



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

User Manual Therapeutic Drug Monitoring (TDM)

Version	: 12th Edition
Document ID	: U. MANUAL_THERAPEUTIC DRUG MONITORING



PhIS & CPS Project
User Manual – Therapeutic Drug
Monitoring



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Application reference: PhIS & CPS v2.5.1



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1.0 Introduction

1.1 Overview of PhIS

Pharmacy Information System or better known as PhIS, is a complete and comprehensive system that integrates pharmacy related services 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.

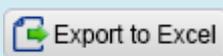
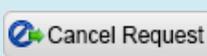
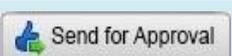
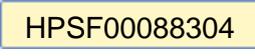
1.3 Organised Sections

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



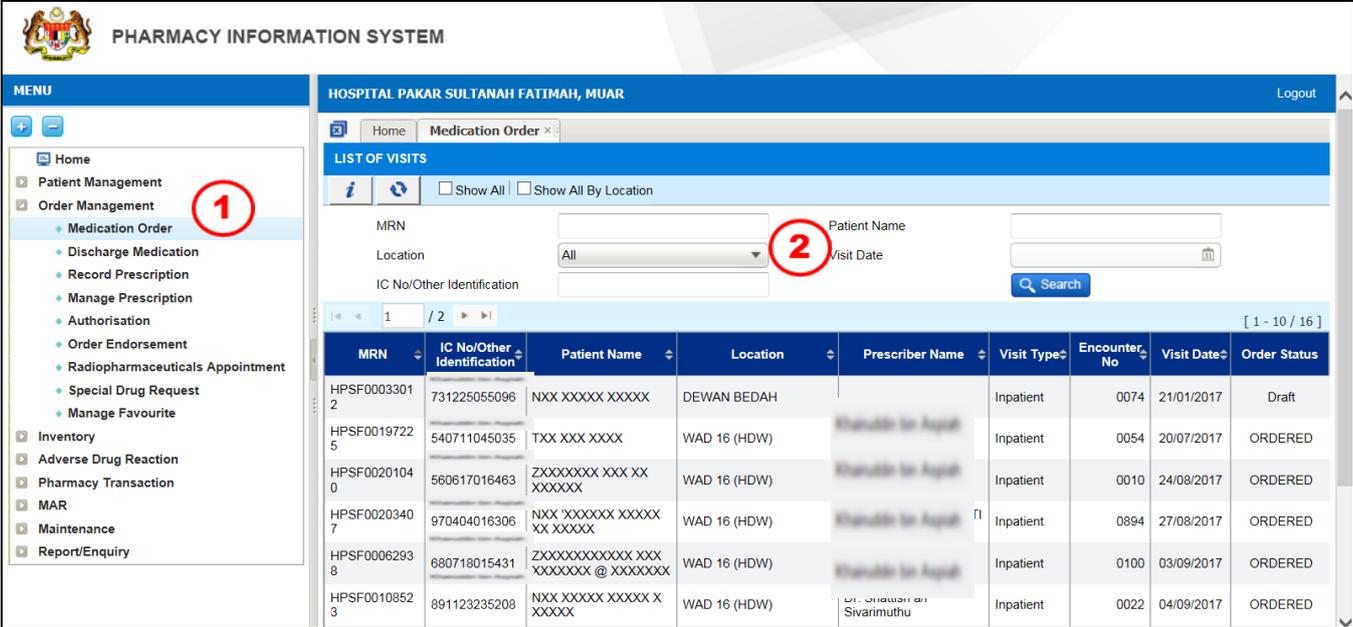
Therapeutic Drug Monitoring Module Legend			
Acknowledge	To Acknowledge	Drug Info	Drug Info
New	To Do New Order	Verify	To Verify
Cancel Order	Cancel the Order	+ Add New Sample	To Add New Sample
Send	To send request	CP2	Ward Pharmacy

Note

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

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.



PHARMACY INFORMATION SYSTEM

HOSPITAL PAKAR SULTANAH FATIMAH, MUAR

Logout

Home Medication Order

LIST OF VISITS

Show All Show All By Location

MRN: Patient Name:

Location: All Visit Date:

IC No/Other Identification:

1 / 2 [1 - 10 / 16]

MRN	IC No/Other Identification	Patient Name	Location	Prescriber Name	Visit Type	Encounter No	Visit Date	Order Status
HPSF00033012	731225055096	NXX XXXXX XXXXX	DEWAN BEDAH		Inpatient	0074	21/01/2017	Draft
HPSF00197225	540711045035	TXX XXX XXXX	WAD 16 (HDW)	Unavailable for Approval	Inpatient	0054	20/07/2017	ORDERED
HPSF00201040	560617016463	ZXXXXXXXX XXX XX XXXXXX	WAD 16 (HDW)	Unavailable for Approval	Inpatient	0010	24/08/2017	ORDERED
HPSF00203407	970404016306	NXX XXXXXX XXXXX XX XXXXX	WAD 16 (HDW)	Unavailable for Approval	Inpatient	0894	27/08/2017	ORDERED
HPSF00062938	680718015431	ZXXXXXXXXXXXX XXX XXXXXX @ XXXXXX	WAD 16 (HDW)	Unavailable for Approval	Inpatient	0100	03/09/2017	ORDERED
HPSF00108523	891123235208	NXX XXXXX XXXXX X XXXXX	WAD 16 (HDW)	Dr. Sivarimuthu	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, MUAR

Home Medication Order

LIST OF VISITS

MRN: [] Patient Name: []
 Location: All Visit Date: []
 IC No/Other Identification: []

[1 / 2] [1 - 10 / 16]

MRN	IC No/Other Identification	Patient Name	Location	Prescriber Name	Visit Type	Encounter No	Visit Date	Order Status
HPSF00033012	[]	NXX XXXXX XXXXX	DE [] EDAH	[]	Inpatient	0074	21/01/2017	Draft
HPSF00197225	5	TXX XXX XXXX	WAD [] (HDW)	[]	Inpatient	0054	20/07/2017	ORDERED
HPSF00201040	[]	ZXXXXXXXX XXX XX XXXXXX	WAD 16 (HDW)	[]	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

MEDICATION ORDER

TXX XXX XXXX Myka... Age 63 Years 05 Months 07 Days Gender Male MRN HPSF00197225

Address Phone And Email Diagnosis No known Allergies

Height [] cm Weight [] kg BMI/BSA 0.0 m² Update (Last Updated:) Nationality: Warganegara

Encounter No: 0054 Admission Date: 20/07/2017 Attending Practitioner: Dr. Thinesh Rao a/l Naidu Visit Location: WAD 16 (HDW)

TDM ORDER

Patient Condition: Oedema Burn Liver Disease Dehydration Others, Please Specify

Latest Lab Result: Blood Urea [] mmol/L Serum Creatinine [] μmol/L Sodium [] mmol/L Creatinine Clearance [] ml/min Potassium [] mmol/L Albumin [] g/L

DRUG DETAILS

Therapeutic Drug Monitoring

Drug Name Drug Details Order Remarks Drug Info

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.
- 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

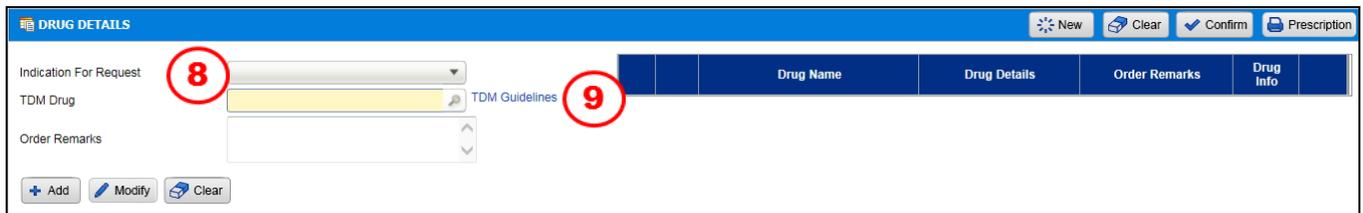


Figure 3.0-5 TDM Drug Details

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.

X

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:

Digoxin

Aminoglycoside Pre

Carbamazepine

Phenobarbitone

Vancomycin Pre

Theophylline

Valproic Acid

Vancomycin Post

Phenytoin

TDM GUIDELINE DETAIL

[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

Patient Diagnosis

Allergy

Adverse Drug Reaction

Nutritional Assessment

Normal Order

Infusion Order

Parenteral Nutrition

Cytotoxic Drug Reconstitution

Therapeutic Drug Monitoring

Radiopharmaceuticals

View MAR

Referral Visit

Patient Condition:

Oedema Burn

Smoker Liver Disease

Dialysis Dehydration

Others, Please Specify:

Latest Lab Result:

Blood Urea: mmol/L

Sodium: mmol/L

Potassium: mmol/L

Serum Creatinine: µmol/L

Creatinine Clearance: ml/min

Albumin: g/L

Not accurate for children

DRUG DETAILS

New

Clear

Confirm

Indication For Request:

TDM Drug:

Order Remarks:

Drug Details:

(Please specify current Dosage, Frequency, Start Date & End Date)

Drug Name	Drug Details	Order Remarks	Drug Info
Add Samp	Gentamicin 80mg/2ml Injection	80mg bd	i

Figure 3.0-8 TDM Drug Detail

MEDICATION ORDER

	<p>TEY SWEE KEAN</p> <p>Address: <input type="text"/></p> <p>Height: <input type="text" value="154 cm"/> Weight: <input type="text" value="64 kg"/> BMI/BSA: <input 20%;"="" type="text" value="27 / 1.7 m<sup>2</sup></p> </td> <td style=" width:=""/> <p>Mykad: <input type="text" value="690527015091"/></p> <p>Phone And Email: <input type="text"/></p> </p>	<p>Age: <input type="text" value="45 Years 05 Months 08 Days"/></p> <p>Diagnosis: <input type="text"/></p>	<p>Gender: <input type="text" value="Male"/></p> <p style="background-color: red; color: white; padding: 2px;">Known Allergies</p>	<p>MRN: <input type="text" value="HPSF00026416"/></p>
---	--	--	--	---

