



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

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## **Full Based User Manual Therapeutic Drug Monitoring (TDM)**

<b>Version</b>	<b>: 1.7</b>
<b>Document ID</b>	<b>: FB_U. MANUAL_THERAPEUTIC DRUG MONITORING</b>



PhIS & CPS Project  
User Manual – Therapeutic Drug  
Monitoring



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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 that geared toward 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 Clinical Pharmacokinetics Services (TDM) sub-module, its key features and functionalities. The primary objective is to guide users through the process of completing PhIS application process.














### 1.3 Organised Sections


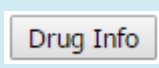



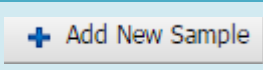

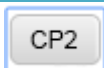
These are the sections within this document:

- Section 1 : Introduction
- Section 2 : Application Standard Features
- Section 3 : Clinical Pharmacokinetics Services (TDM)
- Section 4 : Acronyms
- Section 5 : 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
	Add Item to the list		Delete Item from the list
	Request for Approval		Cancel the Request
	Approve Transaction		Reject Transaction
	Send for Approval		Dropdown Box
	Automatically Display/Retrieve Box		Empty Text Box

Therapeutic Drug Monitoring Module Legend			
	To Acknowledge		Drug Info
	To Do New Order		To Verify
	Cancel the Order		To Add New Sample
	To send request		Ward Pharmacy

### **Note**

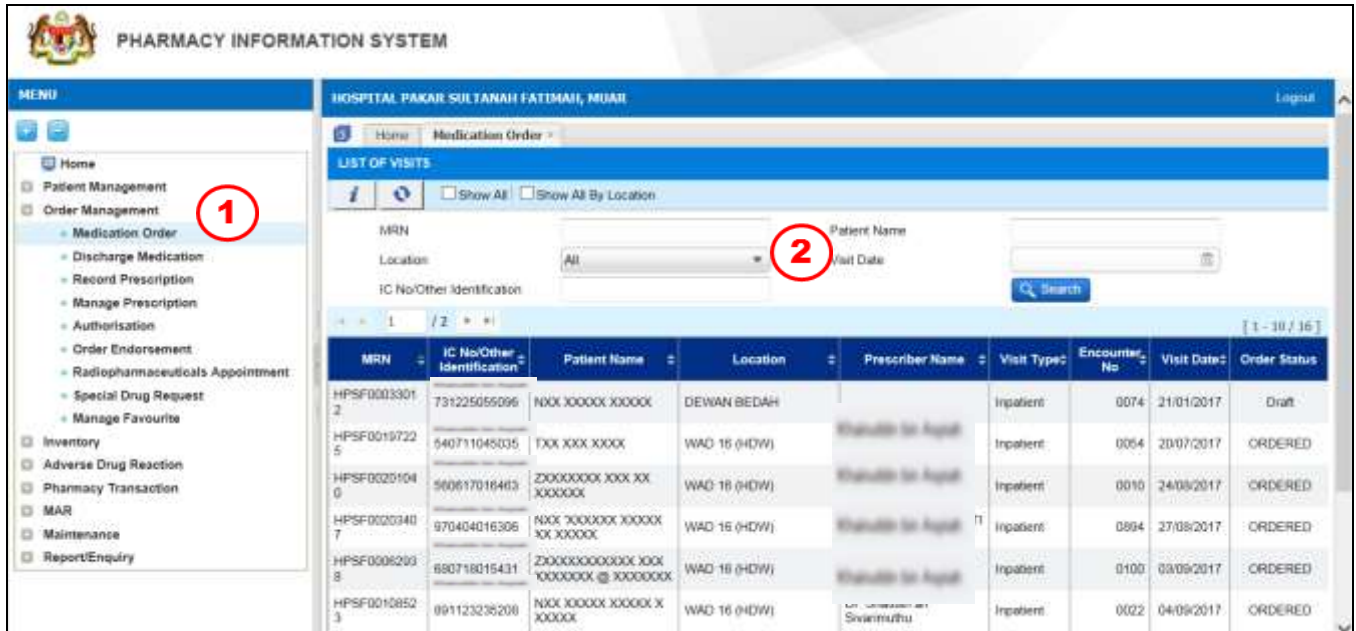
To learn more about Login Information, kindly click [Login Information](#) module for descriptive steps.

## 2.2 Latest Enhancement and Updates

Latest Functions	Page
<b>Tdm Order</b> <ul style="list-style-type: none"><li>New flow of ordering TDM Drug</li><li>Can do multiple TDM Drug in one time</li></ul>	5
<b>Sample Management</b> <ul style="list-style-type: none"><li>Change Facility field from drop down menu to Auto complete search drop down</li></ul>	22
<b>Sample Management</b> <ul style="list-style-type: none"><li>Add on reject reason from previous</li></ul>	23

### 3.0 Therapeutic Drug Monitoring (TDM) Order

TDM Order screen allows Prescriber to place TDM Services order. The order will be sent to Pharmacist for verification and reporting.



MRN	IC No/Other Identification	Patient Name	Location	Prescriber Name	Visit Type	Encounter No	Visit Date	Order Status
HPSF0033012	731225055096	NXX XXXXX XXXXX	DEWAN BEDAH		Inpatient	0074	21/01/2017	Draft
HPSF00197225	540711045035	TXX XXX XXXX	WAD 16 (HDW)	Dr. Sivanmuthu	Inpatient	0064	20/07/2017	ORDERED
HPSF00201040	560617016463	ZXXXXXXXX XXX XX XXXXXX	WAD 16 (HDW)	Dr. Sivanmuthu	Inpatient	0010	24/08/2017	ORDERED
HPSF00203407	970404016306	NXX XXXXXX XXXXX XX XXXXX	WAD 16 (HDW)	Dr. Sivanmuthu	Inpatient	0894	27/08/2017	ORDERED
HPSF00062938	680718015431	ZXXXXXXXXXXXX XXX XXXXXXX @ XXXXXXXX	WAD 16 (HDW)	Dr. Sivanmuthu	Inpatient	0100	03/09/2017	ORDERED
HPSF00108523	091123236208	NXX XXXXX XXXXX X XXXXX	WAD 16 (HDW)	Dr. Sivanmuthu	Inpatient	0022	04/09/2017	ORDERED

Figure 3.0-1 Medication Order Listing Page

#### STEP 1

Click on 'Order Management' module and click on 'Medication Order' sub-module

#### STEP 2

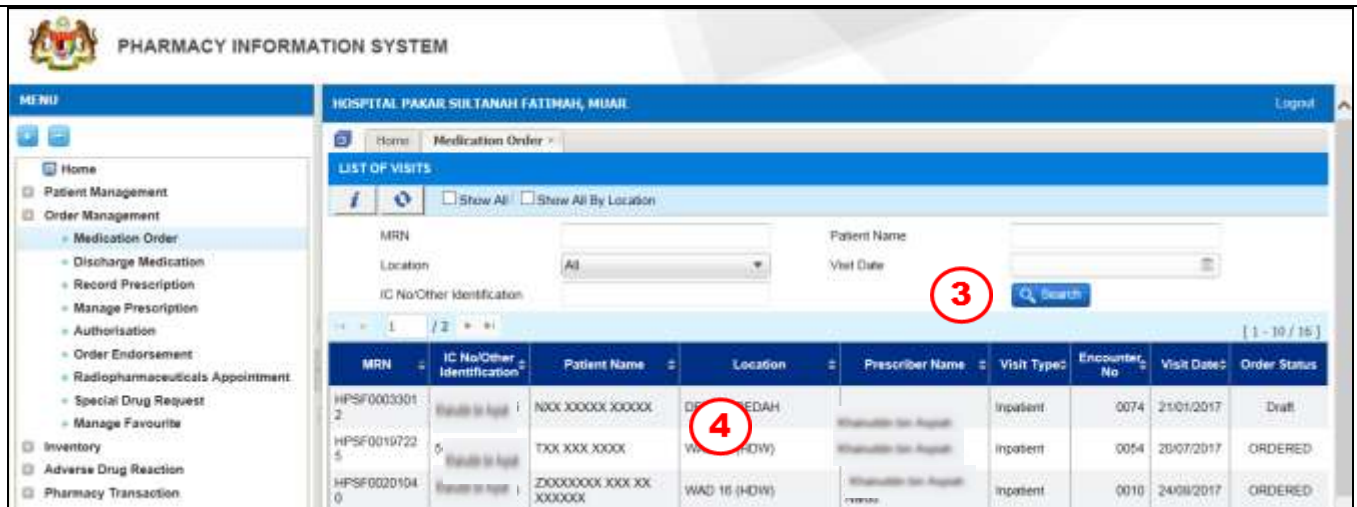
Search for patient records by:

- MRN
- Patient's Name
- Location
- Visit Date
- IC No/Other Identification

#### Note

- Location is defaulted to user's login ID but user is allowed to change to other assigned location.
- Select on ☐ Show All checkbox to display all patients' records based on user's assigned locations.
- Select on ☐ Show All By Location checkbox to display all patients' records based on user's login location.





**PHARMACY INFORMATION SYSTEM**

HOSPITAL PAKAR SULTANAH FATIMAH, MUJIB

Home Medication Order > Logout

LIST OF VISITS

Show All Show All By Location

MRN Patient Name

Location Visit Date

IC No/Other Identification

Search

MRN	IC No/Other Identification	Patient Name	Location	Prescriber Name	Visit Type	Encounter No	Visit Date	Order Status
HPSF0003301	XXXXXX XXXXX	XXXXXX XXXXX	WAD 16 (HAW)	XXXXXX XXXXX	Inpatient	0074	21/01/2017	Draft
HPSF0019722	XXXXXX XXXXX	XXXXXX XXXXX	WAD 16 (HAW)	XXXXXX XXXXX	Inpatient	0054	20/07/2017	ORDERED
HPSF0020104	XXXXXX XXXXX	XXXXXX XXXXX	WAD 16 (HAW)	XXXXXX XXXXX	Inpatient	0010	24/08/2017	ORDERED

**Figure 3.0-2 Medication Order Listing Page**

## STEP 3

Click on the  button to search for patient records

## STEP 4

Double-click on selected patient to display the Medication Order screen

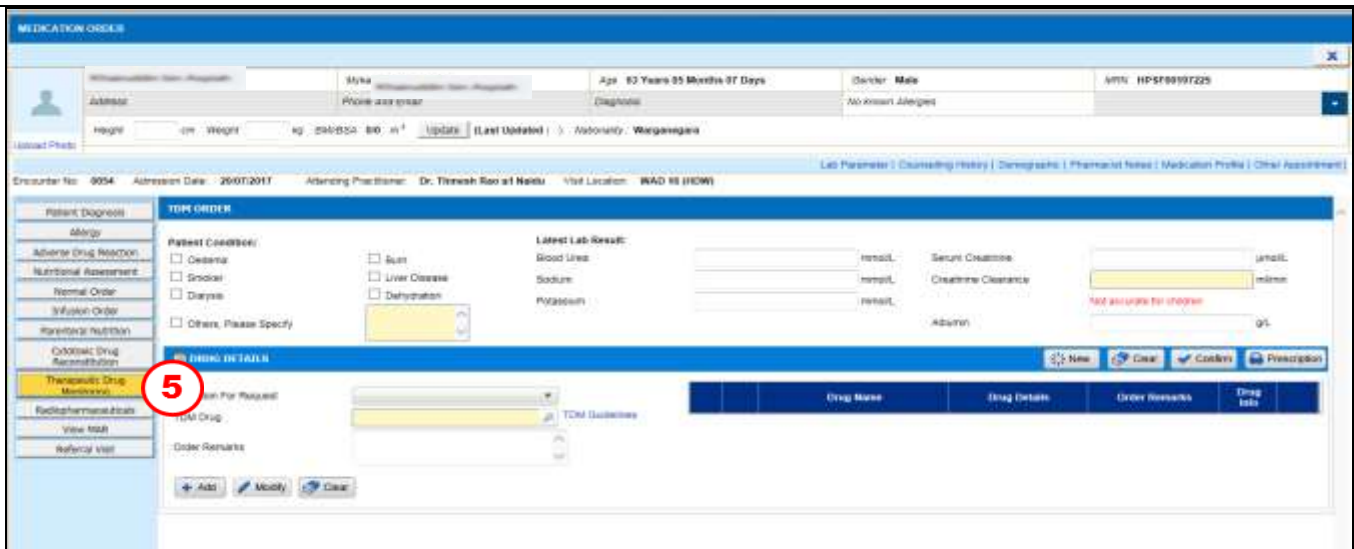


Figure 3.0-3 Medication Order

## STEP 5

Click on the **Therapeutic Drug Monitoring** button to create TDM order

### Note

- User have to enter patient's height and weight and click on the **Update** button and system will automatically calculate the BMI/BSA in  $m^2$ .
- Visit Record will display Breast Feeding and Pregnant checkboxes only if the patient is a female.
- User is allow to do multiple TDM Order

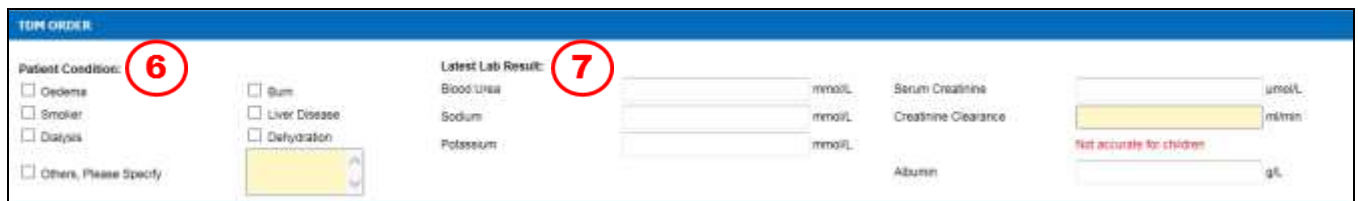


Figure 3.0-4 TDM Order

## STEP 6

Select **Patient Condition** checkbox(es):

- Oedema
- Burn
- Smoker
- Liver Disease
- Dialysis
- Dehydration
- Others

### Note

- User may select more than one condition.
- If 'Others' is selected, user needs to state the patient's condition in the text box provided.
- Fill in Order **Remarks** if applicable.

## STEP 7

Enter **Latest Lab Result** which consists of:

- Blood Urea
- Sodium
- Potassium
- Serum Creatinine
- Creatinine Clearance
- Albumin

#### Note

- Creatinine Clearance will be automatically calculated by system in ml/min when Serum Creatinine is filled.
- Lab result data will be updated in the **Lab Result** hyperlink



Figure 3.0-5 TDM Drug Details

#### STEP 8

Select **Indication For Request** from dropdown box:

- Non Compliance
- Poor Response
- Therapeutic Monitoring
- Suspected Toxicity

#### Note

- Selected *Indication For Request* will be the search key for TDM Drug field.

#### STEP 9

Click on the  button to search for TDM drug based on:

- Current Medication
- Previous Medication
- All Drugs

#### Note

- If the selected *Indication for Request* 'Non Compliance/ Poor Response/ Therapeutic Monitoring', TDM Drug search can be select from three (3) sources :
  - Current Medication
    - Medication which patient still take and active in the system as drug classified as TDM drug only
  - Previous Medication
    - Medication which patient taken before and completed in the system as drug classified as TDM drug only
  - All Drugs
    - All medication classified in TDM drug
- If the selected TDM Drug is the Current Medication or Previous Medication, system will automatically display the Drug Details as per Figure 3.0-6.
- Click on [TDM Guidelines](#) hyperlink to view TDM Guideline details on the selected TDM Drug as per Figure 3.0-7.
- TDM Guideline master setup is controlled by HQ.
- If the selected *Indication for Request* is 'Suspected Toxicity', TDM Drug search will default to 'All drugs' which comes from drugs that have been set in TDM Guideline master.
- The Drug Details field will be a free text field for user to enter the current dosage and frequency as per Figure 3.0-8.

