Pre-intervention materials reviewed

The reviewed intervention materials are presented in the following order:

1. ?STOP chart: An IV to oral chart (?STOP) to guide practitioner's decision-making, and associated lanyards of the decision-making chart
2. Flow chart: A flow chart for identifying eligible children for IV to oral antibiotics conversion, along with a table for identifying suitable oral antibiotic agents when making the switch
3. Patient chart labels
4. Fact sheet: An IV to oral conversion fact sheet for healthcare workers
5. Making the switch: Changing from intravenous to oral antibiotics.

Can IV antibiotics ?STOP

IV to Oral Switch guideline for patients

Version 1.0
Effective: 25/7/2018

Use this guideline to identify patients who have received ≥48 hours of IV therapy that may be suitable to STOP antibiotics or SWITCH to oral therapy.

? Is antibiotic therapy still required?
- NO → **STOP antibiotic**
- YES ↓

S Signs of clinical improvement? (Box 1)
- NO → Review therapy and investigations. Consult ID/Micro if necessary.
- YES ↓

T Tolerating oral medicines? (Box 2)
- NO → Reconsider switch in 24 hours after assessment of reversible factors.
- YES ↓

O Oral option available?** (Consider spectrum & possible class change)
- NO → Consider contacting Infectious Diseases, Clinical Pharmacist or Clinical Microbiologist if necessary.
- YES ↓

P Possible to switch? (Indications requiring prolonged therapy Box 3)
- NO → Consider contacting Infectious Diseases, Clinical Pharmacist or Clinical Microbiologist if necessary.
- YES ↓

Switch to oral therapy**

Box 1

Signs of clinical improvement

- Afebrile (temp >36°C and <38°C for past 24-48 hours)
- Improved vital signs (BP, HR, RR)

Box 2

Tolerating oral medications

- Patient is tolerating oral food/fluid*
- Oral absorption is not compromised (e.g. diarrhoea, vomiting, malabsorptive disorder, unconscious, swallowing disorder)

*If patient is NBM for a procedure, prescribed medications should be given unless otherwise directed

