



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

Full Based User Manual Therapeutic Drug Monitoring (TDM)

Version	: 6th Edition
Document ID	: FB_U. MANUAL_THERAPEUTIC DRUG MONITORING



PhIS & CPS Project
User Manual – Therapeutic Drug
Monitoring



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Reference ID : FB_U. MANUAL_THERAPEUTIC DRUG MONITORING-6th Edition

Application reference: PhIS & CPS v1.6.1



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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 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.

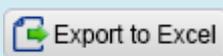
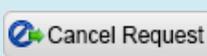
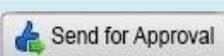
1.3 Organised Sections

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			
Acknowledge	To Acknowledge	Drug Info	Drug Info
New	To Do New Order	Verify	To Verify
Cancel Order	Cancel the Order	+ Add New Sample	To Add New Sample
Send	To send request	CP2	Ward Pharmacy

Note

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

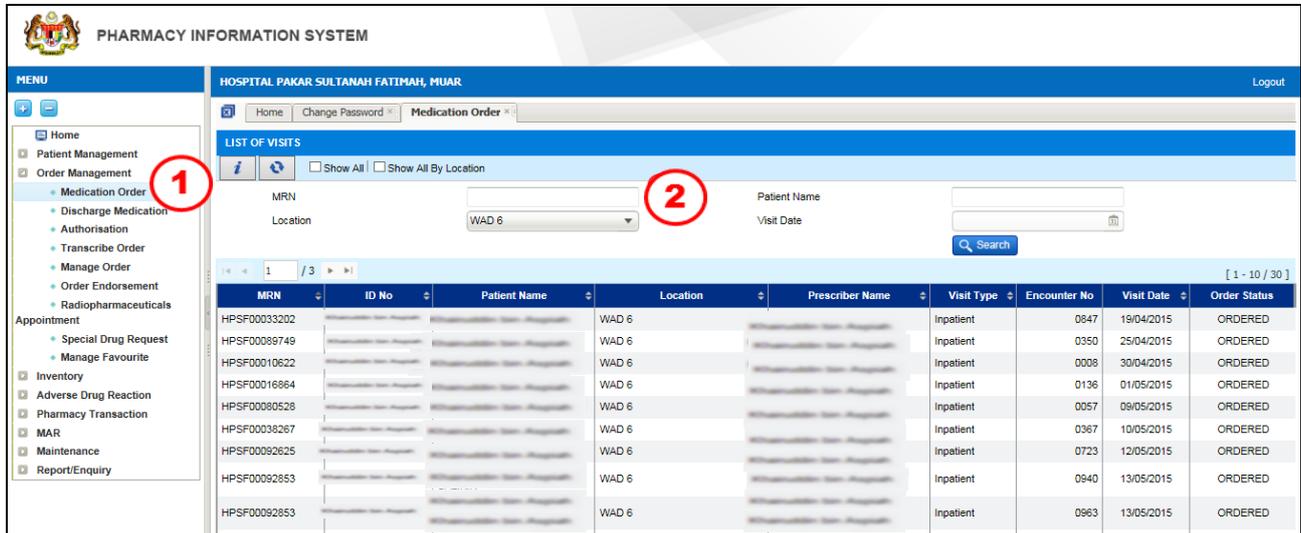


2.2 Latest Enhancement and Updates

Latest Functions	Page
TDM Reporting <ul style="list-style-type: none">✓ To autocapture height & weight fill up during TDM Order✓ Actual sampling time, to be displayed (in details table next to actual drug admin)	26
TDM Report printing <ul style="list-style-type: none">✓ To rename sampling date time to 'Actual Sampling date time'✓ To add drug dosage and frequency in TDM report printing	32

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	ID No	Patient Name	Location	Prescriber Name	Visit Type	Encounter No	Visit Date	Order Status
HPSF00033202			WAD 6		Inpatient	0847	19/04/2015	ORDERED
HPSF00089749			WAD 6		Inpatient	0350	25/04/2015	ORDERED
HPSF00010622			WAD 6		Inpatient	0008	30/04/2015	ORDERED
HPSF00016864			WAD 6		Inpatient	0136	01/05/2015	ORDERED
HPSF00080528			WAD 6		Inpatient	0057	09/05/2015	ORDERED
HPSF00038267			WAD 6		Inpatient	0367	10/05/2015	ORDERED
HPSF00092625			WAD 6		Inpatient	0723	12/05/2015	ORDERED
HPSF00092853			WAD 6		Inpatient	0840	13/05/2015	ORDERED
HPSF00092853			WAD 6		Inpatient	0963	13/05/2015	ORDERED

Figure 3.0-1 Medication Order Listing Page

STEP 1

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

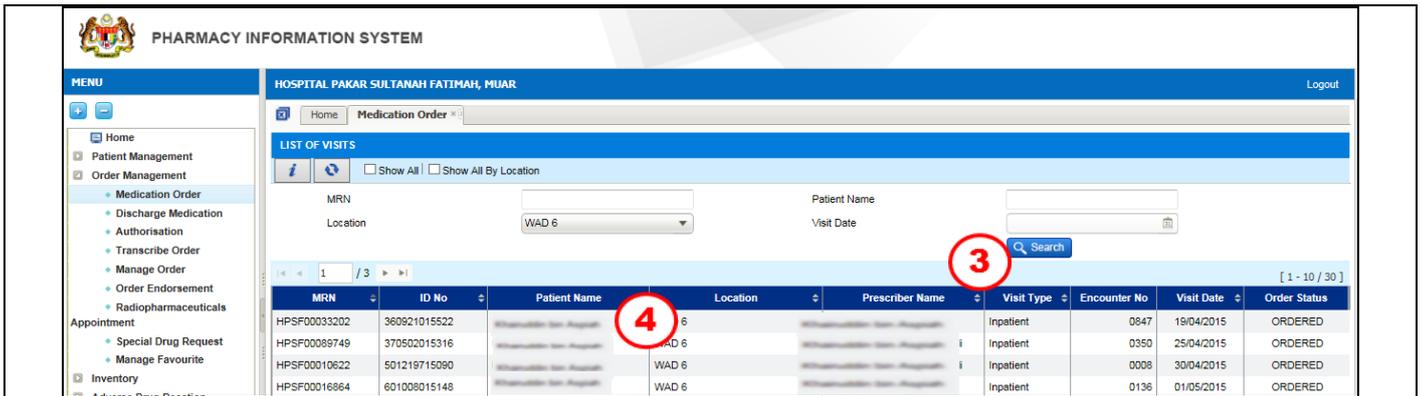
STEP 2

Search for patient records by:

- MRN
- Patient's Name
- Location
- Visit Date

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, MUAR

Home Medication Order

LIST OF VISITS

MRN: [] Patient Name: []
Location: WAD 6 Visit Date: []

[1 - 10 / 30]

MRN	ID No	Patient Name	Location	Prescriber Name	Visit Type	Encounter No	Visit Date	Order Status
HPSF00033202	360921015522	[]	6	[]	Inpatient	0847	19/04/2015	ORDERED
HPSF00089749	370502015316	[]	WAD 6	[]	Inpatient	0350	25/04/2015	ORDERED
HPSF00010622	501219715090	[]	WAD 6	[]	Inpatient	0008	30/04/2015	ORDERED
HPSF00016864	601008015148	[]	WAD 6	[]	Inpatient	0136	01/05/2015	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

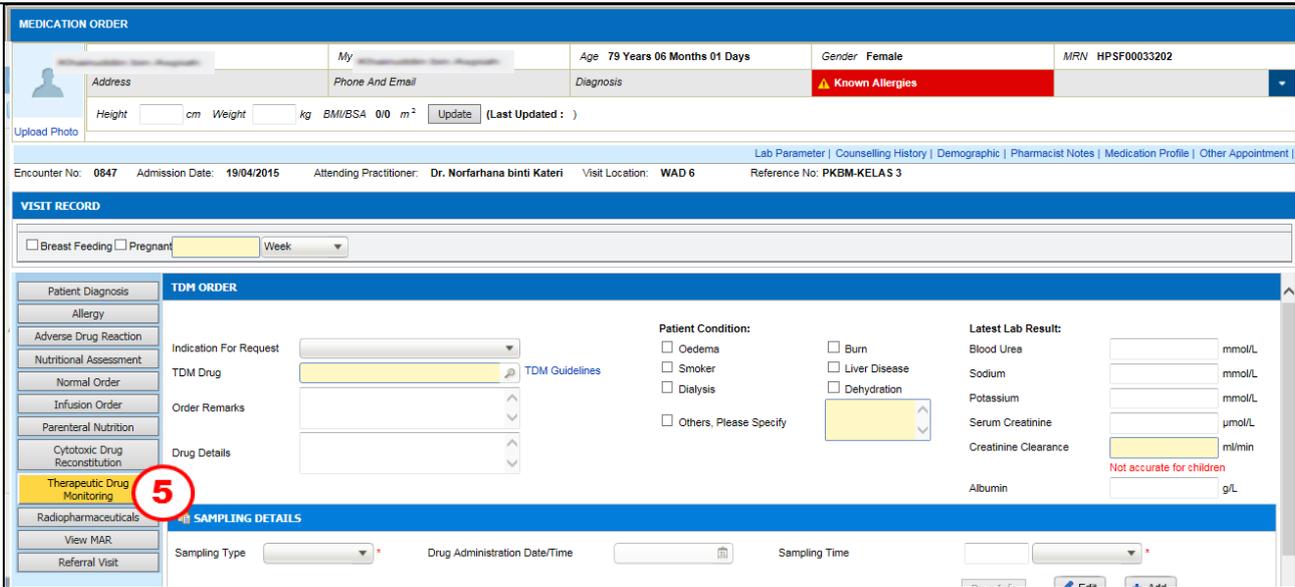


Figure 3.0-3 Medication Order

STEP 5

Click on the  button to create TDM order

Note

- User have to enter patient's height and weight and click on the  button and system will automatically calculate the BMI/BSA in m².
- Visit Record will display Breast Feeding and Pregnant checkboxes only if the patient is a female.

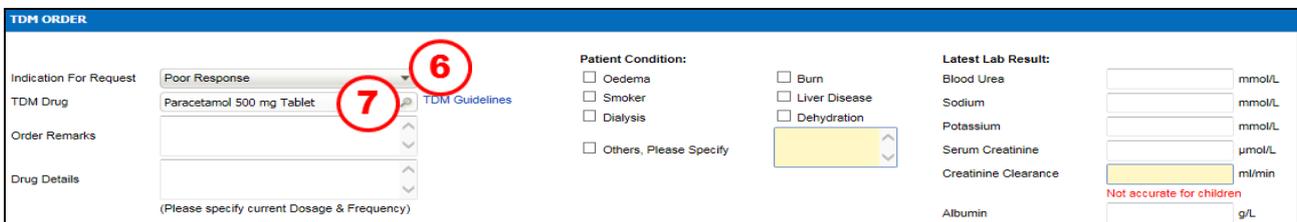


Figure 3.0-4 TDM Order

STEP 6

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.

