



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

Pharmacy Based User Manual Therapeutic Drug Monitoring (TDM)

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



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Application reference: PhIS & CPS v2.5



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1.0 Introduction

1.1 Overview of PhIS

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

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

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

1.2 Purpose and Objectives

This user manual outlines the Therapeutic Drug Monitoring (TDM) module and its key features/functionalities. The primary objective is to help guide user through the process of completing PhIS application process. User will understand the following activities in detail:

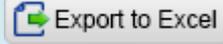
1.3 Organised Sections

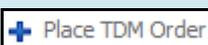
These are the sections within this document:

- Section 1 : Introduction
- Section 2 : Application Standard Features
- Section 3 : Therapeutic Drug Monitoring
- 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
<input type="checkbox"/>	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
	Automatically Display/Retrieve Box	<input type="text"/>	Empty Text Box
	Dropdown Box		

TDM Module Legend			
 Delete	Delete Record	 Update	Update Record
TDM Guidelines	Display TDM Guidelines Details	 Add	Add Sampling Details
 Update	Update Sampling Details	Drug Info	Display Selected TDM Drug Information
 New	Create New TDM Order	 Add New Sample	Add New Sampling Details
 Place TDM Order	Display TDM Order Screen to Place New TDM Order	Details	Display Reporting Details Screen
Register Patient	Register External Patient for Outsource	Manage Sample	Display External TDM Resulting Screen

Note

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

3.0 Therapeutic Drug Monitoring (TDM)

Overview

The Order Management - Therapeutic Drug Monitoring (TDM) module handles all the information to specify the ordered items as per local drug formulary, MOH and non-MOH including registered and non-registered drugs. This function is to enable data mining. All medication orders must be prescribed by authorized personnel only and in compliance with guidelines on prescribing in the drug formulary (drug category, discipline / specialty) as defined by MOH.

User Group

This module is intended for Pharmacist, Assistant Pharmacist and Nurse.