Box 3

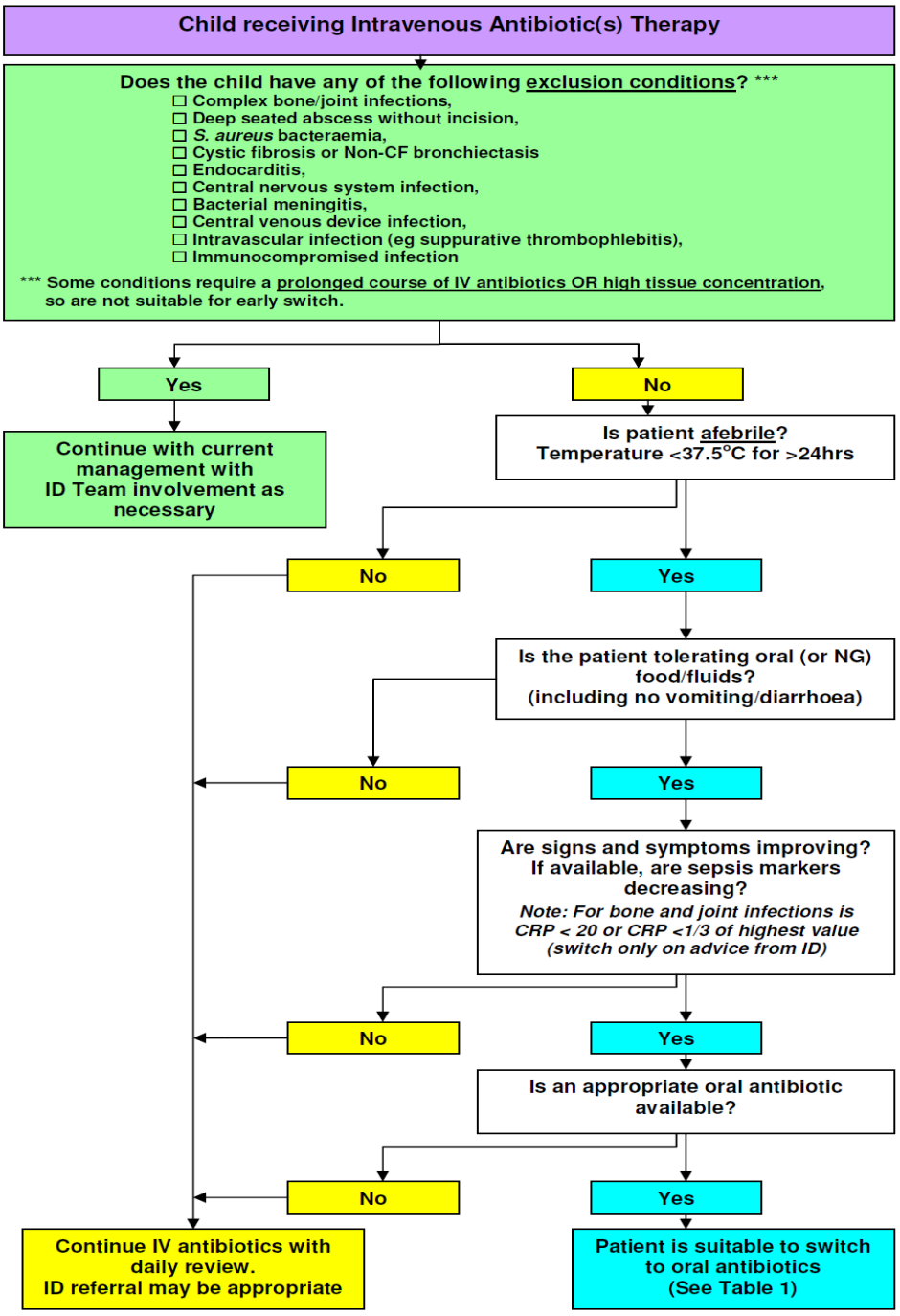
Prolonged parenteral therapy is required for the following indications:

- Deep-seated infection e.g. abscess/empyema
- *Staphylococcus aureus* bacteraemia
- Meningitis or encephalitis
- Fungi or yeasts in blood (fungaemia)
- Septic arthritis
- Osteomyelitis
- Endocarditis
- Necrotising soft tissue infection
- Infected implant or prosthesis

** For oral options refer to your local guidelines or the Therapeutic Guidelines: Antibiotic

Adapted from Intravenous to Oral Switch Guideline for Adults Patients – can antibiotics S.T.O.P. South Australian expert Advisory Group on Antibiotic Resistance (SAAGAR). 2015

Flowchart for Identification of Children Suitable for Early Switch to Oral Antibiotics



Role of the Healthcare Team

Suitable Agents

antibiotics considered equivalent and suitable for IV to oral switch are listed in Table 1. If no equivalent oral formulation available, the choice of antimicrobial should be based on advice from Paediatric ID.

Table 1:

Table 1: Suitable Agents for infants (>1 month of age) and children

Empiric antibiotics considered equivalent and suitable for IV to oral switch are listed in Table 1. If no equivalent oral formulation available, the choice of antimicrobial should be based on advice from Paediatric ID specialist.

