

## INTRODUCTION - ANTIMICROBIALS

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### IN THIS ISSUE

Introduction to  
Antimicrobials 1

Criteria To Determine  
Patients For IV to PO  
Therapy Conversion 2

List of Oral  
Antimicrobials Available  
In Hospital Segamat.  
3-5

Safety Update:  
The Use of Codeine in  
Children 6

Activities of Pharmacy  
Department 7-10

The word **antimicrobial** was derived from the Greek words anti (against), mikros (little) and bios (life) and refers to all agents that act against microbial organisms. This is not synonymous with antibiotics, a similar term derived from the Greek word anti (against) and biotikos (concerning life). In contrast, the term “antimicrobials” include all agents that act against all types of microorganisms – bacteria (antibacterial), viruses (antiviral), fungi (antifungal) and protozoa (antiprotozoal).<sup>1</sup>

In the last 40 years, the prevalence of multidrug resistant microorganisms (eg. extended spectrum Beta lactamase inhibitor enterobacteriaceae) have risen alarmingly. Antimicrobial resistance (AMR) occurs when microorganisms change in ways that render the medications used to cure the infections they cause ineffective. There is evidence that overall rates of antimicrobial resistance correlate with the use of antimicrobials. As more resistance is acquired, we are eventually left without any effective drug therapies. Thus, AMR can give a negative impact on patient outcomes, poses a major threat for patient safety, increases health expenditure and results in loss of treatment options for common infections.<sup>2</sup>

Antimicrobial management or stewardship program have been developed as a response to these issues. **Antimicrobial Stewardship (AMS)** is thus a coordinated systematic approach to improve the appropriate use of antimicrobials by promoting the selection of the optimal antimicrobial drug regimen; right choice of antimicrobial, right route of administration, right dose, right time, right duration and minimize harm to the patient and future patients. There are many policy being developed in the antimicrobial stewardship program, one of that will be Initiation of intravenous (IV) to oral (PO) switch program whereby intravenous antimicrobial therapy must be reviewed and switched to oral alternatives when clinically appropriate and available.<sup>2</sup>

### References:

1. Antimicrobial Resistance Learning Site Pharmacology:  
<http://amrls.cvm.msu.edu/pharmacology/antimicrobials/antimicrobials-an-introduction> [Accessed on 12th May 2017]
2. Protocol On Antimicrobial Stewardship Program In Healthcare Facilities First Edition 2014 by MOH Malaysia.

# Criteria Used to Determine Patients for IV to PO Therapy Conversion

## IV - Oral Antibiotic Switch Therapy

Patient receiving an IV antibiotic?

Oral route compromised (vomiting, nil by mouth, severe diarrhoea, swallowing disorder, unconscious)

Or

Continuing sepsis (i.e. 2 or more of the following:  $T > 38^{\circ}\text{C}$  or  $< 36^{\circ}\text{C}$ ,  $\text{HR} > 90\text{bpm}$ ,  $\text{RR} > 20/\text{min}$ ,  $\text{WCC} > 12$  or  $< 4$ ) / deteriorating clinical condition

Or

Special indication [endocarditis, central nervous system infections (e.g.; meningitis, brain abscess, etc.), orbital cellulitis, osteomyelitis, endophthalmitis, melioidosis (at least 10 to 14 days of IV therapy), deep abscesses]

Or

No oral formulation of the drug available

YES

Continue to review the need for IV therapy

NO

Switch to oral therapy

Reference:

Protocol On Antimicrobial Stewardship Program In Healthcare Facilities First Edition 2014 by MOH Malaysia.