Functional Diagram

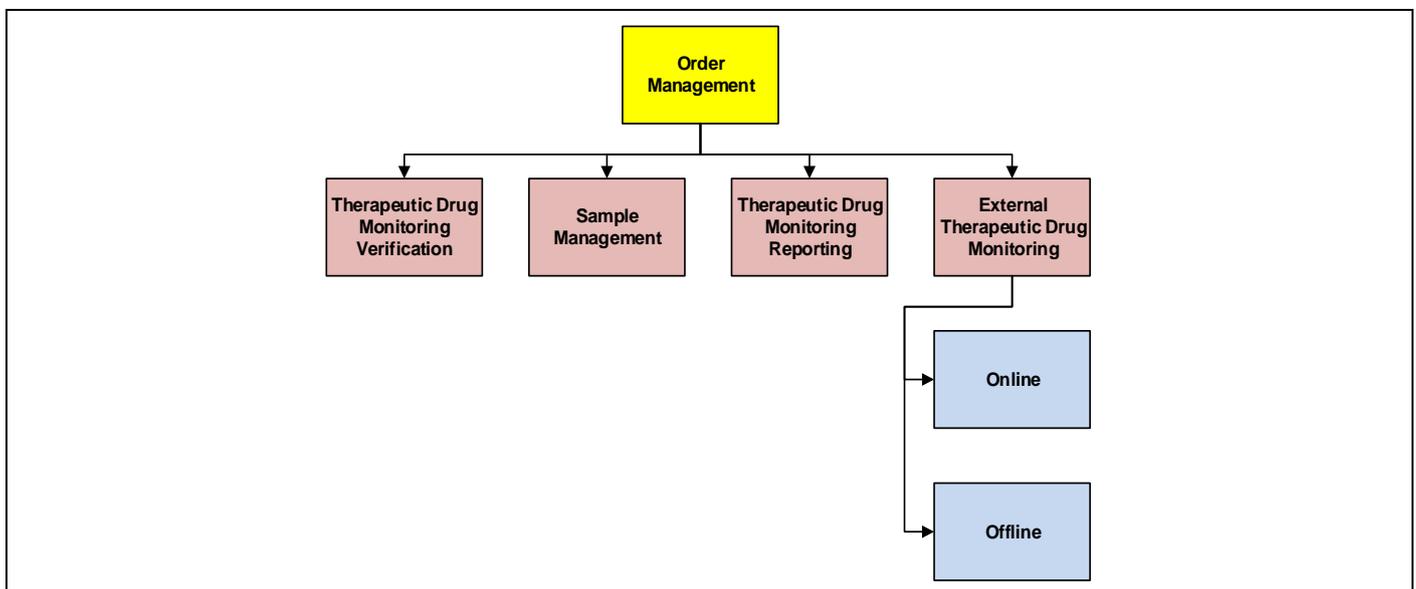


Figure 3.0-1

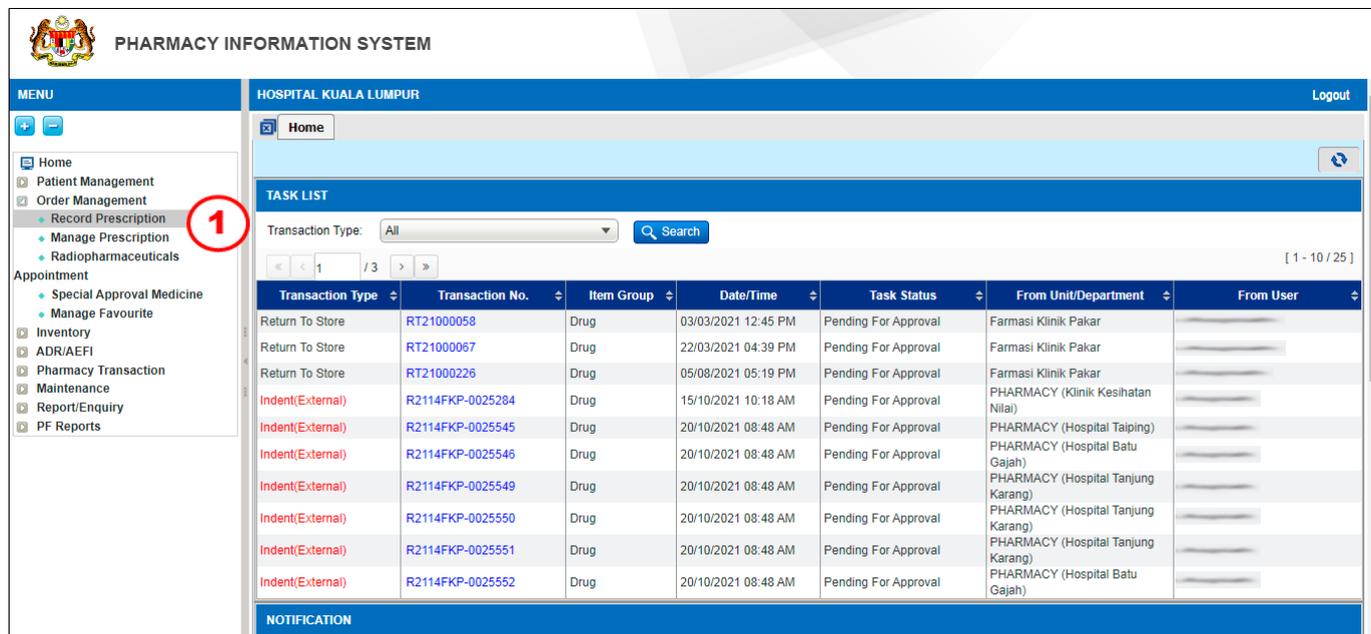
Functional Description

Therapeutic Drug Monitoring (TDM) comprises of four (4) main functions:

- **Verification**
Verification is for pharmacist to verify the prescriptions received from order management. This process is mandatory for all prescriptions receive before the user can proceed with reporting.
- **Sample Management**
TDM Sampling Management is to record the sampling details into the system including information of the samples which need to be send outsource.
- **Reporting**
TDM Reporting is to enter the TDM resulting and the interpretation to the Doctor.
- **External TDM**
External TDM is for record TDM resulting received from other facility

3.1 Search Registered Patient

To view existing patient record, perform steps below:



Transaction Type	Transaction No.	Item Group	Date/Time	Task Status	From Unit/Department	From User
Return To Store	RT21000058	Drug	03/03/2021 12:45 PM	Pending For Approval	Farmasi Klinik Pakar	
Return To Store	RT21000067	Drug	22/03/2021 04:39 PM	Pending For Approval	Farmasi Klinik Pakar	
Return To Store	RT21000226	Drug	05/08/2021 05:19 PM	Pending For Approval	Farmasi Klinik Pakar	
Indent(External)	R2114FKP-0025284	Drug	15/10/2021 10:18 AM	Pending For Approval	Farmasi Klinik Pakar (Klinik Kesihatan Nilai)	
Indent(External)	R2114FKP-0025545	Drug	20/10/2021 08:48 AM	Pending For Approval	PHARMACY (Hospital Taiping)	
Indent(External)	R2114FKP-0025546	Drug	20/10/2021 08:48 AM	Pending For Approval	PHARMACY (Hospital Batu Gajah)	
Indent(External)	R2114FKP-0025549	Drug	20/10/2021 08:48 AM	Pending For Approval	PHARMACY (Hospital Tanjung Karang)	
Indent(External)	R2114FKP-0025550	Drug	20/10/2021 08:48 AM	Pending For Approval	PHARMACY (Hospital Tanjung Karang)	
Indent(External)	R2114FKP-0025551	Drug	20/10/2021 08:48 AM	Pending For Approval	PHARMACY (Hospital Tanjung Karang)	
Indent(External)	R2114FKP-0025552	Drug	20/10/2021 08:48 AM	Pending For Approval	PHARMACY (Hospital Batu Gajah)	