Infection	**Intravenous (IV)**		**Oral (PO)**	
	1st CHOICE ANTIMICROBIAL	**Alternative antibiotic in the event of immediate type (eg. anaphylaxis) or delayed type (eg. rash) hypersensitivity to penicillins and cephalosporins**	**1st CHOICE ANTIMICROBIAL**	**Alternative antibiotic in the event of immediate type (eg. anaphylaxis) or delayed type (eg. rash) hypersensitivity to penicillins and cephalosporins**
Community acquired pneumonia (CAP)	Benzylpenicillin IV 60mg/kg/dose every 6 hourly (Max 2.4gram/dose) If Mycoplasma suspected: Add Roxithromycin PO 4mg/kg/dose every 12 hourly (Max 150mg/dose)	Delayed type hypersensitivity, Cefotaxime IV 50mg/kg/dose every 6 hourly (Max 2gram/dose) OR Ceftriaxone IV 50mg/kg/dose every 12 hourly (Max 2gram/ dose). Immediate type hypersensitivity, seek ID advice.	Amoxycillin oral 25mg/kg every 8 hourly (Max 1gram/dose)	For immediate type hypersensitivity to penicillins, use oral Roxithromycin 4mg/kg/dose every 12 hourly (Max 150mg/dose).

	If Staphylococcal Pneumonia suspected: Add Flucloxacillin IV 50mg/kg/dose IV every 4 hours (Max 2gram/dose) and seek ID advice.	Delayed or immediate type hypersensitivity, Lincomycin IV 15mg/kg/dose every 8 hourly (Max 1.2gram/dose) and seek ID advice.		
Infection	**Intravenous (IV)**		**Oral (PO)**	
	1st CHOICE ANTIMICROBIAL	**Alternative antibiotic in the event of immediate type (eg. anaphylaxis) or delayed type (eg. rash) hypersensitivity to penicillins and cephalosporins**	**1st CHOICE ANTIMICROBIAL**	**Alternative antibiotic in the event of immediate type (eg. anaphylaxis) or delayed type (eg. rash) hypersensitivity to penicillins and cephalosporins**
Moderate to severe cellulitis and periorbital cellulitis **(Hib immune)**	Flucloxacillin IV 50mg/kg/dose IV every 6 hours (Max 2gram/dose) If <5 years of age and not Hib immune, seek ID advice.	**Delayed type hypersensitivity,** Cephazolin IV 50mg/kg/dose every 8 hourly (Max 2gram/dose) **Immediate type hypersensitivity,** Lincomycin IV 15mg/kg/dose IV every 8 hours (Max 1.2 gram/dose) and seek ID advice	Cephalexin PO 25mg/kg/dose orally four times a day (Max 1gram/dose) **OR** **For children who can swallow capsules:** Flucloxacillin PO 25mg/kg/dose orally four times a day (Max 1gram/dose)	**Immediate type hypersensitivity,** Trimethoprim/ Sulfamethoxazole PO 4mg/kg/dose orally twice daily (Max 160mg/dose Trimethoprim component)
	If at risk of nmMRSA or if family/personal history of boils (Previous nmMRSA, History of boils or Aboriginal or Pacific islander descent)	**Immediate type hypersensitivity,** Lincomycin IV 15mg/kg/dose IV every 8 hours (Max 1.2	**If at risk of nmMRSA or if family/personal history of boils (Previous nmMRSA, History of boils or Aboriginal or Pacific islander descent)**	**Immediate type hypersensitivity,** Trimethoprim/ Sulfamethoxazole PO 4mg/kg/dose orally twice daily (Max 160mg/dose Trimethoprim component)

	Add Lincomycin IV 15mg/kg/dose IV every 8 hours (Max 1.2 gram/dose)	gram/dose) and seek ID advice	Clindamycin PO 7.5mg/kg/dose orally four times a day (Max 450mg/dose) OR Trimethoprim/ Sulfamethoxazole PO 4mg/kg/dose orally twice daily (Max 160mg/dose Trimethoprim component)	