**TDM Drug Search**

☐ Current Medication
 ☒ Previous Medication
 ☐ All Drugs

Drug Code: 
 Drug Name:

1 / 1 [ 1 - 5 / 5 ]

Drug Code	Drug Name	Order Txn Number	Start Date	End Date	Order Type
N02BE01000T1001XX	Paracetamol 500 mg Tablet	ANEC0000585746	14/07/2016 09:40 AM	21/07/2016 09:40 AM	NM
N02BE01000T1001XX	Paracetamol 500 mg Tablet	STFC0000796948	21/01/2017 10:49 AM	31/01/2017 10:49 AM	NM

Figure 3.0-6 TDM Drug Search

**TDM GUIDELINE**

TDM Drug: 
 Total Cost of Analysis(RM):

Time to reach steady state: 
 Remarks:

Calculator:

**TDM GUIDELINE DETAIL**

Sampling Type	After/Before	Default time	Lab Order	Therapeutic Range	UOM	Updated On
RANDOM	AFTER	15 MINUTES	Paracetamol Random	At least 4 hours post ingestion	mg/ml	03/11/2013

Figure 3.0-7 TDM Guidelines

**DRUG DETAILS**

Indication For Request: 
 TDM Drug: 
 TDM Guidelines:

Order Remarks:

Drug Name	Drug Details	Order Remarks	Drug Info
Acetylsalicylic Acid 300 mg Soluble Tablet	150 mg, Qid (every morning), Oral Disp/Sp/Tab, Oral, 10/09/2015 (90 Days), Start Date: 10/09/2015 End Date: 08/11/2015		

Figure 3.0-8 TDM Drug Detail

**MEDICATION ORDER**

TEY:  Mykad: 61  Age: 45 Years 05 Months 08 Days Gender: Male MRN: HPSF00026416

Address:  Phone And Email:  Diagnosis:

Height: 154 cm Weight: 64 kg BMI/BMI: 27 / 1.7 m<sup>2</sup>  (Last Updated: 23/10/2014)

Figure 3.0-9 Lab Result Hyperlink



Figure 3.0-10 Drug Details

#### STEP 10

Fill the **Order Remark** if neccesarily.


#### STEP 11

Fill the **Drug Detail**.



#### Note

- Please specify current **Dosage, Frequency, Start Date & End Date** if choose '**All Drug**' for TDM Drug Request.

#### STEP 12

Click on the  button to added drug and will be display as Figure 3.0.10

#### Note

- Click on the  button to change any information.
- Click on the  button to clear the drug detail part before added any new information.

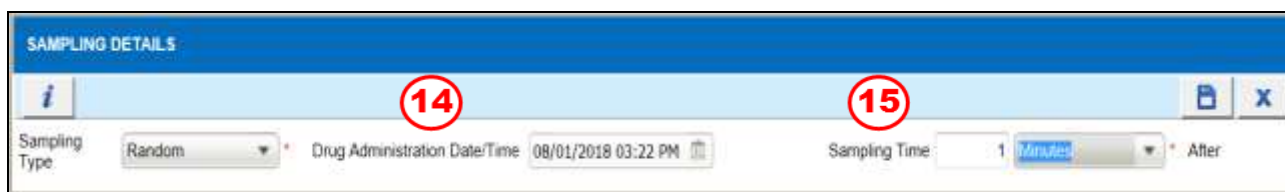


Figure 3.0-11 Sampling Details

#### STEP 13

Right click on the  to fill in sampling details, sampling details screen will be displayed as Figure 3.0.11.

#### Note

- There are several sampling type that can be choose
  - Post 1
  - Post 2
  - Post
  - Pre
  - Random
- Screen for Sampling Details will be displayed differently based on selected 'Indication For Request' below:
- Sampling Type will be displayed differently based on choosen medication together from TDM guideline Example:
  - Paracetamol for random and pre sampling .
  - Vancomycin for Pre ,post and random sampling

- If 'Suspected Toxicity', Sampling Type is defaulted to 'Random' and the 'Suggested Sampling Date/Time' field will be displayed as per Figure 3.0-12.

#### STEP 14

Click on the  button to select **Drug Administration Date/Time**

##### Note

**Drug Administration Date/Time** to be default as empty and change the time format to 12 Hour format

#### STEP 15

Select **Sampling Time** from dropdown box and enter **Interval** and select Hours/Minutes

##### Note

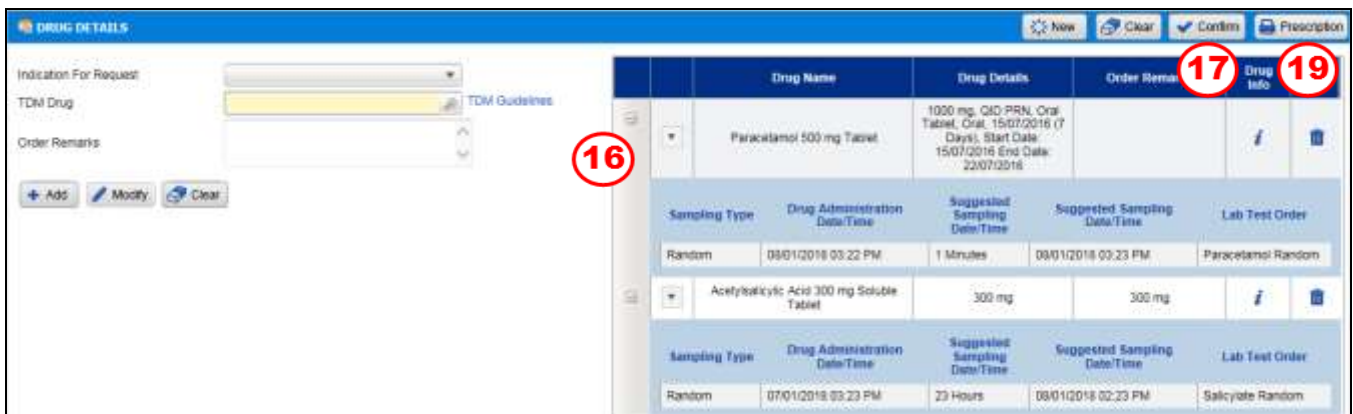
The Interval field is only enable if user choose the Indication for Request as Non Compliance/Poor Response/Therapeutic Monitoring.



Figure 3.0-12 Sampling Details

#### STEP 16


Click on the  to view the sampling details added as Figure 3.0.13



Drug Name	Drug Details	Order Remarks	Drug Info
Paracetamol 500 mg Tablet	1000 mg QID-PRN, Oral Tablet, Oral, 15/07/2016 (7 Days), Start Date: 15/07/2016 End Date: 22/07/2016		
Acetylsalicylic Acid 300 mg Soluble Tablet	300 mg	300 mg	

Figure 3.0-13 Drug Details

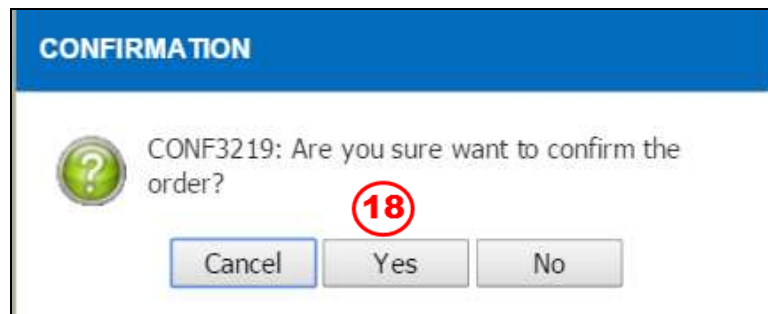
#### STEP 17

Click on the  to confirm TDM order and TDM Order No. will be generated.

#### STEP 18

Click on the  button to save record








**Figure 3.0-14 Confirmation alert message**

**STEP 19**

Click on the  button to print TDM Request Form as per Figure 3.0-15

**Note**

- Click on the  button to clear all entered data.
- Click on the  button to create a new TDM Order and the system will reset all fields in TDM Order screen.



**CLINICAL PHARMACOKINETICS SERVICES**  
**Therapeutic Drug Monitoring (TDM) Request Form**

Ordered By : [Redacted] TDM Order No : TDM0000003311

Ordered Date/Time 09/01/2018 11:45

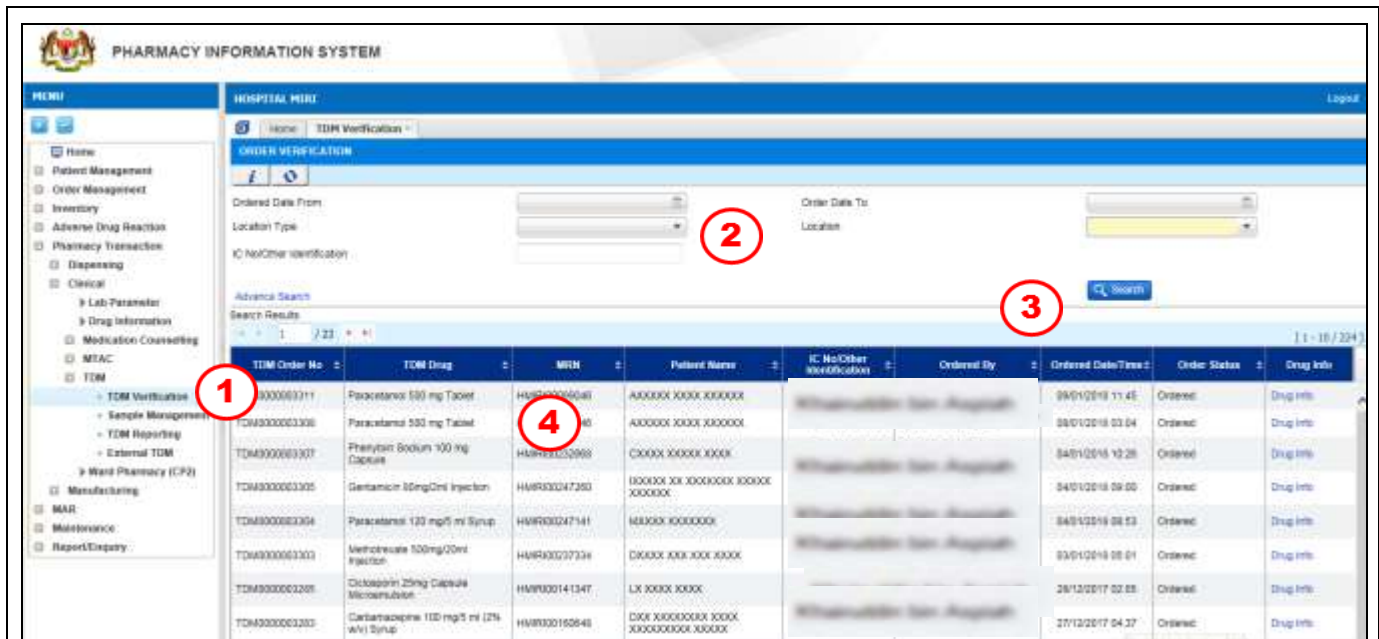
PATIENT DETAILS					
Name: <span style="border: 1px solid black; padding: 2px;">[Redacted]</span> (		MRN NO: <span style="border: 1px solid black; padding: 2px;">[Redacted]</span>		IC: <span style="border: 1px solid black; padding: 2px;">[Redacted]</span>	
Age: 24 Years 06 Months		Sex: Male		Race: <span style="border: 1px solid black; padding: 2px;">[Redacted]</span>	
Weight: 77 kg		Height: 177 cm		Ward/Unit: WARD PSYCHIATRIC AND MENTAL HEALTH	
LATEST LAB RESULT :					
Blood Urea	Sodium	Potassium	Serum Creatinine	Creatinine Clearance	Albumin
PATIENT CONDITION					
Oedema: YES		Smoker: NO		Dehydration: NO	
Dialysis: NO		Burn: NO		Liver Disease: NO	
Others: NO		Details:			
TDM DRUG DETAILS					
No	TDM No	Drug Name	Drug Details	Indication Request	Remarks
1	TDM0000003311	Paracetamol 500 mg Tablet	500 mg Tablet	Suspected Toxicity	
	Sample Type	Lab Test Order	Drug Administration Date/Time	Suggested Sampling Date/Time	Interval
	RANDOM	Paracetamol Random	2018-01-09 11:41:00	2018-01-09 12:41:00	1 Hours

Figure 3.0-15 TDM Request Form



## 4.0 Therapeutic Drug Monitoring (TDM) Verification

TDM Verification module is for user to acknowledge and verify TDM order



TDM Order No	TDM Drug	MRN	Patient Name	IC No./Other Identification	Ordered By	Ordered Date/Time	Order Status	Drug Info
TDM000000011	Propranolol 160 mg Tablet	HA000000000	A00000 X000 X00000	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXX	09/01/2018 11:45	Ordered	Drug Info
TDM0000000306	Paracetamol 500 mg Tablet	HA000000000	A00000 X000 X00000	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXX	09/01/2018 03:04	Ordered	Drug Info
TDM0000000307	Phenylin Sodium 100 mg Capsule	HA000000000	C00000 X0000 X0000	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXX	04/01/2018 10:28	Ordered	Drug Info
TDM0000000305	Gentamicin 10mg/ml Injection	HA000000000	B00000 X00 X0000000 X00000 X00000	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXX	04/01/2018 09:00	Ordered	Drug Info
TDM0000000304	Paracetamol 120 mg/5 ml Syrup	HA000000000	B00000 X0000000	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXX	04/01/2018 08:53	Ordered	Drug Info
TDM0000000303	Veritroline 100mg/20ml Injection	HA000000000	D00000 X00 X000 X0000	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXX	03/01/2018 08:01	Ordered	Drug Info
TDM0000000208	Clozapine 25mg Capsule Microspheres	HA000000000	LX X0000 X0000	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXX	28/12/2017 02:05	Ordered	Drug Info
TDM0000000203	Carbamazepine 100 mg/5 ml (2% w/v) Syrup	HA000000000	D00 X0000000 X0000 X00000000 X00000	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXX	27/12/2017 04:37	Ordered	Drug Info

Figure 4.0-1 TDM Verification Listing Page

### STEP 1

Click on 'TDM' module and click on 'TDM Verification' function

### STEP 2

Search for TDM orders by:

- Ordered Date From
- Order Date To
- Location Type
- Location
- IC No./Others Identification

### STEP 3

Click on the  button to search for TDM orders

### STEP 4

Double click on selected record to display TDM Verification screen

### Note

- Click on [Go To Advance Search](#) hyperlink for advance search using below criteria:
  - TDM Order No
  - Status
  - TDM Drug
  - Ordered By
  - Acknowledged By
  - MRN
- Click on [Back To Basic Search](#) hyperlink for basic search as per Step 2.



Figure 4.0-2 Patient's Banner

**Note**

TDM Verification consists of:

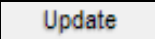
- a) Patient's Banner
  - Patient's Banner display patient's profile. User can update patient's height and weight.
  - Click on the  button and system will automatically calculate the BMI/BSA in m<sup>2</sup>.



