical Interventions:
  – Daily review of all patients on antimicrobials
  – Joint microbiology / pharmacy ward rounds
  – Restricted antimicrobial policy
  – IV to oral switch
  – De-escalation and early discharge
• Surveillance / audit & feedback to prescribers
10 steps to better prescribing

1. **Only treat active infections**
2. Use formulary choices for empirical treatment
3. Send MC&S before prescribing, where appropriate
4. Review choices on the basis of known culture and sensitivities, using narrow spectrum agents where possible
5. **Record choice of antimicrobial and reasoning in medical notes**
6. Adjust dose for age / renal / hepatic / immuno-compromised
7. Consider drug reactions / interactions / allergies
8. Review course length, route and need for antimicrobials daily, switch to oral, simplify or stop when appropriate
9. Consider infection control issues
10. Challenge / refer when necessary to ICN / cons microbiologist / pharmacist
The history of stewardship

• DoH SACAR report 1999
• SGHD:
  – 2002 Antimicrobial Resistance Strategy and Scottish Action Plan
  – 2005 Antimicrobial Prescribing Policy and Practice in Scotland
• Scottish Antimicrobial Prescribing Group
Scotland key recommendations

• Form SAPG, as part of Scottish Medicines Consortium
• Form local Antimicrobial Management Teams (AMT) in each health board
• Chief Exec is directly accountable for HAI
• Each health board must have
  – A clinical lead for HAI
  – A specialist antimicrobial pharmacist
  – An infection control manager
National: Scottish Antimicrobial Prescribing Group (SAPG)

- Formed March 2008 as part of national action plan, under Scottish Medicines Consortium leadership
- Ultimate aim: to reduce HAI and resistance by managing antimicrobial use in humans
- 4 work streams:
  - Organisation
  - Information
  - Infection management
  - Education
SAPG representation (40 members)

• At least one AMT rep from every health board in Scotland

• Professions:
Infectious diseases consultants (chair), microbiologists, antimicrobial pharmacists, medical directors, chief executives, Directors of Pharmacy, consultants in critical care, medicine and surgery, Dentists, GPs, Pharmaceutical prescribing advisors, ICMs, ICNs, charge nurses, public partner

• NHS Groups:
Health Protection Scotland, Information Services Division, NHS Education Scotland, Healthcare Improvement Scotland, Scottish Medicines Consortium, Scottish Government Health Department

• Other groups:
Scottish Infection Research Network; Association of the British Pharmaceutical Industry, Care Inspectorate
Local: Antimicrobial Management Team (AMT)

• Remit: to manage effective antimicrobial use as part of the clinical team
• Work: policies, education, audit, surveillance
• Report to SAPG, Area Drug and Therapeutics Committees and Control of Infection Committee
• AMT Membership:
  – Lead clinician (chair), Antimicrobial pharmacists, Microbiologists, Infectious Diseases Consultant, Infection Control Manager, ICN, Medical, Surgical, GP, public rep.

• CLINICAL LEADERSHIP
Management of CA-UTI
Inappropriate management of UTIs is driving resistance

- Community patient, long-term catheter
- Multiple CSUs
- Each generates a prescription
- Development of ESBL *in vivo*
- ESBL UTI – hospital admission
- Carbapenem prescribed
- Carbapenem use increases in hospital
- Resistance to carbapenemems develops
- Carbapenem resistant strains endemic in hospital
CA-UTI management: key principles

• ONLY treat an *active* infection, not the lab result
• Do not rely on classical symptoms of infection to diagnose CA-UTI
• Do not use dipsticks to diagnose CA-UTI
• Do not routinely use antimicrobial prophylaxis in catheterised patients
• Treat active infections using local guidelines
• Recommendations based upon SIGN 88
Only treat *active* infections