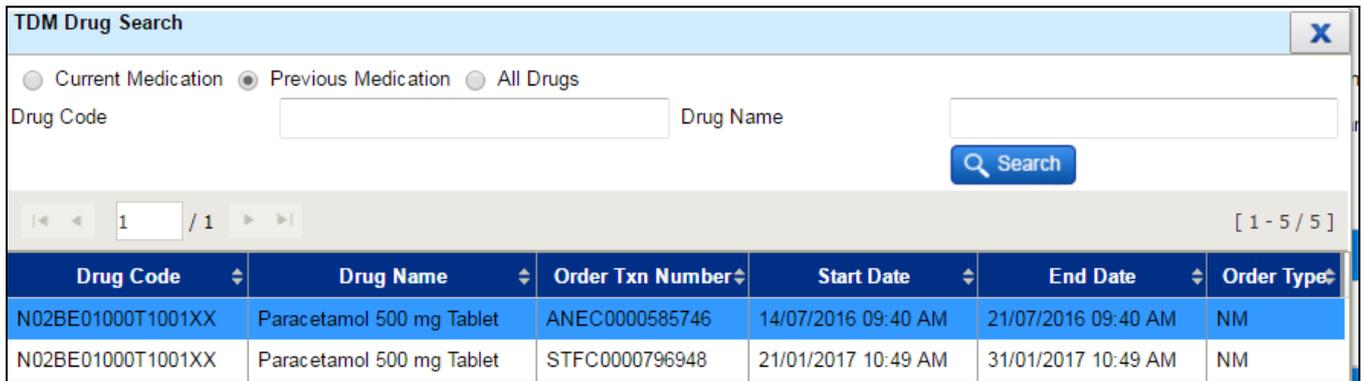
STEP 7

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.



The screenshot shows a web application window titled "TDM Drug Search". It features three radio buttons for selection: "Current Medication", "Previous Medication" (which is selected), and "All Drugs". Below these are input fields for "Drug Code" and "Drug Name", followed by a blue "Search" button. A pagination bar shows "1 / 1" and "[1 - 5 / 5]". Below the search area is a table with the following data:

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 3.0-5 TDM Drug Search



The screenshot shows a "DRUG DETAILS" section with the following information:

Rx No :	ANEC0000585746	Dosage :	2 tablet	Frequency :	QID PRN	Duration :	7 Days
Route :	Oral	Start Date :	14/07/2016	End Date :	21/07/2016		

Figure 3.0-6 Drug Details

TDM GUIDELINE

TDM Drug: Paracetamol 500 mg Tablet
 Time to reach steady state: N/A
 Total Cost of Analysis(RM): 0
 Remarks:

Calculator

Digoxin
 Aminoglycoside Pre
 Carbamazepine
 Phenobarbitone
 Vancomycin Pre
 Theophylline
 Valproic Acid
 Vancomycin Post

Phenytoin

TDM GUIDELINE DETAIL

1 / 1 [1 - 1 / 1]

Sampling Type	After/Before	Default time	Lab Order	Therapeutic Range	UOM	Updated On
RANDOM	AFTER	1 MINUTES	Paracetamol Random	At least 4 hours post ingestion	mcg/ml	03/11/2013

Figure 3.0-7 TDM Guidelines

TDM ORDER

Patient Diagnosis
 Allergy
 Adverse Drug Reaction
 Nutritional Assessment
 Normal Order
 Infusion Order
 Parenteral Nutrition
 Cytotoxic Drug Reconstitution
 Therapeutic Drug Monitoring

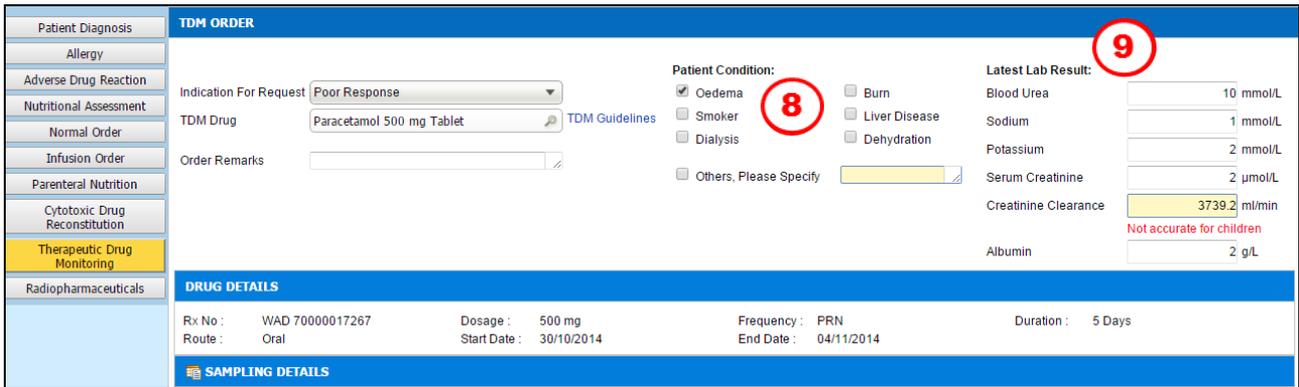
Indication For Request: Poor Response
 TDM Drug: [Search] TDM Guidelines
 Order Remarks: [Text Area]

Patient Condition:
 Oedema
 Smoker
 Dialysis
 Others, Please Specify: [Text Area]

Burn
 Liver Disease
 Dehydration

Latest Lab Result:
 Blood Urea: [Text Area] mmol/L
 Sodium: [Text Area] mmol/L
 Potassium: [Text Area] mmol/L
 Serum Creatinine: [Text Area] µmol/L
 Creatinine Clearance: [Text Area] ml/min
 Albumin: [Text Area] g/L
Not accurate for children

Figure 3.0-8 TDM Order



TDM ORDER	
Indication For Request: Poor Response TDM Drug: Paracetamol 500 mg Tablet Order Remarks:	Patient Condition: <input checked="" type="checkbox"/> Oedema <input type="checkbox"/> Burn <input type="checkbox"/> Smoker <input type="checkbox"/> Liver Disease <input type="checkbox"/> Dialysis <input type="checkbox"/> Dehydration <input type="checkbox"/> Others, Please Specify
Latest Lab Result: Blood Urea: 10 mmol/L Sodium: 1 mmol/L Potassium: 2 mmol/L Serum Creatinine: 2 µmol/L Creatinine Clearance: 3739.2 ml/min Albumin: 2 g/L	
DRUG DETAILS	
Rx No: WAD 70000017267 Route: Oral	Dosage: 500 mg Start Date: 30/10/2014 Frequency: PRN End Date: 04/11/2014 Duration: 5 Days
SAMPLING DETAILS	

Figure 3.0-9 Patient Condition

STEP 8

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 9

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



MEDICATION ORDER					
Mykad	Age 45 Years 05 Months 08 Days	Gender Male	MRN HPSF00026416		
Address	Phone And Email	Diagnosis	Known Allergies		
Height 154 cm	Weight 64 kg	BMI/BSA 27 / 1.7 m ²	Update (Last Updated: 23/10/2014)		
Lab Results			Counselling History Demographic Pharmacist Notes Medication Profile Other Appointment		

Figure 3.0-10 Lab Result Hyperlink

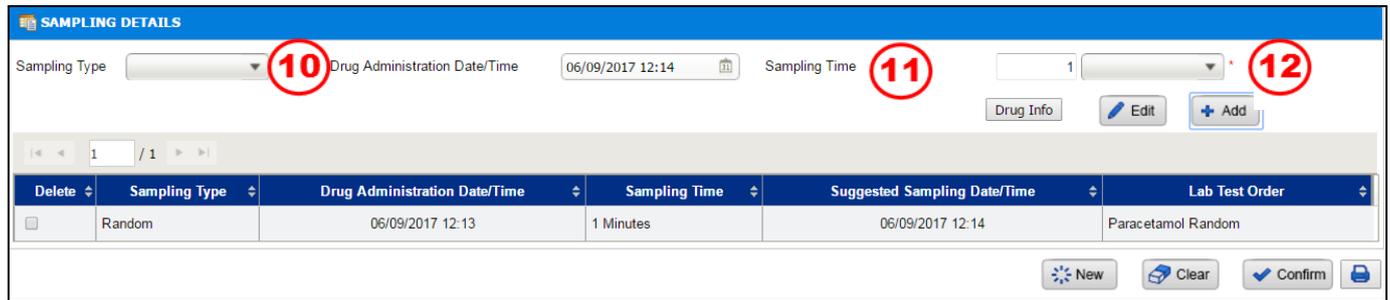


Figure 3.0-11 Sampling Details

Note

- Screen for Sampling Details will be displayed differently based on selected 'Indication For Request' below:
- Sampling Type will be displayed differently based on chosen 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.
- Click on the  button to view drug information on selected TDM drug.

STEP 10

Select **Sampling Type** from dropdown box based on TDM guideline example:

- Pre
- Post
- Random

STEP 11

Click on the  button to select Drug Administration Date/Time

Note

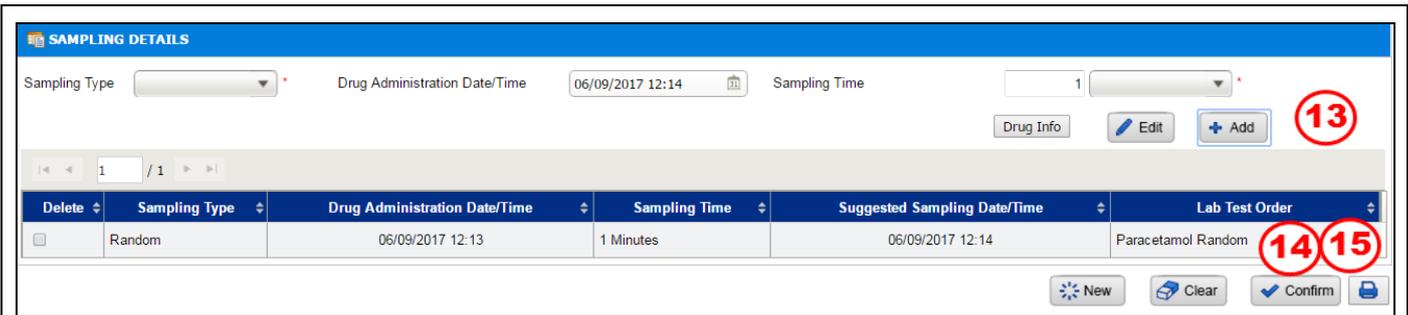
Drug Administration Date/Time can be edited by user and the format should be 'DD/MM/YYYY HH:MM'.

STEP 12

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.



Delete	Sampling Type	Drug Administration Date/Time	Sampling Time	Suggested Sampling Date/Time	Lab Test Order
<input type="checkbox"/>	Random	06/09/2017 12:13	1 Minutes	06/09/2017 12:14	Paracetamol Random

Figure 3.0-12 Sampling Details

STEP 13

Click on the  button to add sampling details

Note

- Repeat Step 10 to Step 13 to add more samples (for Pre and Post Sampling).
- To update sampling details, double-click on sampling record and update sampling details. Then, click on the  button.

