



# Pharmacy Information System (PhIS) and Clinic Pharmacy System (CPS)

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## Full Based User Manual TDM Calculator

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## Verified and Acknowledged By:

Name	Role / Designation	Organization	Signature & Date
Muazzam Bin Zulzalalin	Team Leader	Pharmaniaga Logistics Sdn. Bhd.	

Name	Role / Designation	Organization	Signature & Date
		Bahagian Perkhidmatan Farmasi (BPF), KKM	

## Peer Review

Version No	Reviewed / Verified By	List of changes from Previous Version
1.0	Juridah/Michelle (QA)	First submission to MOH
1.1	Juridah/Michelle (QA)	Change to latest update and screenshot version 1.5.1



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## 1.0 Introduction

### 1.1 Overview of PhIS

Pharmacy Information System or better known as PhIS, is a complete and comprehensive system that integrates pharmacy related services geared towards pharmacy excellence. PhIS implementation would transform most of current manual process to electronic system would benefit facility end user in the health care sector.

There are 12 modules to assist services delivery by the health care sector which comprises of:

1. Order Management
2. Inpatient Pharmacy
3. Outpatient Pharmacy
4. Medication Counselling
5. Ward Pharmacy
6. Pharmacy Inventory
7. Manufacturing of Cytotoxic Drug Reconstitution, Parenteral Nutrition, IV Admixture & Eye Drop , Radiopharmaceuticals and Extemporaneous
8. Adverse Drug Reaction & Drug Allergic (ADR & DAC)
9. Clinical Pharmacokinetics Services (TDM)
10. Drug Information & Consumer Education (DICE)
11. Medication Therapy Adherence Clinic (MTAC)
12. Data Mining (PhARM)

### 1.2 Purpose and Objectives

This user manual outlines the TDM Calculator module and its key features and functionalities. The primary objective is to guide user through the process of completing PhIS application process.

User will understand the following activities in details:

- Calculator for Vancomycin
- Calculator for Gentamicin
- Calculator for Valproic Acid

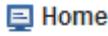
### 1.3 Organized Sections

These are the sections within this document:

- Section 1: Introduction
- Section 2: Application Standard Features
- Section 3: Calculator for Vancomycin
- Section 4: Calculator for Gentamicin
- Section 5: Calculator for Valproic Acid
- Section 6: Acronyms
- Section 7: Links to Clinical Modules

## 2.0 Application Standard Features

### 2.1 PhIS Legend

Standard Legend			
	Login to PhIS		Logout from PhIS
	Change Login Password		Reset Login Screen
	Expand Menu		Collapse Menu
	Display Home Tab		Expand Module
	Collapse Module		Close All Open Tabs
	Refresh Screen		Search Record
	Add/Create New Record		Show Help
	Print	*	Mandatory Field
	Calendar Icon		Search Icon
	Close Window		Radio Button
	Checkbox		Edit Record
	Cancel		Delete Record
	Save		Export and Open Report in Excel Format

### 3.0 Calculator for Vancomycin

To view the calculator in the system, perform the steps below:

