Trustwide Antibiotic Intravenous to Oral Switch Criteria and Tool

University Hospitals of Leicester NHS
NHS Trust

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1. Introduction

There are significant benefits of intravenous to oral switch (IVOS) interventions for antibiotics demonstrated in research literature including: increasing hospital bed capacity to support recovery from the COVID-19 pandemic; reducing exposure to broad spectrum antibiotics; increasing nursing workforce capacity; reducing drug expenditure; reducing carbon footprint of medicines; and reducing healthcare-associated bloodstream infections.

Many patients receive IV antibiotics for longer than necessary, with up to 30% of antibiotic doses administered intravenously when they could be administered orally.

This guideline supports the clinical teams in implementing switching patients from IV to oral antibiotics using nationally agreed IVOS criteria. The completion of the tool is not required for IVOS to be implemented but may assist in decision making.

2. Scope

This guideline applies to all staff, and patients who are prescribed antibiotics while admitted to the hospital.

3. Recommendations, Standards and Procedural Statements

Which staff can undertake IVOS reviews?

All clinical staff can contribute to IVOS reviews. The IVOS review is split into two parts to facilitate collaborative working between different staff groups to increase IVOS rates across the organisation and improve patient care.

Part 1 of the IVOS review can be undertaken by any member of clinical staff including but not exclusively nurses, pharmacists, physicians assistants and doctors. Part 2 of the IVOS review can only be undertaken and implemented by doctors and non-medical prescribers.

Timing of IVOS review

A review of IV antibiotic prescriptions must be undertaken at the first senior of review of the patient following the prescription. If oral antibiotics are appropriate at this stage (ie IV treatment was not necessary or the patient was prescribed a high bioavailability antibiotic that is preferentially prescribed orally*) the prescription must be changed to oral antibiotics, or the prescription stopped if antibiotics are not indicated.

A further review of IV antibiotic prescriptions must be undertaken within 48 hours of the first dose being administered. If the prescription is not changed to oral antibiotics or stopped at this stage, the prescription must be reviewed daily thereafter.

**Ciprofloxacin, levofloxacin, linezolid, co-trimoxazole, clarithromycin and metronidazole are examples of antibiotics with high bioavailability/biotransformation where guidelines recommend the use of oral over IV treatment if the enteral route is available regardless of the indication.*

Part 1 IVOS review criteria

- Is the IV antibiotic prescribed for an indication **other** than those listed below?
    - Bloodstream infection/bacteraemia
    - Empyema
    - Endocarditis
    - Meningitis
    - Osteomyelitis
    - Very severe/necrotising soft tissue infections
    - Septic arthritis
    - Undrained abscess

- Clinical signs and Symptoms
    - Are the clinical signs and symptoms of infection improving?
- Inflammatory markers
    - Has the patients temperature been between 36 and 38°C for the past 24 hours?
    - Is the patients early warning score decreasing?
    - Is the patients white cell count (WCC) trending towards the normal range?*
    - Is the patients C-Reactive Protein (CRP) is decreasing?*

  *Note – WCC and CRP could indicate inflammation or be affected by other factors (for example steroid treatment). If these are the only criteria not met, continue to request a level 2 review.
- Enteral route
    - Does the patient have a functioning gastrointestinal tract with no evidence of malabsorption?
    - Does the patient have a safe swallow or an enteral tube for administration in place?
    - Confirm there are no significant concerns over the patient's adherence to oral treatment.
    - Confirm the patient has not been vomiting within the last 24 hours.
    - Additional criteria for pharmacist/doctor implementation - There is a suitable oral switch option available (taking in to account oral bioavailability, any significant drug interactions and the patients allergies)?

Actions to be undertaken following a part 1 IVOS review

If the response to all the part 1 criteria is 'Yes', this review indicates the prescription and patient may be suitable for IVOS.

If the response is 'Yes' to all questions except for the patients white cell count (WCC) trending towards the normal range and/or CRP is decreasing, the patient may still be suitable for IVOS.

If patient is identified as possibly appropriate for IVOS, the assessment should be progressed to part 2 either by continuing or referring to a doctor or non-medical prescriber.

If the patient is not identified as suitable for IVOS repeat the assessment the next day.

Part 2 IVOS review criteria

If part 1 review is completed by another member of staff, review the answers to the part 1.

Confirm that none of the following are a concern:

- Deep seated infection
- An infection requiring high tissue concentration
- An infection requiring prolonged intravenous antimicrobial therapy
- A critical infection with high risk of mortality

Actions to be undertaken following a part 2 IVOS review

If the response to the part 2 criteria is 'Yes' this indicates the patient is suitable for IVOS.

