NHS Grampian Staff Guidance On Indications For IV Antibiotic Therapy And IV To Oral Antibiotic Switch Therapy (IVOST) In Adults

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Signature: __________________________________________
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Group/Individual responsible for this document: Specialist Antibiotic Pharmacists

Policy statement: It is the responsibility of all staff to ensure that they are working to the most up-to-date and relevant policies, protocols and procedures. It is the responsibility of individual prescribers to ensure the management of infections in primary care patients is within the guidance laid down in this document. By doing so, the quality of the services offered will be maintained, and the chances of staff making erroneous decisions which may affect patient, staff or visitor safety and comfort will be reduced.
Responsibilities for ensuring registration of this document on the NHS Grampian

**Information/Document Silo:** Development Pharmacist – Medicines Management

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**Job title of creator of this document:** Specialist Antibiotic Pharmacists

**Job/group title of those who have control over this document:** Specialist Antibiotic Pharmacists

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**Sector:** General Managers, Medical Leads and Nursing Leads

**Departmental:** Clinical Leads

**Area:** Line Manager

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**Lead Author/Co-ordinator:** Specialist Antibiotic Pharmacists

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<tr>
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<td>June 2013</td>
<td>Update of oral bioavailability tables and references</td>
<td>p6 and 7</td>
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* Changes marked should detail the section(s) of the document that have been amended, i.e. page number and section heading.
# NHS Grampian Staff Guidance on Indications for IV Antibiotics and IV to Oral Antibiotic Switch Therapy (IVOST) in Adults

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NHS Grampian Staff Guidance on Indications for IV Antibiotics and IV to Oral Antibiotic Switch Therapy (IVOST) in Adults

Purpose
To promote the appropriate use of antibiotics for adults in terms of route of administration and duration of treatment.

Scope
All hospital prescribers across NHS Grampian, plus all hospital nursing and hospital pharmacy staff.

Background
Antibiotics are amongst the most commonly used drugs in hospital. On average, one third of patients receive antibiotic therapy, and approximately 40% of these patients will receive an intravenous (IV) agent¹. Up to 40% of antibiotic prescriptions are incorrectly prescribed or inappropriate, which often reflects overuse of expensive IV antibiotics¹. Antibiotics should be prescribed only for suspected or confirmed bacterial infection and where there is likely to be clear, clinical benefit. Inappropriate use of the intravenous route can have adverse consequences for patients, future antibiotic resistance patterns, staff time and financial resources. Prudent antibiotic prescribing, which includes the appropriate route of administration and length of treatment, will help to avoid these consequences and ensure optimal patient care and use of resources.

Key Practice Points For Hospital Prescribers

Route of administration
The intravenous route should be used if the patient:
- Has a severe infection, systemic inflammatory response and/or is unstable clinically
- Requires high doses which cannot be delivered via equivalent oral preparation
- Is likely to have an absorption problem or is nil-by-mouth.

Antibiotic Choice
Broad-spectrum antibiotics may be appropriate initially when the infecting micro-organism is unknown but this should be changed to a narrower spectrum antibiotic once culture results are available.

Duration of antibiotic treatment
This depends on a number of factors other than the suspected micro-organism:
- Site of infection
- Immune status of patient
- Presence/removal of prosthetic material
- Speed of treatment with effective antibiotic(s)
- Supportive therapy
- Surgical intervention as required
- Clinical response.

Recording of information
In order to ensure good practice, medical staff must record the following information in the patient’s medical notes within 24 hours of starting all antimicrobials:
- Indication (diagnosis, site of infection)
Assessment of severity – temperature, pulse rate, blood pressure, respiratory rate, white cell count and C-reactive protein (if available)

Type of microbiology specimens collected prior to antimicrobial administration

Details of relevant microbiology results

Antimicrobial(s) prescribed: name, route, dose and stop/review date or course length.

**Benefits Of Early Switch**

There are a number of advantages to support the prompt switch from IV to oral therapy, these are as follows;

- Reduction in the likelihood of hospital acquired bacteraemia and infected/phlebitic IV lines.
- Patient is more likely to receive oral antibiotics at the correct time and miss fewer doses.
- Potential reduction in the risk of adverse reactions; errors in preparation are significantly higher with parenteral drugs, compared to oral formulations.
- Reduces patient discomfort and enables improved mobility and the possibility of earlier discharge from the hospital.
- Saves medical and nursing time.
- Potential reduction in treatment costs allowing finances to be more appropriately allocated.

**Consideration Of Switch From IV To Oral**

N.B. IV to oral switch therapy is NOT appropriate in critically ill patients who require IV antimicrobials or in patients unable to absorb drugs after oral administration.

Indications to continue IV therapy:

- **Oral route compromised**
  - vomiting, nil by mouth, severe diarrhoea, steatorrhoea, swallowing disorder, unconscious.
- **Continuing sepsis**
  - 2 or more of the following: temp > 38°C or < 36°C, heart rate > 90bpm, respiratory rate > 20 breaths/minute, WCC > 12 or < 4
- **Special Indication requiring high dose IV therapy**
  - e.g. endocarditis, meningitis, *Staph aureus* bacteraemia, immunosuppression, bone/joint infection, deep abscess, cystic fibrosis, prosthetic infection.
- **Febrile with neutropenia**
- **Hypotension/shock**
  - A low blood pressure is associated with reduced blood flow to the gut and reduced / unpredictable drug absorption.
- **For skin and soft tissue infections**
  - IV therapy indicated if there is heat, erythema and induration or sepsis syndrome.