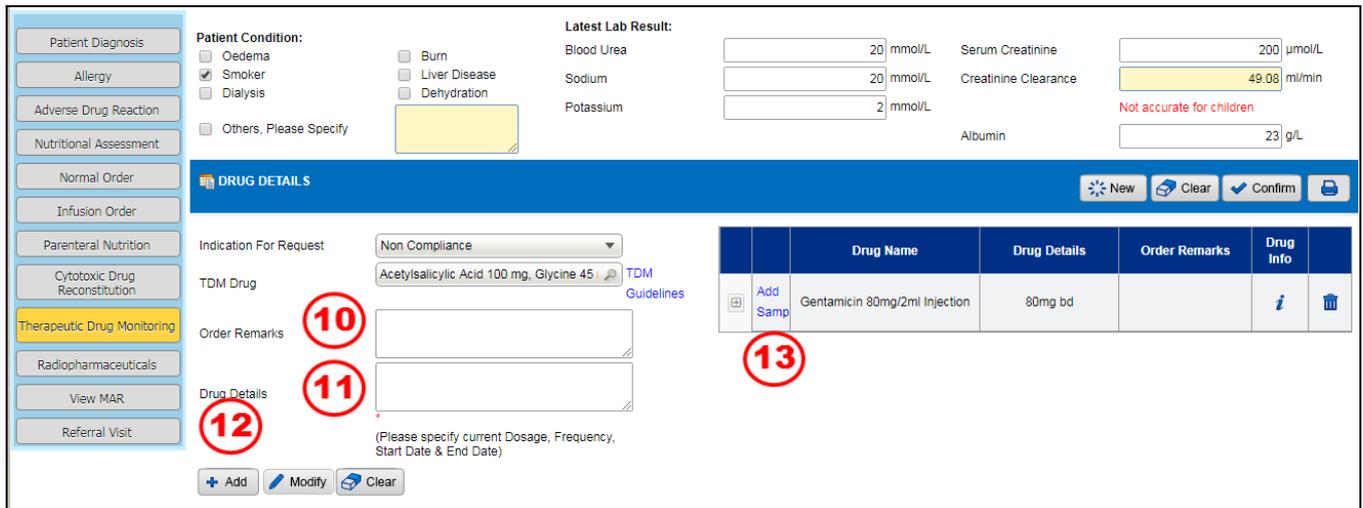
(Last Updated: 23/10/2014)

[Lab Results](#)
[Counselling History](#)
[Demographic](#)
[Pharmacist Notes](#)
[Medication Profile](#)
[Other Appointment](#)

Figure 3.0-9 Lab Result Hyperlink

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Page 8



Patient Condition:
 Oedema
 Smoker
 Dialysis
 Others, Please Specify

Latest Lab Result:
 Blood Urea: 20 mmol/L
 Sodium: 20 mmol/L
 Potassium: 2 mmol/L
 Serum Creatinine: 200 µmol/L
 Creatinine Clearance: 49.08 ml/min
 Albumin: 23 g/L
 (Not accurate for children)

DRUG DETAILS [New] [Clear] [Confirm] [Print]

Indication For Request: Non Compliance
 TDM Drug: Acetylsalicylic Acid 100 mg, Glycine 45 [TDM Guidelines]
 Order Remarks: [10]
 Drug Details: [11]
 (Please specify current Dosage, Frequency, Start Date & End Date)
 [Add] [Modify] [Clear]

Drug Name	Drug Details	Order Remarks	Drug Info
Gentamicin 80mg/2ml Injection	80mg bd	[13]	[i] [trash]

Figure 3.0-10 Drug Details

STEP 10

Fill the **Order Remark** if neccessarily.

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.



SAMPLING DETAILS [i] [14] [15] [Print] [Close]

Sampling Type: RANDOM * Drug Administration Date/Time: [] Suggested Sampling Date/Time: [] * Before: []

Figure 3.0-11 Sampling Details

STEP 13

Click on the  hyperlink 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.
- System allow user to select 'before' or 'after' when random level is selected as per Figure 3.0-11
- If sample type 'Random' is selected, Sampling Date/Time field will appear, user can select date and time of suggested sampling

STEP 14

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

Note

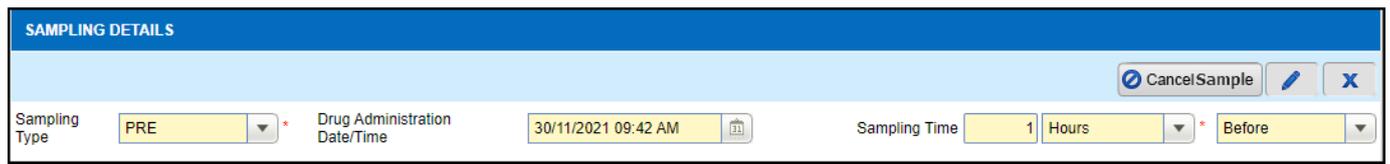
Drug Administration Date/Time to be default as empty and change the time format to 12 Hour format

STEP 15

Select **Sampling Time** from dropdown box and enter **Interval** and select Hours/Minutes and select **Before/After** from drop down

Note

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

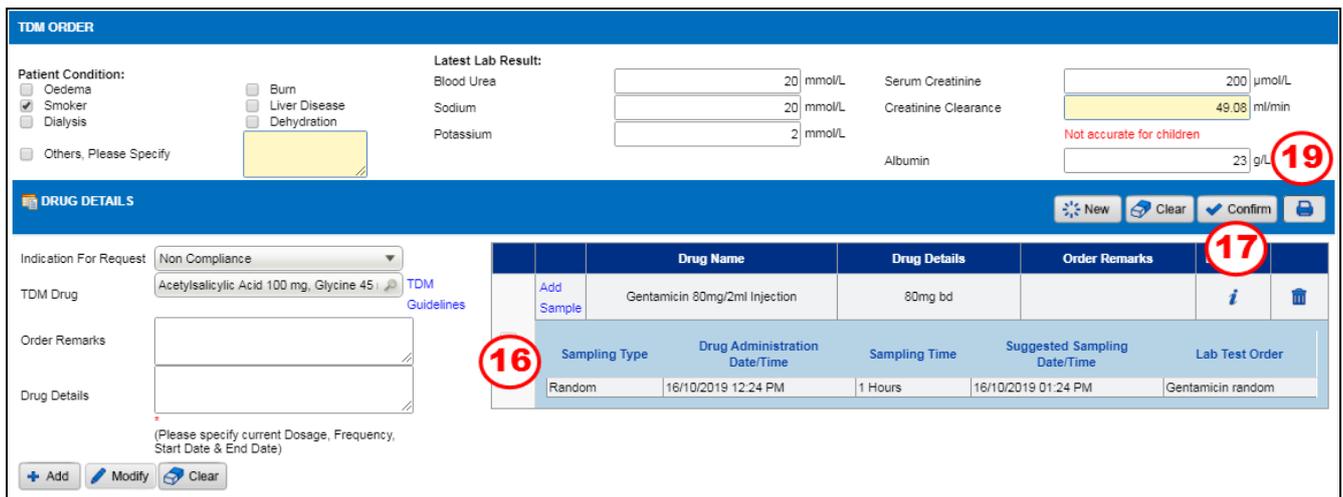


The screenshot shows the 'SAMPLING DETAILS' form. It includes a 'Cancel Sample' button and a close button (X). The form fields are: Sampling Type (PRE), Drug Administration Date/Time (30/11/2021 09:42 AM), Sampling Time (1 Hours), and Before/After (Before).

Figure 3.0-12 Sampling Details

STEP 16

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



The screenshot shows the 'TDM ORDER' and 'DRUG DETAILS' sections. The 'TDM ORDER' section includes patient condition checkboxes (Oedema, Smoker, Dialysis, Others), latest lab results (Blood Urea, Sodium, Potassium, Serum Creatinine, Creatinine Clearance, Albumin), and a 'Confirm' button. The 'DRUG DETAILS' section includes an 'Add Sample' button, a table of drug details, and a 'Confirm' button. Red circles with numbers 16, 17, and 19 highlight specific elements.

Drug Name	Drug Details	Order Remarks
Gentamicin 80mg/2ml Injection	80mg bd	

Sampling Type	Drug Administration Date/Time	Sampling Time	Suggested Sampling Date/Time	Lab Test Order
Random	16/10/2019 12:24 PM	1 Hours	16/10/2019 01:24 PM	Gentamicin random