- Document the outcome of the level 2 review in the medical notes.
- Change the prescription on Nervecentre to an appropriate oral antibiotic, taking into account the guideline recommendations and the remaining duration of the antibiotic course.

Documenting IV to oral switch review

Part 1 IVOS reviews can be documented in nursing or medical notes, or on Nervecentre in the drug monitoring field.

Part 2 IV to oral switch reviews must be documented in the patients medical notes by the prescribing clinician making the decision to switch to oral or continue on IV antibiotic. Reviews must be documented in line with recommendations in the antimicrobial prescribing policy.

The IVOS tool in appendix 1 can support documentation of the assessment.

Patients not identified for IV to oral switch

Where any of the following are a concern:

- Deep seated infection
- An infection requiring high tissue concentration
- An infection requiring prolonged intravenous antimicrobial therapy
- A critical infection with high risk of mortality

Or the patient has any of the following infections:

- Bloodstream infection/bacteraemia
- Empyema
- Endocarditis
- Meningitis
- Osteomyelitis
- Very severe/necrotising soft tissue infections
- Septic arthritis
- Undrained abscess

And this leads to the patient being not identified for IVOS, it may still be possible to switch to oral antibiotics. Discuss these cases with an infection specialist using usual referral processes.

For patients excluded from IV to oral switch or other reasons, repeat IVOS review daily.

4. Education and Training

There are no new skills required to implement this guideline.

5. Monitoring and Audit Criteria

Key Performance Indicator	Method of Assessment	Frequency	Lead
Less than 40% of patients remaining on IV antibiotics when oral antibiotics are appropriate	CQUIN audit	Quarterly	Lead Antimicrobial Pharmacist

6. Supporting Documents and Key References

National IV to Oral Switch Criteria, UK Health Security Agency, Published November 2022. Accessed online on 05/01/22 National antimicrobial intravenous-to-oral switch (IVOS) criteria for early switch - GOV.UK (www.gov.uk)

7. Key Words

Intravenous, oral, switch, IVOS, IV to oral, antibiotic, antimicrobial

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This table is used to track the development and approval and dissemination of the document and any changes made on revised / reviewed versions

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REVIEW RECORD			
Date	**Issue Number**	**Reviewed By**	**Description Of Changes (If Any)**

DISTRIBUTION RECORD:			
Date	**Name**	**Dept**	**Received**

UHL IVOS review tool

Addressograph

DATE ……

Antibiotic currently prescribed……

PART 1 IVOS CRITERIA		**Delete as appropriate**
Indication	Is the IV antibiotic is for an indication **other** than those listed below? • Bloodstream infection/bacteraemia • Empyema • Endocarditis • Meningitis • Osteomyelitis • Very severe/necrotising soft tissue infections • Septic arthritis • Undrained abscess	**YES/NO**
Clinical signs and symptoms	Are the clinical signs and symptoms of infection improving?	**YES/NO**
Inflammatory markers	Has the patients temperature been between 36 and 38°C for the past 24 hours?	**YES/NO**
	Is the patients early warning score decreasing?	**YES/NO**
	Is the patients white cell count (WCC) trending towards the normal range?*	**YES/NO**
	Is the patients C-Reactive Protein (CRP) decreasing?*	**YES/NO**
	*Note – WCC and CRP could indicate inflammation or be affected by other factors (for example steroid treatment). If these are the only criteria not met, continue to request a level 2 review.	
Route of administration	Does the patient have a functioning gastrointestinal tract with no evidence of malabsorption?	**YES/NO**
	Does the patient have a safe swallow or an enteral tube for administration in place?	**YES/NO**
	Confirm there are no significant concerns over the patient's adherence to oral treatment.	**YES/NO**
	Confirm the patient has not been vomiting within the last 24 hours	**YES/NO**
	Additional criteria for pharmacist/doctor implementation - There is a suitable oral switch option available (taking in to account oral bioavailability, any significant drug interactions and the patients allergies)?	**YES/NO**
Part 1 outcome (Circle appropriate action)	**All part 1 responses = Yes or only WCC and CRP response =NO** → **Action: Proceed to part 2 review**	
	Part 1 responses = No (not only WCC and CRP) → **Action: Review tomorrow**	
Part 1 completed by: Name:	**Staff group:**	

PART 2 IVOS CRITERIA	**Delete as appropriate**
If another member of staff has completed part 1, review the responses above	**YES/NO/NA**
Confirm the patient doesn't have any of the following: • Deep seated infection • An infection requiring high tissue concentration • An infection requiring prolonged intravenous antimicrobial therapy • A critical infection with high risk of mortality	**YES/NO**
Part 2 outcome: Responses to part 2 criteria = YES –proceed to IVOS NO – review again tomorrow	
Completed by:	**Staff group: Doctor / Non-medical prescriber**