STEP 14

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

STEP 15

Click on the  button to print TDM Request Form as per Figure 3.0-13

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.
- To delete sampling details added, check on Delete checkbox.



PhIS & CPS Project
User Manual – Therapeutic Drug
Monitoring



CLINICAL PHARMACOKINETICS SERVICES
Therapeutic Drug Monitoring (TDM) Request Form

Ordered By: D [REDACTED] N

TDM Order No : TDM0000001203

Ordered Date/Time: 15/08/2016 17:05

PATIENT DETAILS					
Name:	TXXXX XXXX XXXXXXXX	MRN NO:	HMIRI00192718	IC:	[REDACTED]
				Race:	BERAWAN
Age:	34 Years 02 Months 23 Days	Sex:	Female	Ward/Unit:	EMERGENCY AND TRAUMA DEPARTMENT
Weight:		Height:			
LATEST LAB RESULT					
Blood Urea	Sodium	Potassium	Serum Creatinine	Creatinine Clearance	Albumin
PATIENT CONDITION					
Oedema:	NO	Smoker:	NO	Dehydration:	NO
Dialysis:	NO	Burn:	NO	Liver Disease:	NO
Others:	NO	Details:			
INDICATION FOR REQUEST					
Therapeutic Monitoring:	YES	Poor Response:	NO	Suspected Toxicity:	NO
				Non Compliance:	NO
ORDER REMARKS					
NONE					
DRUG DETAILS					
Rx No:	ETD0000261951	Dosage:	200 mg	Frequency	BD (twice daily)
				Duration	2 Months
Route:	Oral	Start Date:	15/08/2016	End Date	14/10/2016
SAMPLING DETAILS					
Drug Name	Sample Type	Lab Test Order	Drug Administration Date/Time	Suggested Sampling Date/Time	Interval
Sodium Valproate 200 mg Tablet	PRE	Valproic Acid PRE	20/09/2016 08:05	20/09/2016 07:05	1 Hours

Figure 3.0-13 TDM Request Form

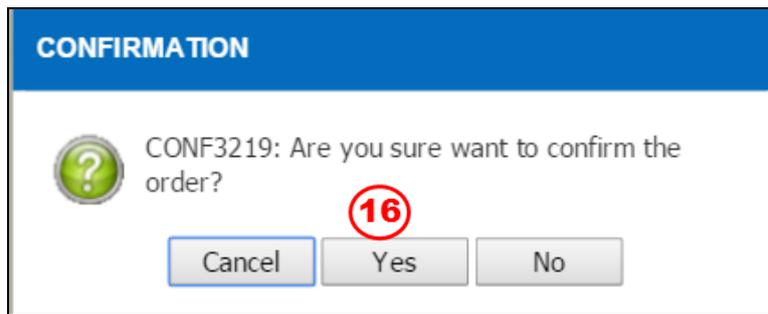


Figure 3.0-14 Confirmation alert message

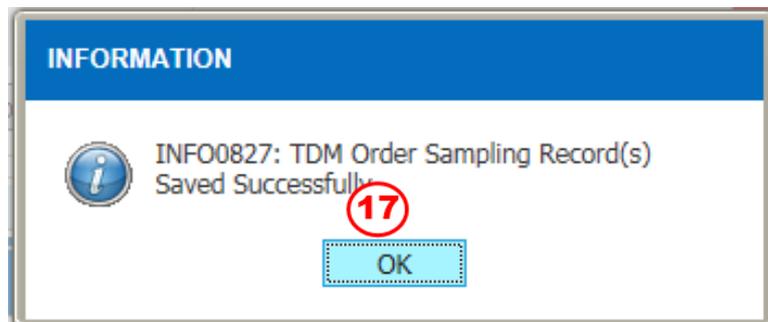
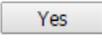


Figure 3.0-15 Information alert message

STEP 16

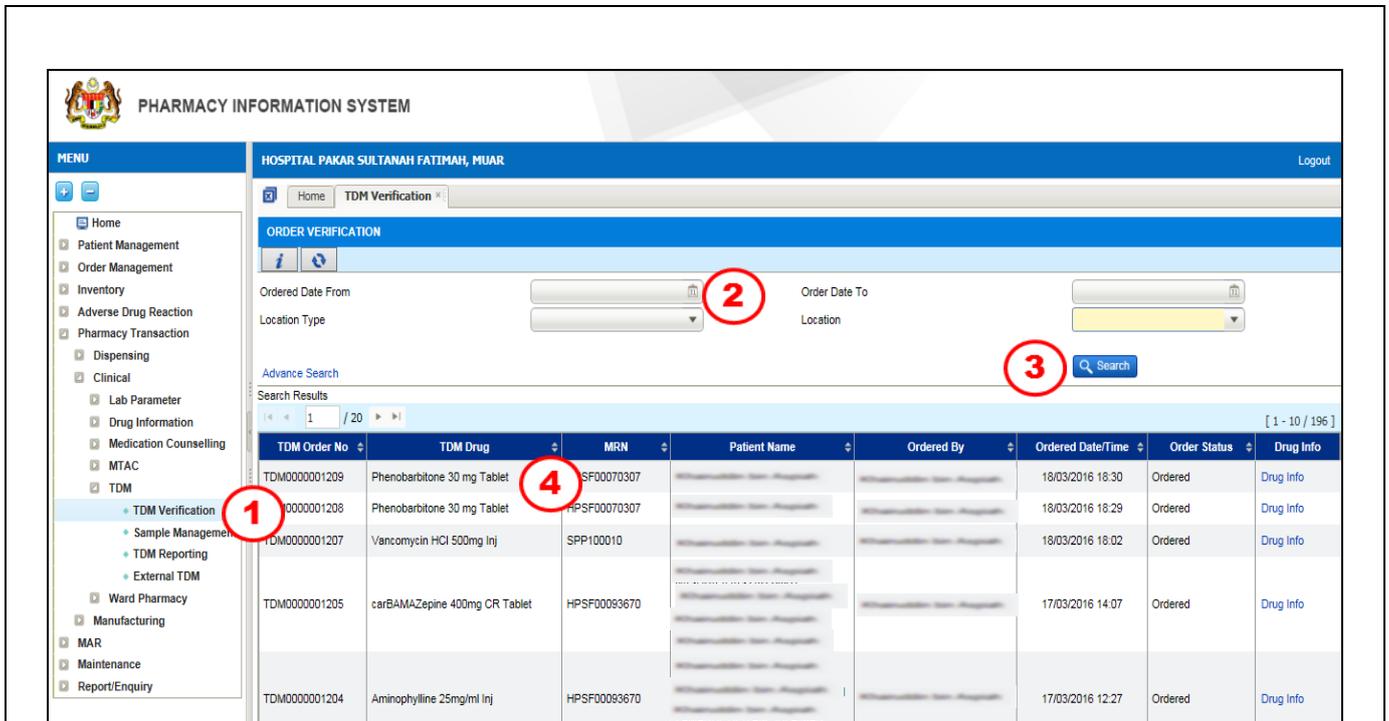
Click on the  button to save record

STEP 17

Click on the  button to save TDM record successfully

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	Ordered By	Ordered Date/Time	Order Status	Drug Info
TDM0000001209	Phenobarbitone 30 mg Tablet	HPSF00070307			18/03/2016 18:30	Ordered	Drug Info
TDM0000001208	Phenobarbitone 30 mg Tablet	HPSF00070307			18/03/2016 18:29	Ordered	Drug Info
TDM0000001207	Vancomycin HCl 500mg Inj	SPP100010			18/03/2016 18:02	Ordered	Drug Info
TDM0000001205	carBAMAZepine 400mg CR Tablet	HPSF00083670			17/03/2016 14:07	Ordered	Drug Info
TDM0000001204	Aminophylline 25mg/ml Inj	HPSF00083670			17/03/2016 12:27	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

STEP 3

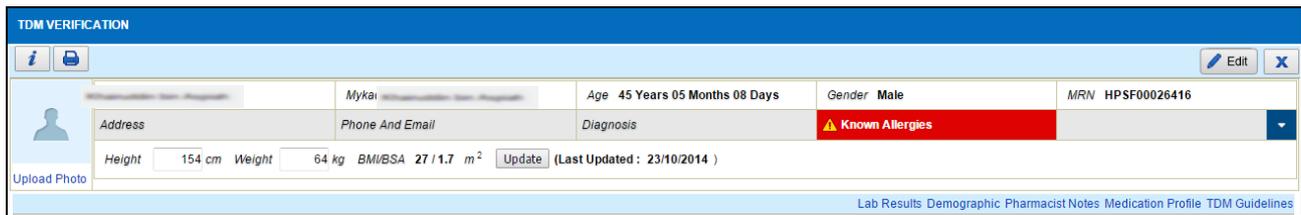
Click on the  button to search for TDM orders

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.



TDM VERIFICATION

Myka: [Redacted] Age: 45 Years 05 Months 08 Days Gender: Male MRN: HPSF00026416

Address: [Redacted] Phone And Email: [Redacted] Diagnosis: [Redacted] **Known Allergies**

Height: 154 cm Weight: 64 kg BMI/BSA: 27 / 1.7 m² (Last Updated: 23/10/2014)

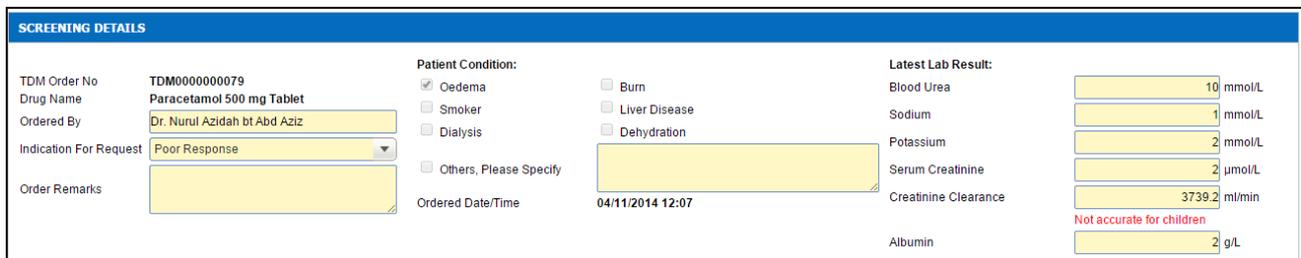
Lab Results Demographic Pharmacist Notes Medication Profile TDM Guidelines

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 m².