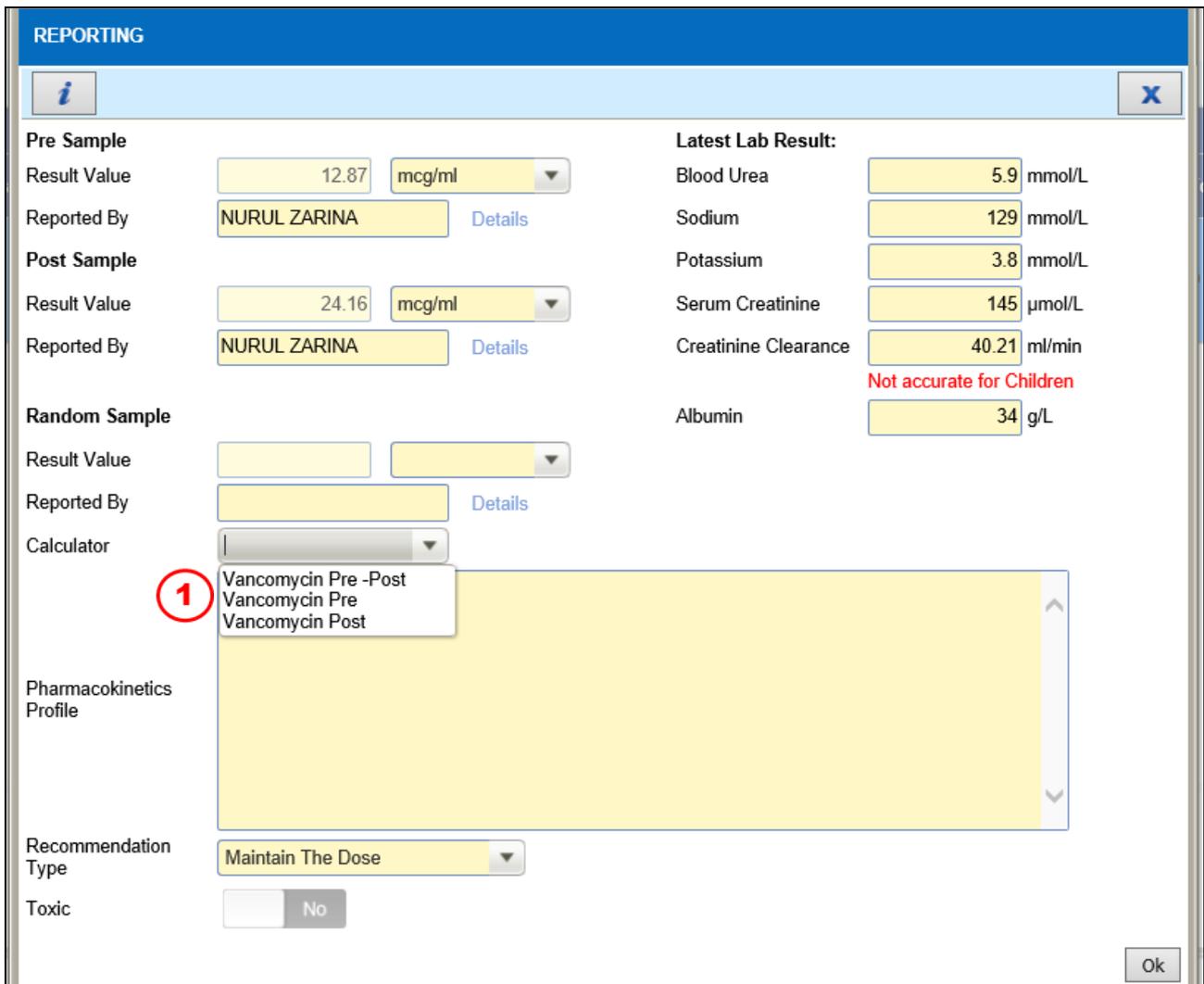


Figure 3.0-1 Pre Calculator for Vancomycin Detail

#### STEP 1

Select calculator from dropdown box example:

- Vancomycin in Pre
- Vancomycin in Post
- Vancomycin in Pre-Post

#### Note

- Choose the calculator and fill the result in the box as per Figure 1.0-1. Sample Details consists of:
  - Pre calculator for vancomycin
  - Dose medication in mg
  - Interval Time
  - Pre level result concentration
  - Serum Creatinine
  - Vd

- After save the calculator, the result will appear at the Pharmacokinetics Profile box
- Calculator is optional only user can direct type at the Pharmacokinetics Profile box without using the calculator as per Figure 3.0-1

CALCULATOR FOR VANCOMYCIN PRE

Body Weight <span style="border: 1px solid gray; padding: 2px;">Actual</span>	Body Weight <span style="border: 1px solid gray; padding: 2px;">67</span> kg
Dose <span style="border: 1px solid gray; padding: 2px;"></span> mg	Total Dose <span style="border: 1px solid gray; padding: 2px;"></span> mg/day
Interval(T) <span style="border: 1px solid gray; padding: 2px;"></span> hour	

---

Pre level result concentration <span style="border: 1px solid gray; padding: 2px;"></span> mcg/ml Serum Creatinine <span style="border: 1px solid gray; padding: 2px;"></span> umol/L Vd <span style="border: 1px solid gray; padding: 2px;"></span> L/Kg	Creatinine Clearance <span style="border: 1px solid gray; padding: 2px;"></span> ml/min pKe <span style="border: 1px solid gray; padding: 2px;"></span> hr-1 Cl <span style="border: 1px solid gray; padding: 2px;"></span> ml/min      t1/2 <span style="border: 1px solid gray; padding: 2px;"></span> hour Expected Cmax <span style="border: 1px solid gray; padding: 2px;"></span> mcg/ml      Expected Cmin <span style="border: 1px solid gray; padding: 2px;"></span> mcg/ml
---	---

Note : Normal = 0.7, Dehydrated = < 0.50, Fluid Overload = > 1 (Edema, Ascites, over hydration)

**Figure 3.0-2 Pre Calculator for Vancomycin Detail**

CALCULATOR FOR VANCOMYCIN POST

Body Weight <span style="border: 1px solid gray; padding: 2px;">Actual</span>	Body Weight <span style="border: 1px solid gray; padding: 2px;">70</span> kg
Dose <span style="border: 1px solid gray; padding: 2px;"></span> mg	Total Dose <span style="border: 1px solid gray; padding: 2px;"></span> mg/day
Interval(T) <span style="border: 1px solid gray; padding: 2px;"></span> hour	

---

**Sampling Time**

Duration between time after complete infusion and post sampling(t)  hour

**Serum level**

Post level result concentration  mcg/ml  
 Creatinine Clearance  ml/min  
 Serum Creatinine  umol/L

---

pKe <span style="border: 1px solid gray; padding: 2px;"></span> hr-1 Vd <span style="border: 1px solid gray; padding: 2px;"></span> L/Kg Cl <span style="border: 1px solid gray; padding: 2px;"></span> ml/min      t1/2 <span style="border: 1px solid gray; padding: 2px;"></span> hour Cmax <span style="border: 1px solid gray; padding: 2px;"></span> mcg/ml      Cmin <span style="border: 1px solid gray; padding: 2px;"></span> mcg/ml	<input type="checkbox"/> To calculate expected Cmin and Cmax based on new suggested dose New suggested dose <span style="border: 1px solid gray; padding: 2px;"></span> mg New Interval <span style="border: 1px solid gray; padding: 2px;"></span> hour Expected Cmax <span style="border: 1px solid gray; padding: 2px;"></span> mcg/ml      Expected Cmin <span style="border: 1px solid gray; padding: 2px;"></span> mcg/ml
---	--