## LIST OF ORAL ANTIMICROBIALS AVAILABLE IN HOSPITAL SEGAMAT

|     | Drugs                     | Bioavailability (%) | Strength | Trade Name                    | Formulation        | Cut | Crush | Strength of ready made syrup | Extemporaneous | References |
|-----|---------------------------|---------------------|----------|-------------------------------|--------------------|-----|-------|------------------------------|----------------|------------|
| 1.  | Acyclovir                 | 10-20               | 800mg    | Lovir<br>Zoran                | Tablet             | NA  | NA    | 200mg/5ml                    | NO             | 4          |
| 2.  | Amoxicillin & Clavulanate | ~70                 | 625mg    | Co-Amoxiclav                  | Film coated tablet | NA  | NA    | 228mg/5ml                    | NO             | 3,6        |
| 3.  | Ampicillin & Sulbactam    | 80                  | 375mg    | Unasyn                        | Film coated tablet | NA  | NA    | 250mg/5ml                    | NO             | 4,6,8      |
| 4.  | Azithromycin              | 34-52               | 250mg    | Azimax-250                    | Film coated tablet | NO  | NO    | 200mg/5ml                    | NO             | 4,6,8      |
| 5.  | Cefuroxime                | 37- 52              | 125mg    | Auroxetil 125                 | Plain tablet       | NO  | NO    | 125mg/5ml                    | NO             | 1,4,6,8    |
| 6.  | Cefuroxime                | 37-52               | 250mg    | Xylid                         | Tablet             | NA  | NA    | NA                           | NO             | 4,8        |
| 7.  | Cephalexin                | 90                  | 250mg    | Pharmaniaga<br>Cephalexin     | Capsule            | NO  | NA    | 125mg/5ml                    | NO             | 4,8        |
| 8.  | Chloroquine               | ~89                 | 250mg    | Chloroquine                   | Film coated tablet | NA  | YES   | NA                           | YES            | 4,5,8      |
| 9.  | Ciprofloxacin             | 70-80               | 250mg    | Ificipro250                   | Film coated tablet | YES | YES   | NA                           | YES            | 1,3,5,7,8  |
| 10. | Clarithromycin            | 50                  | 250mg    | Pharmaniaga<br>Clarithromycin | Film coated tablet | NA  | NO    | NA                           | NO             | 4,8        |
| 11. | Clindamycin               | 90                  | 300mg    | Tidact                        | Capsule            | NO  | NA    | NA                           | NO             | 4          |
| 12. | Doxycycline               | 90*                 | 100mg    | Xidox                         | Capsule            | NA  | NO    | NA                           | NO             | 1,4,8      |

|     |                             |                           |           |  |                        |     |            |           |     |         |
|-----|-----------------------------|---------------------------|-----------|--|------------------------|-----|------------|-----------|-----|---------|
| 13. | Efavirenz                   | 42                        | 600 mg    | Efavir                                   | Tablet                 | NA  | NA         | NA        | NO  | 3,4     |
| 14. | Erythromycin                | 18-45                     | 400mg     | Erythromycin<br>ES                       | Plain Film tablet      | NO  | NO         | 200mg/5ml | NO  | 1,4,6,8 |
| 15. | Ethambutol                  | ~80                       | 400mg     | CCM<br>Ethambutol                        | Tablet                 | YES | YES        | NA        | NO  | 4,7,8   |
| 16. | Fluconazole                 | >90                       | 100mg     | Fluconazole                              | Capsule                | NA  | NA         | NA        | NO  | 8,9     |
| 17. | Isoniazid                   | 100*                      | 100mg     | Pharmaniaga<br>Isoniazid                 | Film coated tablet     | YES | YES        | NA        | YES | 2,4,5,7 |
| 18. | Itraconazole                | 55                        | 100mg     | Itrazol                                  | Capsule                | NA  | NA         | NA        | NO  | 3,4,8   |
| 19. | Lamivudine                  | 80-87                     | 150mg     | Lamivudine                               | Film coated tablet     | NA  | YES        | 10mg/ml   | NO  | 3,4,10  |
| 20. | Lamivudine +<br>zidovudine  | 80-87 (3TC)<br>60-70(ZVD) | 150/300mg | Lamivudine+<br>zidovudine                | Film coated tablet     | NA  | LIKE<br>LY | NA        | NO  | 3,4,10  |
| 21. | Lopinavir +<br>Ritonavir    | NA                        | 200/50mg  | Kaletra                                  | Film coated tablet     | NO  | NO         | NA        | NO  | 4,10    |
| 22. | Metronidazole               | 80                        | 200mg     | Metronidazole                            | Sugar coated<br>tablet | YES | YES        | 200mg/5ml | NO  | 4,6,7,8 |
| 23. | Nevirapine                  | >90: IR                   | 200mg     | Hirapine                                 | Tablet                 | NA  | YES        | 50mg/5ml  | NO  | 3,4,10  |
| 24. | Oseltamivir                 | 75                        | 75mg      | Fluhalt                                  | Capsule                | NA  | NA         | 60mg/5ml  | NO  | 4,8     |
| 25. | Phenoxymethyl<br>Penicillin | 60                        | 125mg     | Beapen VK<br>Phenoxymethyl<br>Penicillin | Tablet                 | NA  | NA         | 125mg/5ml | NO  | 3       |
| 26. | Primaquine                  | NA                        | 7.5mg     | Pharmaniaga<br>Primaquine                | Film coated tablet     | NA  | NA         | NA        | NO  | 4       |