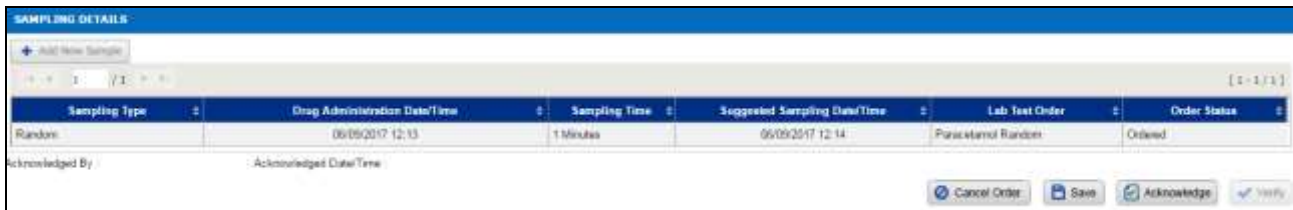
Figure 4.0-3 Screening Details

- b) Screening Details
  - Screening Details consists of:
    - TDM Order No.
    - Drug Name
    - Ordered By
    - Indication For Request
    - Order Remarks
    - Patient Conditions
    - Ordered Date/Time
    - Latest Lab Result



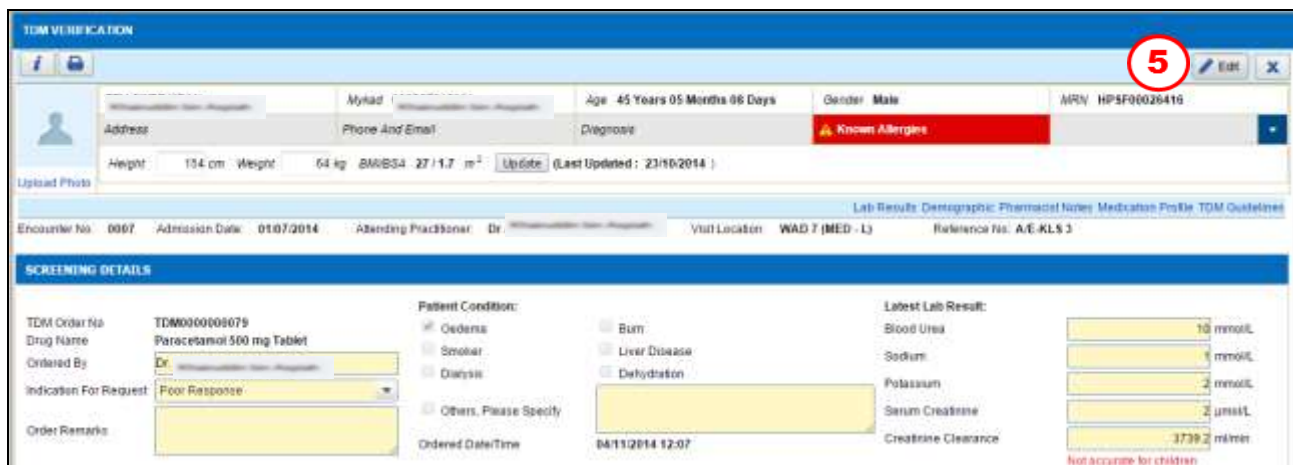
Figure 4.0-4 Drug Details

- c) Drug Details
  - Drug Details consists of:
    - Rx. No. (Order No.)
    - Dosage
    - Frequency
    - Duration
    - Route
    - Start Date
    - End Date



**Figure 4.0-5 Sampling Details**

- d) Sampling Details
- Sampling Details consists of:
    - Sampling Type
    - Drug Administration Date/Time
    - Interval
    - Suggested Sampling Date/Time
    - Lab Test Order



**Figure 4.0-6 TDM Verification**


## STEP 5




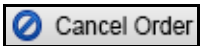
Click on the  button to edit record

### Note

- User able to edit details in Screening Details section as below:
  - Order Remarks
  - Patient Condition
  - Latest Lab Result
- These are additional functions in TDM Verification (If applicable):
  - Edit Sampling Details
  - Add new sample
  - Reject sample
  - Cancel Order

Edit Sampling Details as per Figure 4.0-7:

- Double click on sample record to display sampling details.
- Click on the  button to edit record as per Figure 4.0-8.
- Edit sampling details as below:
  - Sampling Type
  - Drug Administration Date/Time

- Interval
- Click on the  button to save sampling details
- Add New Sample
- Click on the  button to add new sample
- Edit sampling details as below:
  - Sampling Type
  - Drug Administration Date/Time
  - Interval
- Click on the  button to save new sample record.
- Click on the  button to cancel order.
- Order Status will be changed to “Cancelled” and users not necessary to place new order.



Sampling Type	Drug Administration Date/Time	Interval	Suggested Sampling Date/Time	Lab Test Order	Order Status
RANDOM	04/11/2014 12:14	1 Hour	04/11/2014 13:14	Paracetamol Random	Ordered

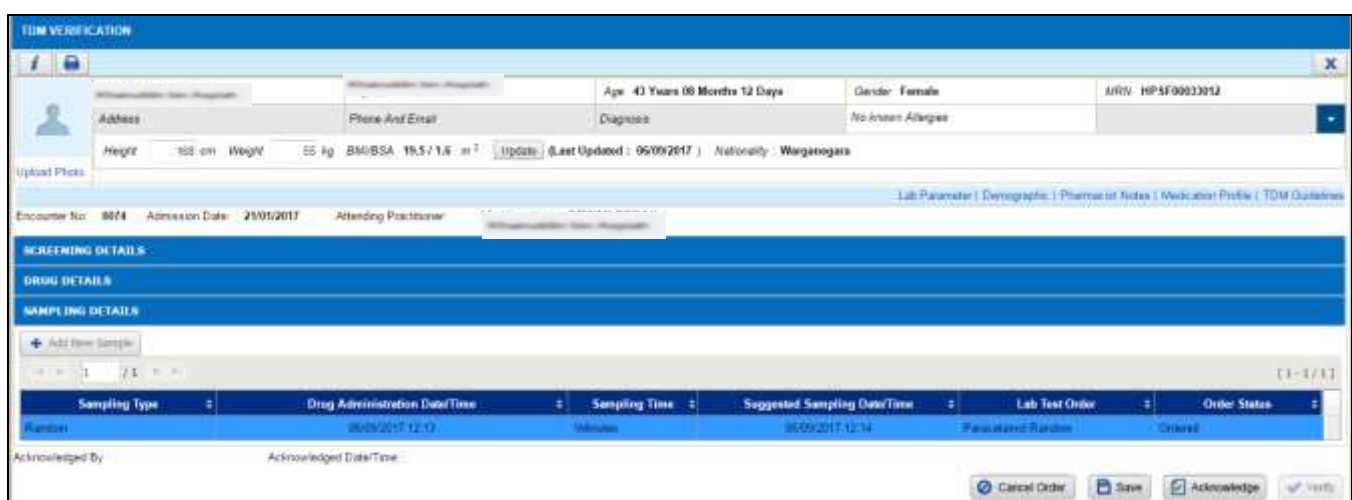
**Figure 4.0-7 Sampling Details**



**SAMPLING DETAILS**

Sampling Type: Random Drug Administration Date/Time: 06/09/2017 12:13 Sampling Time: 1 Minutes

**Figure 4.0-8 Edit Sampling Details**



**TDM VERIFICATION**

Age: 43 Years 08 Months 12 Days Gender: Female A/R/N: HP5F00033012

Address: Phone And Email: Diagnosis: No known Allergies

Height: 168 cm Weight: 55 kg BMI/BSA: 19.5 / 1.6 m<sup>2</sup> Update (Last Updated: 06/09/2017) Nationality: Warganegara

Encounter No: 0074 Admission Date: 21/01/2017 Attending Practitioner: [Name]





**SCREENING DETAILS**

**DRUG DETAILS**

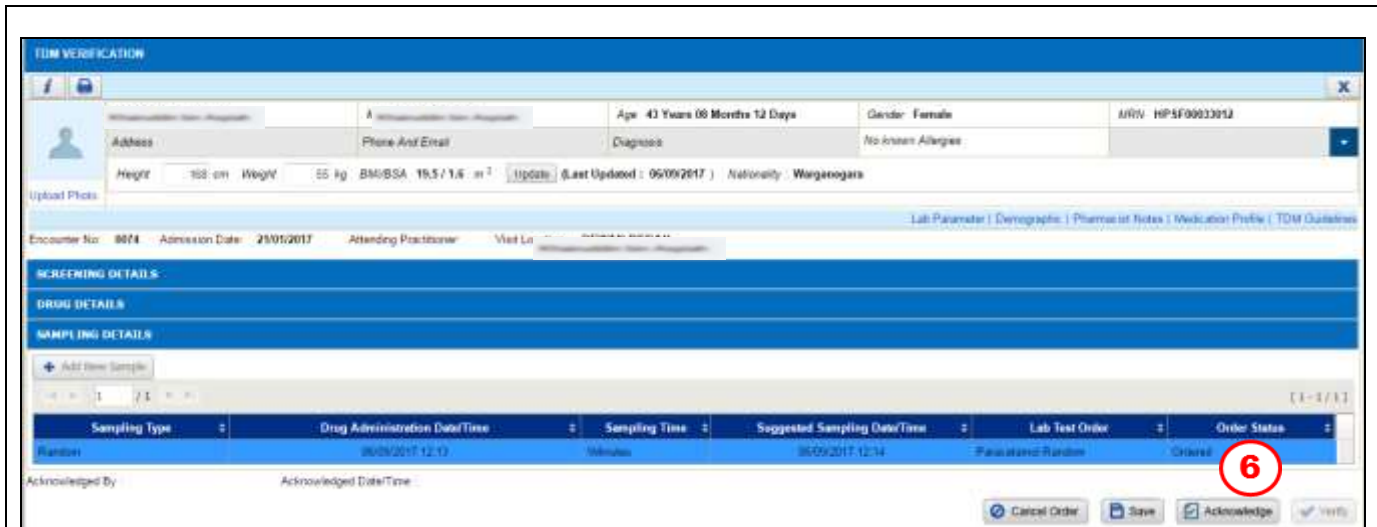
**SAMPLING DETAILS**

Sampling Type	Drug Administration Date/Time	Sampling Time	Suggested Sampling Date/Time	Lab Test Order	Order Status
Random	06/09/2017 12:13	Minutes	06/09/2017 12:14	Paracetamol Random	Ordered

Acknowledged By: Acknowledged Date/Time:

**Figure 4.0-9 Reject and Cancel Order Function**



**TDM VERIFICATION**

Address: [Redacted] Phone/Email: [Redacted] Age: 43 Years 08 Months 12 Days Gender: Female A/VV: HPSF00013012

Height: 158 cm Weight: 55 kg BMI/BSA: 19.5 / 1.6 m<sup>2</sup> Update (Last Updated: 05/09/2017) Nationality: Warganegara

Encounter No: 0074 Admission Date: 25/01/2017 Attending Practitioner: [Redacted] Visit La: [Redacted]

**SCREENING DETAILS**

**DRUG DETAILS**

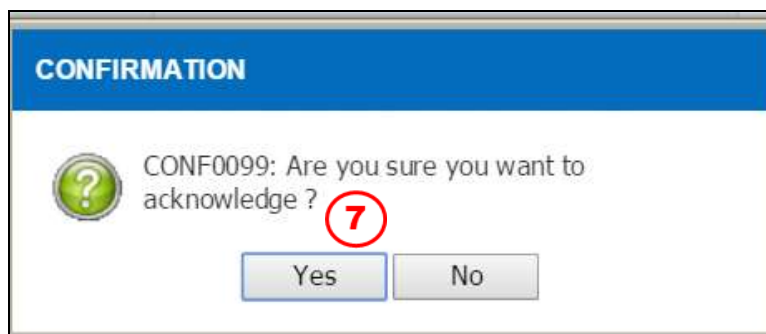
**SAMPLING DETAILS**

Sampling Type	Drug Administration Date/Time	Sampling Time	Suggested Sampling Date/Time	Lab Test Order	Order Status
Random	06/09/2017 12:13	Minutes	06/09/2017 12:14	Plasma Level Random	Ordered

Acknowledged By: Acknowledged Date/Time:

Buttons: Cancel Order, Save, Acknowledge, Verify

**Figure 4.0-10 Save and Acknowledge Function**



**CONFIRMATION**

CONF0099: Are you sure you want to acknowledge?

Buttons: Yes, No

**Figure 4.0-11 Confirmation alert message**

## STEP 6

Click on the  button to acknowledge order

## STEP 7

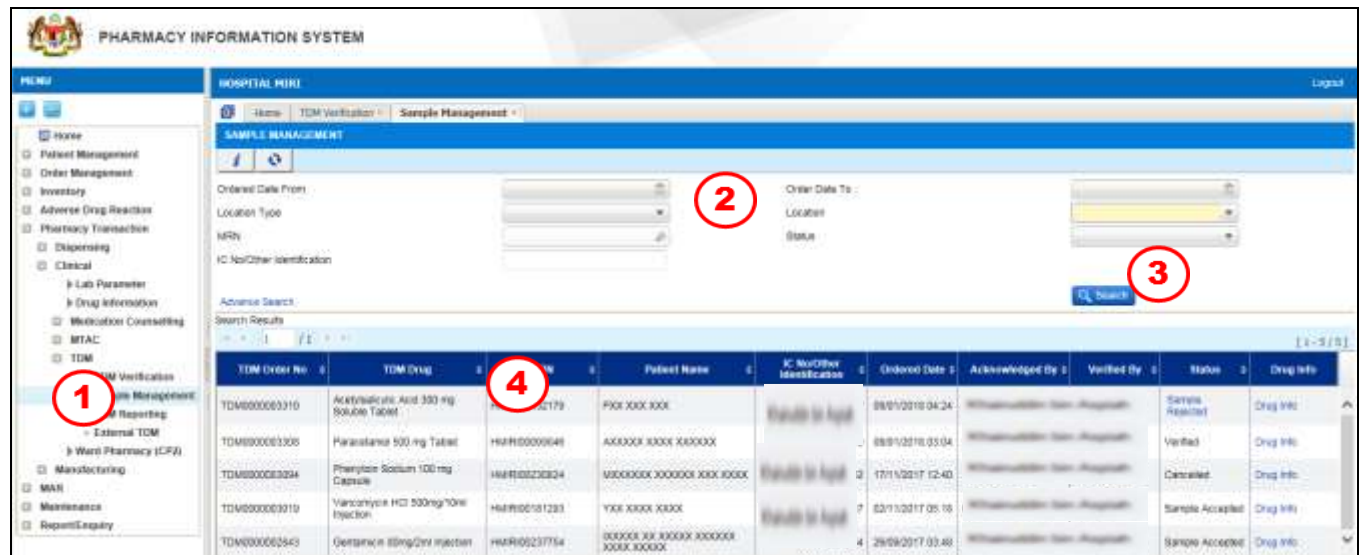
Click on the  button to save record

## Note

- Order Status changed from "Ordered" to "Acknowledge".
- User still can update sampling details.
- Acknowledged By and Acknowledged Date/Time will be displays.

## 5.0 Sample Management

This sub-module is to record the movement of the sample.



**PHARMACY INFORMATION SYSTEM**

**SAMPLE MANAGEMENT**

Ordered Date From: [ ] Order Date To: [ ]  
 Location Type: [ ] Location: [ ]  
 MRN: [ ] Status: [ ]  
 IC No/Other Identification: [ ]

Advanced Search: [Go To Advance Search]  
 Search Results: [ ]

TDM Order No.	TDM Drug	MRN	Patient Name	IC No/Other Identification	Ordered Date	Acknowledged By	Verified By	Status	Drug Info
TDM000003310	Acetylsalicylic Acid 300 mg Soluble Tablet	MRN0000033179	PKR XXX XXX	XXXXXX XXXX XXXXXX	88/9/2018 04:24	Whispered Sam Anggah	Whispered Sam Anggah	Sample Received	Drug Info
TDM000003305	Paracetamol 500 mg Tablet	MRN0000033048	AXXXXX XXXX XXXXXX	XXXXXX XXXX XXXXXX	88/9/2018 03:04	Whispered Sam Anggah	Whispered Sam Anggah	Verified	Drug Info
TDM000003304	Phenytoin Sodium 100 mg Capsule	MRN0000033024	XXXXXX XXXX XXXXXX	XXXXXX XXXX XXXXXX	17/11/2017 12:40	Whispered Sam Anggah	Whispered Sam Anggah	Canceled	Drug Info
TDM000003319	Vancocin HCl 500mg/10ml Injection	MRN0000033233	YXX XXXX XXXX	XXXXXX XXX XXXXX XXXXXX	82/11/2017 05:15	Whispered Sam Anggah	Whispered Sam Anggah	Sample Accepted	Drug Info
TDM000003343	Gentamicin 80mg/2ml injection	MRN0000033754	XXXXXX XXX XXXXX XXXXXX	XXXXXX XXXX XXXXXX	29/09/2017 03:48	Whispered Sam Anggah	Whispered Sam Anggah	Sample Accepted	Drug Info

Figure 5.0-1 Sample Management Listing Page

### STEP 1

Click on 'TDM' module and click on 'Sample Management' function

### STEP 2

Search for TDM order using basic search:

- Ordered Date From
- Order Date To
- Location Type
- Location
- MRN
- Status
- IC No./ Other Identification

### Note

Click on the [Go To Advance Search](#) hyperlink for advance search.