---

To calculate new dose and Cmin based on desired Cmax  
 Desired Cmax  mcg/ml  
 Desired Interval  hour  
 Expected Cmin  mcg/ml      New Dose  mg

**Figure 3.0-3 Post Calculator for Vancomycin Detail**

CALCULATOR FOR VANCOMYCIN PRE & POST

Body Weight <span style="border: 1px solid gray; padding: 2px;">Actual</span>	Body Weight <span style="border: 1px solid gray; padding: 2px;">70</span> kg
Dose <span style="border: 1px solid gray; padding: 2px;"></span> mg	Total Dose <span style="border: 1px solid gray; padding: 2px;"></span> mg/daily
Interval(T) <span style="border: 1px solid gray; padding: 2px;"></span> hour	

---

**Sampling Time**

Duration between time after complete infusion and post sampling(t)  hour  
 Duration between completion time of pre and post sampling (t2-t1)  hour

**Serum level**

Pre level result concentration  mcg/ml  
 Post level result concentration  mcg/ml  
 Serum Creatinine  umol/L  
 Creatinine Clearance  ml/min

---

<input type="checkbox"/> To calculate Vd , Ka and t1/2 Ka <span style="border: 1px solid gray; padding: 2px;"></span> hr-1 Vd <span style="border: 1px solid gray; padding: 2px;"></span> L/Kg Cl <span style="border: 1px solid gray; padding: 2px;"></span> ml/min      t1/2 <span style="border: 1px solid gray; padding: 2px;"></span> hour Cmax <span style="border: 1px solid gray; padding: 2px;"></span> mcg/ml      Cmin <span style="border: 1px solid gray; padding: 2px;"></span> mcg/ml	<input type="checkbox"/> To calculate expected Cmin and Cmax if Vd varies Vd <span style="border: 1px solid gray; padding: 2px;"></span> L/Kg Expected Cmax <span style="border: 1px solid gray; padding: 2px;"></span> mcg/ml Expected Cmin <span style="border: 1px solid gray; padding: 2px;"></span> mcg/ml
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To calculate Area Under Curve (AUC) Over 24hrs  
 Vd  L/Kg  
 MIC  mg/L  
 Note MIC < 2mg/L AUC > 400  
 AUC

---

To calculate expected Cmin and Cmax based on new suggested dose  
 New suggested dose  mg  
 Every Hour  hour  
 Expected Cmax  mcg/ml      Expected Cmin  mcg/ml

---

To calculate new dose and Cmin based on desired Cmax  
 Desired Cmax  mcg/ml  
 Desired Interval  hour  
 Expected Cmin  mcg/ml      New Dose  mg

**Figure 3.0-4 Pre & Post Calculator for Vancomycin Detail**

## 4.0 Calculator for Gentamicin

To view the calculator in the system, perform the steps below:

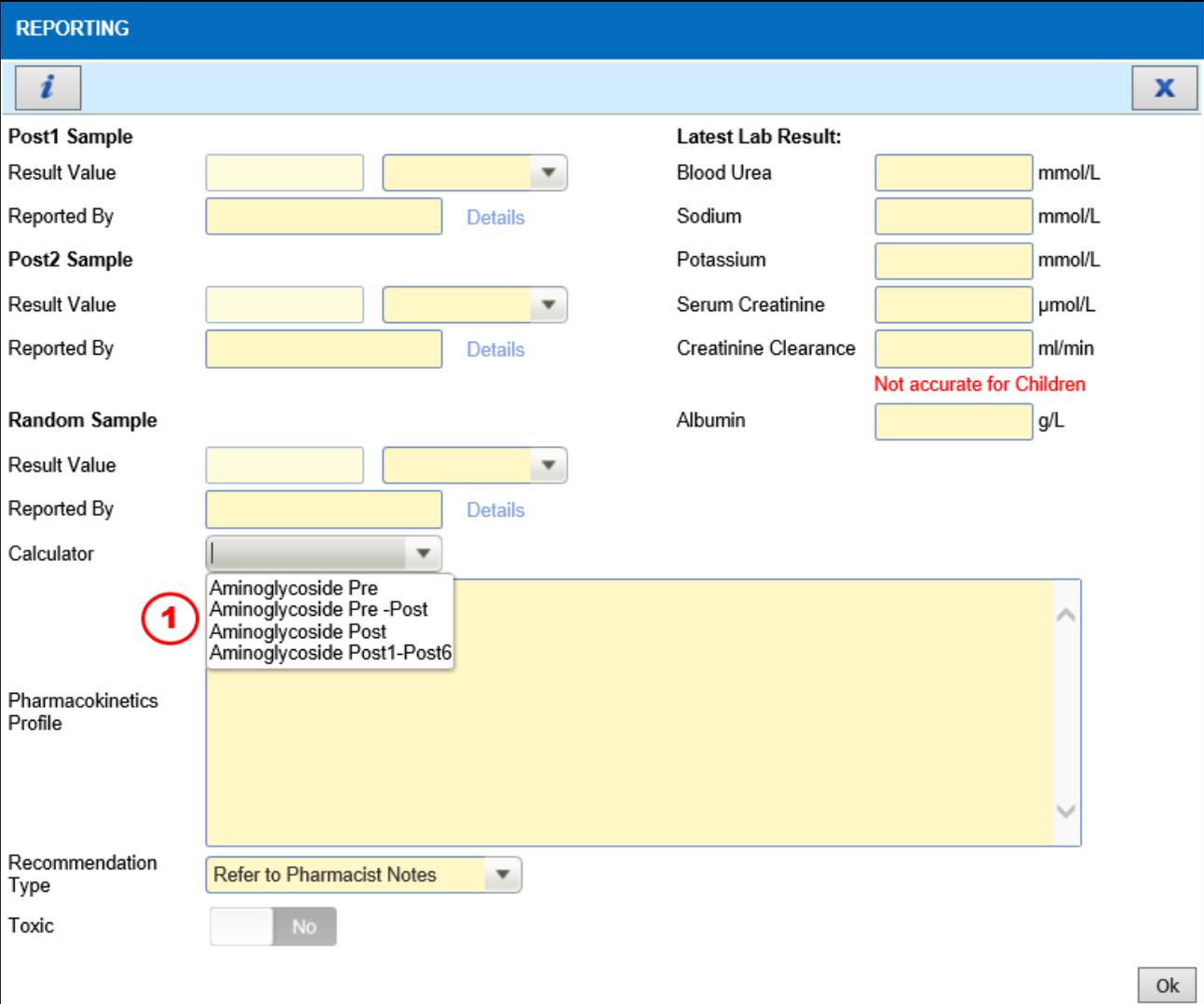


Figure 4.0-1 Calculator for Gentamicin

### STEP 1

Select calculator from dropdown box example:

- Aminoglycoside Pre-Post
- Aminoglycoside Pre
- Aminoglycoside Post
- Aminoglycoside Post 1- Post 6

### Note

- Choose the calculator and fill the result in the box as per Figure 2.0-1. Sample Details consists of:
  - Aminoglycoside Pre-Post calculator for Gentamicin
  - Dose medication in mg
  - Interval Time
  - Sampling time
  - Serum Level
  - Vd, Ke and t1/2

**CALCULATOR FOR AMINOGLYCOSIDE PRE POST**

Body Weight:  Body Weight:  kg  
 Dose:  mg Total Dose:  mg/daily  
 Interval(T):  hour

Note : mcg/ml = mg/L

**Sampling Time**  
 Duration between time after complete infusion and post sampling(t):  hour  
 Duration between completion time of pre and post sampling (t2-t1):  hour

**Serum level**  
 Pre level result concentration:  mcg/ml  
 Post level result concentration:  mcg/ml  
 Serum Creatinine:  umol/L Creatinine Clearance:  ml/min

To calculate Vd , Ke and t1/2

Ke:  hr-1  
 Vd:  L/Kg  
 t1/2:  hour  
 Cmax:  mcg/ml    Cmin:  mcg/ml

To calculate expected Cmin and Cmax based on new suggested dose

New suggested dose:  mg  
 New Interval:  hour  
 Expected Cmax:  mcg/ml    Expected Cmin:  mcg/ml

To calculate new dose and Cmin based on desired Cmax

Desired Cmax:  mcg/ml  
 Desired Interval:  hour  
 Expected Cmin:  mcg/ml    New Dose:  mg

**Figure 4.0-2 Calculator for Aminoglycoside Pre-Post Detail**

**CALCULATOR FOR AMINOGLYCOSIDE PRE**

Body Weight:  Body Weight:  kg  
 Dose:  mg Total Dose:  mg/day  
 Interval(T):  hour

**Sampling Time**  
 Pre level result concentration:  hour  
 Serum Creatinine:  umol/L Creatinine Clearance:  ml/min  
 Vd:  L/Kg pKe:  hr-1  
 t1/2:  hour Expected Cmax:  mcg/ml    Expected Cmin:  mcg/ml

Note : Normal = 0.25, Dehydrated = < 0.20, Fluid Overload = > 0.30 (Edema, Ascites, over hydration)

**Figure 4.0-3 Calculator for Aminoglycoside Pre Detail**

**CALCULATOR FOR AMINOGLYCOSIDE POST**

Body Weight:  Body Weight:  kg  
 Dose:  mg Total Dose:  mg/daily  
 Interval(T):  hour

Note : mcg/ml = mg/L

**Sampling Time**  
 Duration between time after complete infusion and post sampling(t):  hour

**Serum level**  
 Post level result concentration:  mcg/ml Serum Creatinine:  umol/L  
 Creatinine Clearance:  ml/min

To calculate Vd , Ke and t1/2

Vd:  L/Kg  
 pKe:  hr-1  
 t1/2:  hour  
 Cmax:  mcg/ml    Cmin:  mcg/ml

To calculate expected Cmin and Cmax based on new suggested dose

New suggested dose:  mg  
 New Interval:  hour  
 Expected Cmax:  mcg/ml    Expected Cmin:  mcg/ml

