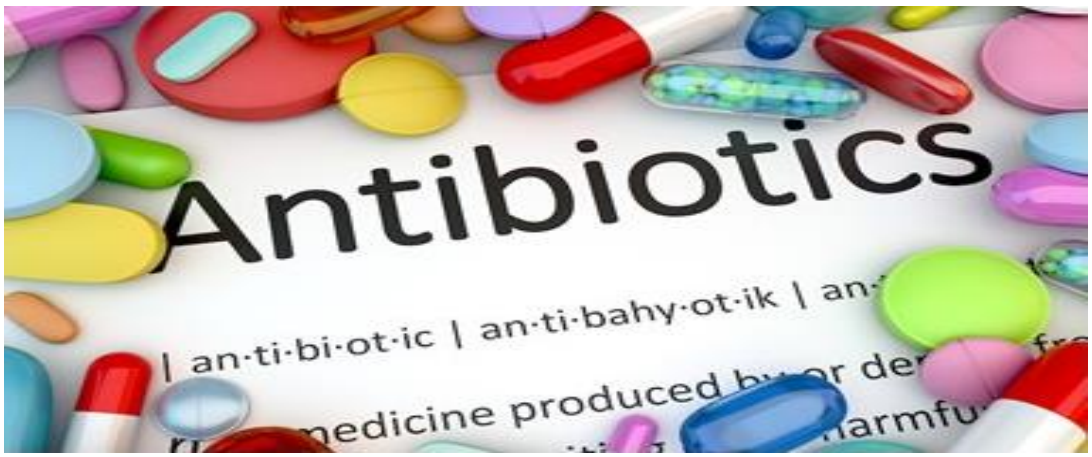
ANTIBIOTIC POLICY

HOSPITAL KLUSTER MELAKA



Executive summary

This policy provides guidance to all health professionals working in cluster hospital Melaka who involved in the prescribing and administering of antibiotics regarding prudent prescribing of antibiotics.

The main objectives for this policy:

- To improve patient outcomes through reduce morbidity and mortality from infection
- To optimize antimicrobial therapy, by promoting judicious use of antimicrobials, optimizing antimicrobial selection, dosing, route and duration of therapy in order to maximize clinical cure or prevent infections.
- To limit the unintended consequences such as the emergence of antimicrobial resistance and adverse drug events.
- To reduce healthcare cost without adversely impacting quality of care.

Approved by:



DR. ZAHARIMAH BINTI ABDUL KADIR
Director of Hospital Melaka
&
Head of Kluster Hospital Melaka

Date approved:
17 October 2022

Table of content

	Page
1.0 General considerations when starting antibiotic	4
2.0 Antibiotic stop/ review date and indication policy	5-7
3.0 Intravenous to oral/enteral (IV to PO) antibiotic switch protocol	8-11
4.0 Antibiotic usage monitoring	12
5.0 Point prevalence survey (PPS)	13
6.0 References	14

1.0 GENERAL CONSIDERATIONS WHEN STARTING ANTIBIOTIC

1. Antibiotics must be prescribed for the shortest duration necessary. All antibiotic prescriptions must therefore have a **written indication on the drug chart** and for a **defined duration**

2. **Culture** should be taken preferably **before starting antibiotic.**

3. All antibiotics should be **reviewed 72 hours** after started based on culture results and patient's clinical condition

4. Antibiotic doses should not be missed unless unavoidable. Missed doses are everyone's responsibility and should be investigated.

5. Empirical antibiotic to be served within 1 hour after diagnosis of sepsis or septic shock. Antibiotic should be narrowed or adjusted once pathogen and sensitivities are established or it should be discontinued if infection already ruled out after further investigation.

2.0 ANTIBIOTIC STOP/ REVIEW DATE AND INDICATION POLICY

2.1 Introduction:

This policy is part of antibiotic stewardship program in reducing antimicrobial resistance. Antimicrobial prescriptions are needed to be reviewed on regular basis to ensure that the selected agents are still appropriate, continuation of therapy is still deemed necessary and the route is still appropriate. Unnecessarily prolong and excessive antimicrobial treatment can have an impact on:

a) Increased selection of resistance organisms
b) Antibiotic treatment related illnesses e.g. *Clostridium difficile* diarrhea
c) Increased risk of adverse effects
d) Increased expenditure

The addition on the antibiotic prescription chart for a stop date or intended duration of treatment can help to avoid unnecessarily prolong antibiotic usage. Pharmacists and nurses can facilitate the policy as part of their role in the wards.