If none of the above indications for IV therapy applies and the signs/symptoms of infection are improving, then the patient would be eligible for a switch to oral antibiotics.
Use narrow spectrum antibiotics or stop antibiotic therapy where possible and appropriate. **If no suitable oral formulation** of the drug is available, contact microbiology or ward clinical pharmacist for advice.

See Appendices 1 and 2 for oral switch options and summary of indications for continued IV therapy.

When a patient has an enteral tube (e.g. N/G or PEG) in place that allows medication to be administered reliably, a switch to an appropriate oral formulation of the antibiotic administered via the tube, may be considered provided that gastric motility has been established. **Care must be taken when administering antibiotics via the enteral tube due to the potential for interactions with feeds, e.g. ciprofloxacin, flucloxacillin.** For further information on any aspect of drug administration via an enteral tube, contact Medicines Information (Tel 52316) or ward Clinical Pharmacist.

**Consideration For Outpatient Parenteral Antibiotic Therapy (OPAT)**

Some patients may be suitable for consideration for OPAT if they are not suitable for oral switch but are clinically stable and their only requirement to be in hospital is to receive antibiotics.

Patients may need their antibiotic regime rationalised for outpatient treatment to minimise frequency of administration and simplify regime.

Some suitable infections include:
- Bone/Joint infections
- Vascular graft infections
- S.aureus bacteraemia
- Wound infections
- Endocarditis
- Discitis
- Lyme disease.

OPAT Patient selection criteria includes:
- IV therapy is necessary
- condition stable and well enough to be treated out of hospital
- no other medical problems requiring inpatient care
- patient willingness to participate in OPAT
- physically/mentally able to attend clinics
- no drugs/alcohol/self harm history
- family /other support
- telephone access for emergencies.

If a patient is considered to be a potential candidate then please refer to Sharon Falconer, OPAT Specialist Nurse (bleep 3526). Further information is available on the intranet [http://intranet.grampian.scot.nhs.uk/ccc_nhsg/12539.html](http://intranet.grampian.scot.nhs.uk/ccc_nhsg/12539.html)
References

4. Martindale (entries for various drugs) www.medicinescomplete.com
6. ADFS [accessed online via www.medicinescomplete.com].
8. Kucer’s The Use Of Antibiotics www.medicinescomplete.com

Consultation List

This document (including summary guide) was originally developed in consultation with:
- All Consultants
- Group Pharmacy
- HSCP Clinical Hospital Leads
- HSCP Pharmacists
- Medical Microbiology Registrars
- Non-Medical Prescribers
- Unit Nurse Managers

Review consultation list (for 2015 update):
All Acute Sector Pharmacists

Comments received from:
Janet Hasell, ICU Pharmacist, ARI
Jennie Hewitt, Pharmacist, ARI
Lisa Davidson, Pharmacist, ARI

This policy has been reviewed and agreed by:

Distribution List
- All Consultants
- Group Pharmacy
- HSCP Clinical Hospital Leads
- HSCP Pharmacists
- Medical Microbiology Registrars
- Non-Medical Prescribers
- Unit Nurse Managers
Appendix 1: SUGGESTED IVOST CHANGES

Always check for allergy, interactions and antibiotic sensitivity profile for any positive microbiology results
See [Acute Sector Empirical Guidance](#) for specific oral switch options for various conditions. For IV antibiotics with no oral formulations the switch should be guided by specialist advice or as per microbiology sensitivities.