SCREENING DETAILS

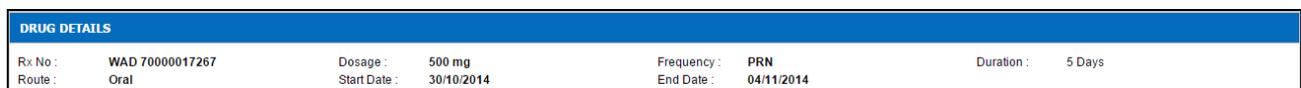
TDM Order No: TDM000000079
Drug Name: Paracetamol 500 mg Tablet
Ordered By: Dr. Nurul Azidah bt Abd Aziz
Indication For Request: Poor Response
Order Remarks: [Redacted]

Patient Condition:
 Oedema
 Burn
 Smoker
 Liver Disease
 Dialysis
 Dehydration
 Others, Please Specify: [Redacted]
 Ordered Date/Time: 04/11/2014 12:07

Latest Lab Result:
 Blood Urea: 10 mmol/L
 Sodium: 1 mmol/L
 Potassium: 2 mmol/L
 Serum Creatinine: 2 µmol/L
 Creatinine Clearance: 3739.2 ml/min
 Albumin: 2 g/L
 (Note: Creatinine Clearance is marked as 'Not accurate for children')

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



DRUG DETAILS

Rx No: WAD 70000017267 Dosage: 500 mg Frequency: PRN Duration: 5 Days
 Route: Oral Start Date: 30/10/2014 End Date: 04/11/2014

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

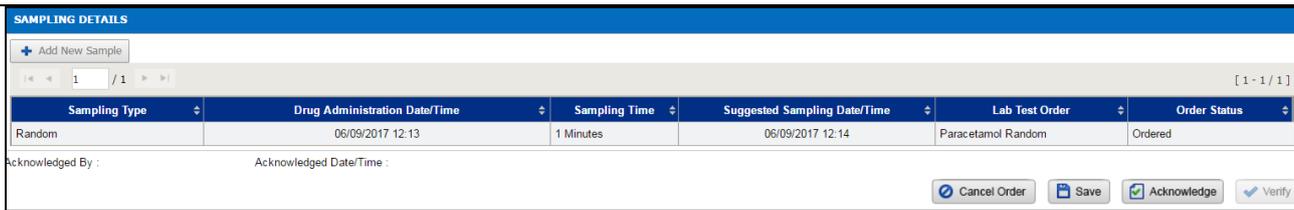


Figure 4.0-5 Sampling Details

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

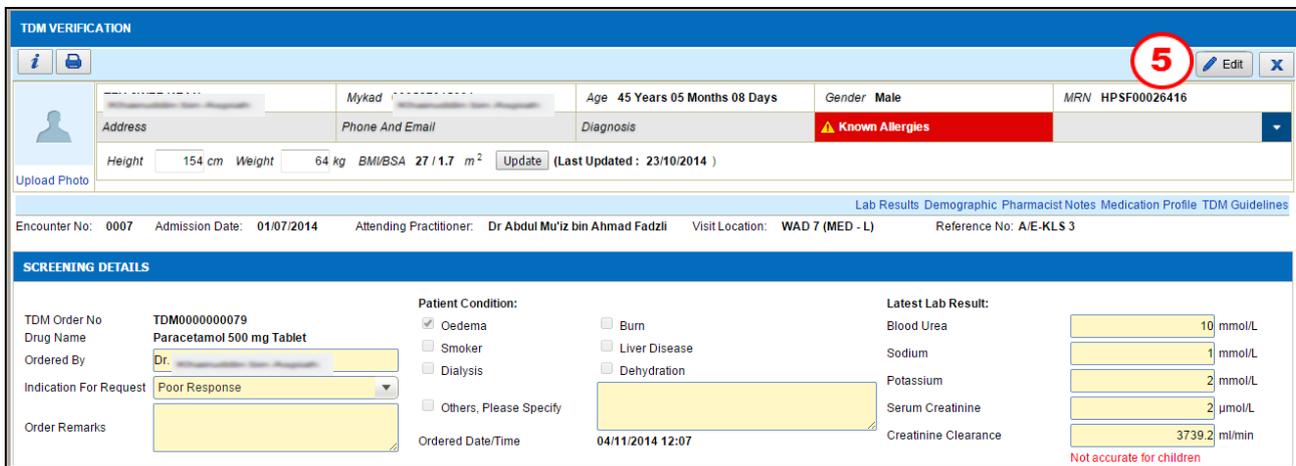


Figure 4.0-6 TDM Verification

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 DETAILS					
+ Add New Sample					
[1 - 1 / 1]					
Sampling Type	Drug Administration Date/Time	Interval	Suggested Sampling Date/Time	Lab Test Order	Order Status
RANDOM	04/11/2014 12:14	1 Hours	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	MRN	HPSF00033012
Address	Phone And Email	Diagnosis	No known Allergies		
Height	168 cm	Weight	55 kg	BMI/BSA	19.5 / 1.6 m ²
Update (Last Updated : 06/09/2017) Nationality : Warganegara					
Encounter No: 0074 Admission Date: 21/01/2017 Attending Practitioner:					
SCREENING DETAILS					
DRUG DETAILS					
SAMPLING DETAILS					
+ Add New Sample					
[1 - 1 / 1]					
Sampling Type	Drug Administration Date/Time	Sampling Time	Suggested Sampling Date/Time	Lab Test Order	Order Status
Random	06/09/2017 12:13	1Minutes	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	Phone And Email	Diagnosis	No known Allergies
----------------	------------------------	------------------	---------------------------

Height: 168 cm Weight: 55 kg BMI/BSA: 19.5 / 1.6 m² (Last Updated : 06/09/2017) Nationality : Warganegara

Encounter No: 0074 Admission Date: 21/01/2017 Attending Practitioner: Visit Location: **DEWAN BERAU**

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	1Minutes	06/09/2017 12:14	Paracetamol Random	Ordered 6

Acknowledged By : Acknowledged Date/Time :

Figure 4.0-10 Save and Acknowledge Function

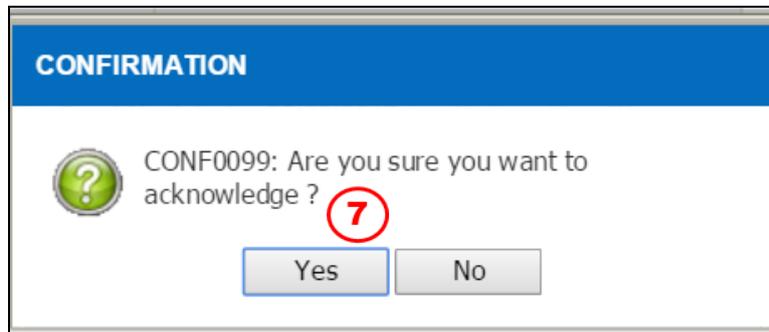
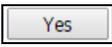


Figure 4.0-11 Confirmation alert message

STEP 6

Click on the  button to acknowledge order

STEP 7

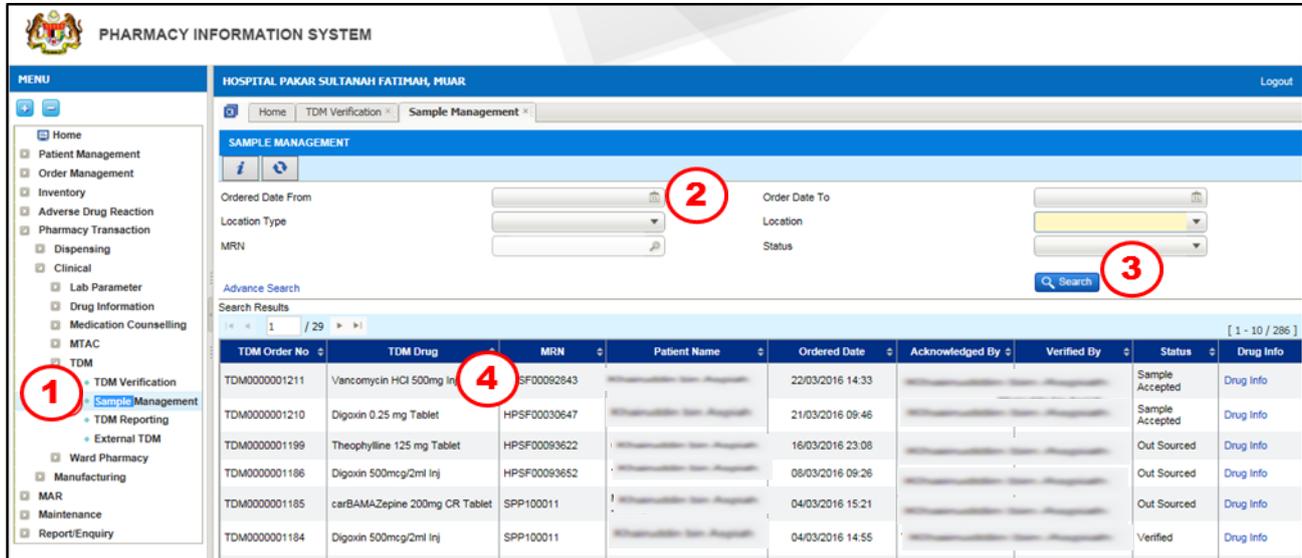
Click on the  button to save record

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.



TDM Order No	TDM Drug	MRN	Patient Name	Ordered Date	Acknowledged By	Verified By	Status	Drug Info
TDM0000001211	Vancomycin HCl 500mg Inj	SF00092843	[Redacted]	22/03/2016 14:33	[Redacted]	[Redacted]	Sample Accepted	Drug Info
TDM0000001210	Digoxin 0.25 mg Tablet	HPSF00030647	[Redacted]	21/03/2016 09:46	[Redacted]	[Redacted]	Sample Accepted	Drug Info
TDM0000001199	Theophylline 125 mg Tablet	HPSF00093622	[Redacted]	16/03/2016 23:08	[Redacted]	[Redacted]	Out Sourced	Drug Info
TDM0000001186	Digoxin 500mcg/2ml Inj	HPSF00093652	[Redacted]	08/03/2016 09:28	[Redacted]	[Redacted]	Out Sourced	Drug Info
TDM0000001185	carBAMAZepine 200mg CR Tablet	SPP100011	[Redacted]	04/03/2016 15:21	[Redacted]	[Redacted]	Out Sourced	Drug Info
TDM0000001184	Digoxin 500mcg/2ml Inj	SPP100011	[Redacted]	04/03/2016 14:55	[Redacted]	[Redacted]	Verified	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

Note

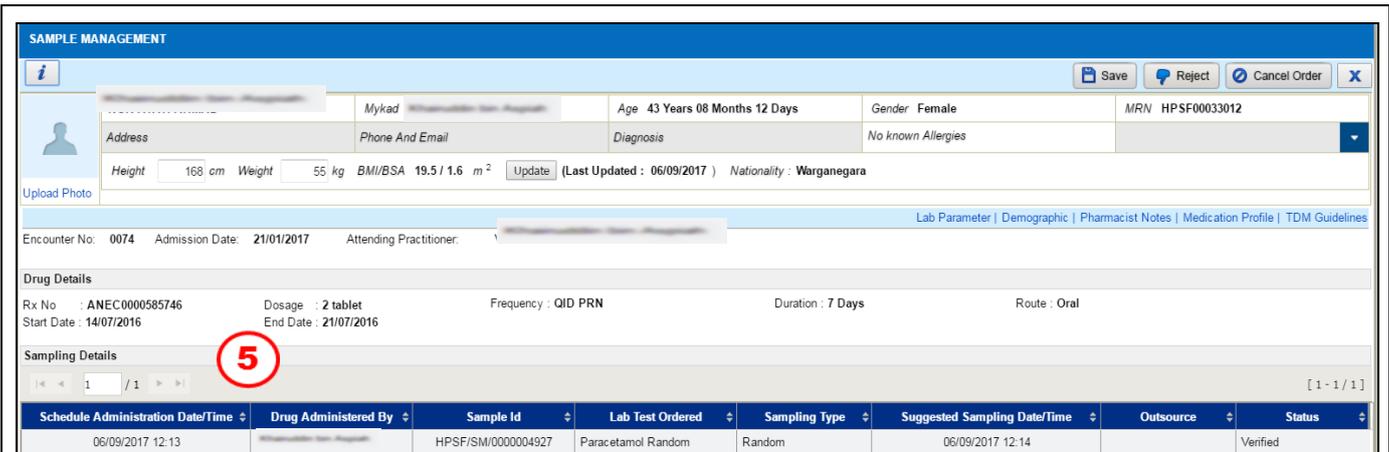
Click on the [Go To Advance Search](#) hyperlink for advance search.