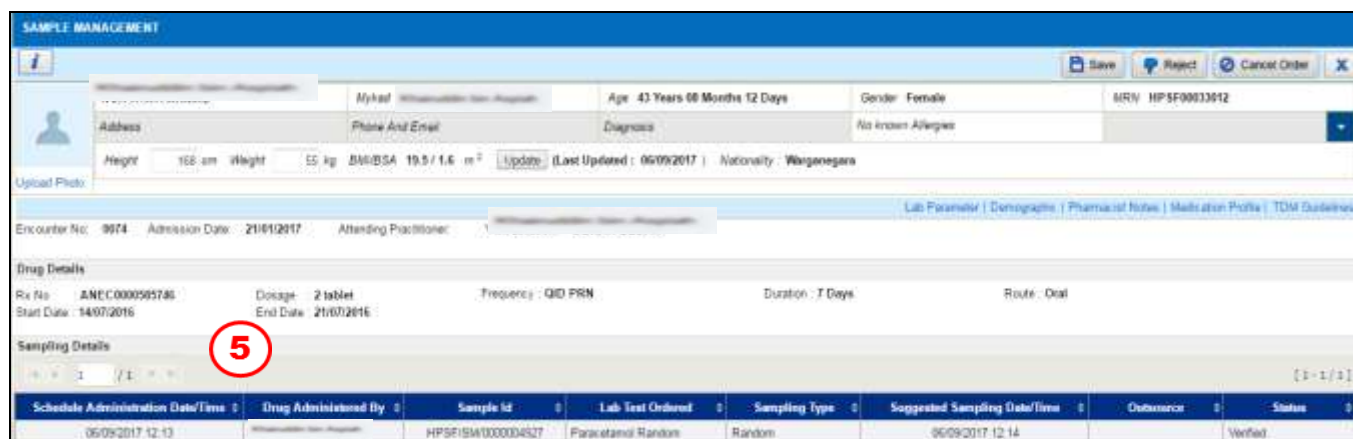
### STEP 3

Click on the  button to search for records

### STEP 4

Double-click on the record to display Sample Management screen





**SAMPLE MANAGEMENT**

Save Reject Cancel Order X

Mykad: [Redacted] Age: 43 Years 08 Months 12 Days Gender: Female MRN: HPSF00013012

Address: [Redacted] Phone And Email: [Redacted] Diagnosis: [Redacted] No known Allergies

Height: 168 cm Weight: 55 kg BMI/BSA: 19.5 / 1.6 m<sup>2</sup> Update (Last Updated: 06/09/2017) Nationality: Warganegara

Encounter No: 9974 Admission Date: 21/01/2017 Attending Practitioner: [Redacted]

Lab Parameter | Demographic | Pharmacist Notes | Medication Profile | TDM Guidelines

**Drug Details**

Rx No: ANEC0000595786 Dosage: 2 tablet Frequency: QID PRN Duration: 7 Days Route: Oral

Start Date: 14/07/2016 End Date: 21/07/2016

**Sampling Details**

Schedule Administration Date/Time	Drug Administered By	Sample Id	Lab Test Ordered	Sampling Type	Suggested Sampling Date/Time	Outsource	Status
06/09/2017 12:13	[Redacted]	HPSF15M100004527	Paracetamol Random	Random	06/09/2017 12:14		Verified

Figure 5.0-2 Sample Management

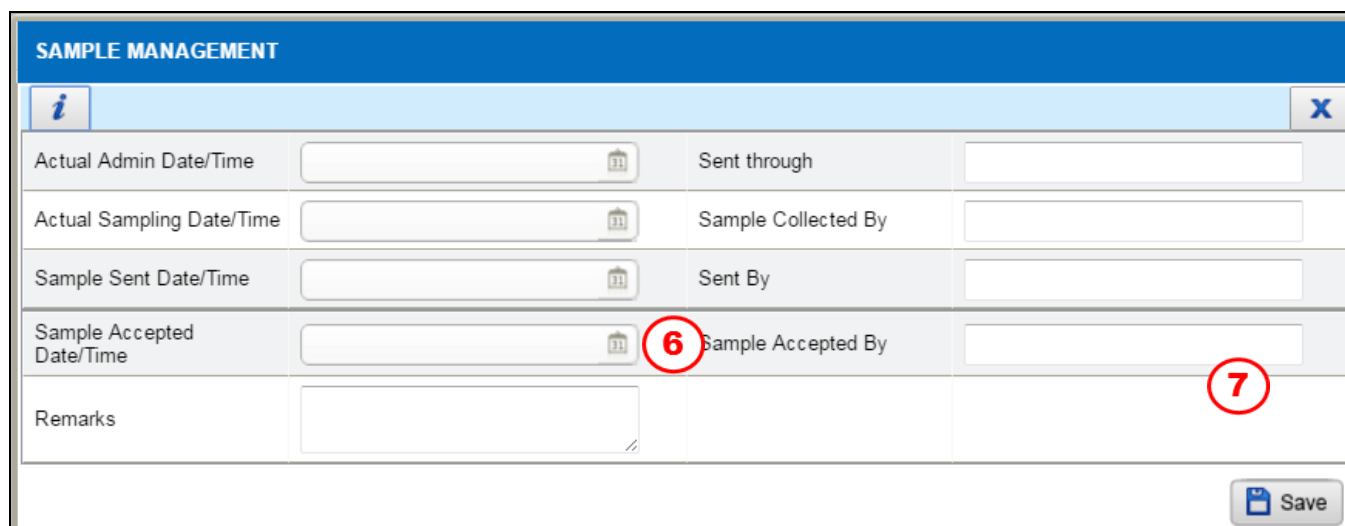
### STEP 5

Double-click on the record to proceed to next step

#### Note

These fields are inserted by the Nurse for the sampling process:

- Actual Admin Date/Time
- Actual Sampling Date/Time
- Sample Sent Date/Time
- Sent Through
- Sample Collected By
- Sent By



**SAMPLE MANAGEMENT**

Actual Admin Date/Time [Calendar Icon] Sent through [Text Field]

Actual Sampling Date/Time [Calendar Icon] Sample Collected By [Text Field]

Sample Sent Date/Time [Calendar Icon] Sent By [Text Field]

Sample Accepted Date/Time [Calendar Icon] Sample Accepted By [Text Field]

Remarks [Text Field]

Save

Figure 5.0-3 Sampling Process

### STEP 6

Enter details in these fields:

- Sample Accepted Date/Time
- Sample Accepted By
- Remarks

#### Note

These field are entered by Pharmacist/Assistant Pharmacist when receiving the sample.

## STEP 7

Click on the  button to save record

### Note

The system will change order status from “Verified” to “Sample Accepted”.

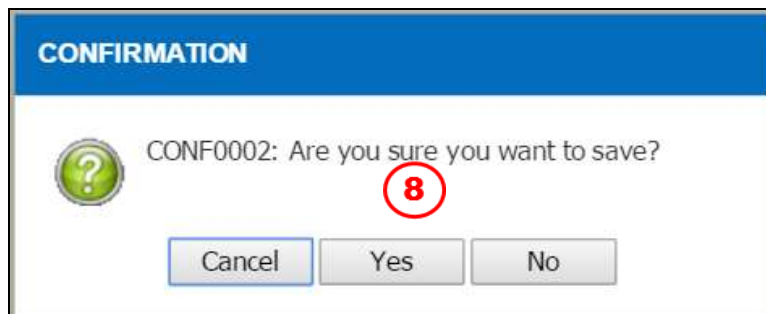
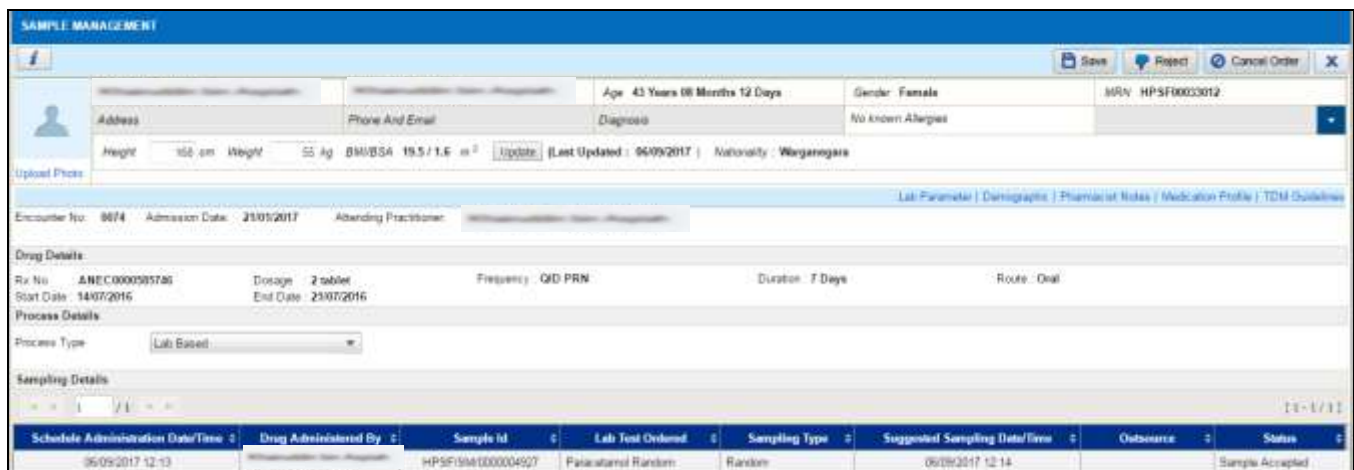


Figure 5.0-4 Confirmation alert message




The screenshot shows the "SAMPLE MANAGEMENT" form. At the top, there are buttons for "Save", "Reject", and "Cancel Order". The form contains fields for patient information (Age, Gender, Address, Phone And Email, Diagnosis, No known Allergies), vital signs (Height, Weight, BMI, BP, HR, RR, SpO2), and medication details (Drug Name, Dosage, Frequency, Duration, Route). The "Process Type" is set to "Lab Based". The "Sampling Details" section shows a table with columns for Schedule Administration Date/Time, Drug Administered By, Sample Id, Lab Test Ordered, Sampling Type, Suggested Sampling Date/Time, Outsource, and Status. The table has one row with data: 05/05/2017 12:13, [Name], HP5F/SM1000004927, Palatalated Random, Random, 05/05/2017 12:14, [Name], and Sample Accepted.

Figure 5.0-5 Outsource

## STEP 8

### Note

- If Process Type is “Outsource”, the system will display **Send To** dropdown box and  button.
- **Send To** dropdown box will list down all facilities that will receive the Outsource request.
- Select **Process Type** from dropdown box:
  - Pharmacy Based
  - Lab Based
  - Outsource



The screenshot shows the "Process Details" section of the form. The "Process Type" dropdown is set to "Out Source". To the right of the dropdown is a "Send To" dropdown box and a "Send" button with a green arrow icon.

Figure 5.0-6 Process Type



- For Outsource the Change Facility field from drop down menu to Auto complete search drop down menu as Figure 5.0.7



Facility Name	State
Hospital Alor Gajah	Melaka
Hospital Ampang	Selangor
Hospital Bahagia Ulu Kinta	Perak
Hospital Balik Pulau	Pulau Pinang
Hospital Baling	Kedah
Hospital Banting	Selangor
Hospital Batu Gajah	Perak
Hospital Bau	Sarawak
Hospital Beaufort	Sabah
Hospital Beluran	Sabah

Figure 5.0-7 Search Other Facility

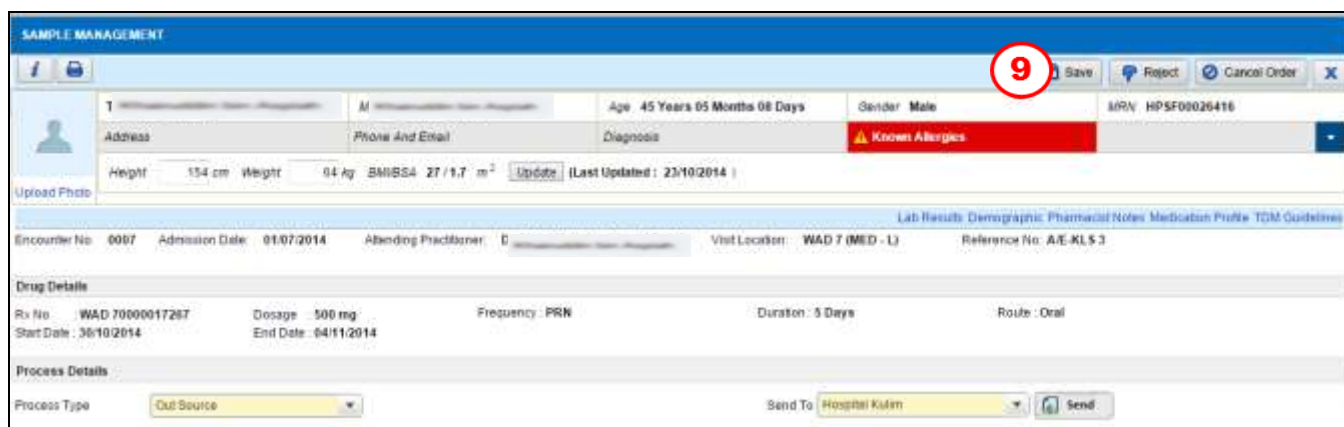


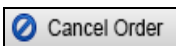



Figure 5.0-8 Outsource

## STEP 9

Click on the  button to save record (Repeat Step 8)

## Note

- If Process Type is "Outsource", in the Outsource column under Sampling Details will be set as "Yes". Otherwise Outsource will be set as "No".
- If "Outsource", user needs to select which facility to send the order to under Send To dropdown box and click on the  button.
- Click on the  button to cancel the order. User may not need to place new order.

- Click on the  button to reject the sampling details. User needs to place a new order.
- User can see hyperlink to view reject reason if the status is 'Reject'. Click on the Sample Rejected Hyperlink to view the reason such as below:

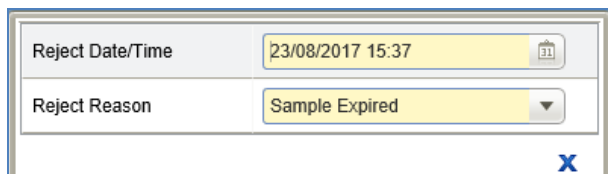


Figure 5.0-9 shows a form with two fields: 'Reject Date/Time' with a value of '23/08/2017 15:37' and a calendar icon, and 'Reject Reason' with a dropdown menu showing 'Sample Expired'. A blue 'X' button is at the bottom right.