The indication for an antimicrobial agent is often not clear or easy to find in the case notes and makes monitoring for appropriateness by other clinicians and health professionals difficult. In many cases the prescriber initiating the antimicrobial may not be available to regularly review it (due to shift working). It would therefore be very beneficial to have the indication written on the prescription chart for all orders of antimicrobial agents.

Overall, documenting the indication and intended stop date/duration on the prescription chart will be beneficial to all and help prevent unnecessarily extended antibiotic courses.

2.2 The Antimicrobial Policy:

All prescribers must write a **stop/review date** and **indication** on the drug chart for all order of antimicrobial agents.

2.3 Standard:

An indication and a stop/review date or intended duration should be documented on the drug chart at the point of prescribing any antimicrobial agent.

2.4 Audit:

This will be an ongoing campaign monitored six monthly. Outcome measures:

a) Percentage of compliance
b) Changes in antibiotic consumption

2.5 Objectives:

- To reduce the unnecessary antibiotic use
- To prevent unintended long duration of therapy
- To lower the selection of resistance organisms
- To reduce the risk of adverse effects
- To lower the hospitalization expenditure

2.6 Action for Doctors:

a) Write the indication and stop/review date or intended duration on the medicine chart for each antimicrobial agent prescribed.
b) Antibiotic review should be documented on the chart e.g. crossing through R/V.

Example with indication and review date (mostly appropriate for initial IV therapy)

R/V

Name: ABC No. KP: 123456-78-9012 R/N: 56789 Age: 80 Ward: 2-1 Indikasi Ubat: **HAP (EMPIRICAL)**	Ubat		Tarikh/ Masa	22/11	23/11	24/11	25/11
	IV MEROPENEM 2G STAT, 1G TDS						
Disaring oleh peg. Farmasi:	Dimula oleh: DR CDE	Tarikh: 22/11					
	Ditamat oleh:	Tarikh:					

2.7 Action For Pharmacist:

a) All pharmacist should request a stop/review date and indication to be written in the diagnosis/ indication column on the medicine chart for all antimicrobials.
b) For all prescription which already written, pharmacist should endorse the chart appropriately for review/stop date after discussing with the prescriber.
c) If a stop date has been documented, the pharmacist may alter the administration boxes to ensure nurses do not give a longer course than intended.

Example with a stop date

<table>
<tr><td rowspan="6">Name: ABC
No. KP: 123456-78-9012
R/N: 56789 Age: 80
Ward: 2-1
Indikasi Ubat: Severe CAP</td><td colspan="2">Ubat</td><td>Tarikh/ Masa</td><td>22/11</td><td>23/11</td><td>24/11</td><td>25/11</td></tr>
<tr><td colspan="2" rowspan="5">IV AZITHROMYCIN 500MG OD x 3/7</td><td></td><td></td><td></td><td></td><td rowspan="5"></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">Disaring oleh peg. Farmasi:</td><td>Dimula oleh: DR CDE</td><td>Tarikh: 22/11</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Ditamat oleh:</td><td>Tarikh:</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

3.0 INTRAVENOUS TO ORAL/ENTERAL (IV TO PO) ANTIBIOTIC SWITCH PROTOCOL

3.1 Introduction

Most clinicians used intravenous (IV) antibiotics initially in managing serious infections to ensure optimal concentration of antibiotic at the site of infection. Inappropriate antibiotic use is recognized as a key driver of antimicrobial resistance. Unnecessarily prolonged courses of IV antibiotics are also associated with increased length of hospital stay, increased costs and the increased morbidity and mortality associated with IV-line infections [3-5].

Therefore, a switch from IV antibiotics to oral therapy as soon as patients are clinically stable can reduce length of hospitalization and lower associated costs [3, 6-8]. While intravenous antibiotics may be more bioavailable and have greater effects, some oral drugs produce serum level comparable to those of parenteral form. Studies in 2014 showed cost savings and effectiveness of IV to oral switch therapy [9-10].

3.2 Objectives

a) To provide a process for changing certain parenteral medications to oral/enteral route when medically appropriate.
b) To provide an oral/enteral dosage form with comparable bioavailability to the intravenous form.
c) To avoid the added risk associate with continued intravenous therapy.
d) To lower overall medication and associate costs to the patients and the hospital.

There is no minimum length of time for IV antibiotic to continue. A majority of patient with a severe infection who are adequately absorbing oral medication and initially require IV therapy can be safely switched to oral therapy within 48 hours. The benefits achieved are:

a) Reduction in the likelihood of hospital acquired infection and thrombophlebitis
b) Saving both medical and nursing time
c) Potential reduction in the risk of adverse effects; errors in preparation are significantly higher with parenteral drugs, compared to oral formulation
d) Reduce treatment costs e.g. disposables such as syringes, needles, drug costs etc.
e) Patients is more likely to receive antibiotics at the correct time

3.3 When to switch

The optimal time to consider switching from IV antibiotics to oral therapy is after 2 to 4 days of intravenous therapy. This allows the clinicians to evaluate the patient's microbiology results and assess their response to treatment.