To calculate new dose and Cmin based on desired Cmax

Desired Cmax:  mcg/ml  
 Desired Interval:  hour  
 Expected Cmin:  mcg/ml    New Dose:  mg

**Figure 4.0-4 Calculator for Aminoglycoside Post Detail**

**CALCULATOR FOR AMINOGLYCOSIDE POST1 & POST6**

Body Weight: Actual

Dose:  mg

Interval(T):  hour

Body Weight:  kg

Total Dose:  mg/daily

Note : mcg/ml = mg/L

**Sampling Time**

Duration between time after complete infusion and post1 sampling(t1):  hour

Duration between completion time of post6 and post1 sampling (t6-t1):  hour

**Serum level**

Post 1 level result concentration:  mcg/ml

Post 6 level result concentration:  mcg/ml

Serum Creatinine:  umol/L

Creatinine Clearance:  ml/min

**To calculate Vd, Ke and t1/2**

Ke:  hr<sup>-1</sup>

Vd:  L/Kg

t1/2:  hour

Cmax:  mcg/ml    Cmin:  mcg/ml

**To calculate expected Cmin and Cmax based on new suggested dose**

New suggested dose:  mg

New Interval:  hour

Expected Cmax:  mcg/ml    Expected Cmin:  mcg/ml

**To calculate new dose and Cmin based on desired Cmax**

Desired Cmax:  mcg/ml

Desired Interval:  hour

Expected Cmin:  mcg/ml    New Dose:  mg

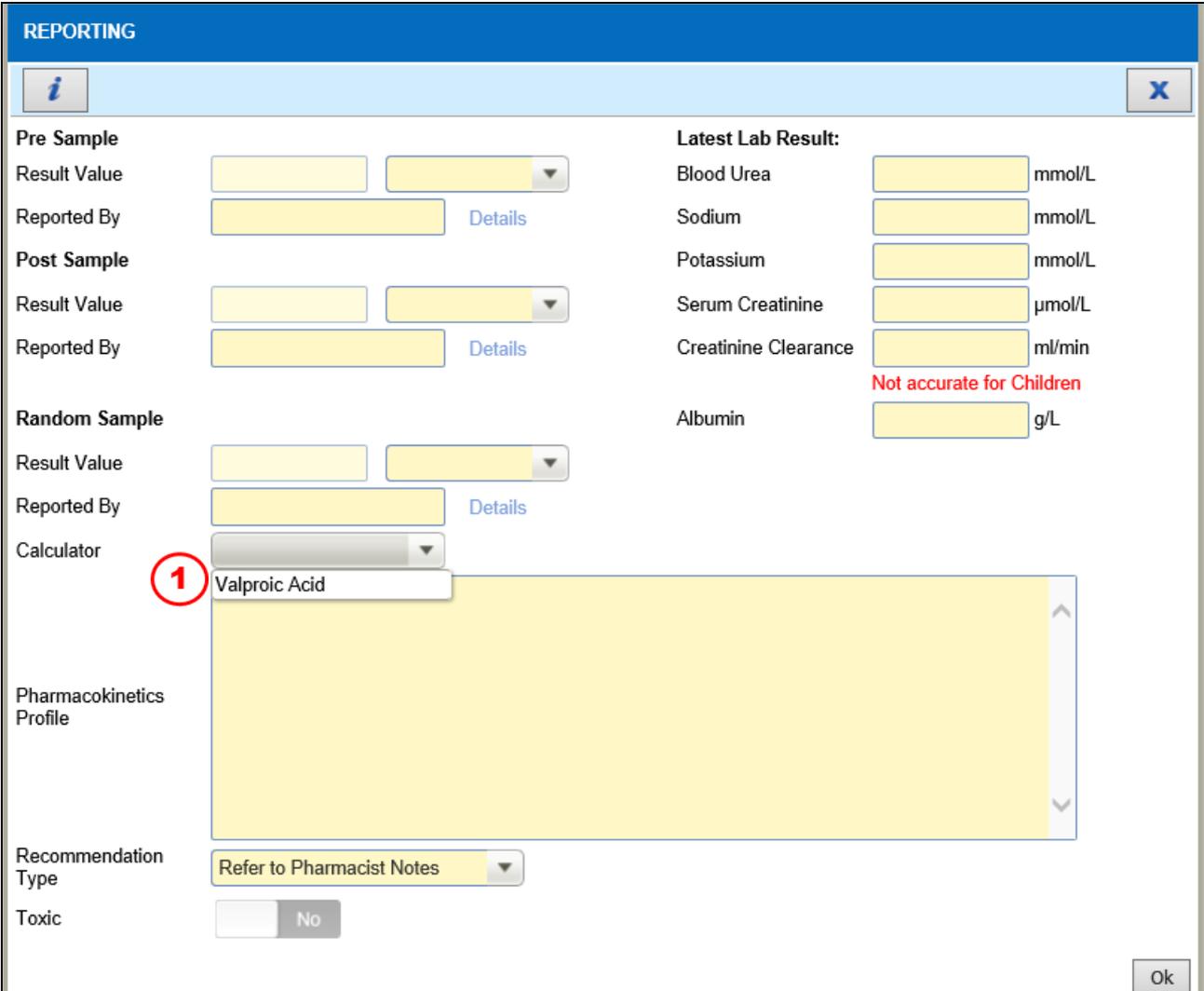
**Figure 4.0-5 Calculator for Aminoglycoside Pre 1-Post 6 Detail**