**Figure 5.0-9 Reject Reason**

- To add new data reject Reason as below:

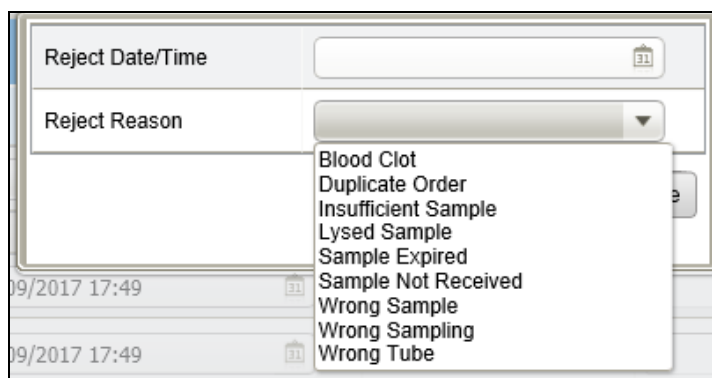
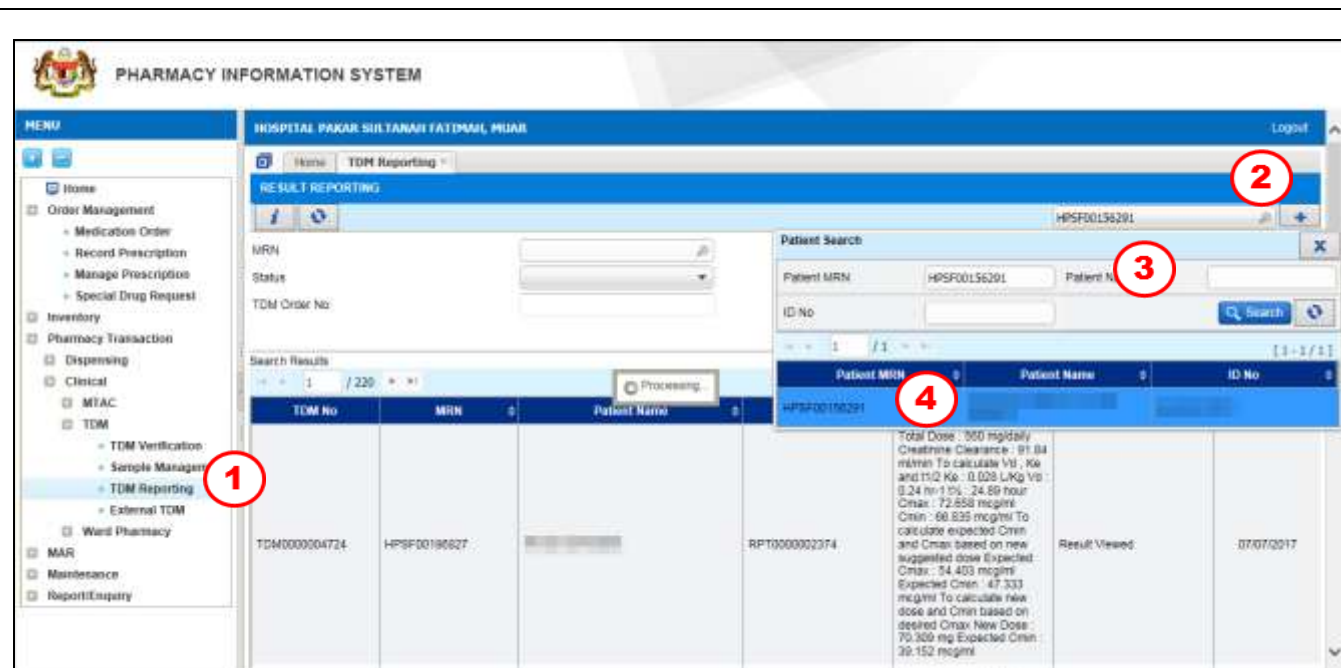


Figure 5.0-10 shows a form with two fields: 'Reject Date/Time' and 'Reject Reason'. The 'Reject Reason' dropdown menu is open, showing a list of reasons: Blood Clot, Duplicate Order, Insufficient Sample, Lysed Sample, Sample Expired, Sample Not Received, Wrong Sample, Wrong Sampling, and Wrong Tube. The background shows a list of rejected samples with dates and times.

**Figure 5.0-10 Add Reject Reason**

## 6.0 TDM Reporting

TDM Reporting module is for user to record the TDM results and Pharmacist Recommendation.



**PHARMACY INFORMATION SYSTEM**

HOSPITAL PAKAR SITI TANAH FATIMAH, MUAR

Home TDM Reporting

RESULT REPORTING

MRN:  Status:  TDM Order No:

Search Results: 1 / 220

TDM No	MRN	Patient Name	Patient MRN	Patient Name	ID No
TDM000004724	HPSFD0190627		HPSFD0156291		

Total Dose : 360 mg/daily  
Creatinine Clearance : 81.84 ml/min To calculate Vd : 106 and 11/2 K<sub>e</sub> : 0.028 L/Kg Vd : 0.24 hr<sup>-1</sup> t<sub>1/2</sub> : 24.89 hour  
C<sub>max</sub> : 72.858 mg/ml  
C<sub>min</sub> : 68.825 mg/ml To calculate expected C<sub>min</sub> and C<sub>max</sub> based on new suggested dose Expected C<sub>max</sub> : 54.403 mg/ml Expected C<sub>min</sub> : 47.333 mg/ml To calculate new dose and C<sub>min</sub> based on desired C<sub>max</sub> New Dose : 70.300 mg Expected C<sub>min</sub> : 39.152 mg/ml


Result Viewed: 07/07/2017

Figure 6.0-1 TDM Reporting Listing Page

### STEP 1

Click on 'TDM' module and click on 'TDM Reporting' function

### STEP 2

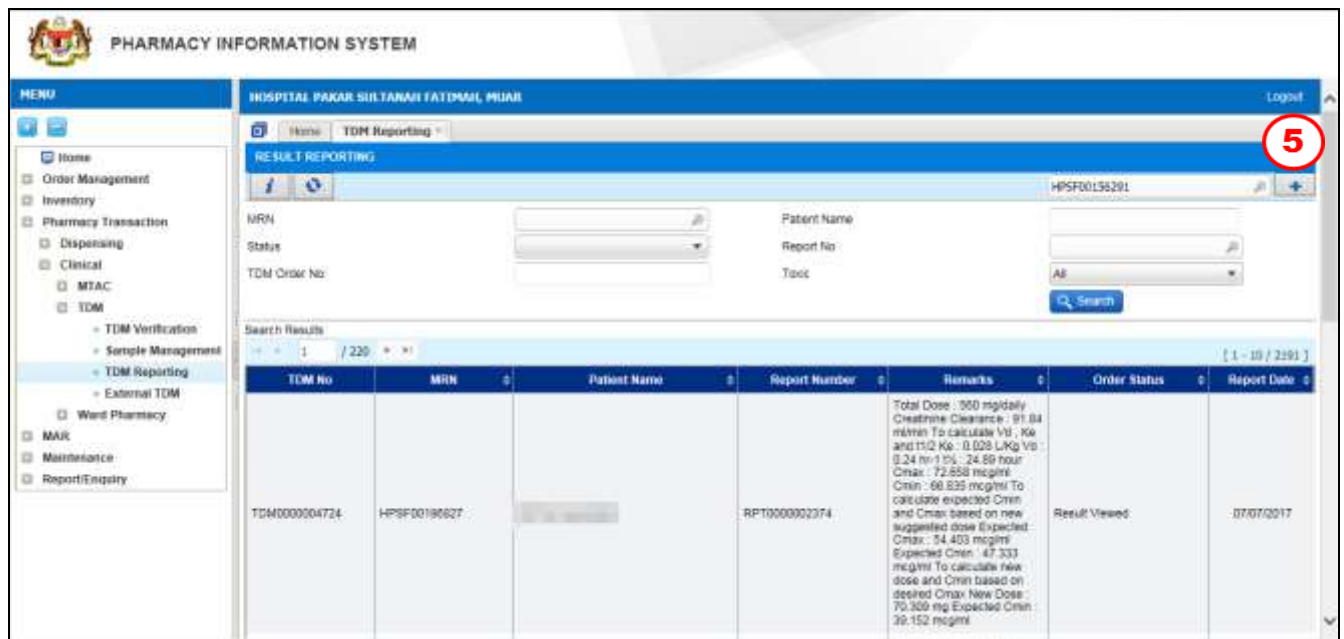
Click on the  button to search patient MRN

### STEP 3

Enter Patient MRN or Patient Name or ID no and click on the  button

### STEP 4

Double click on patient name



**PHARMACY INFORMATION SYSTEM**

HOSPITAL PAKAR SULTANAH FATIMAH, MUAR

Home TDM Reporting

RESULT REPORTING

MRN: HPSF00156291

Status: Patient Name: Report No: TDM Order No: Toxic: All

Search Results: 1 / 220

TDM No	MRN	Patient Name	Report Number	Remarks	Order Status	Report Date
TDM000004724	HPSF00180627		RPT0000002374	Total Dose : 900 mg/day Creatinine Clearance : 91.84 ml/min To calculate Vd : K <sub>e</sub> and t <sub>1/2</sub> K <sub>e</sub> : 0.028 L/Kg Vd : 0.24 hr <sup>-1</sup> t <sub>1/2</sub> : 24.89 hour C <sub>max</sub> : 72.858 mcg/ml C <sub>min</sub> : 66.835 mcg/ml To calculate expected C <sub>min</sub> and C <sub>max</sub> based on new suggested dose Expected C <sub>min</sub> : 34.403 mcg/ml Expected C <sub>max</sub> : 47.333 mcg/ml To calculate new dose and C <sub>min</sub> based on desired C <sub>max</sub> New Dose : 70.309 mg Expected C <sub>min</sub> : 39.152 mcg/ml	Result Viewed	07/07/2017

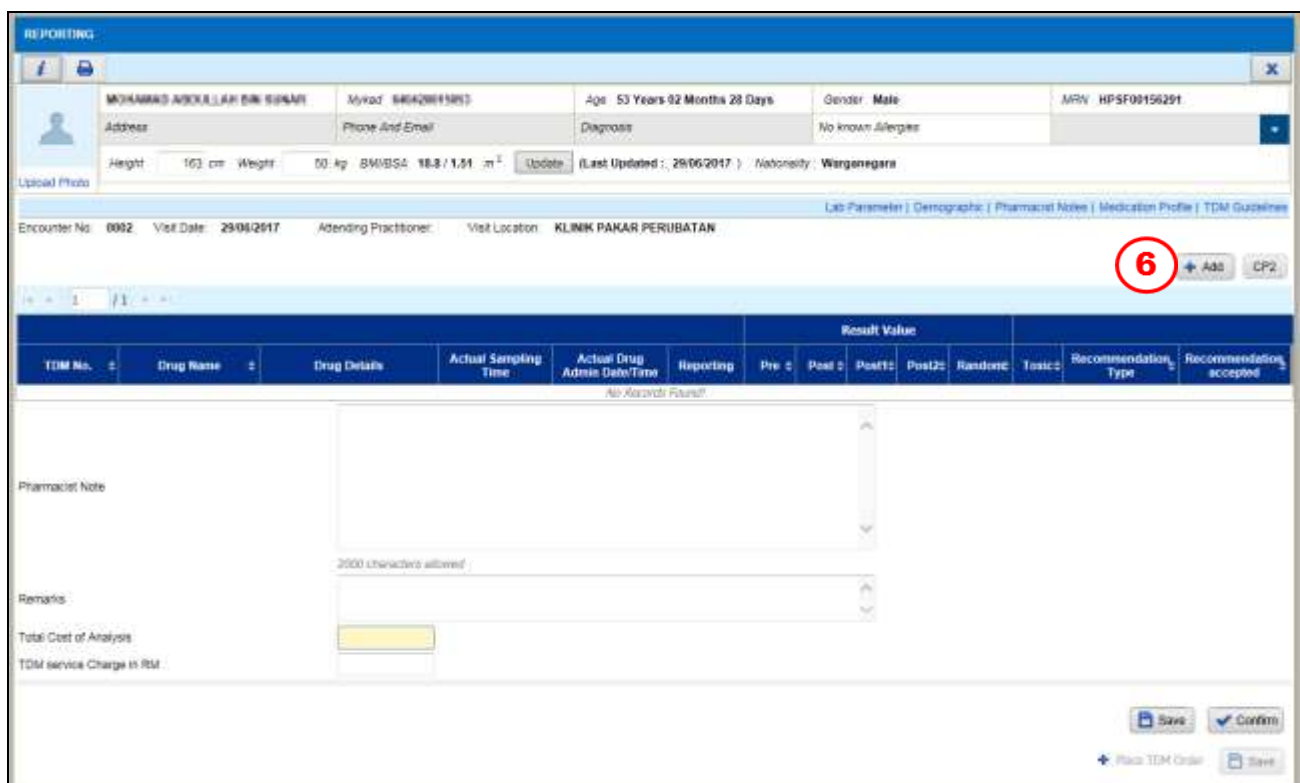
Figure 6.0-2 TDM Reporting Listing Page

## STEP 5

Click on the  button

## Note

Reporting screen will be displayed as Figure 6.0-3



**REPORTING**

MOHAMMAD ABUJALIL BIN SULAIMI Mykad: 946428615863 Age: 53 Years 92 Months 28 Days Gender: Male MRN: HPSF00156291

Address: Phone And Email: Diagnosis: No known Allergies

Height: 163 cm Weight: 80 kg BMI/BMI: 18.8 / 1.91 m<sup>2</sup> Update (Last Updated: 28/06/2017) Nationality: Warganegara

Encounter No: 0092 Visit Date: 29/06/2017 Attending Practitioner: Visit Location: KLINIK PAKAR PERUBATAN

Lab Parameter: Demographic: Pharmacist Note: Medication Profile: TDM Guidelines

1 / 1

TDM No.	Drug Name	Drug Details	Actual Sampling Time	Actual Drug Admin Date/Time	Reporting	Pre	Post	Post1	Post2	Random	Toxic	Recommendation Type	Recommendation acceptance
No Records Found!													

Pharmacist Note

2000 characters allowed

Remarks

Total Cost of Analysis


TDM service Charge in RM

Save Confirm

Place TDM Order Save

Figure 6.0-3 TDM Reporting

## STEP 6

Click on the  button to display TDM Add Result screen



Select	TDM No.	Drug Name	MRN	Patient Name	Gender	Age	Order Status
<input checked="" type="checkbox"/>	TDM000004722	Gentamicin 80mg/2ml Injection	HPSF00156291	MOHAMAD ABDULLAH BIN SUNAR	M	53	Sample Accepted

Figure 6.0-4 TDM Add Result


## STEP 7

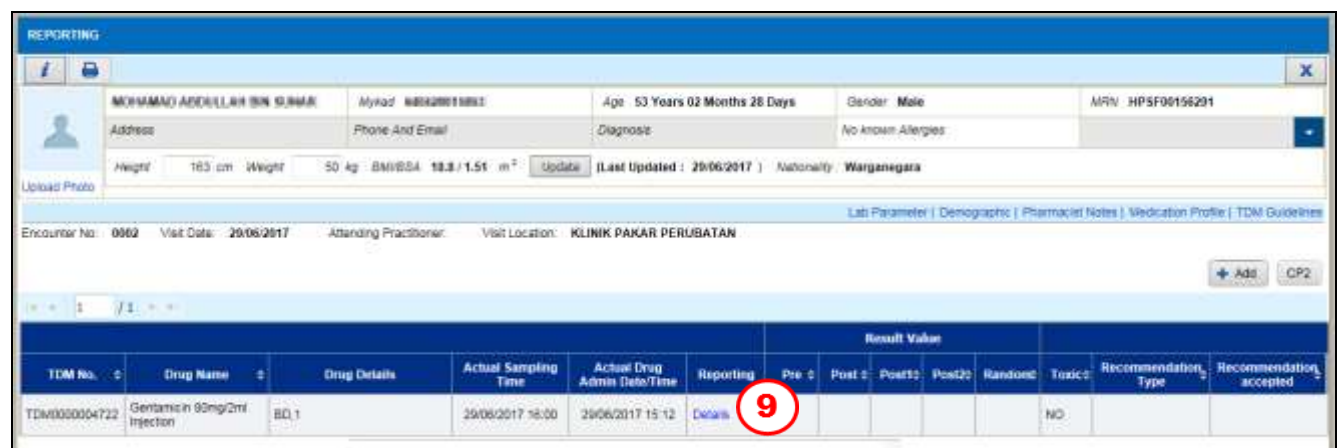
Select on ☐ checkbox(es) for selected TDM order

### Note

The system will display all the active TDM order for the patient. User can combine the TDM orders in one reporting process.