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

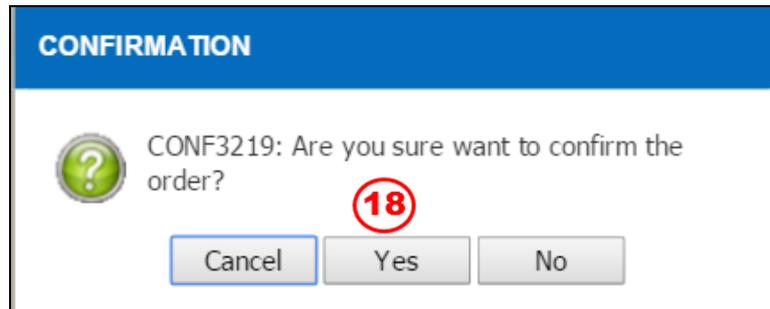


Figure 3.0-14 Confirmation alert message

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

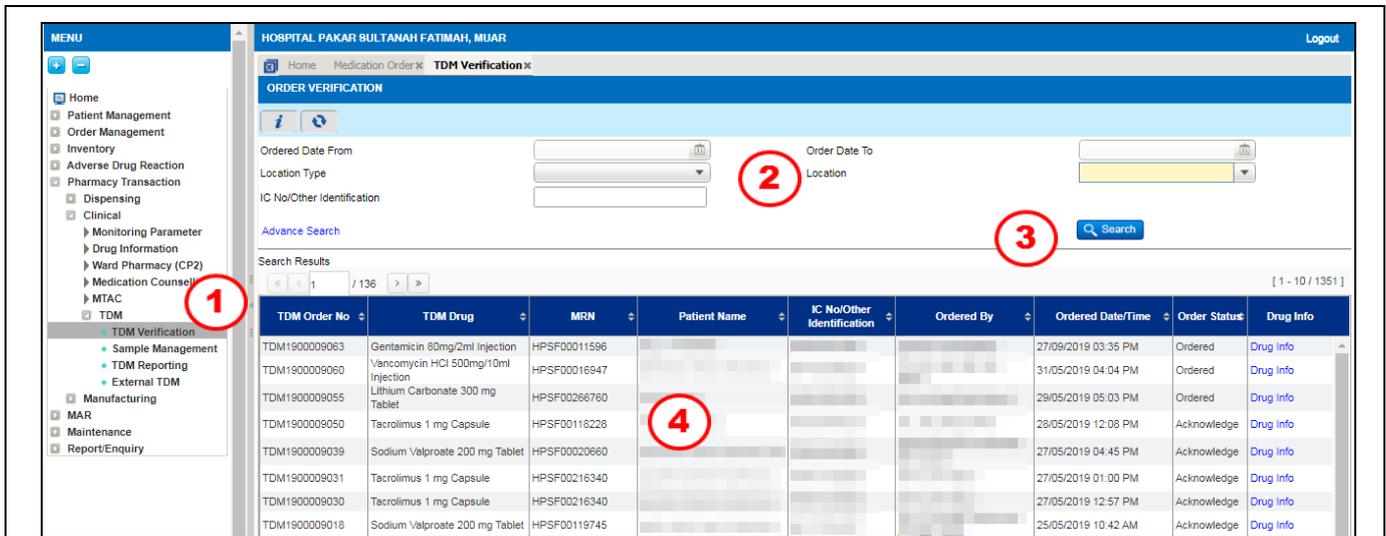
Ordered By [REDACTED] TDM Order No : TDM1900009063
Ordered Date/Time 27/09/2019 03:35 PM

PATIENT DETAILS					
Name:	[REDACTED]	MRN NO:	HPSF00011596	IC:	[REDACTED]
				Race:	Malay
Age:	26 Years 01 Months 24 Days	Sex:	Male	Ward/Unit:	WAD 2 L (MED/SURG/ORTO)
Weight:	70 kg	Height:	170 cm		
LATEST LAB RESULT :					
Blood Urea	Sodium	Potassium	Serum Creatinine	Creatinine Clearance	Albumin
20	20	2	200	49.08	23
PATIENT CONDITION					
Oedema:	NO	Smoker:	YES	Dehydration:	NO
Dialysis:	NO	Burn:	NO	Liver Disease:	NO
Others:	NO	Details:			
TDM DRUG DETAILS					
No	TDM No	Drug Name Injection	Drug Details	Indication Request	Remarks
	RANDOM	Gentamicin random	16/10/2019 12:24 PM	16/10/2019 01:24 PM	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
TDM1900009063	Gentamicin 80mg/2ml Injection	HPSF00011596	[REDACTED]	[REDACTED]	[REDACTED]	27/09/2019 03:35 PM	Ordered	Drug Info
TDM1900009060	Vancomycin HCl 500mg/10ml Injection	HPSF00016947	[REDACTED]	[REDACTED]	[REDACTED]	31/05/2019 04:04 PM	Ordered	Drug Info
TDM1900009055	Lithium Carbonate 300 mg Tablet	HPSF00266760	[REDACTED]	[REDACTED]	[REDACTED]	29/05/2019 05:03 PM	Ordered	Drug Info
TDM1900009050	Tacrolimus 1 mg Capsule	HPSF00118228	[REDACTED]	[REDACTED]	[REDACTED]	28/05/2019 12:08 PM	Acknowledge	Drug Info
TDM1900009039	Sodium Valproate 200 mg Tablet	HPSF00020660	[REDACTED]	[REDACTED]	[REDACTED]	27/05/2019 04:45 PM	Acknowledge	Drug Info
TDM1900009031	Tacrolimus 1 mg Capsule	HPSF00216340	[REDACTED]	[REDACTED]	[REDACTED]	27/05/2019 01:00 PM	Acknowledge	Drug Info
TDM1900009030	Tacrolimus 1 mg Capsule	HPSF00216340	[REDACTED]	[REDACTED]	[REDACTED]	27/05/2019 12:57 PM	Acknowledge	Drug Info
TDM1900009018	Sodium Valproate 200 mg Tablet	HPSF00119745	[REDACTED]	[REDACTED]	[REDACTED]	25/05/2019 10:42 AM	Acknowledge	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 m².

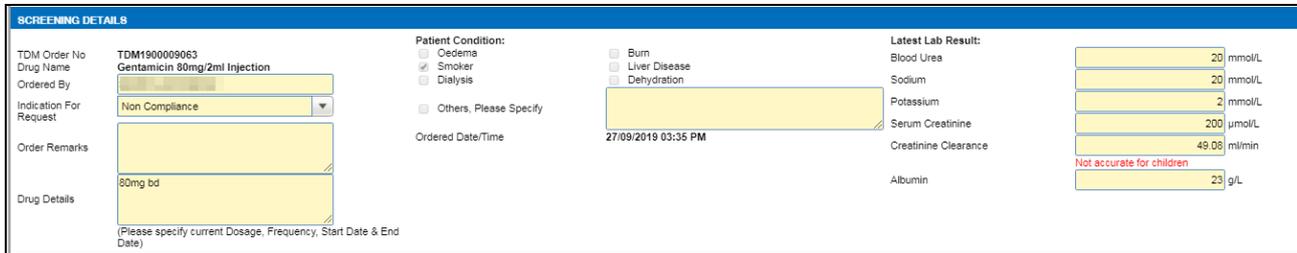


Figure 4.0-3 Screening Details

- 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

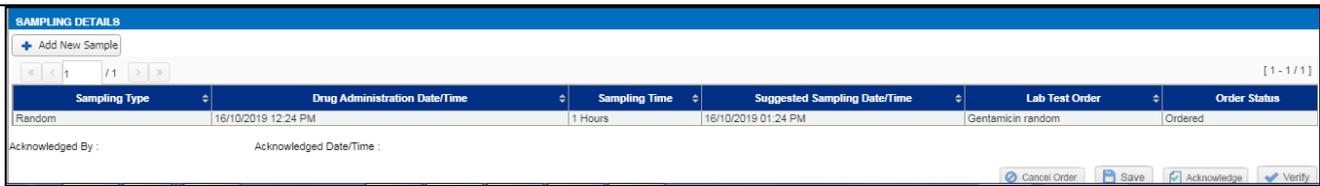


Figure 4.0-5 Sampling Details

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

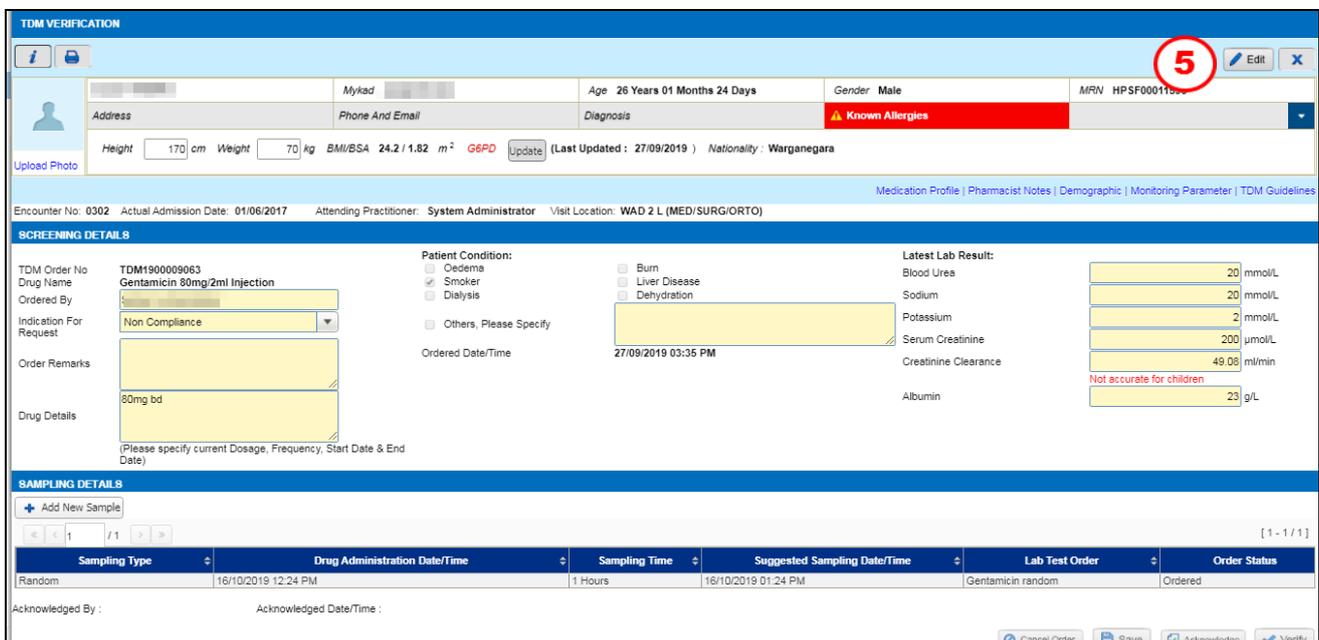


Figure 4.0-6 TDM Verification

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
- 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.
- User able to cancel just 1 sample and remain other sample's in same TDM order
- Order Status will be changed to "Cancelled" and users not necessary to place new order.