FB\_U. MANUAL\_TDM CALCULATOR-v1.1

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## 5.0 Calculator for Valproic Acid

To view the calculator in the system, perform the steps below:



The screenshot shows a software window titled "REPORTING" with a close button (X) in the top right. The window is divided into several sections:

- Pre Sample:** Includes "Result Value" (text and dropdown), "Reported By" (text and "Details" link), and "Post Sample" (text and dropdown).
- Post Sample:** Includes "Result Value" (text and dropdown), "Reported By" (text and "Details" link), and "Random Sample" (text and dropdown).
- Random Sample:** Includes "Result Value" (text and dropdown), "Reported By" (text and "Details" link), and "Calculator" (dropdown menu). The dropdown menu is open, showing "Valproic Acid" selected and circled in red with the number "1".
- Latest Lab Result:** Includes "Blood Urea" (text and dropdown), "Sodium" (text and dropdown), "Potassium" (text and dropdown), "Serum Creatinine" (text and dropdown), "Creatinine Clearance" (text and dropdown, with a red note "Not accurate for Children"), and "Albumin" (text and dropdown).
- Pharmacokinetics Profile:** A large yellow area with a scroll bar.
- Recommendation Type:** A dropdown menu set to "Refer to Pharmacist Notes".
- Toxic:** A button labeled "No".
- An "Ok" button is located in the bottom right corner.

Figure 5.0-1 Calculator for Valproic Acid

### STEP 1

Select calculator from dropdown box example:

- Valproic Acid

### Note

- Choose the calculator and fill the result in the box as per Figure 3.0-1. Sample Details consists of:
  - Valproic Acid calculator
  - Dose medication in mg
  - Interval Time
  - Choose between monotherapy or phototherapy
  - $V_d$ ,  $K_e$  and  $t_{1/2}$

CALCULATOR FOR VALPROIC ACID

Body Weight Actual Body Weight 44 kg

Dose  mg Total Dose  mg/day

Interval(T)  hour

Select Calculator:

Monotherapy Polytherapy

**Note: single or combination therapies of different enzyme activities.**

Cp measured  mcg/ml  
*Note: mcg/ml = mg/L*

Clearance CP measured  L/day  
 L/hr

To calculate Vd, Ke and t1/2 based on CI

CI  L/hr

Constant Vd  L/Kg  
*Note: 0.1 - 0.5 L/Kg*

Vd  L/kg

Ke  hr<sup>-1</sup>      t1/2  hour

To calculate New Maintenance Dose (NMD) based on CI, Cp measured and Cp desired

Cp desired  mcg/ml  
*Note: mcg/ml = mg/L*

CI  L/day

New Dose  mg/day

Constant CI  ml/kg/hr  
*Note: Adult=8 ml/kg/hr Children (< 12years 11month) = 13 ml/kg/hr*

Clearance (Population)  U/day  
 L/hr

To calculate Cpss level based on current dose and CI

CI  L/hr

Cpss  mcg/ml  
*Note: mcg/ml = mg/L*

To calculate Expected Cp based on CI and New Suggested Dose(NSD)

CI  U/day

NSD  mg/day

Expected Cp  mcg/ml  
*Note: mcg/ml = mg/L*

**Figure 5.0-2 Calculator for Valproic Acid Detail**

CALCULATOR FOR THEOPHYLLINE

Body Weight Actual Body Weight 70 kg

Dose  mg Interval(T)  hour

S

Theophylline (monohydrate) = 0.97 Theophylline = 1

Select Calculator:

Oral IV

Cp Measured  mcg/ml  
*Note: mcg/ml = mg/L*

To calculate Clearance based on patient's factors

Factor Q

Clearance Cp Measured  L/hr

Clearance(pcp)  L/hr

<b>Note: Q:</b>	
Smoking History	1.6
Cystic Fibrosis	1.5
Severe COPD	0.8
Acute Pulmonary Edema	0.5
Hepatic Cirrhosis	0.5
Acute Pulmonary Edema	0.5
Acute Vial Stress	0.5
Chronic Heart Failure	0.4
Note	1
Phenobarbitone	1.3
Phenytoin	1.6
Rifampicin	1.3
Erythromycin	0.75
Ciprofloxacin	0.7
Cimetidine	0.6
Rosiglitazone	0.6
Influenza Vaccine	0.5
Elderly > 75 y.o.	0.8