## STEP 8

Click on the  button to proceed with TDM reporting process



TDM No.	Drug Name	Drug Details	Actual Sampling Time	Actual Drug Admin Date/Time	Reporting	Pre	Post	Post10	Post20	Random	Toxic	Recommendation Type	Recommendation accepted
TDM000004722	Gentamicin 80mg/2ml Injection	BD,1	29/06/2017 18:00	29/06/2017 15:12	<a href="#">Details</a>						NO		

Figure 6.0-5 Reporting Details Hyperlink

## STEP 9

Click on [Details](#) hyperlink to display Reporting screen

**REPORTING**

i
X

**Post1 Sample**

Result Value

Reported By  [Details](#)

**Post2 Sample**

Result Value   10

Reported By  [Details](#)

**Random Sample**

Result Value

Reported By  [Details](#)

Calculator  11

Aminoglycoside Pre -Post  
Aminoglycoside Pre  
Aminoglycoside Post1-Post6  
Aminoglycoside Post

Pharmacokinetics Profile

Recommendation Type

Toxic ☐ No ☒

**Latest Lab Result:**

Blood Urea  mmol/L

Sodium  mmol/L

Potassium  mmol/L

Serum Creatinine  µmol/L

Creatinine Clearance  ml/min

Not accurate for Children

Albumin  g/L

Ok

**Figure 6.0-6 Reporting**

**Note**

- User needs to enter sample details for pre sample, post sample or random sample based on TDM order.
- Latest Lab Result will display the latest lab results recorded for:
  - Blood Urea
  - Sodium
  - Potassium
  - Serum Creatinine
  - Creatinine Clearance
  - Albumin



**STEP 10**

Enter sample details as below:

- a. Result Value
- b. Resulted By

**Note**

- Click on [Details](#) hyperlink to view sample details as per Figure 6.0-7. Sample Details consists of:
- Reference Range
- Sample Collected Date/Time
- Actual Drug Admin Date/Time
- Outsource

DETAILS		
 		
Reference Range	:	TROUGH : 10 – 20 mcg / ml PEAK : 20 – 40 mcg /ml ( < 40 – 50 mcg/ml )
Sample Collected Date/Time	:	22/03/2016 07:30
Actual Drug Admin Date/Time	:	22/03/2016 08:00
Out Source	:	NO

**Figure 6.0-7 Sample Details**

**STEP 11**

Select calculator from dropdown box. Please refer to [TDM Calculator](#) to view sample calculator calculation.

REPORTING

i
X

**Post1 Sample**

Result Value  ▼

Reported By  Details

**Post2 Sample**

Result Value  mcg/ml ▼

Reported By  Details

**Random Sample**

Result Value  ▼

Reported By  Details

Calculator ▼

**Latest Lab Result:**

Blood Urea  mmol/L

Sodium  mmol/L

Potassium  mmol/L

Serum Creatinine  µmol/L

Creatinine Clearance  ml/min  
Not accurate for Children

Albumin  g/L

**Pharmacokinetics Profile**

t½ : 24.89 hour

C<sub>max</sub> : 72.658 mcg/ml

C<sub>min</sub> : 66.835 mcg/ml

To calculate expected C<sub>min</sub> and C<sub>max</sub> based on new suggested dose

Expected C<sub>max</sub> : 54.403 mcg/ml

Expected C<sub>min</sub> : 47.333 mcg/ml

To calculate new dose and C<sub>min</sub> based on desired C<sub>max</sub>

New Dose : 70.309 mg

Expected C<sub>min</sub> : 39.152 mcg/ml

Recommendation Type Maintain The Dose ▼

Toxic ☐ No

Ok

Figure 6.0-8 Reporting

#### STEP 12

Enter **Pharmacokinetics Profile**

#### STEP 13

Select **Recommendation Type** from dropdown:

- Increase The Dose
- Maintain The Dose
- Reduce The Dose
- Refer to Pharmacist Notes
- Stop The Dose
- Withhold The Dose

#### Note

Recommendation Type will be copied and displayed in Pharmacist Notes.

#### STEP 14

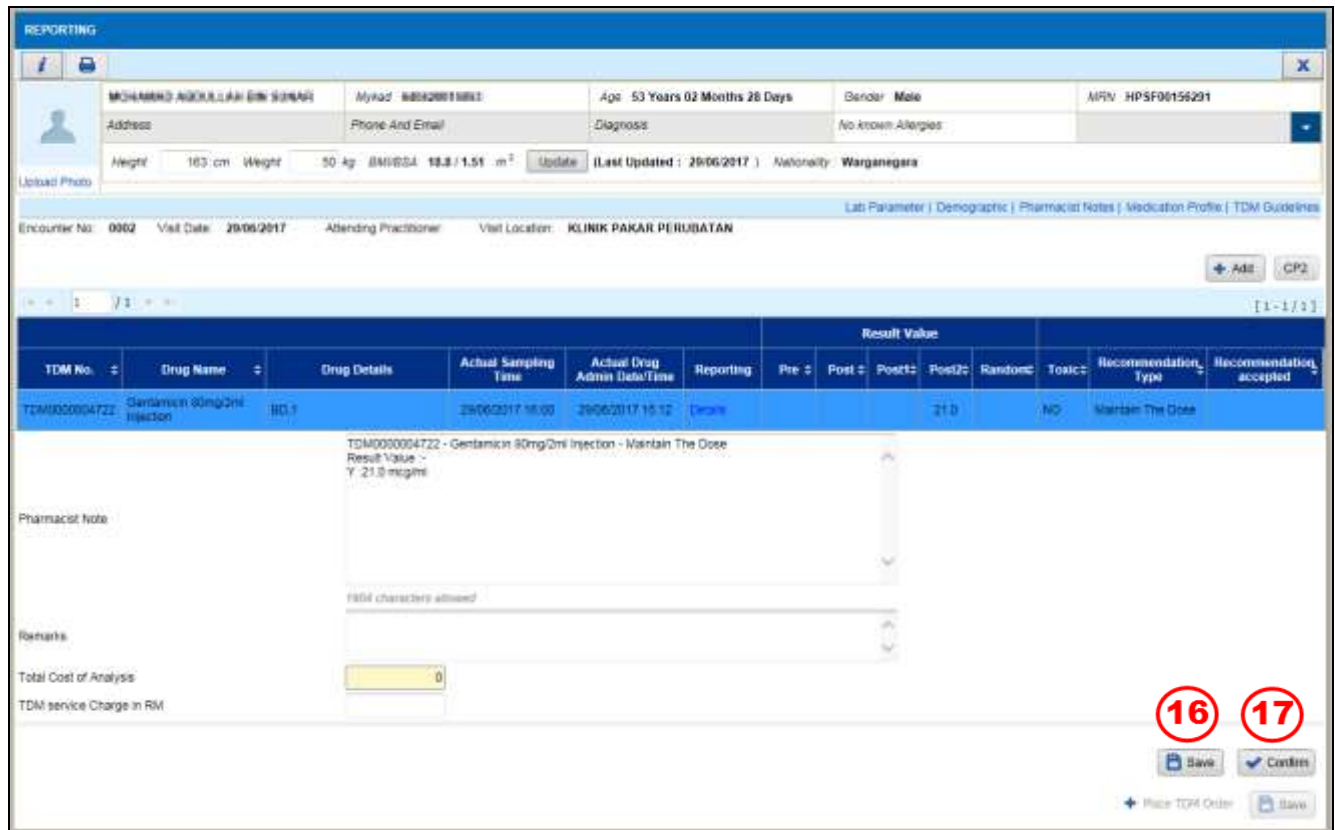
Select **Toxic**:

- a. Yes
- b. No

#### STEP 15

Click on the Ok button to proceed with TDM reporting process





**REPORTING**

MOHAMMAD AGHULILLAH BIN SUDHAN Mykad: 888828811881 Age: 53 Years 02 Months 28 Days Gender: Male MRN: HPSF00156291

Address: Phone And Email: Diagnosis: No known Allergies

Weight: 163 cm Weight: 50 kg BMI(BSA): 18.3 / 1.51 m<sup>2</sup> Update (Last Updated: 29/06/2017) Nationality: Warganegara

Encounter No: 0002 Visit Date: 29/06/2017 Attending Practitioner: Visit Location: KLINIK PAKAR PERUBATAN

Lab Parameter | Demographic | Pharmacist Notes | Medication Profile | TDM Guidelines

+ Add CP2

[1-1/3]

TDM No.	Drug Name	Drug Details	Actual Sampling Time	Actual Drug Admin Date/Time	Reporting	Pre	Post	Post1	Post2	Random	Toxic	Recommendation Type	Recommendation accepted
TDM000004722	Gentamicin 80mg/2ml Injection	BD, 1	29/06/2017 16:00	29/06/2017 15:12	Done					21.0	NO	Maintain The Dose	

Pharmacist Note: TDM000004722 - Gentamicin 80mg/2ml Injection - Maintain The Dose  
Result Value - Y: 21.0 mcg/ml

Remarks:

Total Cost of Analysis: 0

TDM service Charge in RM:

16 17

Save Confirm

+ Place TDM Order Save

Figure 6.0-9 TDM Reporting

**Note**

- Pharmacist Notes field will automatically display:
  - Drug Name
  - Recommendation Type
- User may edit Pharmacist Note.
- Enter Remarks if applicable.
- Total Cost of Analysis will be based on TDM Guideline master setup.

**STEP 16**

Click on the  button to save report

**Note**

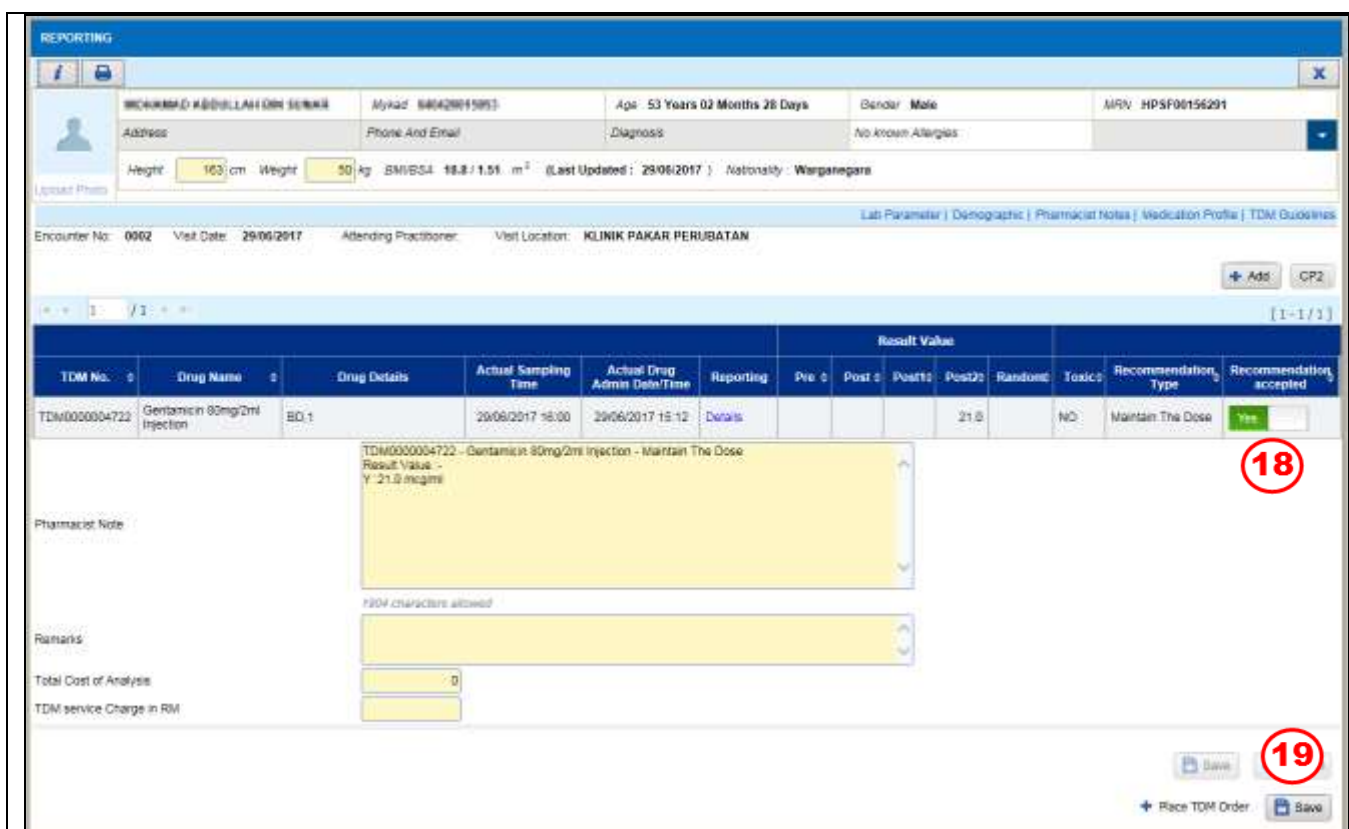
The status will be set as "In-Process".

**STEP 17**

Click on the  button to confirm report

**Note**

- The status will change to "TDM Completed".
-  button and  button will be enabled.



**REPORTING**

ENCERKAD ABDULLAH OM SENAR Mykad: 880428915851 Age: 53 Years 02 Months 28 Days Gender: Male MRN: HPSF00156291

Address: Phone And Email: Diagnosis: No known Allergies:

Height: 163 cm Weight: 50 kg BMI/BSA: 18.8 / 1.51 m<sup>2</sup> (Last Updated: 29/06/2017) Nationality: Warganegara

Encounter No: 0902 Visit Date: 29/06/2017 Attending Practitioner: Visit Location: KLINIK PAKAR PERUBATAN

Lab Parameter | Demographic | Pharmacist Notes | Medication Profile | TDM Guidelines

+ Add CP2

[1-1/1]

TDM No.	Drug Name	Drug Details	Actual Sampling Time	Actual Drug Admin Date/Time	Reporting	Pre	Post	Post1	Post2	Random	Toxic	Recommendation Type	Recommendation accepted
TDM0000004722	Gentamicin 80mg/2ml Injection	BD,1	29/06/2017 16:00	29/06/2017 16:12	Details				21.8		NO	Maintain The Dose	Yes

Pharmacist Note: TDM0000004722 - Gentamicin 80mg/2ml Injection - Maintain The Dose  
Result Value: Y 21.8 mcg/ml

Remarks: 1804 characters allowed

Total Cost of Analysis: 0

TDM service Charge in RM:

Save + Place TDM Order Save

Figure 6.0-10 TDM Reporting

## STEP 18

Click 'Yes' or 'No' at the ☒ button under **Recommendation accepted**

## STEP 19

Click on the  button to authorize the report

## Note

- The status will change to "Result Viewed".
- Click on the  button to place new TDM order.
- User can click on the  button to print the external TDM resulting as Figure 6.0-11. The TDM report will be display as in Figure 6.0-12.