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: HPSF00033012

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

Height: 168 cm Weight: 55 kg BMI/BSA: 19.5 / 1.6 m² Update (Last Updated: 06/09/2017) Nationality: Warganegara

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

Drug Details

Rx No: ANEC0000585746 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]	HPSF/SM/0000004927	Paracetamol Random	Random	06/09/2017 12:14		Verified

Figure 5.0-2 Sample Management

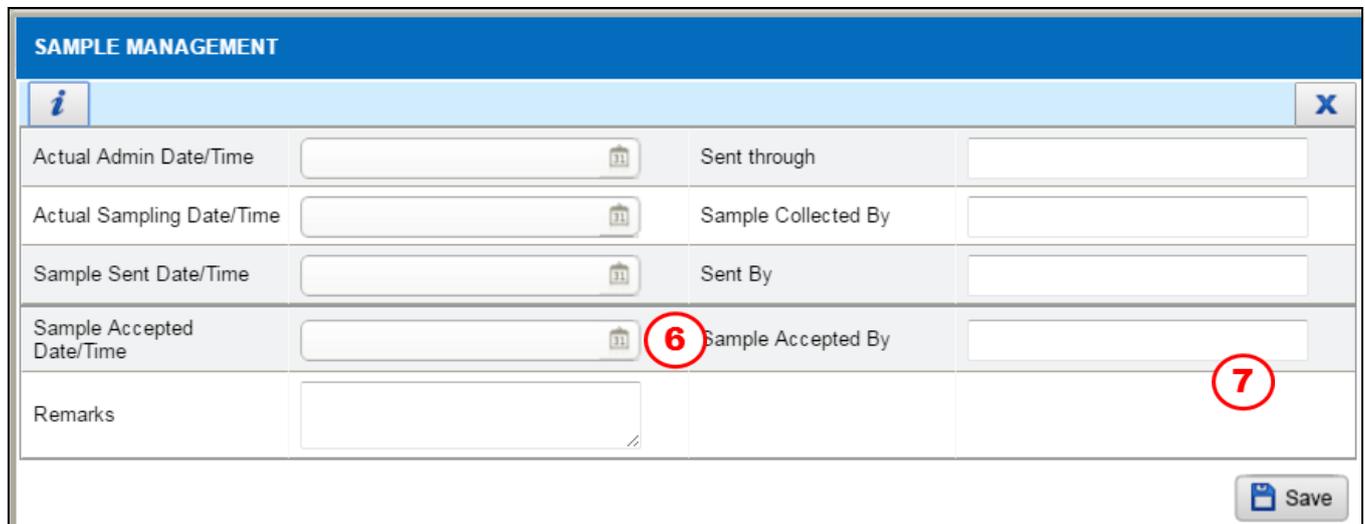
STEP 5

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 Sent through

Actual Sampling Date/Time Sample Collected By

Sample Sent Date/Time Sent By

Sample Accepted Date/Time **6** Sample Accepted By **7**

Remarks

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”.

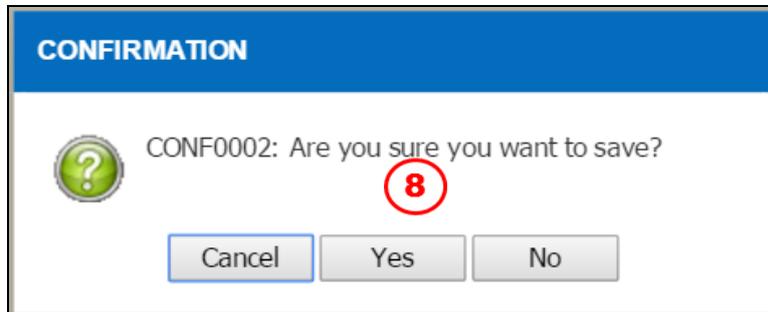


Figure 5.0-4 Confirmation alert message

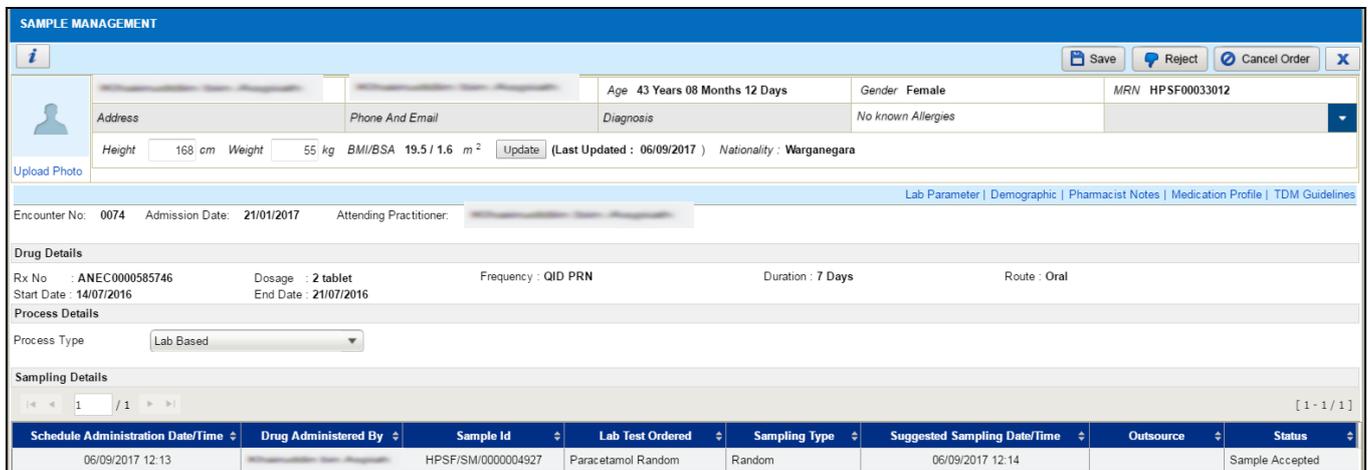
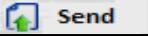


Figure 5.0-5 Outsource

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



Figure 5.0-6 Process Type

SAMPLE MANAGEMENT																			
[Info]		[Print]				[Save]		[Reject]		[Cancel Order]		[X]							
Myk: [Myk]		Age: 45 Years 05 Months 08 Days		Gender: Male		MRN: HPSF00026416													
Address		Phone And Email		Diagnosis		Known Allergies													
Height: 154 cm		Weight: 64 kg		BMI/BSA: 27 / 1.7 m ²		[Update]		(Last Updated: 23/10/2014)											
[Upload Photo]																			
Encounter No: 0007										Admission Date: 01/07/2014		Attending Practitioner: [Name]		Izli		Visit Location: WAD 7 (MED - L)		Reference No: A/E-KLS 3	
Drug Details																			
Rx No: WAD 70000017267		Dosage: 500 mg		Frequency: PRN		Duration: 5 Days		Route: Oral											
Start Date: 30/10/2014		End Date: 04/11/2014																	
Process Details																			
Process Type: Out Source										Send To: Hospital Kulim		[Send]							

Figure 5.0-7 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 reject the sampling details. User needs to place a new order.
- Click on the  button to cancel the order. User may not need to place new order.

6.0 TDM Reporting

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

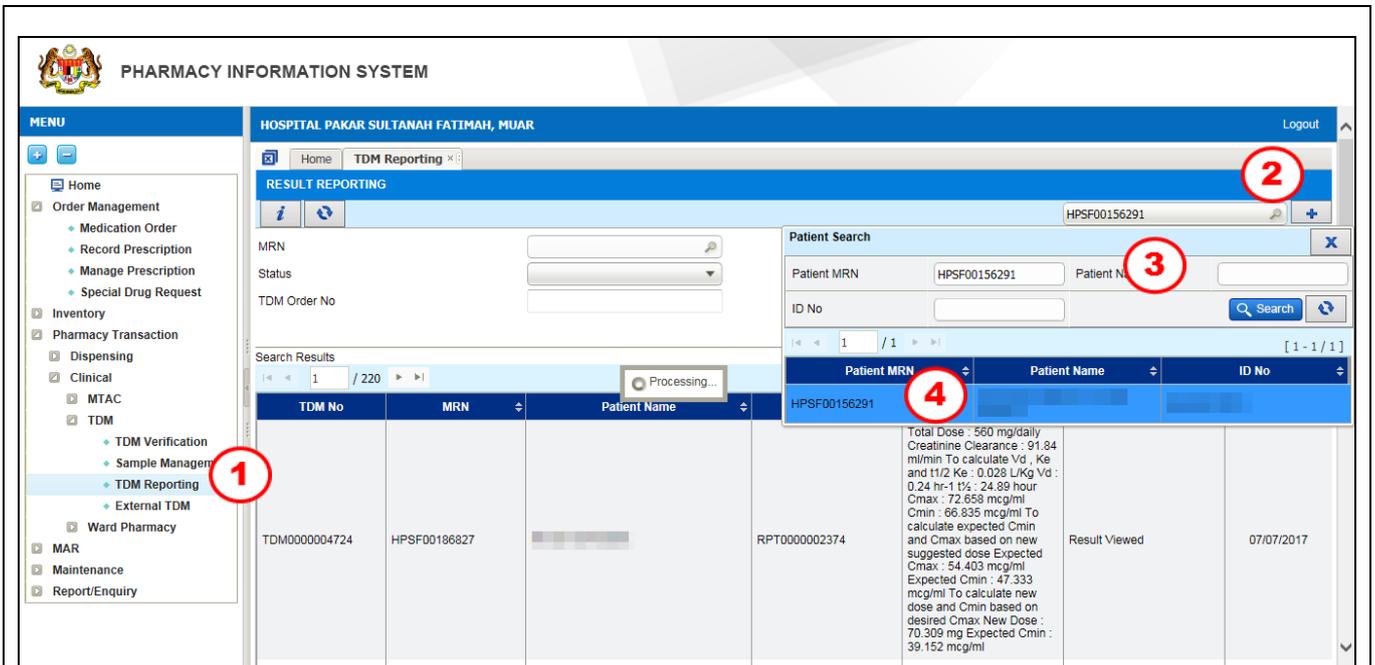


Figure 6.0-1 TDM Reporting Listing Page

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

Logout

Home TDM Reporting

RESULT REPORTING

HPSF00156291

MRN: Patient Name:

Status: Report No:

TDM Order No: Toxic:

Search

Search Results [1 - 10 / 2191]

TDM No	MRN	Patient Name	Report Number	Remarks	Order Status	Report Date
TDM0000004724	HPSF00186827	[REDACTED]	RPT0000002374	Total Dose : 560 mg/daily Creatinine Clearance : 91.84 ml/min To calculate Vd , Ke and t1/2 Ke : 0.028 L/Kg Vd : 0.24 hr-t1/2 : 24.89 hour Cmax : 72.658 mcg/ml Cmin : 66.835 mcg/ml To calculate expected Cmin and Cmax based on new suggested dose Expected Cmax : 54.403 mcg/ml Expected Cmin : 47.333 mcg/ml To calculate new dose and Cmin based on desired Cmax New Dose : 70.309 mg Expected Cmin : 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 ABUJALAN BIN SULAIM Mykad: [REDACTED] Age: 53 Years 02 Months 28 Days Gender: Male MRN: HPSF00156291

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

Height: 163 cm Weight: 50 kg BMI/BSA: 18.8 / 1.51 m² Update (Last Updated: 29/06/2017) Nationality: Warganegara

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

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

+ Add CP2

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
No Records Found!													