Figure 3.1-1 PhIS Home page

STEP 1

Click on 'Order Management' menu followed by 'Record Prescription' and screen will be displayed as per Figure 3.1-1

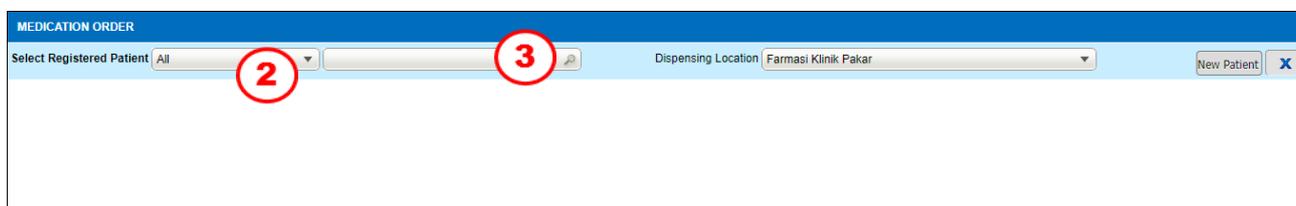


Figure 3.1-2 Medication Order

STEP 2

Select Registered Patient

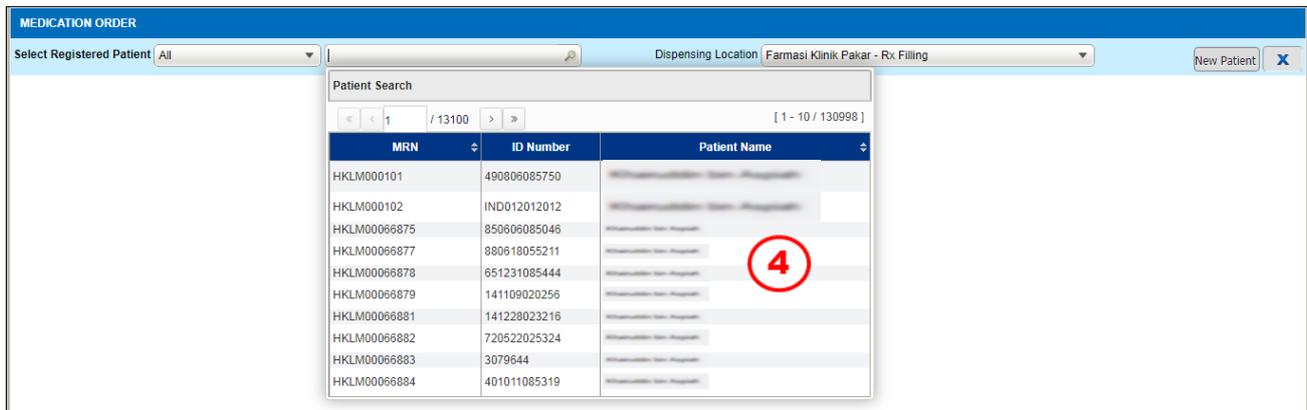
- All
- Patient ID
- Patient Name
- Patient MRN

STEP 3

Click on the  button to search for a registered patient

Note

- This page is used to search for a registered patient
- If the patient is not registered, click on the  button and the Patient Registration screen will be displayed.



MRN	ID Number	Patient Name
HKLM000101	490806085750	[Redacted]
HKLM000102	IND012012012	[Redacted]
HKLM00066875	850606085046	[Redacted]
HKLM00066877	880618055211	[Redacted] 4
HKLM00066878	651231085444	[Redacted]
HKLM00066879	141109020256	[Redacted]
HKLM00066881	141228023216	[Redacted]
HKLM00066882	720522025324	[Redacted]
HKLM00066883	3079844	[Redacted]
HKLM00066884	401011085319	[Redacted]