Infection	**IV**		**Oral**	
	1st CHOICE ANTIMICROBIAL	**Alternative antibiotic in the event of immediate type (eg. anaphylaxis) or delayed type (eg. rash) hypersensitivity to penicillins and cephalosporins**	**1st CHOICE ANTIMICROBIAL**	**Alternative antibiotic in the event of immediate type (eg. anaphylaxis) or delayed type (eg. rash) hypersensitivity to penicillins and cephalosporins**
CAP	Benzylpenicillin IV 60mg/kg/dose every 6 hours (Max 2.4gram/dose) If Mycoplasma suspected: Add Roxithromycin PO 4mg/kg/dose every 12 hours (Max 150mg/dose) If Staphylococcal Pneumonia	Delayed type hypersensitivity, Cefotaxime IV. Immediate type hypersensitivity, seek ID advice. Delayed or immediate type hypersensitivity,	Amoxycillin oral 25mg/kg (Max 1gram) every 8 hourly	For immediate type hypersensitivity to penicillins, use oral Roxithromycin.

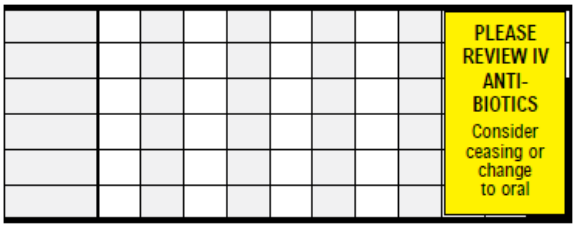
	suspected: Add Flucloxacillin IV 50mg/kg/dose IV every 4 hours (Max 2gram/dose)	Lincomycin IV		
	Flucloxacillin IV 50mg/kg/dose IV every 6 hours (Max 2gram/dose) If at risk of nmMRSA or if family/personal history of boils (Previous nmMRSA, History of boils or Aboriginal or Pacific islander descent) Add Lincomycin IV 15mg/kg/dose IV every 8 hours (Max 1.2 gram/dose)	Delayed type hypersensitivity, Cephazolin IV Immediate type hypersensitivity, Lincomycin IV and seek ID advice	Cephalexin PO 25mg/kg/dose orally four times a day (Max 1000mg/dose) OR Flucloxacillin PO 25mg/kg/dose orally four times a day (Max 1000mg/dose) (For children who can swallow capsules) If at risk of nmMRSA or if family/personal history of boils (Previous nmMRSA, History of boils or Aboriginal or Pacific islander descent) Clindamycin PO 7.5mg/kg/dose orally four times a day (Max 450mg/dose) OR Trimethoprim/ Sulfamethoxazole PO 4mg/kg/dose orally twice daily (Max 160mg/dose Trimethoprim component)	Immediate type hypersensitivity, Trimethoprim/ Sulfamethoxazole PO

The successful implementation of the IV to Oral Switch campaign will rely on proactive discussion between the medical staff, nursing staff and ward pharmacist.

Steps to follow:

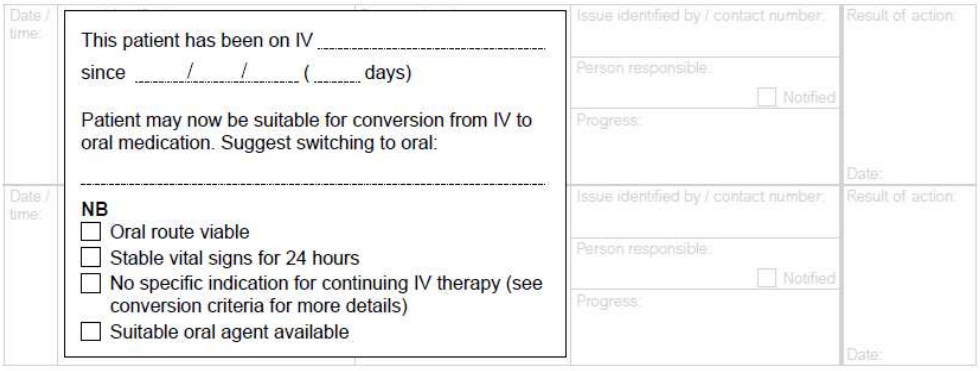
On a daily basis assess all patients with Community Acquired Pneumonia and Skin and soft tissue infections IV antibiotic orders for appropriateness of switching to oral therapy (during daily medication chart review) – refer to **flow chart**.