Diagnosis where a switch to oral antibiotics should be considered including:

- Pneumonia
- Skin and soft tissue infections
- Urinary tract infections
- Uncomplicated Gram negative bacteraemia
- Intra-abdominal infections without deep seated collections

Certain deep-seated infection that may require an initial 2 weeks of IV therapy OR certain high risks infections which requiring prolonged IV therapy as summarized in table below are not for early IV to PO antibiotic switch:

Deep seated infections that may require an initial two weeks of IV therapy	**High Risk infections requiring prolonged IV therapy**
• Liver abscess • Osteomyelitis, septic arthritis • Empyema • Cavitating Pneumonia	• Staphylococcus aureus bacteraemia • Severe necrotizing soft tissues infections • Severe infections during chemotherapy related neutropenia • Infected implants/prosthesis • Meningitis/encephalitis • Intracranial abscesses • Mediastinitis • Endocarditis • Inadequately drained abscesses or empyema

In summary, patient should generally have all the COMS criteria as shown below before deciding for early IV to PO antibiotic switch:

C	Clinical improvement observed
O	Oral route is not compromised due to vomiting, malabsorptive disorder, NBM, swallowing problems, unconscious, severe diarrhea. (ie, patient is able to eat a regular or modified diet OR receiving enteral nutrition by the oral, gastric or other appropriate enteral tube OR receiving other scheduled medications by the oral route)
M	Markers showing a trend towards normal. Patient should be apyrexial for the last 24 hours (T > 36ºC and < 38ºC) AND no more than one of the following; a) Heart rate>90/min b) Respiratory rate>20/min c) Blood pressure unstable d) Total white blood cell <4 or >12 x 10/L
S	Specific indication/ Deep seated infection already excluded

3.4 How to switch

Antimicrobials with high bioavailability and are available both as intravenous and oral formulations such as fluoroquinolones, linezolid and fluconazole are candidates for IV to PO switch. Other antimicrobials that have similar activity also can be switched to oral antibiotics (e.g., cefazolin to cephalexin) when the patient's clinical condition has improved according to the predefined criteria. IV to PO switch also can occur in conjunction with de-escalation, based on susceptibility culture.

There are 3 types of switch therapy:

Sequential therapy	Changing to the oral version of the same compound. Example: Levofloxacin 500mg IV od to Levofloxacin 500mg PO od
Switch therapy	Changing to an oral drug that is a different compound and has the same potency. Example: Levofloxacin 500mg IV od to Ciprofloxacin 500mg PO bd
Step-down therapy	Changing to an oral drug that is a different compound and has different frequency, dose or spectrum of activity. Example: Ceftriaxone IV 2g od to Cefuroxime 500mg PO bd

Table below provides some examples of selection for appropriate oral agent:

Intravenous	Oral
Amoxicillin/ Clavulanate 1.2g TDS	Amoxicillin/ Clavulanate 625mg TDS
Benzylpenicillin 2-4 MU Q4H to QID	Penicillin V 500mg QID
Cefuroxime 750mg-1.5g TDS	Cefuroxime 500mg BD
Ciprofloxacin 400mg BD-TDS	Ciprofloxacin 500mg - 750mg BD
Cloxacillin 1-2g QID	Cloxacillin 500mg-1g QID
Metronidazole 500mg TDS	Metronidazole 400mg TDS
Ampicillin/Sulbactam 1.5g TDS	Ampicillin/Sulbactam 375mg BD
Other antibiotics	Seek advice

4.0 ANTIBIOTIC USAGE MONITORING

4.1 Introduction

Antibiotic usage surveillance involved in-patients' parenteral antibiotic usage monitoring. The main objective is to analyze and compare the commonly used antibiotics in government hospital among facilities.

This surveillance was focused on adult patients only as World Health Organization (WHO) haven publish Daily Defined Dose (DDD) for pediatric population. DDD parameter used in the surveillance was recognized by WHO which was well known as a tool to monitor antibiotic usage. The formulae which were chosen in the surveillance was DDD for each 1000 patients' day.

4.2 Data collection and submission

Pharmacists in charge will collect the respective data and carry out analysis as per predetermined manual. The list of antimicrobials being monitored including broad spectrum antibiotic and the list will be revised when necessary.