To calculate Ke and t1/2 based on CI

CI  L/hr

Ke  hr<sup>-1</sup>

t1/2  hour

To calculate Loading Dose (LD) based on Cp desired and Vd

Cp desired  mcg/ml  
*Note: mcg/ml = mg/L*

Vd  L

LD  mg

To calculate New Maintenance Dose (NMD) based on Cp desired and CI

Cp desired  mcg/ml  
*Note: mcg/ml = mg/L*

CI  L/hr

T  Hr

New Dose  mg every  Hr

To calculate Vd based on patient's factors

Factor Vd

Vd (pp)  L  
*Note: Adult = 0.6 Premature = 0.7*

To calculate Cpss level based on current dose and CI

CI  L/hr  
*Note: mcg/ml = mg/L*

Cpss  mcg/ml

To calculate Incremental Loading Dose (ILD) if level is SUB-therapeutic based on Cp desired and Vd

Cp desired  mcg/ml  
*Note: mcg/ml = mg/L*

Vd  L

ILD  mg

To calculate New Dose (K0) based on Cp and CI when convert Oral to IV Aminophylline

Cp  mcg/ml  
*Note: mcg/ml = mg/L*

CI  L/hr

K0(IV)  mg/hr

**Figure 5.0-3 Calculator for Theophylline for Drug Aminophylline**

CALCULATOR FOR CARBAMAZEPINE

Body Weight: Actual | Body Weight: 70 kg

Dose:  mg | Total Dose:  mg/day

Interval(T):  Hr

Select Calculator:

Monotherapy  **Polytherapy**

Note: single or combination therapies of different enzyme activities.

Cp Measured:  mcg/ml

Note: mcg/ml = mg/L

Clearance CP measured: 0.000 L/day

Clearance (Population): 107.520 L/day

≈ 0.000 L/hr

≈ 4.480 L/hr

To calculate Vd, Ke and t1/2

Cl:  L/hr

Vd:  L/hr

Ke:  hr<sup>-1</sup>

t1/2:  hour

To calculate C<sub>ps</sub> level based on current dose and Cl

Cl:  L/hr

Note: mcg/ml = mg/L

C<sub>ps</sub>:  mcg/ml

To calculate New Maintenance Dose (NMD) based on Cp measured dan Cp desired

Cp Desired:  mg/L

Note: mcg/ml = mg/L

Cl:  L/day

New Dose:  mg/day

To calculate Expected Cp based on New Suggested Dose

Cl:  L/day

Note: mcg/ml = mg/L

Suggested dose:  mg/day

Expected Cp:  mg/L

**Figure 5.0-4 Calculator for Carbamazepine for Drug Carbamazepine**

CALCULATOR FOR DIGOXIN

Body Weight: Actual | Body Weight: 70 kg

Total Dose:  mg/day

Serum Creatinine:  umol/L

Creatinine Clearance:  ml/min

F:

Note: Tablet = 0.7, Elixir = 0.6, Soft Gelatin capsule / Injection = 1

Select Patient's Condition:

Without CHF and not renally impaired

Without CHF and renally impaired

With CHF and not renally impaired

With CHF and renally impaired

Cp measured:  ng/ml

Note: mcg/ml = mg/L = 10<sup>-3</sup> mcg/ml = 10<sup>-3</sup> mg/L

≈  mg/L

To calculate Cl based on Patient's Factor(s)

Factor Cl:

Note: None = 1 Quinidine = 0.5 Amiodarone = 0.55 Verapamil = 0.75 Clinically hypothyroid = 0.7 Clinically hyperthyroid = 1.3

Clearance CP measured:  L/day

Clearance (Population):  L/day

To calculate Vd based on Patient's Factor(s)

Factor Vd:

Note: None = 1 Quinidine = 0.7 Clinically hypothyroid = 0.7 Clinically hyperthyroid = 1.3

Vd (pop):  L

To calculate Ke and t1/2 based on Cl

Cl:  L/day

Ke:  hr<sup>-1</sup>

t1/2:  hour

To calculate Loading Dose(LD) based on Vd and Cp desired

Cp Desired:  ng/ml

LD:  mg/day

To calculate C<sub>ps</sub> level based on current dose and Cl

Cl:  L/day

C<sub>ps</sub>:  mg/L

≈  ng/ml

To calculate New Maintenance Dose(NMD) based on Cl and Cp desired

Cl:  L/day

Cp Desired:  ng/ml

New Dose:  mg/day

To calculate Expected Cp based on Cl and New Suggested Dose(NSD)

Cl:  L/day

New Suggested dose:  mg/day

Expected Cp:  mg/L

≈  ng/ml

**Figure 5.0-5 Calculator for Digoxin for Drug Digoxin**

**CALCULATOR FOR PHENOBARBITONE**

Body Weight:    
 Body Weight:  kg   
 Dose:  mg

Interval(T):  hour   
 S:    
 Note: Oral / IV = 1   
 Total Dose:  mg/day

Cp measured:  mcg/ml   
 Note: mcg/ml = mg/L   
 Clearance CP measured:  L/day   
 =  L/hr

Constant CI:  ml/kg/hr   
 Note: Adult = 4 ml/kg/hr Children (<12years 11month) = 8 ml/kg/hr Neonate = 4 ml/kg/hr   
 Clearance (Population):  L/day   
 =  L/hr