If appropriate to switch: Place switch sticker on medication chart (place in section ensuring that you do not obscure or obstruct nursing administration signatures).



It is intended that these stickers would be placed in the medical chart by the pharmacist / nurse to alert the treating clinician / team that their patient meets the criteria to convert from IV to oral antimicrobials. The stickers will be removable and therefore if intravenous therapy needs to continue, this could be documented and the sticker removed.

Use communication sticker on Medication Action Plan (MAP form) and suggest appropriate oral antimicrobial therapy.



It is intended that this sticker will be placed on the MAP form by the pharmacist / nurse to provide the treating clinician / team with more information relating to the recommendation place in the medication chart that the patient should be converted from IV to oral antimicrobials. The pharmacist / nurse will complete the details and tick which criteria the

patient meets. The stickers have been designed to fit within the 'issues identified' and 'proposed action' boxes on the MAP form. It is intended that the sticker will be a permanent sticker that cannot be removed from the patient's record.

Communicate this information with the Treating Consultant/ Medical officer (e.g. page, verbally).

Department of Health

Queensland Statewide
Antimicrobial Stewardship Program

PRESERVING EFFECTIVE ANTIBIOTICS

AMS Pearls

AMS Pearls: IV to PO. Effective 07/2018.

Can IV antibiotics ?STOP

Did You Know?

In many indications, the use of IV antibiotic therapy exclusively is NOT more effective than oral therapy when suitable oral agents are available.[1-2]

Additionally, NOT switching your patient from IV antibiotics to oral therapy appropriately and in a timely manner can increase IV-associated morbidity, result in a longer total duration of antibiotic therapy and increase the length of the hospital stay.[3]

Consider This

- IV to oral switch decreases the risk of IV line-associated infections such as local cellulitis, abscess formation, septic thrombophlebitis, line sepsis, and endocarditis.[4]
- An appropriate switch to oral antibiotics results in BOTH good clinical outcomes AND a substantial reduction in antibiotic expenses in many cases.[3,4]

For example: appropriately timed switch from IV to oral antibiotics in patients with severe community acquired pneumonia can decrease length of hospital stay by 2-4 days whilst maintaining clinical cure rates.[5-7]

Take Action Now!

- Review all patients at 48 hours from commencement of IV antibiotics. Refer to your local IV to PO guideline for advice.
- See the Queensland Statewide AMS (QSAMSP) website for IV to PO clinical tools such as poster, lanyard and chart stickers.
- Contact your local AMS team or QSAMSP for assistance in implementation.

Contact us

(07) 3646 1886

statewide.ams@health.qld.gov.au

Queensland Health employees join:
Queensland Statewide AMS Program

yammer

Disclaimer: This fact sheet is intended as a guide only and does not equate to individual patient level expert opinion. Interpretation should always be taken in context with the patient's current condition and formal clinical review.

Reference

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MAKING THE SWITCH

CHANGING FROM INTRAVENOUS TO ORAL ANTIBIOTICS

INFORMATION FOR PARENTS AND CARERS

Why do we give your child antibiotics?

Antibiotics are medicines used to treat infections caused by bacteria, and these infections are commonly seen in patients needing treatment in hospital.

To manage serious bacterial infections, antibiotics are often given intravenously or "IV" (meaning through the vein via a drip) to begin. This is an effective way to get antibiotics into the blood system quickly, and reach the site of infection.

IV antibiotics may also be used if:

- It is not possible or difficult to give antibiotics by mouth (e.g. difficulty swallowing)
- There are problems absorbing medicines from the stomach (e.g. vomiting)
- There are no antibiotics available that can be given by mouth for a particular infection

When is it safe to switch to oral antibiotics?