- Most urinary catheters are colonised with multiple strains of bacteria
- Colonisation ≠ Infection
- Most UTIs are caused by a single strain, therefore multiple strains = colonisation
- Bacteria grow in biofilms on surface of catheter, which are almost impossible to eradicate unless you remove the catheter
- Treating with antimicrobials will lead to resistance
- Do not treat if no signs / symptoms of infection
Diagnosis of CA-UTI

• Signs / symptoms of infection:
  – New onset or worsening of fever, rigors, altered mental state, malaise or lethargy with no other identified cause
  – Costovertebral angle tenderness
  – Acute haematuria
  – Dysuria, urgent or frequent urination, or flank or supra-pubic pain or tenderness in those whose catheter has been removed
Management of CA-UTI

• Do not use a dipstick to diagnose a CA-UTI
• Send CSU for microbiology culture and sensitivity, clearly marking CSU on form
• Remove and replace catheter
• Start antimicrobials as per local formulary
• Consider analgesia to relieve pain
• Review daily, consider admitting to hospital if
  – Patient has fever with chills or new onset hypotension, take blood cultures
  – No improvement / deterioration
Antimicrobial choice

• Local formulary for empirical treatment
  – Based on most likely organisms
  – Adjusted for local resistance patterns
  – Therefore guidelines will vary between boards
• Adjust for MC&S results
• Avoid broad spectrum agents where possible, to reduce risk of CDI / HAI
• Avoid nitrofurantoin if eGFR <60ml/min
• Consider escalation / microbiology review if septic
Treatment duration (IDSA)

- Women <65 who develop CA-UTI without symptoms of upper UTI following removal of catheter – 3 days
- Patients symptomatic of CA-UTI with rapid resolution of symptoms on treatment – 7 days
- Delayed response to treatment – 10-14 days
- DO NOT send CSU to check for clearance of infection
Antimicrobial prophylaxis

- DO NOT USE when changing catheters
- Only give prophylaxis when changing catheters in patients with previous history of UTI following catheter change
- Prophylaxis can be considered in female patients *without* catheters if >3 episodes of infection within 12 month period – 6 months trial then review
- DO NOT give prophylaxis long term in catheterised patients as resistance will develop
NHS Scotland UTI algorithm

• SAPG in collaboration with other stakeholders has developed a decision aid for UTI
• Covers diagnosis and management and aligned with national guidance
• Decision aid piloted with GPs and care home staff from Sept 2012 – Feb 2013

• Available in Spring 2013 from SAPG website, hosted by the Scottish Medicines Consortium
Decision aid for diagnosis and management of suspected urinary tract infection (UTI) in older people

This flowchart has been designed to help nursing and care staff and prescribers manage patients/residents with urinary tract infection. If a patient/resident has a fever (defined as temperature > 37.5°C or 1.5°C increase above baseline occurring on at least 2 occasions in last 12 hours) this suggests they may have an infection. Hypothermia (low temperature of <36°C) may also indicate infection, especially if comorbidities (heart or lung disease, diabetes). Some patients/residents may also have non-specific symptoms of infection such as abdominal pain, alteration of behaviour or loss of diabetes control. The information provided gives good practice points and evidence sources for prescribers.

Contact medical/clinical staff to request review of patient/resident

Are there any symptoms suggestive of non-urinary infection?

Respiratory - shortness of breath, cough or sputum, pigmented sputum production, new pleuritic chest pain (deep pain on coughing)

Gastrointestinal - nausea/vomiting, new abdominal pain, new onset diarrhoea

Skin/Soft tissue - new rash, wounds, soreness, recent wound drainage

Yes

Do the patient/resident have a urinary catheter?

Yes

Does patient/resident have one or more of the following signs or symptoms?

- shivering (chills,rigors)
- non-neurovascular (nausea, vomiting, unwellness, drowsiness)
- neurovascular or neurovascular deficit (confusion)

No

Contact medical/clinical staff to request review of patient/resident

UTI unlikely but continue to monitor symptoms for 72 hours

Development of 1 symptom?