SAMPLING DETAILS					
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: Visit Location: DEWAN BEDAH					
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
Acknowledged By :		Acknowledged Date/Time :			
<input type="button" value="Cancel Order"/> <input type="button" value="Save"/> <input checked="" type="button" value="Acknowledge"/> <input type="button" value="Verify"/>					

Figure 4.0-9 Reject and Cancel Order Function

TDM VERIFICATION

Age: 26 Years 01 Months 24 Days | Gender: Male | MRN: HPSF00011596

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

Height: 170 cm | Weight: 70 kg | BMI/BSA: 24.2 / 1.82 m² | G6PD: [Redacted] | (Last Updated: 27/09/2019) | Nationality: Warganegara

Encounter No: 0302 | Actual Admission Date: 01/06/2017 | Attending Practitioner: [Redacted] | Visit Location: WAD 2 L (MED/SURG/ORTO)

SCREENING DETAILS

TDM Order No: TDM1900009063
 Drug Name: Gentamicin 80mg/2ml Injection
 Indication For Request: Non Compliance
 Patient Condition: Oedema, Smoker, Dialysis, Others, Please Specify
 Ordered Date/Time: 27/09/2019 03:35 PM
 Latest Lab Result: Blood Urea (20 mmol/L), Sodium (20 mmol/L), Potassium (2 mmol/L), Serum Creatinine (200 µmol/L), Creatinine Clearance (49.08 ml/min - Not accurate for children), Albumin (23 g/L)

SAMPLING DETAILS

Sampling Type	Drug Administration Date/Time	Sampling Time	Suggested Sampling Date/Time	Lab Test Order	Order Status
Random	16/10/2019 12:24 PM	1 Hours	16/10/2019 01:24 PM	Gentamicin random	6

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 Acknowledge button to acknowledge order

STEP 7

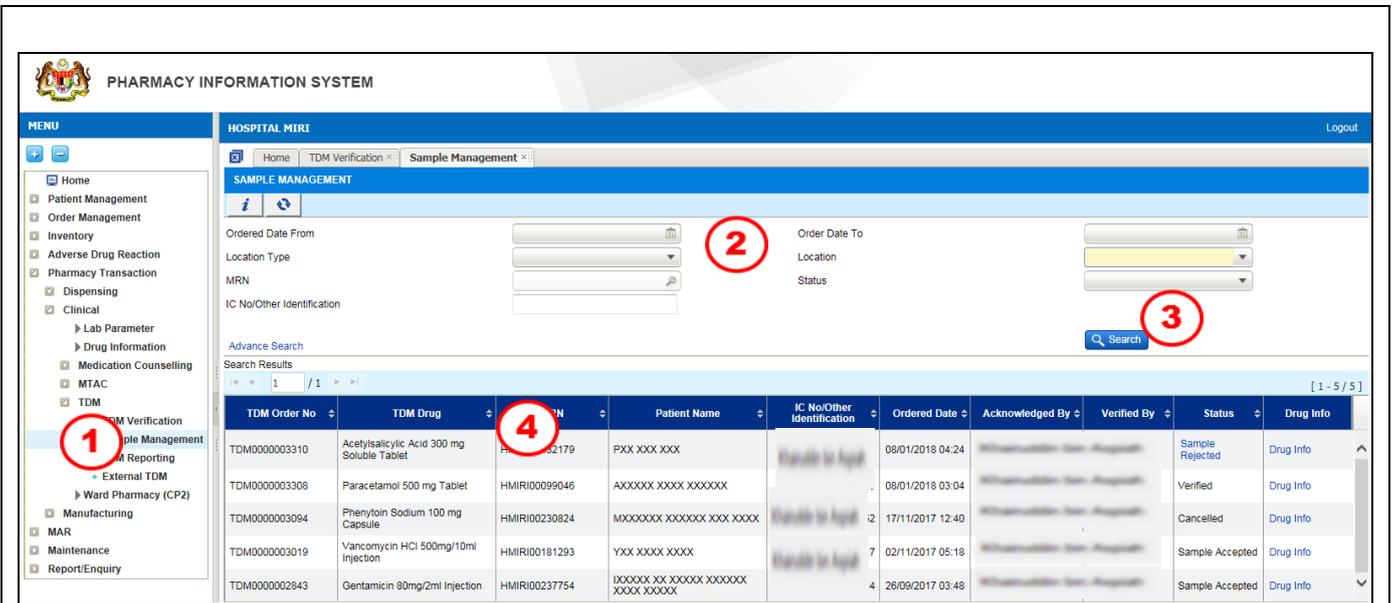
Click on the Yes button to save record

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

HOSPITAL MIRI

Logout

Home TDM Verification Sample Management

SAMPLE MANAGEMENT

Ordered Date From Order Date To

Location Type Location

MRN Status

IC No/Other Identification

Advance Search

Search Results [1 - 5 / 5]

TDM Order No	TDM Drug	MRN	Patient Name	IC No/Other Identification	Ordered Date	Acknowledged By	Verified By	Status	Drug Info
TDM0000003310	Acetylsalicylic Acid 300 mg Soluble Tablet	HMIRI00099046	PXX XXX XXX	XXXXXXXXXXXXXXXXXXXX	08/01/2018 04:24	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	Sample Rejected	Drug Info
TDM0000003308	Paracetamol 500 mg Tablet	HMIRI00099046	AXXXXX XXXX XXXXXX	XXXXXXXXXXXXXXXXXXXX	08/01/2018 03:04	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	Verified	Drug Info
TDM0000003094	Phenytoin Sodium 100 mg Capsule	HMIRI00230824	MXXXXXX XXXXXX XXX XXXX	XXXXXXXXXXXXXXXXXXXX	17/11/2017 12:40	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	Cancelled	Drug Info
TDM0000003019	Vancomycin HCl 500mg/10ml Injection	HMIRI00181293	YXX XXXX XXXX	XXXXXXXX XXX XXXXX XXXXXX XXXXX XXXXXX	02/11/2017 05:18	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	Sample Accepted	Drug Info
TDM0000002843	Gentamicin 80mg/2ml Injection	HMIRI00237754	XXXXXXXX XXX XXXXX XXXXXX XXXXX XXXXXX	XXXXXXXXXXXXXXXXXXXX	26/09/2017 03:48	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	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

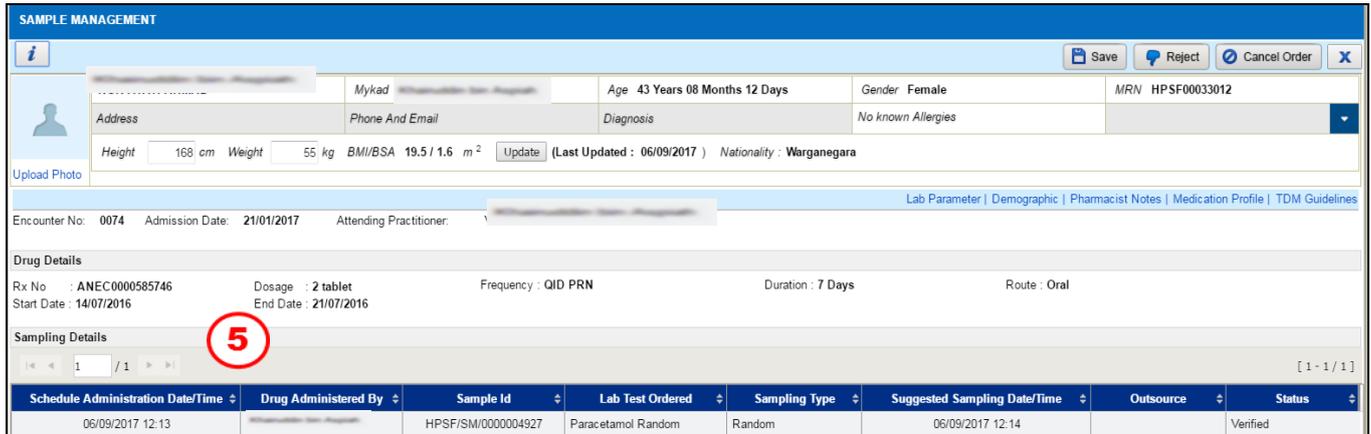
Click on the [Go To Advance Search](#) hyperlink for advance search.

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

Mykrad 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 m² Update (Last Updated : 06/09/2017) Nationality : Warganegara

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

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		HPSF/SM/0000004927	Paracetamol Random	Random	06/09/2017 12:14		Verified

Figure 5.0-2 Sample Management

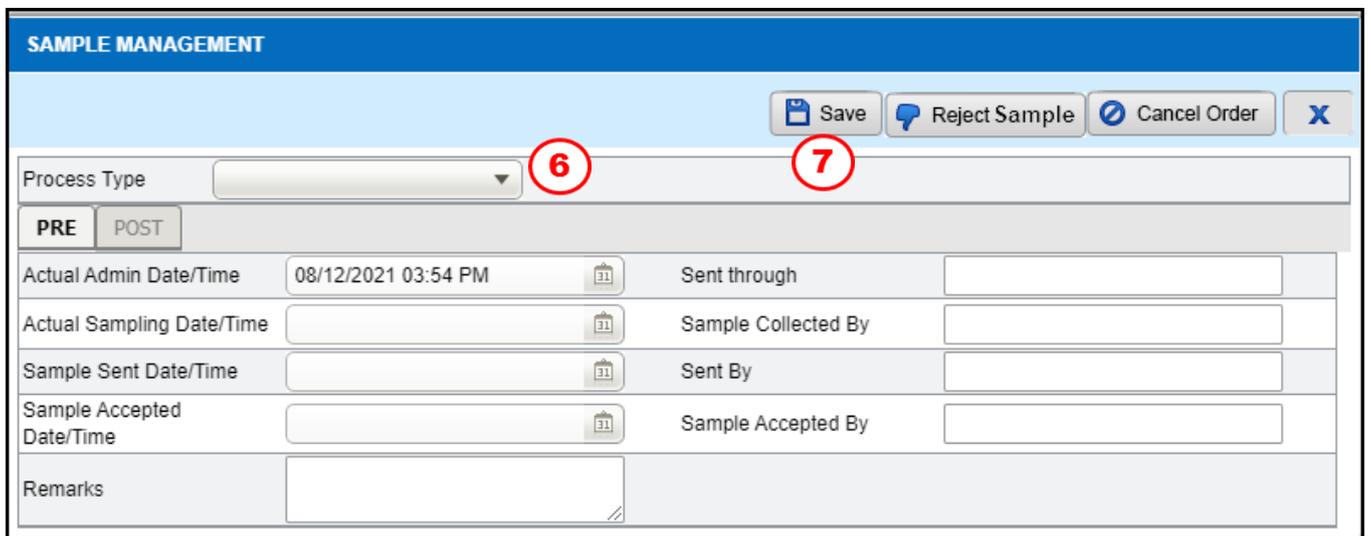
STEP 5

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

Save Reject Sample Cancel Order X

Process Type

PRE POST

Actual Admin Date/Time 08/12/2021 03:54 PM Sent through

Actual Sampling Date/Time Sample Collected By

Sample Sent Date/Time Sent By

Sample Accepted Date/Time Sample Accepted By

Remarks

Figure 5.0-3 Sampling Process

STEP 6

Select Process type from the drop down box and fill in details in these fields:

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

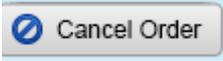
Note

- These field are entered by Pharmacist/Assistant Pharmacist when receiving the sample.
- User allowed to cancel or reject just 1 sample

STEP 7

Click on the  button to save record

Note

- The system will change order status from “Verified” to “Sample Accepted”
- ‘Actual Admin Date/Time’ is captured from ‘Drug Administration Date/Time’ from TDM Order Screen
- User able to cancel just 1 type of sampling by clicking at the type of sampling and click  .
- Cancel sample is only applicable in TDM verification
- User able to reject just 1 sample type by clicking at the type of sampling and click  . and then fill in the reject reason to confirm reject sample process

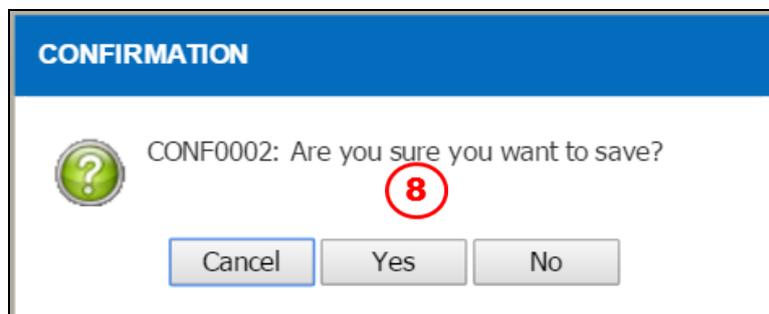


Figure 5.0-4 Confirmation alert message

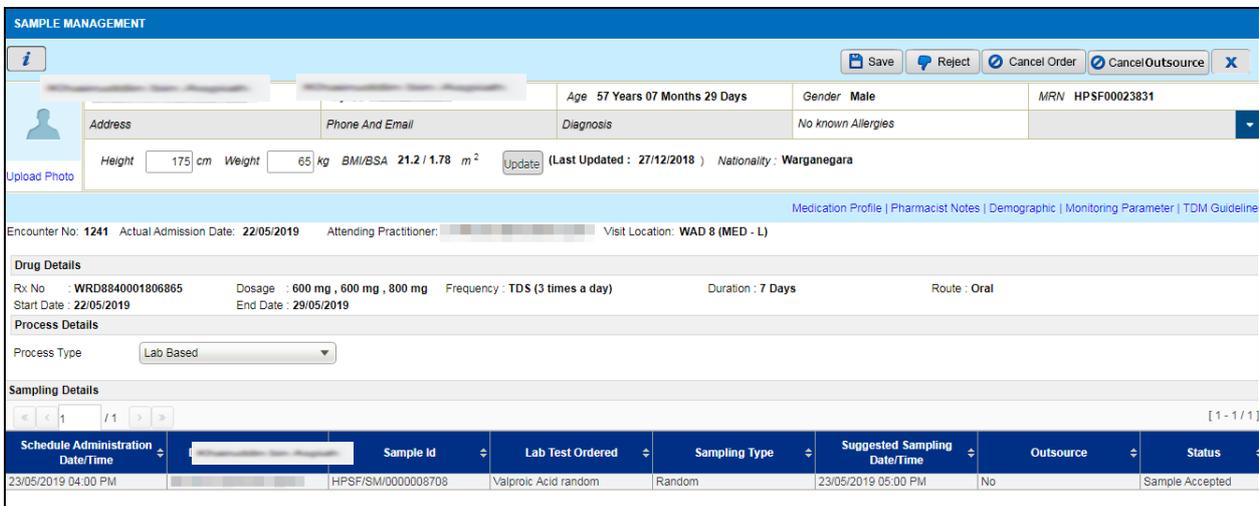


Figure 5.0-5 Sample Management

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

Process Details

Process Type: Send To:  Send

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

Search Other Facility

Facility Name:  

1 / 113 [1 - 10 / 1127]

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

SAMPLE MANAGEMENT

  Save  Reject  Cancel Order  Cancel Outsource  X

9 

Age: 39 Years 08 Months 22 Days Gender: Male MRN: HPSF000206 **10**

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

Height: 161 cm Weight: 61 kg BMI/BSA: 23.5 / 1.65 m²  (Last Updated: 13/06/2019) Nationality: Warganegara

Encounter No: 0268 Actual Visit Date: 13/06/2019 Attending Practitioner: _____ Visit Location: KLINIK PAKAR PERUBATAN

Process Details

Process Type: Send To:  Send

Sampling Details

Schedule Administration Date/Time	Drug Administered By	Sample Id	Lab Test Ordered	Sampling Type	Suggested Sampling Date/Time	Outsource	Status
13/06/2019 04:48 PM	Clinical01	HPSF/SM/0000008761	Carbamazepine random	Random	13/06/2019 05:48 PM	Yes	Out Sourced

Figure 5.0-8 Outsource

STEP 9

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

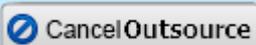
Note

- 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.

STEP 10

Click on the  button to cancel outsource and pop up will appear as per Figure 5.0-9

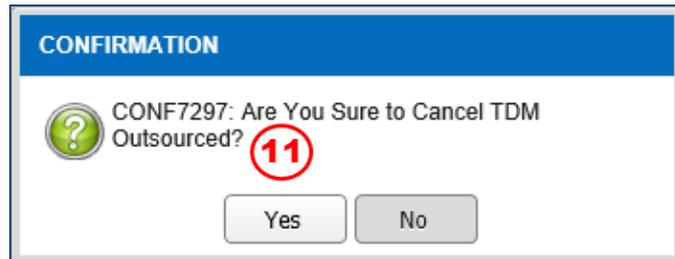


Figure 5.0-9 Cancel Outsource

STEP 11

Click on the  button to cancel outsource and pop up will appear as per Figure 5.0-10

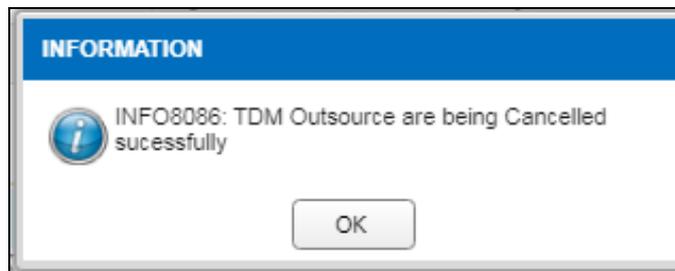
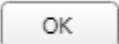


Figure 5.0-10 Cancel Outsource

Note

- Click on  button to confirm Cancel Outsource
- The cancellation is only valid if the record not yet register by the receiver.
- Status at sending facility will be '**Sample Accepted**' as shown in Figure 5.0-12
- User can proceed to reporting or send outsource to other facility
- Click on the  button to reject outsource and pop up will appear as per Figure 5.0-12

SAMPLE MANAGEMENT

Save Reject Cancel Order Cancel/Outsource X

Age 39 Years 09 Months 11 Days Gender Male MRN HPSF00020612

Address Phone And Email Diagnosis No known Allergies

Height 161 cm Weight 61 kg BMI/BSA 23.5 / 1.65 m² Update (Last Updated : 13/06/2019) Nationality : Warganegara

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

Encounter No: 0268 Actual Visit Date: 13/06/2019 Attending Practitioner: Visit Location: KLINIK PAKAR PERUBATAN

Process Details

Process Type

Sampling Details

Schedule Administration Date/Time	Drug Administered By	Sample Id	Lab Test Ordered	Sampling Type	Suggested Sampling Date/Time	Outsource	Status
13/06/2019 04:48 PM	Clinical01	HPSF/SI/0000008761	Carbamazepine.random	Random	13/06/2019 05:48 PM		Sample Accepted

Figure 5.0-11 Sample Management

Note

- 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:

Reject Date/Time 23/08/2017 15:37

Reject Reason Sample Expired

Figure 5.0-12 Reject Reason

- To add new data for Reject Reason as below:

REJECT REASON

Save X

Reject Date/Time

Reject Reason

Rejected By

- Blood Clot
- Duplicate Order
- Insufficient Sample
- Lysed Sample
- Others
- Sample Expired
- Sample Not Received
- Wrong Sample
- Wrong Sampling
- Wrong Tube

Figure 5.0-13 Add Reject Reason

- Click at button to save the reject reason and pop up will appear as Figure 5.0-14