Pharmacist Note:

Remarks:

Total Cost of Analysis:

TDM service Charge in RM:

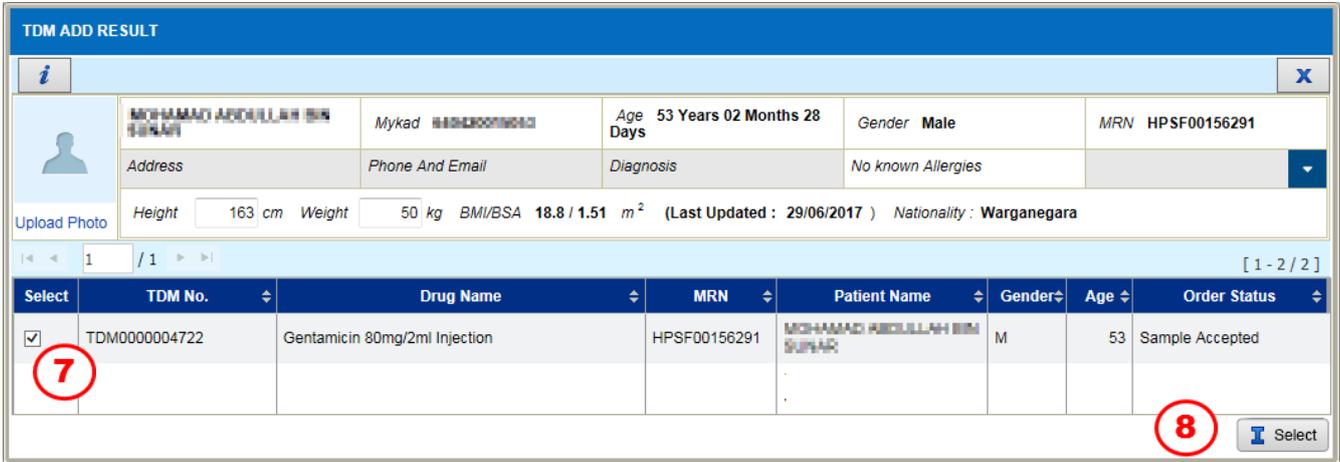
Save Confirm

+ Place TDM Order Save

Figure 6.0-3 TDM Reporting

STEP 6

Click on the  button to display TDM Add Result screen



TDM ADD RESULT

MOHAMAD ABDULLAH BIN SUNAR | Mykad: 8804280110000 | 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 m² (Last Updated: 29/06/2017) | Nationality: Warganegara

Select	TDM No.	Drug Name	MRN	Patient Name	Gender	Age	Order Status
<input checked="" type="checkbox"/>	TDM0000004722	Gentamicin 80mg/2ml Injection	HPSF00156291	MOHAMAD ABDULLAH BIN SUNAR	M	53	Sample Accepted



Figure 6.0-4 TDM Add Result

STEP 7

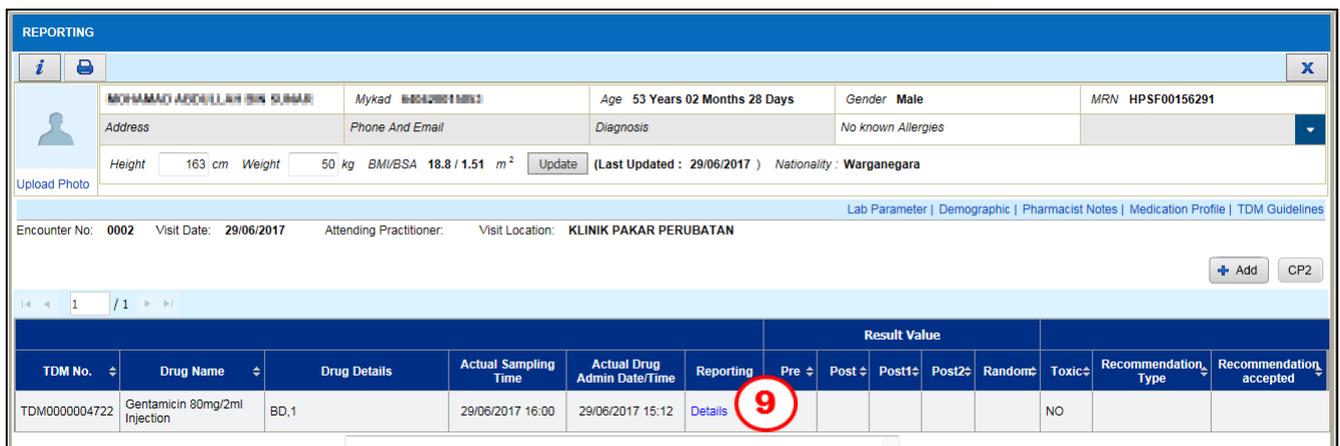
Select on checkbox(es) for selected TDM order

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



REPORTING

MOHAMAD ABDULLAH BIN SUNAR | Mykad: 8804280110000 | 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 m² | 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

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 15:12	Details						NO		

Figure 6.0-5 Reporting Details Hyperlink

STEP 9

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

REPORTING

i
X

<p>Post1 Sample</p> <p>Result Value <input type="text"/> <input type="text"/></p> <p>Reported By <input type="text"/> Details</p> <p>Post2 Sample</p> <p>Result Value <input type="text" value="21"/> <input type="text" value="mcg/ml"/> 10</p> <p>Reported By <input type="text"/> Details</p> <p>Random Sample</p> <p>Result Value <input type="text"/> <input type="text"/></p> <p>Reported By <input type="text"/> Details</p> <p>Calculator <input type="text"/> 11</p> <div style="border: 1px solid #ccc; padding: 5px; margin-top: 5px;"> Aminoglycoside Pre -Post Aminoglycoside Pre Aminoglycoside Post1-Post6 Aminoglycoside Post </div> <p>Pharmacokinetics Profile</p> <p>Recommendation Type <input type="text"/></p> <p>Toxic <input type="checkbox"/> <input checked="" type="checkbox"/> No</p>	<p>Latest Lab Result:</p> <p>Blood Urea <input type="text" value="25"/> mmol/L</p> <p>Sodium <input type="text" value="31"/> mmol/L</p> <p>Potassium <input type="text" value="33"/> mmol/L</p> <p>Serum Creatinine <input type="text" value="35"/> µmol/L</p> <p>Creatinine Clearance <input type="text" value="152.87"/> ml/min Not accurate for Children</p> <p>Albumin <input type="text" value="37"/> g/L</p>
---	--

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

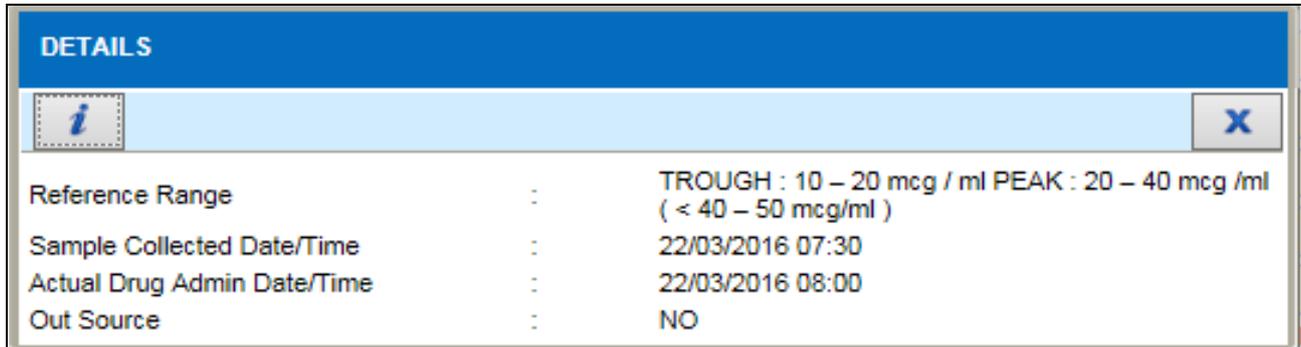
STEP 10

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

<p>Post1 Sample</p> <p>Result Value <input type="text"/> <input type="text"/></p> <p>Reported By <input type="text"/> Details</p> <p>Post2 Sample</p> <p>Result Value <input type="text" value="21"/> <input type="text" value="mcg/ml"/></p> <p>Reported By <input type="text"/> Details</p> <p>Random Sample</p> <p>Result Value <input type="text"/> <input type="text"/></p> <p>Reported By <input type="text"/> Details</p> <p>Calculator <input type="text"/></p>	<p>Latest Lab Result:</p> <p>Blood Urea <input type="text" value="25"/> mmol/L</p> <p>Sodium <input type="text" value="31"/> mmol/L</p> <p>Potassium <input type="text" value="33"/> mmol/L</p> <p>Serum Creatinine <input type="text" value="35"/> μmol/L</p> <p>Creatinine Clearance <input type="text" value="152.87"/> ml/min Not accurate for Children</p> <p>Albumin <input type="text" value="37"/> g/L</p>
--	--

Pharmacokinetics Profile

t½ : 24.89 hour
C_{max} : 72.658 mcg/ml
C_{min} : 66.835 mcg/ml

To calculate expected C_{min} and C_{max} based on new suggested dose 12

Expected C_{max} : 54.403 mcg/ml
Expected C_{min} : 47.333 mcg/ml

To calculate new dose and C_{min} based on desired C_{max}

New Dose : 70.309 mg
Expected C_{min} : 39.152 mcg/ml

Recommendation Type 13

Toxic No 14

15

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 button to proceed with TDM reporting process

REPORTING

X

	MOHAMMAD ABDULLAH BIN SUNAR	Mykad: 88042811MKT	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 ²	Update (Last Updated: 29/06/2017)		Nationality: Warganegara

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

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

+ Add
CP2

<< 1 / 1 >>
[1 - 1 / 1]

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

Pharmacist Note

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

1904 characters allowed

Remarks

Total Cost of Analysis

TDM service Charge in RM

16
17

Save
 Confirm

+ Place TDM Order

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 Save button to save report

Note

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

STEP 17

Click on the Confirm button to confirm report

Note

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

REPORTING



MOHAMMAD ABDULLAH BIN SUKRI Mykad: **880420115951** 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 m²** (Last Updated: 29/06/2017) Nationality: **Warganegara**

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

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

+ Add CP2

[1 - 1 / 1]

TDM No.	Drug Name	Drug Details	Actual Sampling Time	Actual Drug Admin Date/Time	Reporting	Result Value					Toxic	Recommendation Type	Recommendation accepted	
Pre	Post	Post1	Post2	Random										
TDM0000004722	Gentamicin 80mg/2ml Injection	BD,1	29/06/2017 16:00	29/06/2017 15:12	Details					21.0		NO	Maintain The Dose	<input checked="" type="checkbox"/>

Pharmacist Note

TDM0000004722 - Gentamicin 80mg/2ml Injection - Maintain The Dose
Result Value :-
Y :21.0 mcg/ml

18

Remarks

1904 characters allowed

Total Cost of Analysis

TDM service Charge in RM

19

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.