UTI likely

UTI unlikely but continue to monitor symptoms for 72 hours

Development of ≥2 symptoms?

UTI unlikely but continue to monitor symptoms for 72 hours

Development of ≥2 symptoms?

Contact medical/clinical staff to request review of patient/resident

- Assess if retention or dysfunctional retention of urine is likely - blocked catheter, obstruction bilevel
- DO NOT have a diaphoresis test for diagnosis of UTI in older people
- Obtain a sample for urine culture and send to Microbiology
- Start antibiotic therapy following local policy or guidance from Microbiology
- If patient has urinary catheter, remove and replace it. Consider the ongoing need for a long term catheter in consultation with nephrologists.
- Consider use of analgesia (e.g. meperidine, chlorpromazine) to relieve pain
- Consider admission to hospital if patient has been in hospital or has any signs of hypotension (low blood pressure)
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- Ensure urine culture results are received when available in order to streamline antibiotic therapy

August 2013  Review date: August 2013
**Good practice points for prescribers**

**Urine culture**
- Older people often have asymptomatic bacteriuria (no symptoms but bacteria in urine which does not indicate infection).
- Do not send catheter specimens of urine (CSU) unless patient has signs and symptoms of infection as CSU samples will almost always have bacteria (bacteria in urine).
- Review urine culture results to check organism is sensitive to antibiotic prescribed and change to an alternative antibiotic if necessary.
- Interpretation of the urine culture results – high epithelial cell count or heavy mixed growth may indicate contamination. Ensure correct sampling process is followed and take repeat urine sample if clinically indicated.
- Be alert to UTI due to resistant organisms such as Extended Spectrum Beta-Lactamase E. coli. Microbiology will provide advice on treatment options. In patients with previous ESBL discuss anticipatory care planning for future management with Microbiology.
- Do not send urine samples for post-antibiotic checks or clearance of infection.

**Good practice points**

**Antibiotic therapy**
- Older people are vulnerable to infection, particularly Clostridium difficile infection, therefore use of broad spectrum antibiotics such as ciprofloxacin, co-amoxiclav and cefuroxime should be avoided if possible.
- First choice antibiotics for uncomplicated lower UTI in non-catheterised patients are trimethoprim 200mg twice daily or nitrofurantoin 50mg four times daily (or nitrofurantoin MR 100mg twice daily). Recommended course duration is 3 days for women and 7 days for men.
- Avoid nitrofurantoin in patients with renal impairment (eGFR < 60 ml/min/1.73m³).
- In men, if there is clinical suspicion of acute prostatitis suggested by fever and pain at the base of the penis, around the anus, just above the pubic bone and/or in the lower back, a 28 day course of ciprofloxacin or ofloxacin is recommended. Trimethoprim may be used if the organism is sensitive.
- In catheterised patients with symptoms of UTI, a 7 day course of antibiotics, following local antibiotic guidelines is recommended in both men and women. The catheter should be removed then replaced if necessary.
- Second choice antibiotics should always be guided by urine culture and history of antibiotic use.
- Female patients who do not have a catheter and have more than three UTI within a 12 month period may be considered for a 6 month trial of nightly antibiotic prophylaxis with trimethoprim or nitrofurantoin. Cranberry products may be considered as an alternative.
- In post-menopausal women consider the possibility of recurrent symptoms being associated with vaginal atrophy.
- Long term antibiotics prescribed for UTI prophylaxis promote resistance and their clinical need should be reviewed after 6-12 months.

**References**
Summary

- Do not treat asymptomatic bacteriuria or lab result, only treat *active* infections
- Refer to local guidelines for treatment choices
- Avoid antimicrobial prophylaxis where possible
- Refer to SIGN 88 for further details
- Within your own health board, you can seek help from the antimicrobial pharmacists, the consultant microbiologist on-call or the Infection Control Manager (the Antimicrobial Management Team)