INFORMATION

INFO8086: TDM Outsource are being Rejected successfully

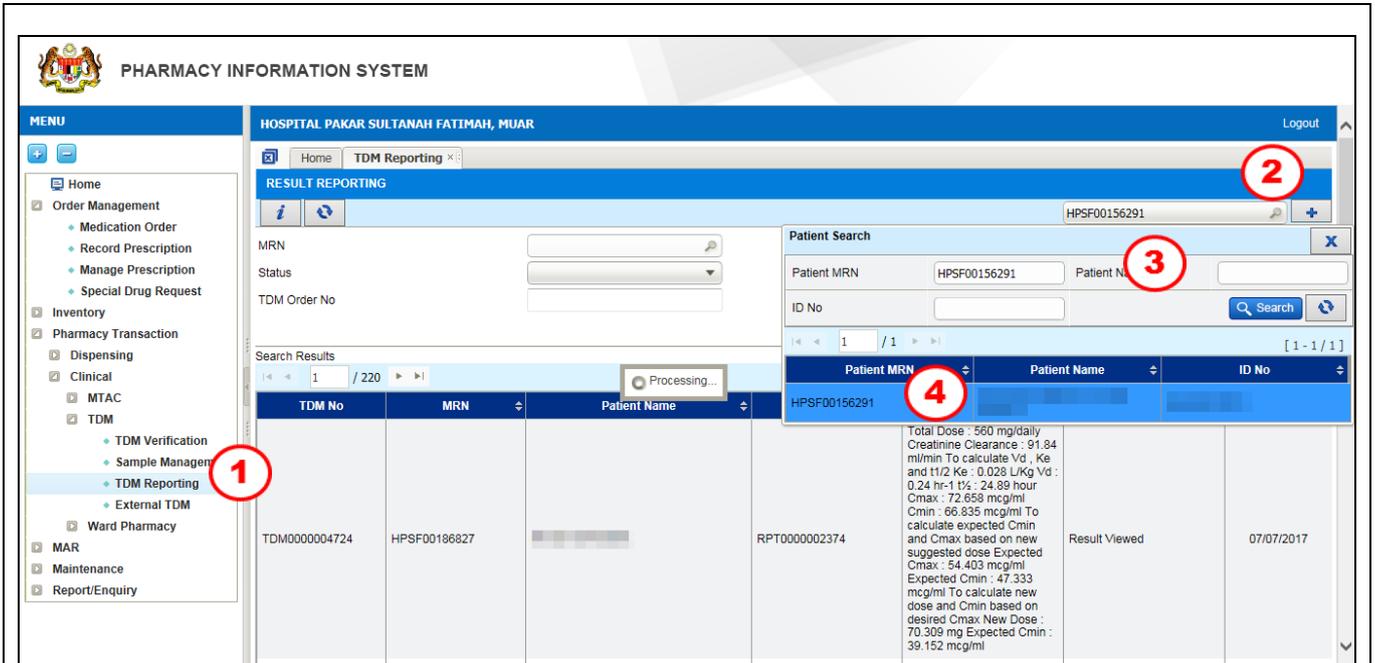
OK

Figure 5.0-14 TDM Outsource Rejected

- Click on button to confirm Reject Outsource

6.0 TDM Reporting

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



PHARMACY INFORMATION SYSTEM

HOSPITAL PAKAR SULTANAH FATIMAH, MUAR

Logout

Home TDM Reporting

RESULT REPORTING

Home

- Order Management
 - Medication Order
 - Record Prescription
 - Manage Prescription
 - Special Drug Request
- Inventory
- Pharmacy Transaction
 - Dispensing
 - Clinical
 - MTAC
 - TDM
 - TDM Verification
 - Sample Management
 - TDM Reporting
 - External TDM
 - Ward Pharmacy
 - MAR
 - Maintenance
 - Report/Enquiry

MRN:

Status:

TDM Order No:

Search Results: 1 / 220

Processing...

Search Results Table:

TDM No	MRN	Patient Name	Patient MRN	Patient Name	ID No
TDM0000004724	HPSF00186827	[Redacted]	HPSF00156291	[Redacted]	[Redacted]

Search Results Detail:

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-1 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 6.0-1 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: [input field] Patient Name: [input field]

Status: [dropdown] Report No: [input field]

TDM Order No: [input field] Toxic: [dropdown]

Search

Search Results [1 - 10 / 2191]

TDM No	MRN	Patient Name	Report Number	Remarks	Order Status	Report Date
TDM0000004724	HPSF00186827	[blurred]	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-1 t1/2 : 24.89 hour Cmax : 72.658 mcg/ml Cmin : 86.835 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

Mykad [blurred] Age 30 Years 04 Months Gender Female M/RN HKL00433134

Address [blurred] Phone And Email [blurred] Diagnosis [blurred] No known Allergies Vital Sign [dropdown]

Height 160 cm Weight 60 kg BMI/BSA 23.4 / 1.63 m² Update (Last Updated : 14/12/2021) Nationality : Warganegara

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

Encounter No: 0001 Actual Admission Date: 14/12/2021 Visit Location: Wad Urologi 3A (Female) Ordered By: [blurred]

+ Add CP2

TDM No.	Drug Name	Drug Details	Order Remarks	Actual Sampling Time	Actual Drug Admin Date/Time	Reporting	Pre	Post
No Records Found!								

Pharmacist Note

Remarks

Total Cost of Analysis

TDM service Charge in RM

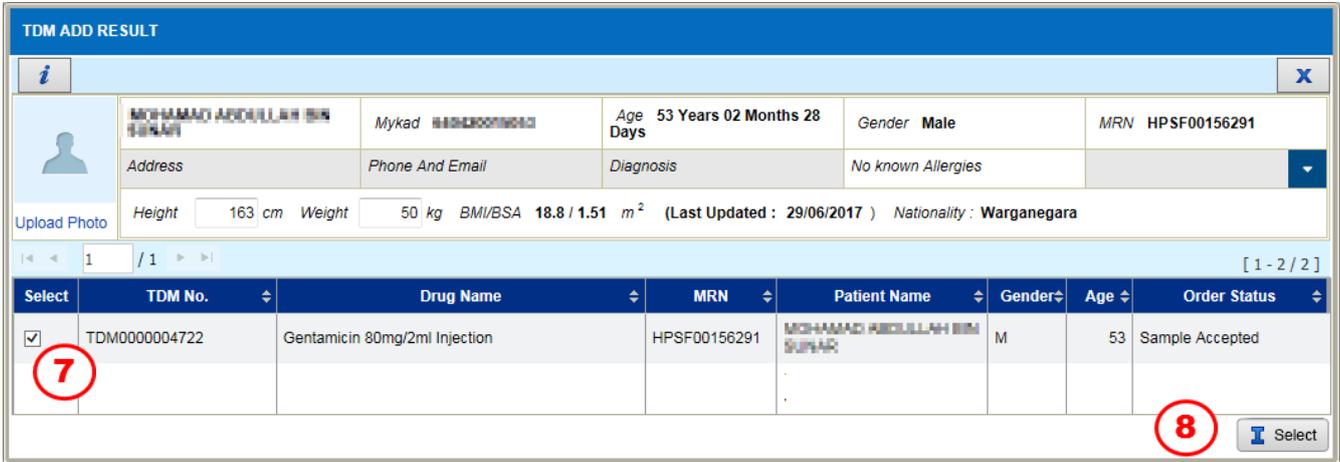
Save Report Confirm

+ 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 SUKARI | Mykad: 88040000000 | 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 SUKARI	M	53	Sample Accepted



Figure 6.0-4 TDM Add Result

STEP 7

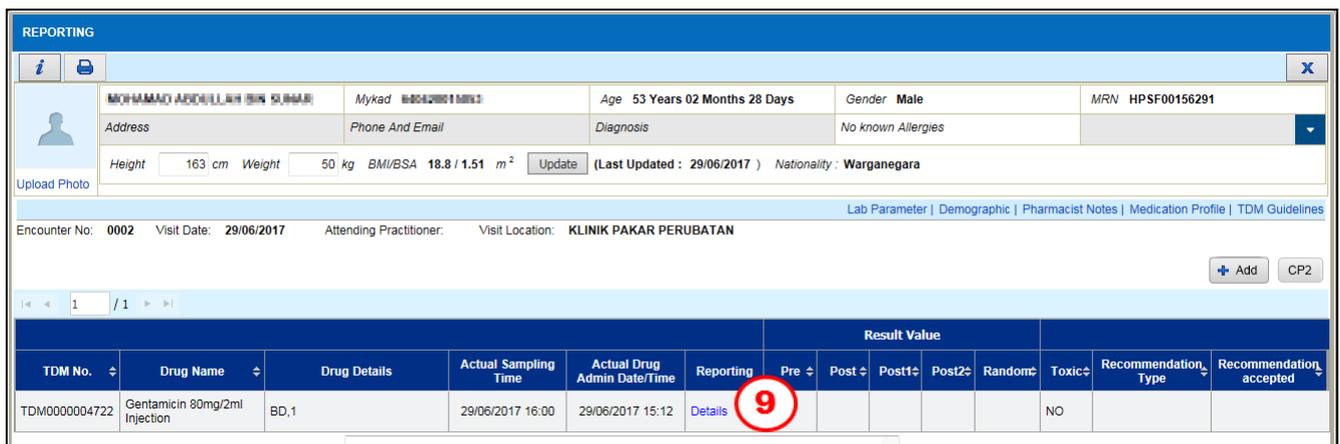
Select on checkbox(es) for selected TDM order

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 SUKARI | Mykad: 88040000000 | 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;"> <p>Aminoglycoside Pre -Post</p> <p>Aminoglycoside Pre</p> <p>Aminoglycoside Post1-Post6</p> <p>Aminoglycoside Post</p> </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</p> <p style="color: red; font-weight: bold;">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

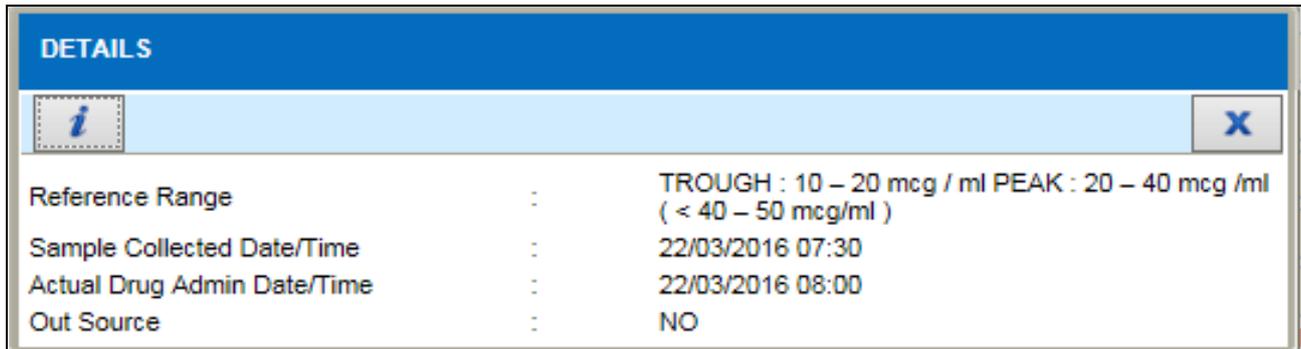
STEP 10

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
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 Yes 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



Mykad

Age 25 Years 09 Months 08 Days

Gender Male

MRN HKL0323072

X

Address

Phone And Email

Diagnosis

No known Allergies

Vital Sign

Height cm

Weight kg

BMI/BSA m²

Update (Last Updated : 22/09/2021)

Nationality : Warganegara

Encounter No: 0005 Actual Admission Date: 22/09/2021 Visit Location: Farmasi Pesakit Dalam Ordered By:

+ Add CP2

[1 - 1 / 1]

TDM No.	Drug Name	Drug Details	Order Remarks	Actual Sampling Time	Actual Drug Admin Date/Time	Reporting	Pre	Post
TDM2100002835	Alprazolam 0.25 mg Tablet	d	Remarks	21/12/2021 02:51 PM	21/12/2021 02:51 PM	Details		

ddd

Pharmacist Note

1947 characters allowed

Remarks

Total Cost of Analysis

TDM service Charge in RM

16
17

Save Report 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.