PhIS & CPS Project User Manual – Therapeutic Drug Monitoring



REPORTING

MUHAMMAD HADIPULLAH BIN SUKRI Mykad: **980420015091** 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 m²** (Last Updated: 29/06/2017) Nationality: **Warganegara**

Upload Photo

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

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

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/0000004848	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 : 05/06/2017 Printed By: Unit 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 SPUB 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	Mrn No	Patient Name	Patient ID	TDM Drug	Sample Type	Date/Time	Register
<input type="checkbox"/> Hospital Pakar Sultanah Fatimah, Muar	HPSF00007006	[blurred]	[blurred]	carBAMAZepine 200mg Tablet	RANDOM	22/07/2014 13:26	Register
<input type="checkbox"/> Hospital Pakar Sultanah Fatimah, Muar	HPSF00017231	[blurred]	[blurred]	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	Mrn No	Patient Name	Patient ID	TDM Drug	Sample Type	Date/Time	Register
<input type="checkbox"/> Hospital Pakar Sultanah Fatimah, Muar	HPSF00007006	[blurred]	[blurred]	carBAMAZepine 200mg Tablet	RANDOM	22/07/2014 13:26	Register
<input checked="" type="checkbox"/> Hospital Pakar Sultanah Fatimah, Muar	HPSF00017231	[blurred]	[blurred]	Sodium Valproate 200 mg Tablet	PRE	22/09/2014 15:48	Registered

Figure 7.1-3 Outsource Listing – Registered Patient

STEP 3

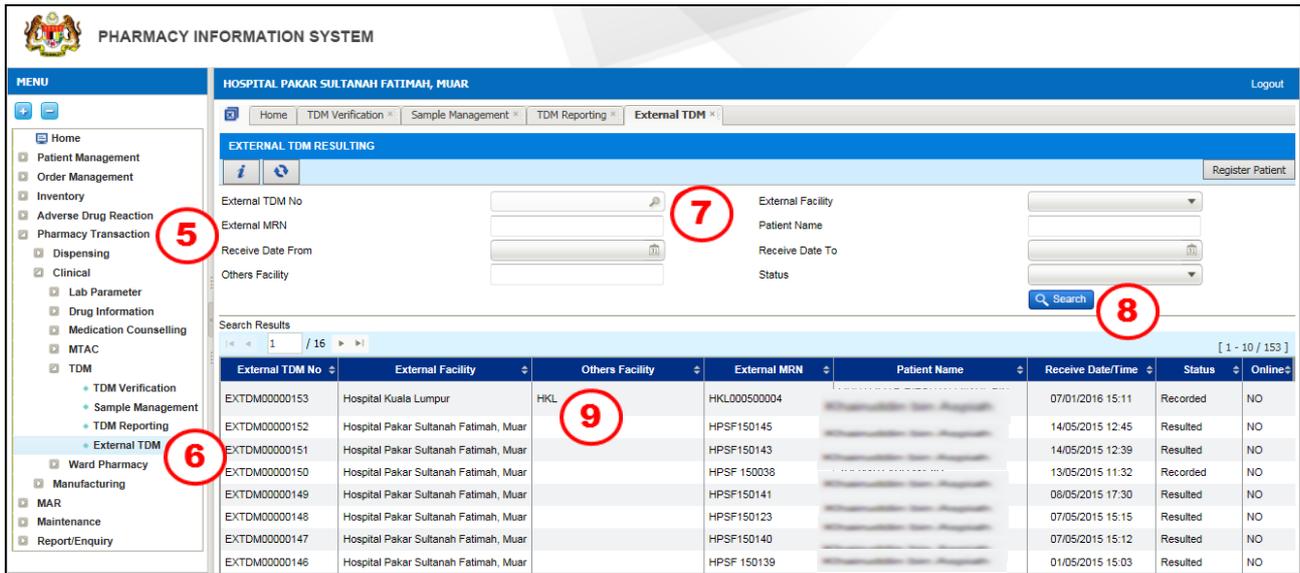
Click on the checkbox for selected patient

STEP 4

Click on the  button to save the record

Note

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



PHARMACY INFORMATION SYSTEM

HOSPITAL PAKAR SULTANAH FATIMAH, MUAR

Home | TDM Verification | Sample Management | TDM Reporting | External TDM

EXTERNAL TDM RESULTING

Register Patient

External TDM No: (7)

External Facility:

External MRN:

Patient Name:

Receive Date From:

Receive Date To:

Others Facility:

Status:

Search (8)

Search Results

External TDM No	External Facility	Others Facility	External MRN	Patient Name	Receive Date/Time	Status	Online
EXTDM00000153	Hospital Kuala Lumpur	HKL	HKLD00500004	[REDACTED]	07/01/2016 15:11	Recorded	NO
EXTDM00000152	Hospital Pakar Sultanah Fatimah, Muar		HPSF150145	[REDACTED]	14/05/2015 12:45	Resulted	NO
EXTDM00000151	Hospital Pakar Sultanah Fatimah, Muar		HPSF150143	[REDACTED]	14/05/2015 12:39	Resulted	NO
EXTDM00000150	Hospital Pakar Sultanah Fatimah, Muar		HPSF 150038	[REDACTED]	13/05/2015 11:32	Recorded	NO
EXTDM00000149	Hospital Pakar Sultanah Fatimah, Muar		HPSF150141	[REDACTED]	08/05/2015 17:30	Resulted	NO
EXTDM00000148	Hospital Pakar Sultanah Fatimah, Muar		HPSF150123	[REDACTED]	07/05/2015 15:15	Resulted	NO
EXTDM00000147	Hospital Pakar Sultanah Fatimah, Muar		HPSF150140	[REDACTED]	07/05/2015 15:12	Resulted	NO
EXTDM00000146	Hospital Pakar Sultanah Fatimah, Muar		HPSF 150139	[REDACTED]	01/05/2015 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

X

External TDM No : EXTDM00000004

Patient Details

External MRN : HPSF00017231 10 Patient Name: [Redacted] Patient Id Num: [Redacted] External Facility : Hospital Pakar Sultanah Fatimah, Muar

Delivery Details

Sample Sent By: Sample Sent Date/Time:

Sample Received By: Sample Received Date/Time:

Drug Details

TDM Drug: Sampling Type: + Add

Drug Name	Sample Type	Result Value	UOM	Lab Based	Toxic	Status	Delete	Reject
carBAMAZepine 200mg Tablet	PRE	11	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	Recorded	<input type="checkbox"/>	<input type="checkbox"/>

Prepared By: Remarks:

Figure 7.1-5 External TDM Resulting

STEP 10
Enter **Delivery Details** as below:

- a) Sample Sent By
- b) Sample Sent Date/Time
- c) Sample Received By
- d) 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.

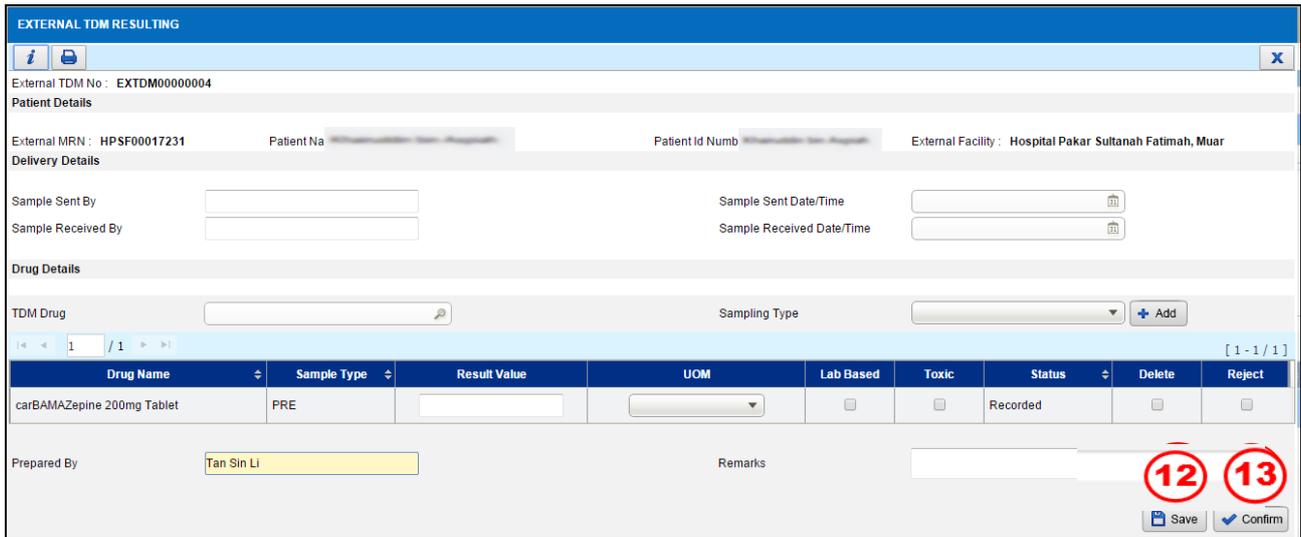
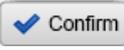


Figure 7.1-6 External TDM Resulting

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](#))

