UK Health Security Agency

Antimicrobial Intravenous-to-Oral Switch (IVOS) Decision Aid for paediatrics

Based on the National Antimicrobial IVOS Criteria

Why use this IVOS decision aid?

IVOS is an important antimicrobial stewardship intervention.[1-3] Research evidence confirms several IVOS benefits, including decreased risk of bloodstream and catheter-related infections, reduced equipment costs, carbon footprint and hospital length-of-stay, increased patient mobility and comfort, and released nursing time to care for patients.[4-5] Most oral antibiotics have good bioavailability in children.* Success of IVOS in children with serious infections relies on adequate dose and choice of oral antibiotic.

When to use this IVOS decision aid?

The audit standard recommended for the implementation of this decision aid is that all children on intravenous (IV) therapy should be reviewed promptly from first dose of IV antimicrobial with formal review completed within 48 hours and daily thereafter, unless clearly documented exemptions. **This IVOS decision aid is not for use in children for whom an appropriate dose of oral antibiotics should be initially started, or for whom suspicion of a bacterial infection is low (for these children, antibiotics should be stopped at 48 hours once microbiology +/- virology results are available, or earlier at discretion of senior decision makers).**

Does your patient have an infection that may require special consideration?

Infections that may require special consideration include: deep-seated infections, infections, infections requiring immediate or persistently high blood or tissue concentration not achievable via oral antimicrobials, confirmed bacterial infections in severely immunocompromised children or in young infants (28 days of age and under), or in children being managed on a paediatric intensive care unit or with critical infections with high risk of mortality (for example, sepsis requiring inotropes or ventilation).

To note: on specialist advice, an IVOS within 48 hours may still be indicated for some patients with these infections.

Infections for special consideration include, but are not limited to, those listed below:

- bloodstream infection Y/N
- pleural empyema Y/N
- endocarditis Y/N
- meningitis Y/N
- exacerbation of cystic fibrosis or bronchiectasis Y/N
- osteomyelitis Y/N
- severe or necrotising soft tissue infections Y/N
- septic arthritis Y/N
- undrained abscess Y/N
- central venous catheter-associated infection Y/N

If **YES** → check for clearly documented plan or seek specialist advice, with the aim to switch if appropriate

If **NO** → continue to 1.

1. Enteral route

1.1. Is the patient's gastrointestinal tract functioning with no evidence of malabsorption? Y/N
1.2. Is the patient's swallow or enteral tube administration safe? Y/N
1.3. Has the patient been free from vomiting for the past 24 hours? Y/N
1.4. Is there a tolerable oral antibiotic available (taste / frequency of dosing)? Rather than offering large volumes of suspensions, has pill swallowing training been offered? Y/N
1.5. Is the patient expected to adequately adhere to oral treatment? Y/N

If **NO** → continue IV and reassess in 24 hours

If **YES** → continue to 2.

***Oral bioavailability:** amoxicillin 70%, azithromycin 60-90%, cefalexin 95%, ciprofloxacin 70-80%, clarithromycin 50-55%, clindamycin >90%, co-amoxiclav 70%, flucloxacillin 80%, fluconazole >90%, linezolid 100%, metronidazole 90-95%, rifampicin 90-95%[6]

2. Clinical signs and symptoms

2.1. Are the patient's clinical signs and symptoms of infection improving? Y/N
2.2. Is the patient's Early Warning Score (EWS) decreasing? Y/N
2.3. Has the patient's temperature been between 36-38°C for the past 24 hours? Y/N

If **NO** → continue IV and reassess in 24 hours

If **YES** → continue to 3.

3. Infection markers (if available)

3.1. Is the patient's White Cell Count (WCC) trending towards the normal range?** Y/N
3.2. Is the patient's C-Reactive Protein (CRP) decreasing?** Y/N

If **NO** → continue IV and reassess in 24 hours

If **YES** → prompt or assess for switch

PROMPT FOR SWITCH & DOCUMENT RATIONALE:

Nursing/pharmacy teams to prompt prescriber or infection specialist to consider IV to oral switch.

ASSESS FOR SWITCH & DOCUMENT RATIONALE:

Paediatric team or infection specialist to consider IV to oral switch. Identify whether a suitable oral switch option is available, considering for example microbiology results, oral bioavailability, any clinically significant drug interactions, patient allergies or contra-indications.

Intravenous antimicrobial initiation:	Date: __/__/____	Time:	Name: .....
IVOS first assessment (daily thereafter):	Date: __/__/____	Time:	Name: .....
IV to Oral Switch:	Date: __/__/____	Time:	Name: .....

** To note: These infection markers could also indicate inflammation or be affected by for example, steroid treatment, 'Prompt for switch' or 'Assess for switch' may still be considered if the CRP/WCC are not falling or have not been repeated in a child that is improving clinically.

References: For references go to: www.gov.uk/government/publications/antimicrobial-intravenous-to-oral-switch-criteria-for-early-switch/national-antimicrobial-intravenous-to-oral-switch-ivos-criteria-for-early-switch

Additional resources:

BSAC Paediatric Pathways and UK-PAS Antimicrobial Paediatric Summary: https://bsac.org.uk/paediatrics/

Guide to swallowing tablets: https://www.e-lfh.org.uk/programmes/kidzmed/

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