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.

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 : [REDACTED] MRN NO : [REDACTED] IC : [REDACTED]
 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 : 05/09/2017 Printed By : [REDACTED] Unit Name : [REDACTED] 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

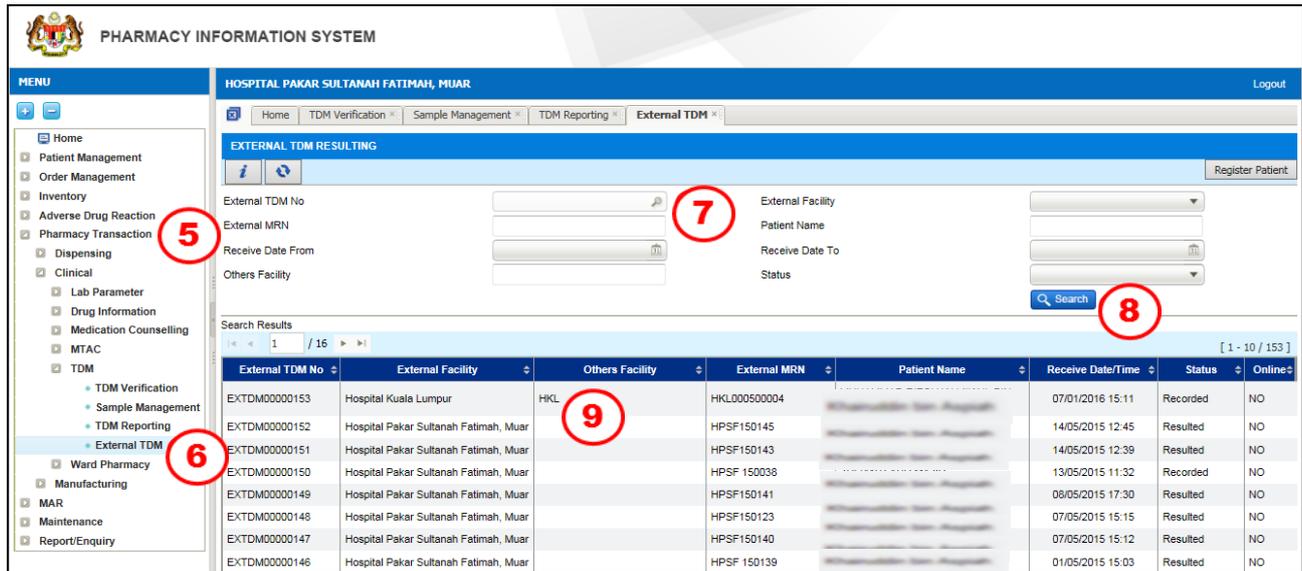
Click on the checkbox for selected patient

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

External TDM No: External Facility:

External MRN: Patient Name:

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
EXTDM00000153	Hospital Kuala Lumpur	HKL	HKL000500004		07/01/2016 15:11	Recorded	NO
EXTDM00000152	Hospital Pakar Sultanah Fatimah, Muar		HPSF150145		14/05/2015 12:45	Resulted	NO
EXTDM00000151	Hospital Pakar Sultanah Fatimah, Muar		HPSF150143		14/05/2015 12:39	Resulted	NO
EXTDM00000150	Hospital Pakar Sultanah Fatimah, Muar		HPSF 150038		13/05/2015 11:32	Recorded	NO
EXTDM00000149	Hospital Pakar Sultanah Fatimah, Muar		HPSF150141		08/05/2015 17:30	Resulted	NO
EXTDM00000148	Hospital Pakar Sultanah Fatimah, Muar		HPSF150123		07/05/2015 15:15	Resulted	NO
EXTDM00000147	Hospital Pakar Sultanah Fatimah, Muar		HPSF150140		07/05/2015 15:12	Resulted	NO
EXTDM00000146	Hospital Pakar Sultanah Fatimah, Muar		HPSF 150139		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

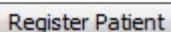
STEP 8

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

External TDM No : EXTDM00000014
X

Patient Details

External MRN : HTAR00068908
Patient Name : [REDACTED]
Patient ID Number : [REDACTED]
External Facility : Hospital Tengku Ampuan Rahimah, Klang

Delivery Details

Sample Sent By

Sample Received By

Sample Sent Date/Time

Sample Received Date/Time

Drug Details

TDM Drug

Sampling Type + Add

[1 - 1 / 1]

Drug Name	Actual Sampling Date/time	Sample Type	Result Value	UOM	Lab Based	Toxic	Status	Delete	Reject
Ciclosporin 25mg Capsule Microemulsion	05/05/2021 11:20 AM	Random	<input type="text"/>	<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

Note

Actual Sampling Date/Time will auto captured from outsourcing sample management screen

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.

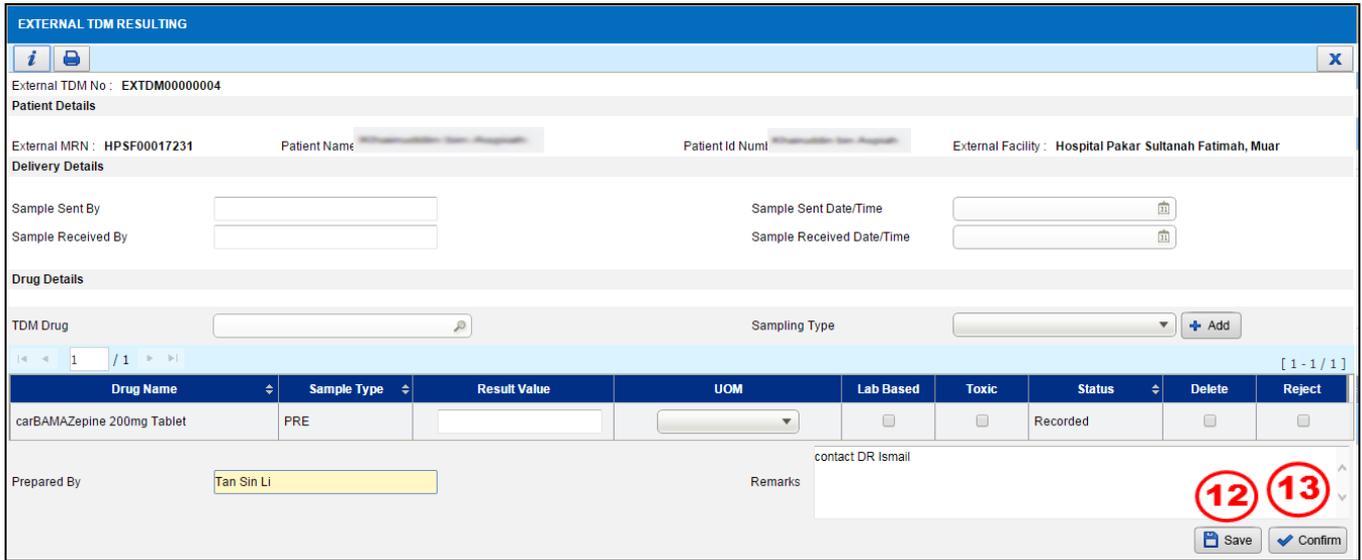


Figure 7.1-6 External TDM Resulting

STEP 12

Click on the  button to save external TDM resulting

STEP 13

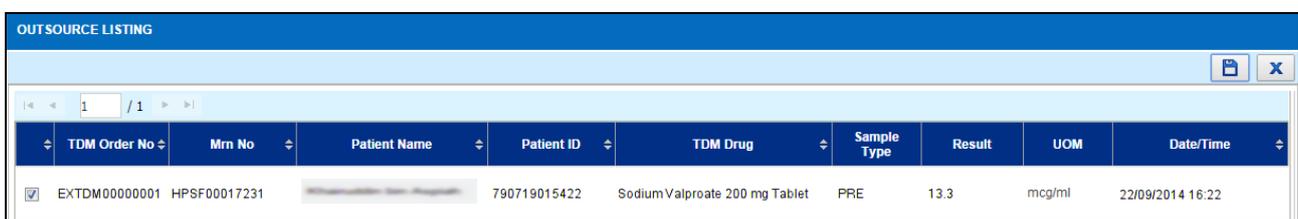
Click on the  button to confirm external TDM resulting

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"/>	EXTDM0000001	HPSF00017231	[redacted]	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.