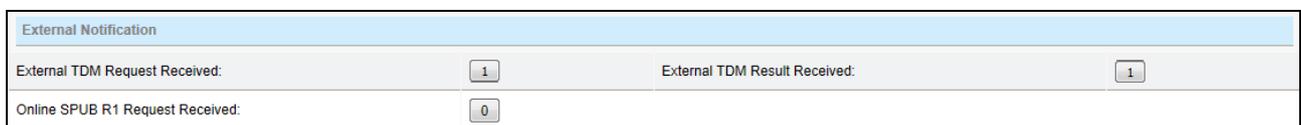
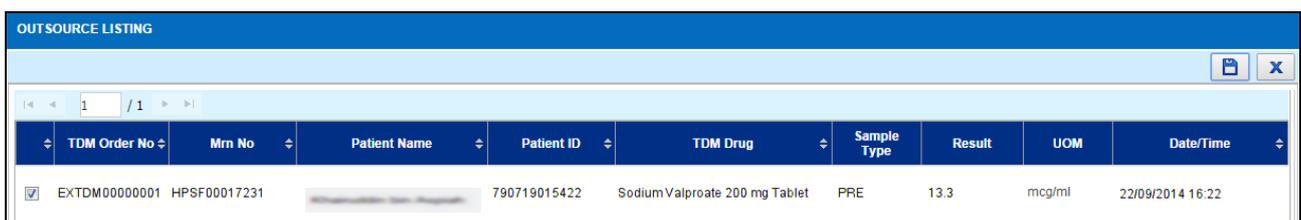


Figure 7.1-7 External Notification

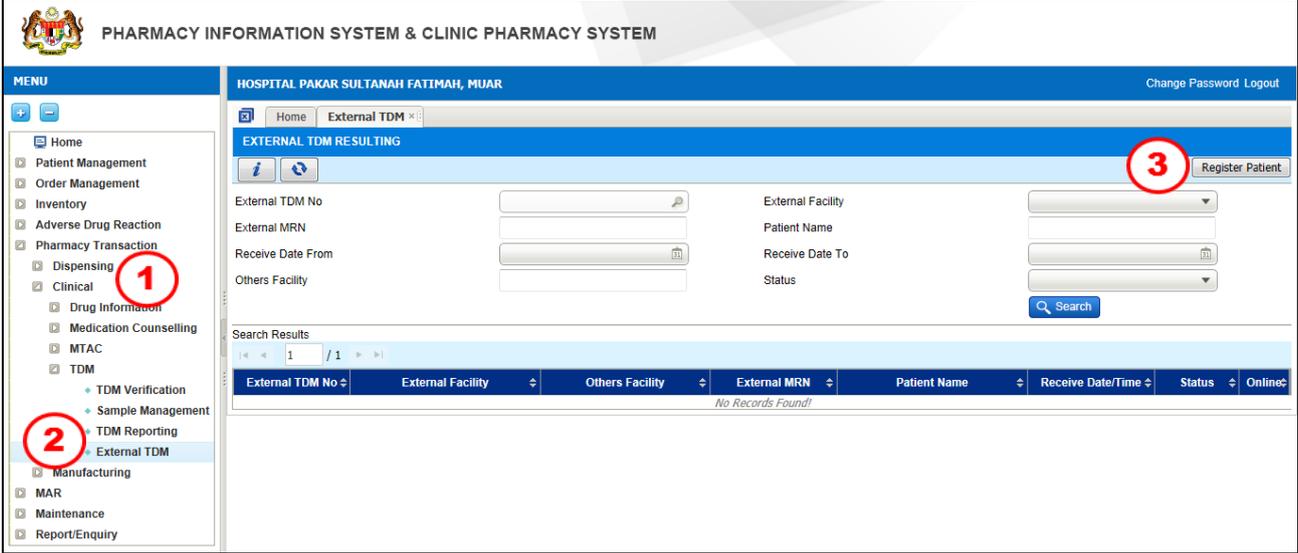


TDM Order No	Mrn No	Patient Name	Patient ID	TDM Drug	Sample Type	Result	UOM	Date/Time
<input checked="" type="checkbox"/>	EXTDM00000001	HPSF00017231	790719015422	Sodium Valproate 200 mg Tablet	PRE	13.3	mcg/ml	22/09/2014 16:22

Figure 7.1-8 Outsource Listing

7.2 External TDM Offline

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



The screenshot displays the 'EXTERNAL TDM RESULTING' page. The left-hand menu has 'External TDM' selected, indicated by a red circle with the number '2'. The main area contains a 'Register Patient' button, also circled with a red '3'. Below this are input fields for 'External TDM No', 'External Facility', 'Patient Name', 'Receive Date From', 'Receive Date To', and 'Others Facility'. A 'Search' button is located to the right of these fields. The search results section shows a table with columns: External TDM No, External Facility, Others Facility, External MRN, Patient Name, Receive Date/Time, Status, and Online. The table is currently empty, with the text 'No Records Found!' displayed below it.

Figure 7.2-1 External TDM Listing Page

STEP 1

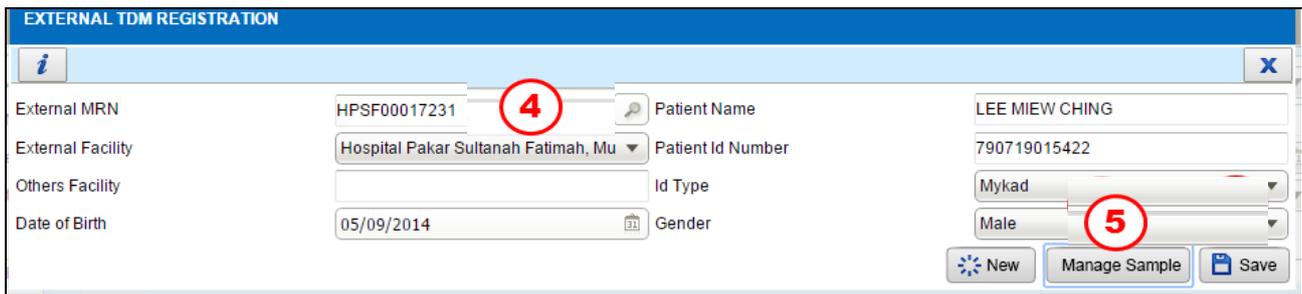
Click on 'Pharmacy Transaction' menu follow by 'Clinical' sub-menu

STEP 2

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

STEP 3

Click on the  button to register external patient



EXTERNAL TDM REGISTRATION			
External MRN	HPSF00017231	Patient Name	LEE MIEW CHING
External Facility	Hospital Pakar Sultanah Fatimah, Mu	Patient Id Number	790719015422
Others Facility		Id Type	Mykad
Date of Birth	05/09/2014	Gender	Male

New Manage Sample Save

Figure 7.2-2 External TDM Registration

STEP 4

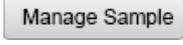
Enter details in the fields below:

- 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

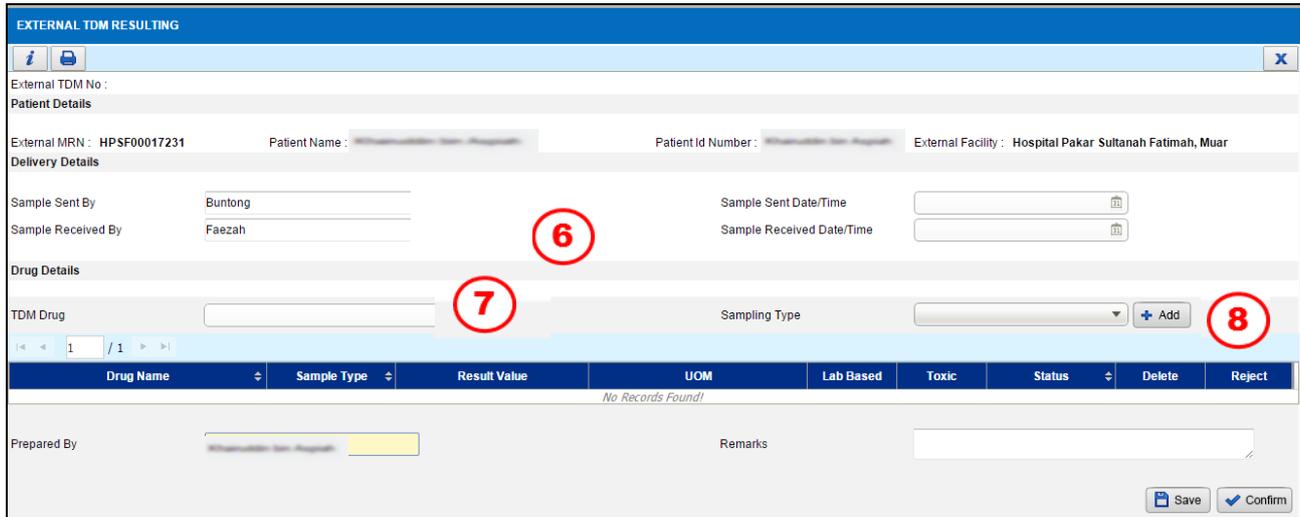
Click on the External MRN  button to search for registered patient and all fields will be automatically retrieved.

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



The screenshot shows the 'EXTERNAL TDM RESULTING' form. It includes fields for Patient Details (External MRN, Patient Name, Patient Id Number, External Facility), Delivery Details (Sample Sent By, Sample Received By, Sample Sent Date/Time, Sample Received Date/Time), Drug Details (TDM Drug, Sampling Type), and a table for results. Annotations 6, 7, and 8 are placed over the Sample Received Date/Time field, the TDM Drug search button, and the Add button respectively.

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

Figure 7.2-3 External TDM Resulting

STEP 6

Enter **Delivery Details** as below:

- a. Sample Sent By
- b. Sample Sent Date/Time
- c. Sample Received By
- d. 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 Numb: [Redacted] External Facility : Hospital Pakar Sultanah Fatimah, Muar

Delivery Details
 Sample Sent By: Buntong Sample Sent Date/Time: 05/11/2014 11:55
 Sample Received By: Faedah Sample Received Date/Time: 05/11/2014 11:55

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

Drug Name	Sample Type	Result Value	UOM	Lab Based	Toxic	Status	Delete	Reject
Theophylline 250 mg Long Acting Tablet	PRE	100 9	mg/dL	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>

Prepared By: Tan Lim Hui Remarks: [Text Area]

10 11

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	<i>Inpatient</i>	Click Here	12	<i>CDR Dispensing</i>	Click Here
2	<i>CDR Order</i>	Click Here	13	<i>Methadone Dispensing</i>	Click Here
3	<i>TDM Order</i>	Click Here	14	<i>PN Dispensing</i>	Click Here
4	<i>PN Order</i>	Click Here	15	<i>Order Management</i>	Click Here
5	<i>IV Order</i>	Click Here	16	<i>Patient Management</i>	Click Here
6	<i>Prepacking</i>	Click Here	17	<i>Radiopharmaceutical</i>	Click Here
7	<i>Galenical</i>	Click Here	18	<i>Outpatient</i>	Click Here
8	<i>MTAC</i>	Click Here	19	<i>Special Drug Request</i>	Click Here
9	<i>ADR & DAC</i>	Click Here	20	<i>MAR</i>	Click Here
10	<i>Medication Counselling</i>	Click Here	21	<i>DICE</i>	Click Here
11	<i>Ward Pharmacy</i>	Click Here	22		