**REPORTING**

Encounter No: 0002 Visit Date: 29/06/2017 Attending Practitioner: Visit Location: KLINIK PAKAR PERUBATAN

MRN: HPSF00156291

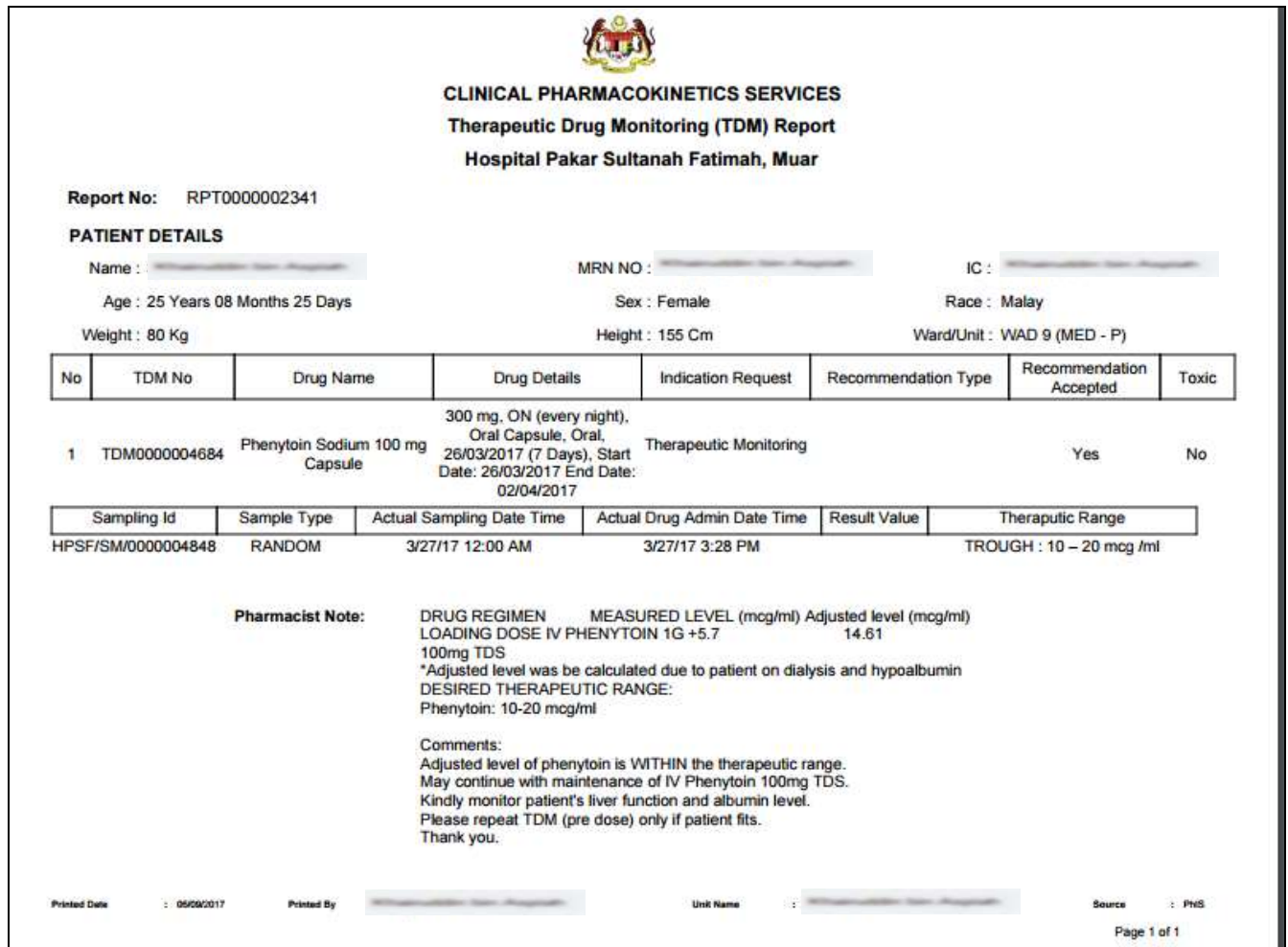
Age: 53 Years 02 Months 28 Days Gender: Male

Address: Phone And Email: Diagnosis: No known Allergies:

Height: 163 cm Weight: 50 kg BMI/BSA: 18.8 / 1.51 m<sup>2</sup> (Last Updated: 29/06/2017) Nationality: Warganegara

Lab Parameter | Demographic | Pharmacist Notes | Medication Profile | TDM Guidelines

Figure 6.0-11 Print Report



**CLINICAL PHARMACOKINETICS SERVICES**  
**Therapeutic Drug Monitoring (TDM) Report**  
**Hospital Pakar Sultanah Fatimah, Muar**

**Report No:** RPT0000002341

**PATIENT DETAILS**

Name: MRN NO: IC: Age: 25 Years 08 Months 25 Days Sex: Female Race: Malay Weight: 80 Kg Height: 155 Cm Ward/Unit: WAD 9 (MED - P)

No	TDM No	Drug Name	Drug Details	Indication Request	Recommendation Type	Recommendation Accepted	Toxic
1	TDM0000004684	Phenytoin Sodium 100 mg Capsule	300 mg, ON (every night), Oral Capsule, Oral, 26/03/2017 (7 Days), Start Date: 26/03/2017 End Date: 02/04/2017	Therapeutic Monitoring		Yes	No

Sampling Id	Sample Type	Actual Sampling Date Time	Actual Drug Admin Date Time	Result Value	Therapeutic Range
HPSF/SM/0000004684	RANDOM	3/27/17 12:00 AM	3/27/17 3:28 PM		TROUGH : 10 – 20 mcg /ml

**Pharmacist Note:**

DRUG REGIMEN MEASURED LEVEL (mcg/ml) Adjusted level (mcg/ml)  
LOADING DOSE IV PHENYTOIN 1G +5.7 14.61  
100mg TDS  
\*Adjusted level was be calculated due to patient on dialysis and hypoalbumin  
DESIRED THERAPEUTIC RANGE:  
Phenytoin: 10-20 mcg/ml

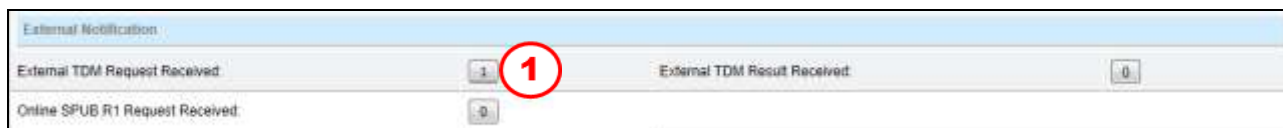
**Comments:**  
Adjusted level of phenytoin is WITHIN the therapeutic range.  
May continue with maintenance of IV Phenytoin 100mg TDS.  
Kindly monitor patient's liver function and albumin level.  
Please repeat TDM (pre dose) only if patient fits.  
Thank you.

Printed Date : 05/09/2017 Printed By: User Name: Source : PhIS  
Page 1 of 1

Figure 6.0-12 TDM Report

## 7.0 External TDM

### 7.1 External TDM Online



External Notification

External TDM Request Received	1	External TDM Result Received	0
Online SFUB R1 Request Received	0		

Figure 7.1-1 External Notification

External TDM module is for user to record external TDM resulting (Outsource) via online or offline.

It will be recorded online if both facilities use PhIS to perform TDM processes.

#### STEP 1

Click on the **External TDM Result Received**  button to view Outsource information



OUTSOURCE LISTING

	Hosp/Clinic	Mmn No	Patient Name	Patient ID	TDM Drug	Sample Type	Date/Time	Register
<input type="checkbox"/>	Hospital Pakar Sultanah Fatimah, Muar	HPSF00007005	Wahabuddin bin Asyraf	Wahabuddin bin Asyraf	carBAMAZepine 200mg Tablet	RANDOM	22/07/2014 13:26	Register
<input type="checkbox"/>	Hospital Pakar Sultanah Fatimah, Muar	HPSF00017231	Wahabuddin bin Asyraf	Wahabuddin bin Asyraf	Sodium Valproate 200 mg Tablet	PRE	22/09/2014 15:48	Register

Figure 7.1-2 Outsource Listing

#### STEP 2

Click on **Register** hyperlink to register the patient in the system

#### Note

The status will change to 'Registered' as per Figure 7.1-2



OUTSOURCE LISTING

	Hosp/Clinic	Mmn No	Patient Name	Patient ID	TDM Drug	Sample Type	Date/Time	Register
<input type="checkbox"/>	Hospital Pakar Sultanah Fatimah, Muar	HPSF00007006	Wahabuddin bin Asyraf	Wahabuddin bin Asyraf	carBAMAZepine 200mg Tablet	RANDOM	22/07/2014 13:26	Register
<input checked="" type="checkbox"/>	Hospital Pakar Sultanah Fatimah, Muar	HPSF00017231	Wahabuddin bin Asyraf	Wahabuddin bin Asyraf	Sodium Valproate 200 mg Tablet	PRE	22/09/2014 15:48	Registered

Figure 7.1-3 Outsource Listing – Registered Patient

#### STEP 3

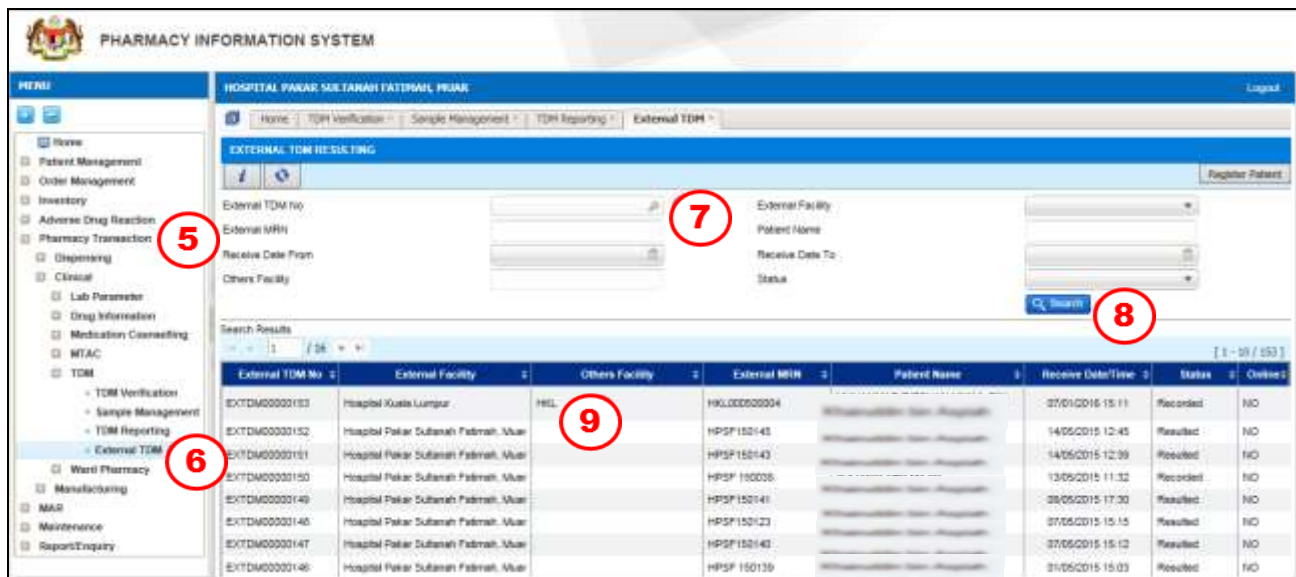
Click on the ☒ checkbox for selected patient

#### STEP 4

Click on the  button to save the record

#### Note

Registered patient will be uploaded to the External TDM listing page.



External TDM No.	External Facility	Others Facility	External MRN	Patient Name	Receive Date/Time	Status	Online
EXTDM0000103	Hospital Kuala Lumpur	PHL	HP000000004	[Redacted]	07/01/2015 15:11	Recorded	NO
EXTDM0000152	Hospital Pakar Sultanah Fadimah, Muar		HPSP150145	[Redacted]	14/05/2015 12:45	Resulted	NO
EXTDM0000151	Hospital Pakar Sultanah Fadimah, Muar		HPSP150143	[Redacted]	14/05/2015 12:39	Resulted	NO
EXTDM0000150	Hospital Pakar Sultanah Fadimah, Muar		HPSP100038	[Redacted]	13/05/2015 11:32	Recorded	NO
EXTDM0000149	Hospital Pakar Sultanah Fadimah, Muar		HPSP150141	[Redacted]	08/05/2015 17:30	Resulted	NO
EXTDM0000148	Hospital Pakar Sultanah Fadimah, Muar		HPSP150123	[Redacted]	07/05/2015 15:15	Resulted	NO
EXTDM0000147	Hospital Pakar Sultanah Fadimah, Muar		HPSP150143	[Redacted]	07/05/2015 15:12	Resulted	NO
EXTDM0000146	Hospital Pakar Sultanah Fadimah, Muar		HPSP150139	[Redacted]	06/05/2015 15:03	Resulted	NO

Figure 7.1-4 External TDM Listing Page

#### STEP 5

Click on 'Pharmacy Transaction' menu follow by 'Clinical' sub-menu

#### STEP 6


Click on 'TDM' and click on 'External TDM' function

#### STEP 7

Search for patient records by:

- External TDM No.
- External Facility
- External MRN
- Patient Name
- Receive Date From
- Receive Date To
- Others Facility
- Status
  - Recorded
  - Rejected
  - Resulted

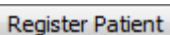
#### STEP 8

Click on the  button to search for patient records

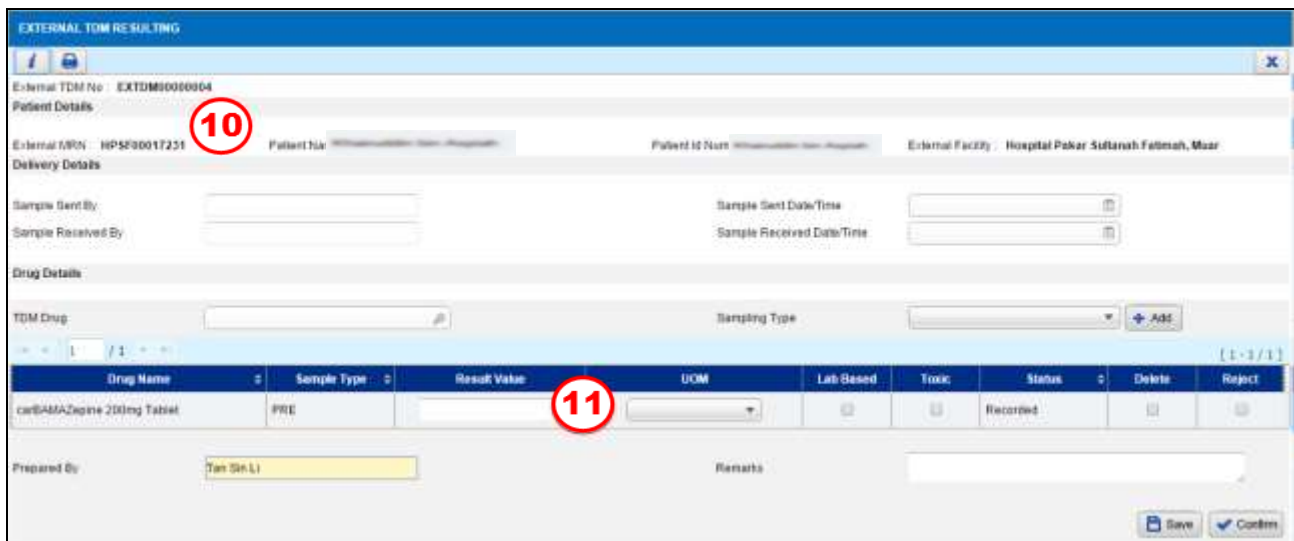
#### STEP 9

Double-click on the selected patient and External TDM Resulting screen will be displayed as per Figure 7.1-5

#### Note



button is for offline External TDM (refer to [section 7.2 External TDM Offline](#))



**EXTERNAL TDM RESULTING**

External TDM No : EXTDM0000004

**Patient Details**

External I/RN : HP5F00017251 Patient Name : [Redacted] Patient ID Num : [Redacted] External Facility : Hospital Pakar Sultanah Fatimah, Muar

**Delivery Details**

Sample Sent By : [Text Box] Sample Sent Date/Time : [Text Box]

Sample Received By : [Text Box] Sample Received Date/Time : [Text Box]

**Drug Details**

TDM Drug : [Text Box] Sampling Type : [Dropdown] + Add

Drug Name	Sample Type	Result Value	UOM	Lab Based	Toxic	Status	Delete	Reject
carbamazepine 200mg Tablet	PRI	[Text Box]	[Dropdown]	<input type="checkbox"/>	<input type="checkbox"/>	Recorded	<input type="checkbox"/>	<input type="checkbox"/>

Prepared By : Tan Sri Li [Text Box] Remarks : [Text Box]

Save Confirm

Figure 7.1-5 External TDM Resulting

#### STEP 10

Enter **Delivery Details** as below:

- Sample Sent By
- Sample Sent Date/Time
- Sample Received By
- Sample Received Date/Time

#### STEP 11

Enter **Result Value** and select **UOM** from dropdown box :

- mcg/ml
- mg/dl
- mmol/l
- ng/ml

#### Note

- Select on ☐ **Lab Based** checkbox if TDM resulting process is done at a laboratory.
- Select on ☐ **Toxic** checkbox if TDM results show toxicity for selected patient.
- Select on ☐ **Reject** checkbox to reject sampling received.
- Select on ☐ **Delete** checkbox to delete TDM order.
- Enter **Remarks** if applicable.