For state hospital (Hospital Melaka), data need to be submitted to KKM by yearly basic and any outlier usage will be informed by KKM if related. For district hospital, data will be submitted to JKN Melaka every 6 monthly and letter will be issued out by Pengarah Kesihatan Negeri to the respective district hospital if there's any outlier antibiotic usage.

4.3 Data presentation

Antibiotic usage surveillance data will be presented during Hospital Infection and Antibiotic Control Committee (HIACC) hospital and state meeting.

5.0 POINT PREVALENCE SURVEY (PPS)

5.1 Introduction

PPS is a one-day cross-sectional survey of every ward within the hospital to analyze the antibiotic prescribing practice and behavior. This study also provides an insight into antibiotic prescribing patterns between various classes of hospitals. PPS provides a comprehensive dataset over a short period that measures and monitors the burden of antibiotic usage in a hospital. PPS provides the ability to identify the target for quality improvement in antibiotic prescribing. Sequential PPS audit allows the hospital to measure changes in practice and determine the impact of interventions and resistance.

5.2 Objective

A. To determine the prevalence of patients on antibiotics, including in the aspect of:

- Prevalence of antibiotics based on type and group of antibiotics.
- Prevalence of antibiotics based on indication category such as empirical, definitive, surgical prophylaxis & non-surgical prophylaxis.

B. To identify antibiotic prescribing behavior in the aspect of:

- Documentation of the indication of antibiotics upon prescribing.
- Prevalence of relevant culture and sensitivity test sent before initiation of Antibiotic.
- Compliance of empirical antibiotic therapy initiated to the guideline.
- Appropriateness of antibiotic therapy, including per microbiology report for antibiotics initiated as definitive therapy.
- Appropriateness of duration of antibiotic therapy (surgical prophylaxis)

5.3 Frequency of survey

Data will be collected by the pharmacists in charge follow predetermined survey protocol. PPS should be carried out in both state and district hospital by yearly basic. Data analysis will be done in local level and the finding will be shared during HIACC meeting for further discussion.

6.0 References

1. National Antimicrobial Guideline 2019, 3rd edition by Ministry of Health Malaysia
2. Protocol on Antimicrobial Stewardship Program in Healthcare Facilities 2014, 1st edition by Ministry of Health Malaysia
3. Barlow G and D Nathwani. Sequential antibiotic therapy. Curr Opin Infect Dis, 2000. 13:599-607
4. Sevinc F, et al. Early switch from intravenous to oral antibiotics: guidelines and implementation in a large teaching hospital. J Antimicrob Chemother, 1999. 43:601-6
5. Vogel F. Intravenous / oral sequential therapy in patients hospitalised with community-acquired pneumonia. Drugs, 2002. 62(2):309-17
6. Athanassa Z, Makris G, Dimopoulos G, Falagas ME. Early switch to oral treatment in patients with moderate to severe community-acquired pneumonia: a meta-analysis. *Drugs*. 2008. 68:2469-81.5.
7. MacGregor R and A Graziani. Oral administration of antibiotics: a rational alternative to the parenteral route. Clin Infect Dis, 1997. 24(3):457-67
8. Waagsbo B, A Sundoy, and E Paulsen. Reduction of unnecessary IV antibiotic days using general criteria for antibiotic switch. Scand J Infectious Dis, 2008. 40:468-73
9. Eckmann C, Lawson W, Nathwani D, Solem CT, Stephens JM, Macahilig C, et al. Undefined. *Int J Antimicrob Agents*. 2014 Jul. 44(1):56-64.
10. Cyriac JM, James E. Switch over from intravenous to oral therapy: A concise overview. *J Pharmacol Pharmacother*. 2014 Apr. 5(2):83-7.
11. Mertz D, Koller M, Haller P, Lampert ML, Plagge H, Hug B, et al. Outcomes of early switching from intravenous to oral antibiotics on medical wards. *J Antimicrob Chemother*. 2009. 64:188-99.
12. Goff DA, Bauer KA, Reed EE, Stevenson KB, Taylor JJ, West JE. Is the "low-hanging fruit" worth picking for antimicrobial stewardship programs? Clin Infect Dis. 2012; 55(4):587-92
13. Dellit TH, Owens RC, McGowan JE Jr, Gerding DN, Weinstein RA, Burke JP, et al. Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America guidelines for developing an institutional program to enhance antimicrobial stewardship. Clin Infect Dis. 2007; 44(2):159-77.
14. Department of Health. Winning ways: working together to reduce healthcare associated infection in England. London: Department of Health, 2003.
15. Short Guidelines for Optimal Hospital Antimicrobial Prescribing; Royal College of Physicians Healthcare Associated Infections Working Group