<table>
<thead>
<tr>
<th>IV antibiotic</th>
<th>Oral option</th>
<th>Oral Bioavailability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amoxicillin</td>
<td>Amoxicillin 500mg-1g, 8hourly</td>
<td>74 - 92%</td>
</tr>
<tr>
<td>Benzylpenicillin</td>
<td>Amoxicillin 500mg-1g, 8hourly or phenoxybenzylpenicillin (Penicillin V)</td>
<td>60% **</td>
</tr>
<tr>
<td></td>
<td>500mg-1g, 6 hourly only for Streptococcal throat infections</td>
<td>(phenoxybenzyl-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>penicillin)</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>Ciprofloxacin 500-750mg, 12 hourly</td>
<td>70-80%</td>
</tr>
<tr>
<td>Clarithromycin</td>
<td>Clarithromycin 500mg, 12 hourly</td>
<td>50 - 55%</td>
</tr>
<tr>
<td>Clindamycin</td>
<td>Clindamycin 300-450mg, 6-8 hourly. Maximum dose 600mg, 8 hourly in severe</td>
<td>90%</td>
</tr>
<tr>
<td></td>
<td>infection (or 450mg, 6hourly)</td>
<td></td>
</tr>
<tr>
<td>Co-amoxiclav</td>
<td>Narrow spectrum where possible, e.g. amoxicillin</td>
<td>70 - 99%</td>
</tr>
<tr>
<td></td>
<td>Co-amoxiclav 625mg, 8 hourly</td>
<td></td>
</tr>
<tr>
<td>Co-trimoxazole</td>
<td>Co-trimoxazole same dose</td>
<td>85-100%</td>
</tr>
<tr>
<td>Flucloxacillin</td>
<td>Flucloxacillin 500mg-2g, 6hourly</td>
<td>80%**</td>
</tr>
<tr>
<td></td>
<td>[doses above 2g daily unlicensed]</td>
<td></td>
</tr>
<tr>
<td>Fluconazole</td>
<td>Fluconazole same dose</td>
<td>&gt;90%</td>
</tr>
<tr>
<td>Gentamicin</td>
<td>Seek specialist advice or as per microbiology sensitivities. Consider if</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>gram negative cover still required.</td>
<td></td>
</tr>
<tr>
<td>Levofoxacin</td>
<td>Levofoxacin same dose but doxycycline or co-trimoxazole may be a more</td>
<td>98-100%</td>
</tr>
<tr>
<td></td>
<td>appropriate oral option (less risk of C. difficile)</td>
<td></td>
</tr>
<tr>
<td>Linezolid</td>
<td>Linezolid same dose</td>
<td>100%</td>
</tr>
<tr>
<td>Metronidazole</td>
<td>Metronidazole 400mg, 8 hourly</td>
<td>&gt;90%</td>
</tr>
<tr>
<td>Piperacillin/tazobactam</td>
<td>Seek specialist advice or as per</td>
<td>NA</td>
</tr>
<tr>
<td>Rifampicin</td>
<td>Rifampicin same dose</td>
<td>70-95% **</td>
</tr>
<tr>
<td>Teicoplanin</td>
<td>Seek specialist advice or as per microbiology sensitivities</td>
<td>NA</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>Seek specialist advice or as per microbiology sensitivities. NB: oral</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>vancomycin not suitable for systemic infection (only indicated for</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C. difficile Infection)</td>
<td></td>
</tr>
</tbody>
</table>
### Appendix 2: Summary Intravenous Antibiotic – Oral Switch Therapy (IVOST) Protocol (Adults)

#### Review the need to continue IV antibiotic DAILY

<table>
<thead>
<tr>
<th><strong>Oral route compromised</strong></th>
<th><strong>Continuing Sepsis</strong></th>
<th><strong>Special Indication</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>(vomiting, nil by mouth, severe diarrhoea, steatorrhoea, swallowing disorder, unconscious)</td>
<td>(2 or more of the following: temp &gt; 38°C or &lt; 36°C, heart rate &gt; 90bpm, respiratory rate &gt; 20 breaths/minute, WCC &gt; 12 or &lt; 4)</td>
<td>(Including endocarditis, meningitis, <em>Staph. aureus</em> bacteraemia, immunosuppression, bone/joint infection, deep abscess, cystic fibrosis, prosthetic infection)</td>
</tr>
</tbody>
</table>

For Skin or Soft Tissue Infections – please refer to main IVOST guidance.

#### Febrile neutropenia

#### Hypotension/shock

<table>
<thead>
<tr>
<th>IV antibiotic</th>
<th>Oral option</th>
<th>Oral Bioavailability (<em>reduced by food</em>)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amoxicillin</td>
<td>Amoxicillin 500mg-1g, 8 hourly</td>
<td>74 - 92%</td>
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<td>60% ** (phenoxymethylpenicillin)</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>Ciprofloxacin 500-750mg, 12 hourly (higher dose if Pseudomonas spp. isolated)</td>
<td>70-80%</td>
</tr>
<tr>
<td>Clarithromycin</td>
<td>Clarithromycin 500mg, 12 hourly</td>
<td>50 - 55%</td>
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<td>Gentamicin</td>
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</tr>
<tr>
<td>Levofoxacin</td>
<td>Levofoxacin same dose but doxycycline or co-trimoxazole may be more appropriate oral options (less risk of <em>C diff</em>)</td>
<td>98-100%</td>
</tr>
<tr>
<td>Linezolid</td>
<td>Linezolid same dose</td>
<td>100%</td>
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<td>Metronidazole</td>
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<tr>
<td>Piperacillin/tazobactam</td>
<td>Seek specialist advice or as per microbiology sensitivities</td>
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<tr>
<td>Rifampicin</td>
<td>Rifampicin same dose</td>
<td>70-90% **</td>
</tr>
<tr>
<td>Teicoplanin</td>
<td>Seek specialist advice or as per microbiology sensitivities</td>
<td>NA</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>Seek specialist advice or as per microbiology sensitivities. <em>NB: oral vancomycin not suitable for systemic infection (only indicated for Clostridium difficile Infection)</em></td>
<td>NA</td>
</tr>
</tbody>
</table>

For IV antibiotics with no oral formulations the switch should be guided by specialist advice or as per microbiology sensitivities.

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NHS Grampian Staff Guidance for IV to Oral Antibiotic Switch Therapy (IVOST) in Adults - Version 4