In many common infections treated in hospitals, patients can, and should be, switched from IV to oral antibiotics. There are special criteria and checklists to make the right decisions about when it is safe and suitable to switch to oral antibiotics. This includes when:

- The patient is stable and their condition is improving (e.g. body temperature is getting back to normal)
- Other medicines can be taken by mouth without problems
- There are no problems with absorbing medicines taken by mouth
- The antibiotic needed is available in an oral form. In most cases this will be a syrup. If a syrup formulation is not available, tablets or capsules may be given instead. Your doctor, nurse or pharmacist can show you how to give this (e.g. crush tablet, dissolve in water), or teach your child how to swallow tablets and capsules whole.
- The patient is likely to be able to take the full course of antibiotics
- You understand the plan to change to an oral antibiotic and you are able to help where required.

Your child's doctor will look at the need for IV antibiotics every day, and will talk to you about this. Please feel free to ask more questions if you have concerns about your child's medicines.

Why should we switch to oral antibiotics?

Taking medicines by mouth (orally) is the safest and easiest way to take most medicines. Every effort is made to switch patients to oral medicines as soon as possible.

The benefits of giving medicines orally include that:

- There is no need for an IV line or drip
- Your child may not need as many needles
- It is more comfortable
- There is less risk of irritation or infection from the line or drip
- Your child may be able to go home sooner

Generally, serious side effects from oral antibiotics are less common.

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What are the risks of switching to oral antibiotics?

There is a small chance the infection may get worse if oral antibiotics do not work. If this happens, your child may be given IV antibiotics again. If you have already gone home, you may need to come back to the hospital.

What are the side effects of antibiotics?

Antibiotics can cause side effects, however, when antibiotics are necessary, the benefits far outweigh the risks.

Side effects can include stomach problems like diarrhoea, nausea and vomiting. Taking antibiotics, intravenously or orally, can affect the normal good gut bacteria.

For some children, probiotics may help to restore good gut bacteria; speak to your doctor for more information.

Less common, but more serious, side effects can be allergic reactions, such as hives (large, red, raised areas on the skin), fever and breathing problems.

If your child experiences any of these, stop taking the antibiotic and seek medical attention. The Consumer Medicine Information (CMI) leaflet that normally comes with the medicine also lists the most common side effects.

You are part of the team making this decision

At this hospital, we encourage staff to provide parents and carers with information on antibiotics prescribed for their child, including when and why it has been started, potential side effects, the treatment plan and options, so you can help make decisions about your child's treatment.

If you have not been involved in these discussions, and wish to know more about your child's antibiotic treatment plan, please ask your hospital doctor, nurse or pharmacist.

Making the switch: Changing from intravenous to oral antibiotics
Information for parents and carers

SHPN (CEC) 180346

What you need to know before your child goes home

If your child has been given oral antibiotics to take at home, it is important that you follow the doctor's advice on when, how, and for how long your child should take them.

You can use the checklist below to make sure you have the information you need to keep giving antibiotics at home.

Checklist

- ☐ Name of the antibiotic
- ☐ How much of the antibiotic to give your child. Plastic syringes or measuring cups should be used to measure liquid medicines.
- ☐ The times of day you need to give the antibiotic to your child
- ☐ If the antibiotic needs to be given on an empty stomach, or with food
- ☐ How many days to give the antibiotic for
- ☐ What to do if your child has a reaction to the antibiotic
- ☐ What to do if your child's condition worsens
- ☐ Who to call if you've gone home and you're worried about your child
- ☐ When you need to see your doctor again

Acknowledgement
The original form of this publication was provided by Sydney Children's Hospitals Network. Adapted with permission.

About the Quality Use of Antimicrobials in Healthcare Program
The CEC's Quality Use of Antimicrobials in Healthcare program aims to help NSW public hospitals develop ways of ensuring antibiotics are used properly and responsibly to improve patient care.

For further information on the program, please visit http://www.cec.health.nsw.gov.au

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