|     |                                 |        |              |                          |         |     |     |    |     |         |
|-----|---------------------------------|--------|--------------|--------------------------|---------|-----|-----|----|-----|---------|
| 27. | Pyrazinamide                    | 95*    | 500mg        | Pharmaniaga Pyrazinamide | Tablet  | YES | YES | NA | YES | 4,5,7   |
| 28. | Rifampicin                      | 70-90* | 150mg,300mg  | Rifampicin               | Capsule | NO  | YES | NA | YES | 2,4,5   |
| 29. | Ritonavir                       | NA     | 100mg        | Novir                    | Capsule | NA  | NO  | NA | NO  | 4       |
| 30. | sulfadoxine + pyrimethamine     | NA     | 500mg + 25mg | Malafon                  | Tablet  | YES | NA  | NA | NO  | 4       |
| 31. | sulfamethoxazole + trimethoprim | 90-100 | 480mg        | Co-trimoxazole           | Tablet  | YES | NA  | NA | NO  | 3       |
| 32. | Trimethoprim                    | 80*    | 300mg        | Alprim 300               | Tablet  | YES | YES | NA | YES | 2,4,7,8 |

Note : \* oral absorption (%)

## References:

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# Safety Update: The Use of Codeine in Children

## Introduction

Codeine and tramadol are opioid medicines that may be used to treat pain. Codeine is also found in some cough and cold remedies.

Recently, the National Pharmaceutical Regulatory Agency (NPRA) has revised the use of these opioids, particularly codeine based on the information from international regulatory authority relating the risk of respiratory depression.

The risk of respiratory depression in children that take this medicine has been linked with genetic polymorphism and codeine metabolism. It was found that a special type of metaboliser known as CYP2D6 ultra-rapid metabolisers, is able to convert codeine to morphine at a faster rate compared to ordinary metaboliser. This leads to accumulation of morphine in the bloodstream and ultimately, respiratory depression. The risk is particularly higher in ultra-rapid metabolisers who has just been undergoing tonsillectomy or/and adenoidectomy.

Nursing mothers who are taking codeine or tramadol can pass unsafe levels of opioids to their babies through breast milk. Those infants can become too sleepy, have difficulty breastfeeding, or have serious breathing problems.



### **Beware of Giving Kids Codeine**

According to NPRA, Codeine are contraindicated in these

types of population:

- In children below the age of 12 years old for symptomatic treatment of colds, due to an increased risk of developing serious and life-threatening adverse reactions.

- In all paediatric patients (0-18) who undergo tonsillectomy or/and adenoidectomy for obstructive sleep apnoea syndrome.
- In women during breastfeeding.
- In patients who are known CYP2D6 ultra-rapid metabolisers

### **How to Know if Your Child's Medicine Has Codeine**



From 1 September 2016, Malaysia Adverse Drug Reaction Advisory Committee has suggested that every codeine-containing packaging to include safety information regarding the risk of

respiratory depression to ensure it is only used in cases where its benefits clearly outweighed the risk in children. Read the label to make sure the medicine doesn't have codeine

### **References**

NPRA Directives (2016), Safety updates in product package pertaining to the risk of respiratory depression for all products containing codeine, BPFK/PASCA/FV/2/JILID 17. Available on <[http://npa.moh.gov.my/images/Publications/Newsletter\\_Berita\\_Ubat-ubatan/2016/Berita\\_Ubat\\_Ubatan\\_Dec\\_vol66\\_n46.pdf](http://npa.moh.gov.my/images/Publications/Newsletter_Berita_Ubat-ubatan/2016/Berita_Ubat_Ubatan_Dec_vol66_n46.pdf)>, [Accessed on 12<sup>th</sup> May 2017]

FDA, (2017). Codeine and Tramadol Can Cause Breathing Problems for Children. [online] Available at <https://www.fda.gov/ForConsumers/ConsumerUpdates/ucm315497.htm> [Accessed on 12<sup>th</sup> May 2017]

# Know Your Medicine (KUA) Activities



## KNOW YOUR MEDICINE (KUA) EXHIBITION & TALK CONDUCTED AT HOSPITAL SEGAMAT

This program was aimed to educate and equip consumers as well as staffs with skills to know and understand their medicines, to use medicines rationally and their right to information on medicine.

# RETIREMENT CELEBRATION OF SENIOR PHARMACY TECHNICIAN

**In Great Appreciation For En.Rosman Ngatiman's Service As A Pharmacy Technician.**

*A time to look back with admiration...*

*A time to look forward with anticipation.*





# Pharmacy Department Farewell Ceremonies



Farewell Ceremony for Miss Nor Liana binti Zul Bahari



With Ms Wan Farhah Adiba bt Wan Abd Ghafar that will continue her services at Hospital Sultan Ismail



Batch of PRP that have successfully completed their provisional training

# ACTIVITIES PHARMACY DEPARTMENT



EKSA Grand Cleaning Day 2017



Participation of Staff in *Larian Muafakat Johor Sempena Hari Keputeraan Sultan Johor 2017*



Pharmacy Department Bowling Competition



Participation in Johor Bowling Tournament