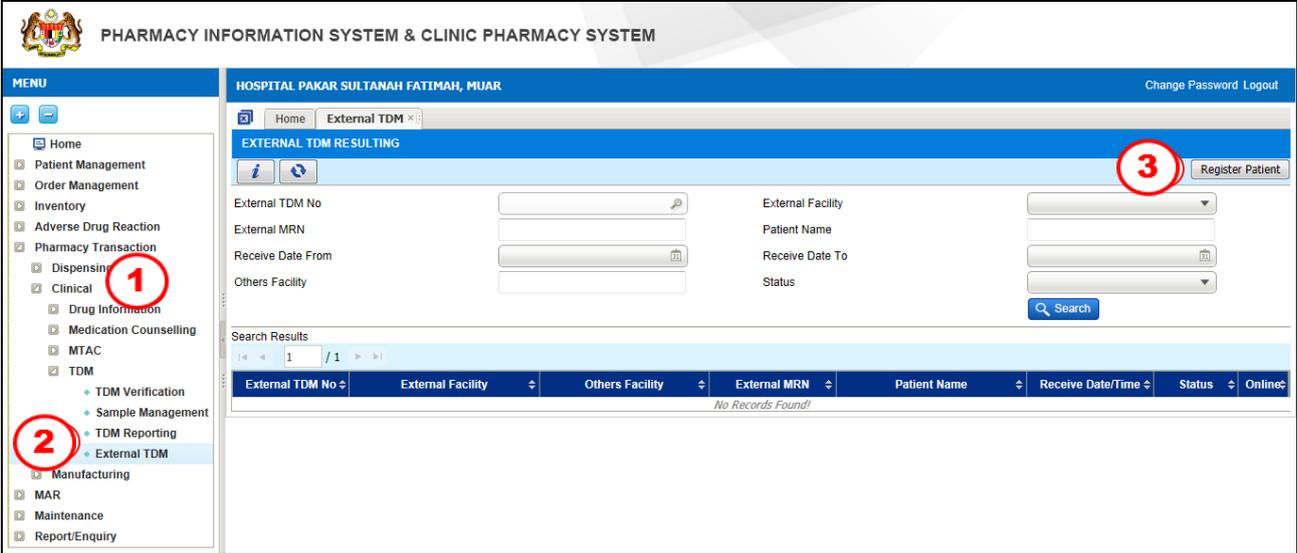


Figure 7.2-1 External TDM Listing Page

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

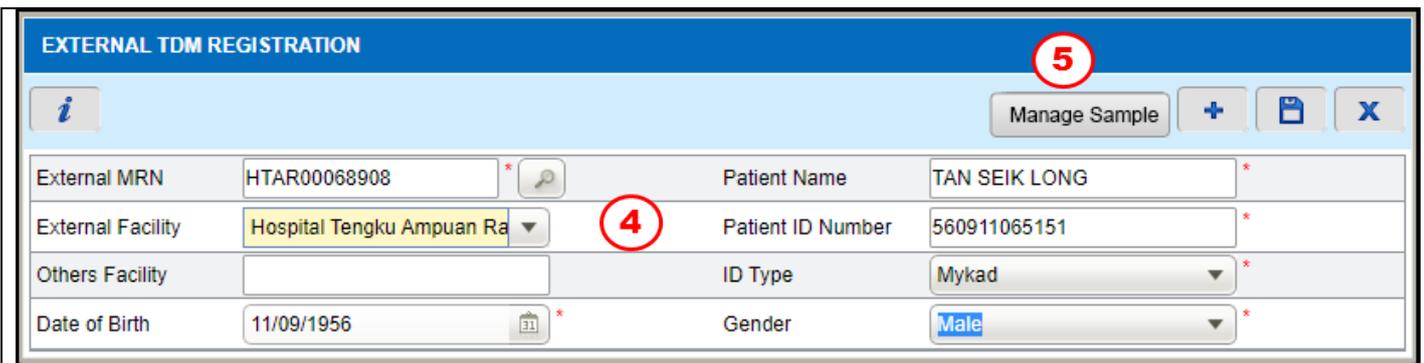


Figure 7.2-2 External TDM Registration

STEP 4

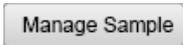
Enter details in the fields below:

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

Note

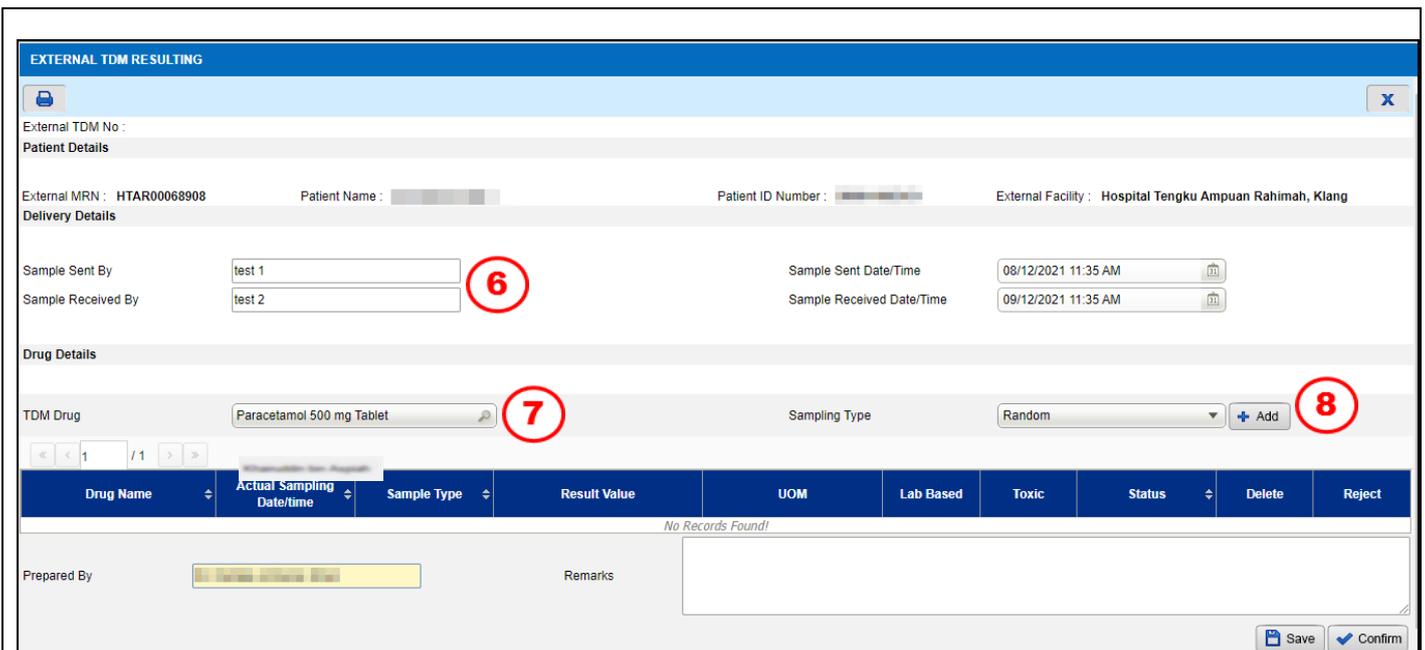
Click on the External MRN  button to search for registered patient and all fields will be automatically retrieved.

STEP 5

Click on the  button and External TDM Resulting screen will be displayed as per Figure 7.2-3

Note

Click on the  button to save the record



EXTERNAL TDM RESULTING

External TDM No :
Patient Details

External MRN : HTAR00068908 Patient Name : Patient ID Number : External Facility : Hospital Tengku Ampuan Rahimah, Klang

Delivery Details

Sample Sent By: test 1 (6) Sample Sent Date/Time: 08/12/2021 11:35 AM
Sample Received By: test 2 Sample Received Date/Time: 09/12/2021 11:35 AM

Drug Details

TDM Drug: Paracetamol 500 mg Tablet (7) Sampling Type: Random (8) + Add

Drug Name	Actual Sampling Date/Time	Sample Type	Result Value	UOM	Lab Based	Toxic	Status	Delete	Reject
No Records Found!									

Prepared By: Remarks:

Save Confirm

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

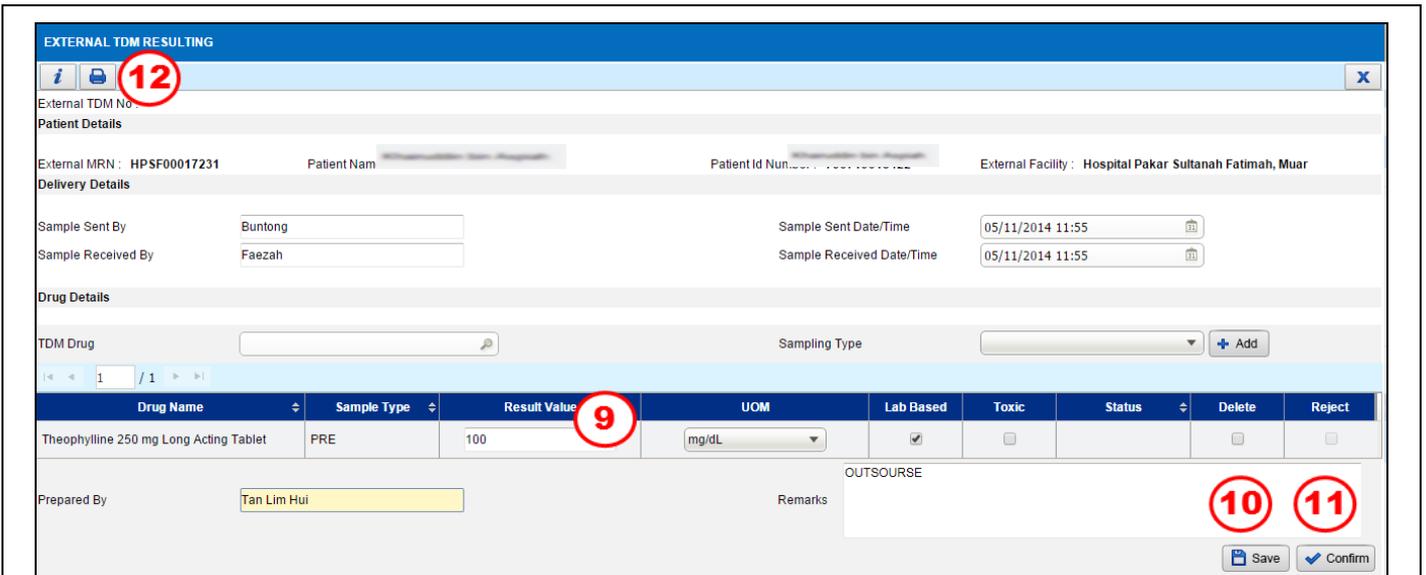
Click on the **TDM Drug**  button to search for drug

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 Num. [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: Faezah 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: OUTSOURCE

[10] [11] Save 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



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			