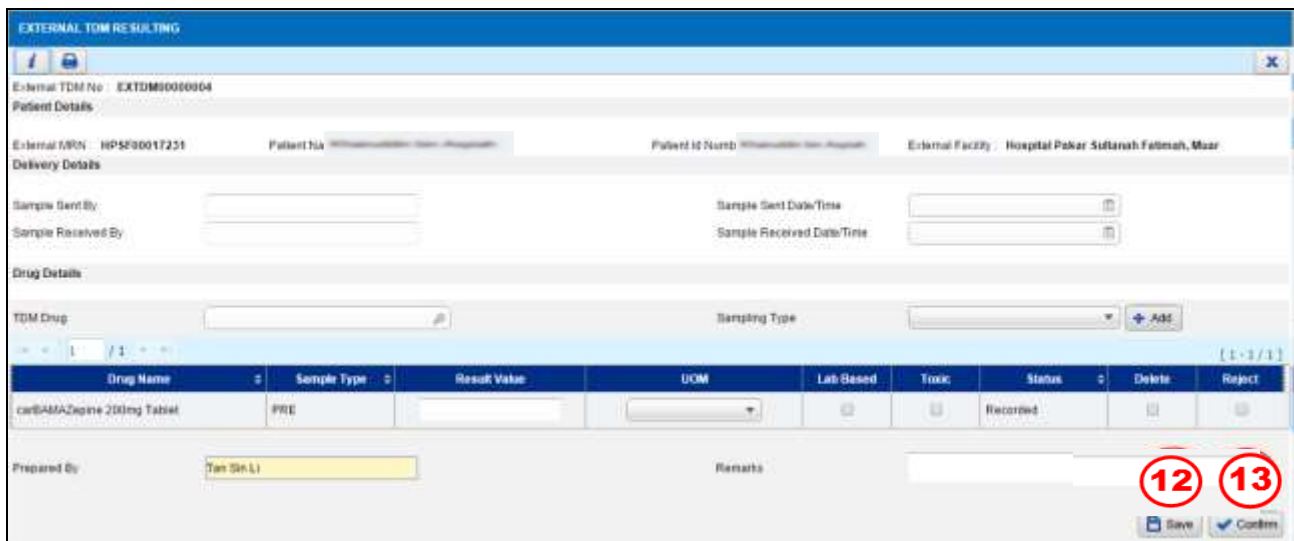




Figure 7.1-6 External TDM Resulting

#### STEP 12

Click on the  button to save external TDM resulting

#### STEP 13

Click on the  button to confirm external TDM resulting

#### Note



- The status will change to “Resulted”.
- Outsource TDM Resulting will be sent back to the requester.
- To receive an **External TDM Result Received**:
- Click on the **External TDM Result Received**  button to view the outsource listing.
- Select on ☐ checkbox(es) on selected outsource request.
- Click on the  button to upload the patient record in order to proceed with TDM Reporting processes.(refer to [section 6.0 TDM Reporting](#))



Figure 7.1-7 External Notification

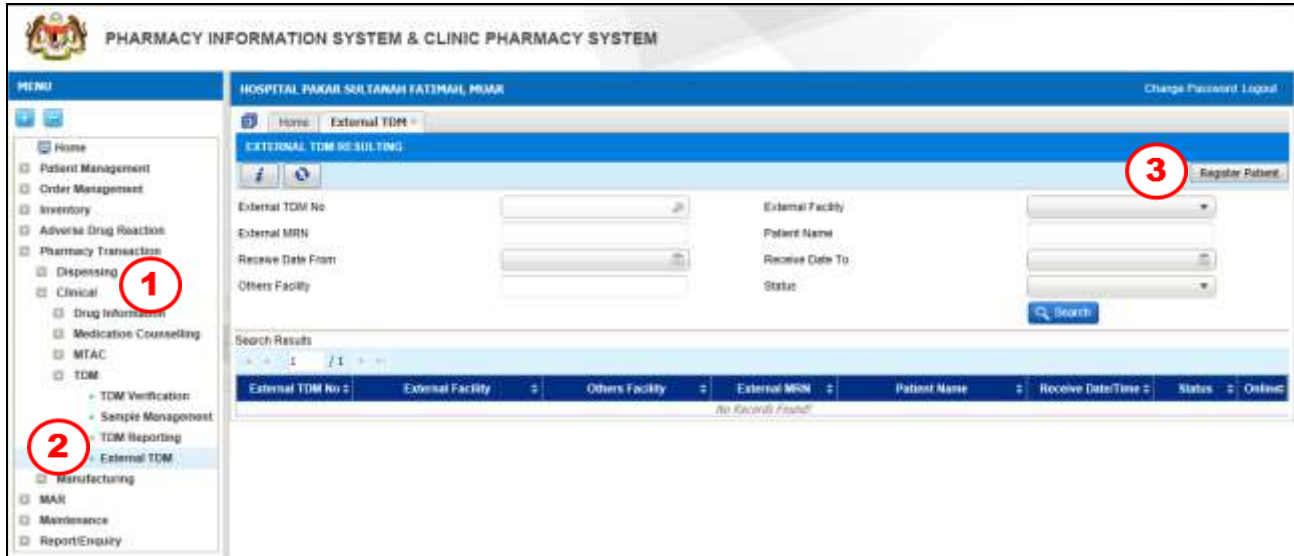


TDM Order No	Min No	Patient Name	Patient ID	TDM Drug	Sample Type	Result	UOM	Date/Time
EXTDM0000001	HP5F00017231	[Redacted]	T90719015422	Sodium Valproate 200 mg Tablet	PRE	13.3	mcg/ml	23/09/2014 16:22

Figure 7.1-8 Outsource Listing

## 7.2 External TDM Offline

External TDM module is for user to record external TDM received via offline.



PHARMACY INFORMATION SYSTEM & CLINIC PHARMACY SYSTEM

HOSPITAL PAKAR SULTANAH FATIMAH, MUK

Change Password Logout

Home External TDM

EXTERNAL TDM RESULTING

Register Patient

External TDM No

External Facility

External MRN

Receive Date From

Receive Date To

Others Facility

Status

Search

Search Results

External TDM No	External Facility	Others Facility	External MRN	Patient Name	Receive Date/Time	Status	Online
No Records Found!							

Figure 7.2-1 External TDM Listing Page

### STEP 1

Click on 'Pharmacy Transaction' menu follow by 'Clinical' sub-menu

### STEP 2

Click on 'TDM' and click on 'External TDM' function

### STEP 3

Click on the **Register Patient** button to register external patient



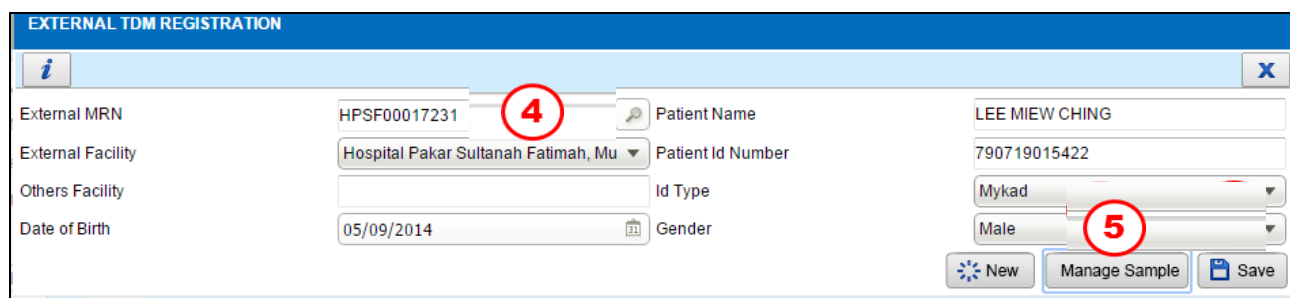


Figure 7.2-2 External TDM Registration

#### STEP 4

Enter details in the fields below:

- External MRN
- Patient Name
- External Facility
- Patient Id Number
- Other Facility  
(If the sample come from private sector or facility which is not listed under MOH facilities)
- Id Type

#### Note

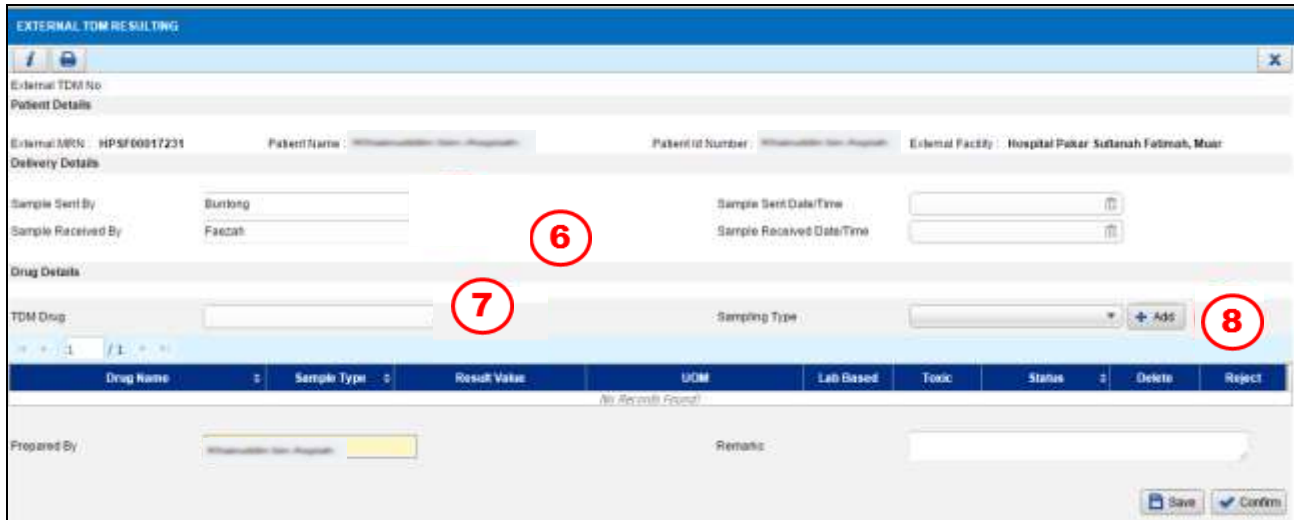
Click on the External MRN  button to search for registered patient and all fields will be automatically retrieved.

#### STEP 5

Click on the  button and External TDM Resulting screen will be displayed as per Figure 7.2-2

#### Note

Click on the  button to save the record



**EXTERNAL TDM RESULTING**

External TDM No: [Field]  
Patient Details  
External MRN: HPSF00817231 Patient Name: [Field] Patient ID Number: [Field] External Facility: Hospital Pakar Sultanah Fatimah, Muar

**Delivery Details**  
Sample Sent By: [Field] Sample Sent Date/Time: [Field]  
Sample Received By: [Field] Sample Received Date/Time: [Field]

**Drug Details**  
TDM Drug: [Field] Sampling Type: [Field] + Add

Drug Name	Sample Type	Result Value	UDM	Lab Based	Toxic	Status	Delete	Reject
No Records Found								

Prepared By: [Field] Remarks: [Field]  
[Save] [Confirm]

Figure 7.2-3 External TDM Resulting

#### STEP 6

Enter **Delivery Details** as below:

- Sample Sent By
- Sample Sent Date/Time
- Sample Received By
- Sample Received Date/Time

#### STEP 7

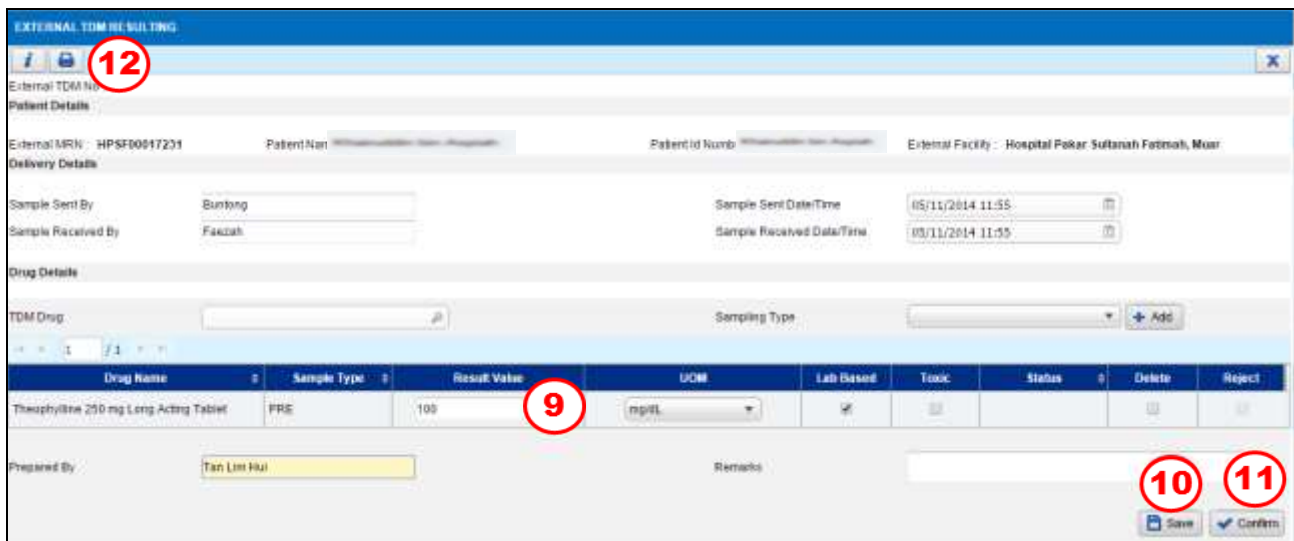
Click on the **TDM Drug**  button to search for drug

#### STEP 8

Select **Sampling Type** from dropdown box:

- Pre
- Post
- Random

and click on the  button to add the information



**EXTERNAL TDM RESULTING**

External TDM No. [12]

Patient Details  
 External MRN : HPSF00017231 Patient Name [Redacted] Patient ID Number [Redacted] External Facility : Hospital Pokar, Sultanah Fatenah, Muar

Delivery Details  
 Sample Sent By : Bunting Sample Sent Date/Time : 05/11/2014 11:55  
 Sample Received By : Faziah Sample Received Date/Time : 05/11/2014 11:55

Drug Details  
 TDM Drug : [Redacted] Sampling Type : [Redacted] + Add

Drug Name	Sample Type	Result Value	UOM	Lab Based	Toxic	Status	Delete	Reject
Theophylline 250 mg Long Acting Tablet	PRE	100	mg/dl	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>

Prepared By : Tan Lim Hui Remarks : [Redacted]

[10] Save [11] Confirm

Figure 7.2-4 External TDM Resulting

#### STEP 9


Enter **Result Value** and select **UOM** from dropdown box :

- mcg/ml
- mg/dl
- mg/ml


#### Note

- Select on ☐ **Lab Based** checkbox if TDM resulting process is done at a laboratory.
- Select on ☐ **Toxic** checkbox if TDM results show toxicity for selected patient.
- Select on ☐ **Reject** checkbox to reject sampling received.
- Select on ☐ **Delete** checkbox to delete TDM order.
- Enter **Remarks** if applicable.

#### STEP 10

Click on the  button to save external TDM resulting


#### STEP 11

Click on the  button to confirm external TDM resulting


## STEP 12



Click on the button to print the external TDM resulting as per Figure 7.2.5



**MINISTRY OF HEALTH, MALAYSIA**  
**Hospital Miri**  
**External TDM Resulting**

**Patient Name** : OXX XXXX XXX **Patient ID** : 


**Age** : **MRN** : HLBG00005547

**Gender** : **Sample Sent** :

**External Facility** : Hospital Limbang **Sample Received** : 29/07/2016 03:20 PM

**External TDM No** : EXTDM00000001

NO.	Drug Name	Sample Type	Result Value	UOM
1	Paracetamol 500 mg Tablet	RANDOM	0.5	mcg/ml

**Resulted By** : 

**Designation** : PF

**Department** : Pharmacy

Page 1 of 1

Figure 7.2-5 External TDM Resulting

## 8.0 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

## 9.0 Links to Clinical Modules

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