To calculate Vd, Ke and t1/2 based on CI   
 CI:  L/hr   
 Constant Vd:  L/kg   
 Note: Adult = 0.6 L/kg, Neonate = 0.8 - 1 L/kg   
 Vd:  L   
 Ke:  hr<sup>-1</sup> t 1/2:  hour

To calculate Cps level based on current dose and CI   
 CI:  L/hr   
 Cps:  mcg/ml   
 Note: mcg/ml = mg/L

To calculate New Maintenance Dose (NMD) based on CI, Cp measured and Cp desired   
 Cp desired:  mcg/ml   
 Note: mcg/ml = mg/L   
 CI:  L/day   
 New Dose:  mg/day

To calculate Expected Cp based on CI and New Suggested Dose(NSD)   
 CI:  L/day   
 NSD:  mg/day   
 Expected Cp:  mcg/ml   
 Note: mcg/ml = mg/L

Figure 5.0-6 Calculator for Phenobarbitone for Drug Phenobarbitone

**CALCULATOR FOR PHENYTOIN**

Body Weight:    
 Body Weight:  kg

Total Dose:  mg/day   
 Albumin:  g/dL   
 Note: g/dL = 10<sup>-1</sup> g/L   
 Km:  mg/L   
 Note: Adult = 4, Children = 7   
 S:    
 Note: Capsule/Injection=0.92, Suspension/tablet=1

Select Patients Condition   
 Without Hypoalbuminemia | Hypoalbuminemia | Hypoalbuminemia with ESF

Cp measured:  mcg/ml   
 Note: mcg/ml = mg/L   
 Vmax (Measured):  mg/day

To calculate Vmax (population)   
 Constant Vmax:  mg/kg/day   
 Note: Adult = 8-15 mg/kg/day, 6mo-5yrs = 10-13 mg/kg/day, 7yrs-15yrs = 8-10 mg/kg/day   
 Vmax (pop):  mg/day

To calculate Cps level based on Vmax   
 Vmax:  mg/day   
 Cps:  mcg/ml   
 Note: mcg/ml = mg/L

To calculate Incremental Loading Dose (ILD) based on Cp desired and Cp measured   
 Cp Desired:  mcg/ml   
 Note: mcg/ml = mg/L   
 ILD:  mg

To calculate therapy without period (T) when level is toxic   
 Vmax:  mg/day   
 Note: mcg/ml = mg/L   
 Cp Desired:  mcg/ml   
 T:  day

To calculate Vd, Ke, t1/2 and CI based on Vmax   
 Constant Vd:  L/kg   
 Note: Adult: 0.65-0.74 L/kg, Children: 0.7-1.0 L/kg   
 Vmax:  mg/day   
 Vd:  L   
 Ke:  hr<sup>-1</sup> t1/2:  hour   
 CI:  L/hr

To calculate Loading Dose (LD) based on Cp desired   
 Cp Desired:  mcg/ml   
 Note: mcg/ml = mg/L   
 LD:  mg

To calculate New Maintenance Dose (NMD) based on Vmax and Cp desired   
 Vmax:  mg/day   
 Note: mcg/ml = mg/L   
 Cp Desired:  mcg/ml   
 New Dose:  mg/day

Figure 5.0-7 Calculator for Phenytoin for Drug Phenytoin



## 6.0 Acronyms

Abbreviation	Definition
PhIS	Pharmacy Information System
CPS	Clinical Pharmacy System
PM	Patient Management
eGL	Electronic Guarantee Letter
HRMIS	Human Resource Management Informasi System
MRN	Medical Record Number
MOH	Ministry Of Health

## 7.0 Links To Clinical Modules

No	Module	PDF Links	No	Module	PDF Links
1	<i>Inpatient</i>	<a href="#">Click Here</a>	12	<i>CDR Dispensing</i>	<a href="#">Click Here</a>
2	<i>CDR Order</i>	<a href="#">Click Here</a>	13	<i>Methadone Dispensing</i>	<a href="#">Click Here</a>
3	<i>TDM Order</i>	<a href="#">Click Here</a>	14	<i>PN Dispensing</i>	<a href="#">Click Here</a>
4	<i>PN Order</i>	<a href="#">Click Here</a>	15	<i>Order Management</i>	<a href="#">Click Here</a>
5	<i>IV Order</i>	<a href="#">Click Here</a>	16	<i>Patient Management</i>	<a href="#">Click Here</a>
6	<i>Prepacking</i>	<a href="#">Click Here</a>	17	<i>Radiopharmaceuticals</i>	<a href="#">Click Here</a>
7	<i>Galenical</i>	<a href="#">Click Here</a>	18	<i>Outpatient</i>	<a href="#">Click Here</a>
8	<i>MTAC</i>	<a href="#">Click Here</a>	19	<i>Special Drug Request</i>	<a href="#">Click Here</a>
9	<i>ADR &amp; DAC</i>	<a href="#">Click Here</a>	20	<i>MAR</i>	<a href="#">Click Here</a>
10	<i>Medication Counselling</i>	<a href="#">Click Here</a>	21	<i>DICE</i>	<a href="#">Click Here</a>
11	<i>Ward Pharmacy</i>	<a href="#">Click Here</a>	22		