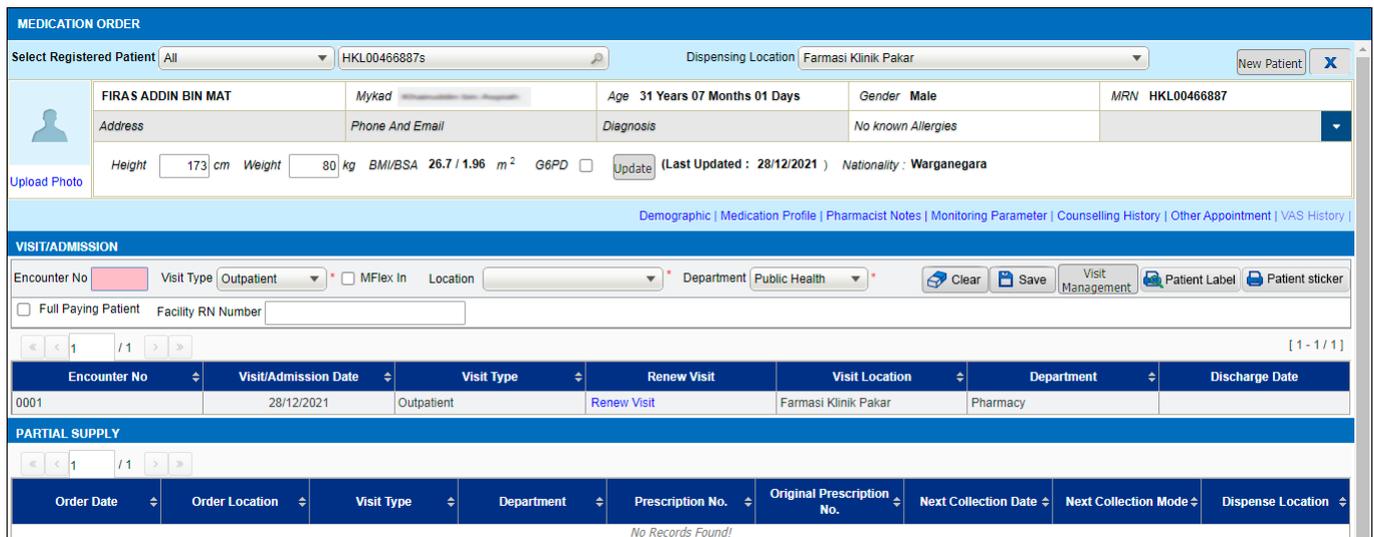
Figure 3.1-3 Search Patient

STEP 4

Double-click on the selected patient and the details will be displayed as per Figure 3.1-4

Note

- Click on the 'Renew Visit' hyperlink to renew a visit for the same location.
- Select the 'Visit Type' and 'Location' to create a new visit.
- Click on the [Visit Management](#) button to assess 'Visit Management' Screen. (Refer to Appendix 1).



Encounter No	Visit/Admission Date	Visit Type	Renew Visit	Visit Location	Department	Discharge Date
0001	28/12/2021	Outpatient	Renew Visit	Farmasi Klinik Pakar	Pharmacy	

Figure 3.1-4 Medication Order Screen

MEDICATION ORDER

Select Registered Patient: All | HKL00466887s | Dispensing Location: Farmasi Klinik Pakar | New Patient X

	FIRAS ADDIN BIN MAT	Mykad: [Redacted]	Age: 31 Years 07 Months 01 Days	Gender: Male	MRN: HKL00466887
Address: [Redacted]		Phone And Email: [Redacted]		Diagnosis: [Redacted]	
Height: 173 cm		Weight: 80 kg		BMI/BSA: 26.7 / 1.96 m ²	
G6PD: <input type="checkbox"/>		Update (Last Updated: 28/12/2021)		Nationality: Warganegara	

[Demographic](#) | [Medication Profile](#) | [Pharmacist Notes](#) | [Monitoring Parameter](#) | [Counselling History](#) | [Other Appointment](#) | [VAS History](#)

VISIT/ADMISSION

Encounter No: 0001 | Visit Type: Outpatient | MFlex In | Location: [Redacted] | Department: Public Health

Full Paying Patient | Facility RN Number: [Redacted]

[1 - 1 / 1]

Encounter No	Visit/Admission Date	Visit Type	Renew Visit	Visit Location	Department	Discharge Date
0001	28/12/2021	Outpatient	5 Renew Visit	Farmasi Klinik Pakar	Pharmacy	

PARTIAL SUPPLY

[1 - 1 / 1]

Order Date	Order Location	Visit Type	Department	Prescription No.	Original Prescription No.	Next Collection Date	Next Collection Mode	Dispense Location
No Records Found!								

Figure 3.1-5 Visit/Admission Detail

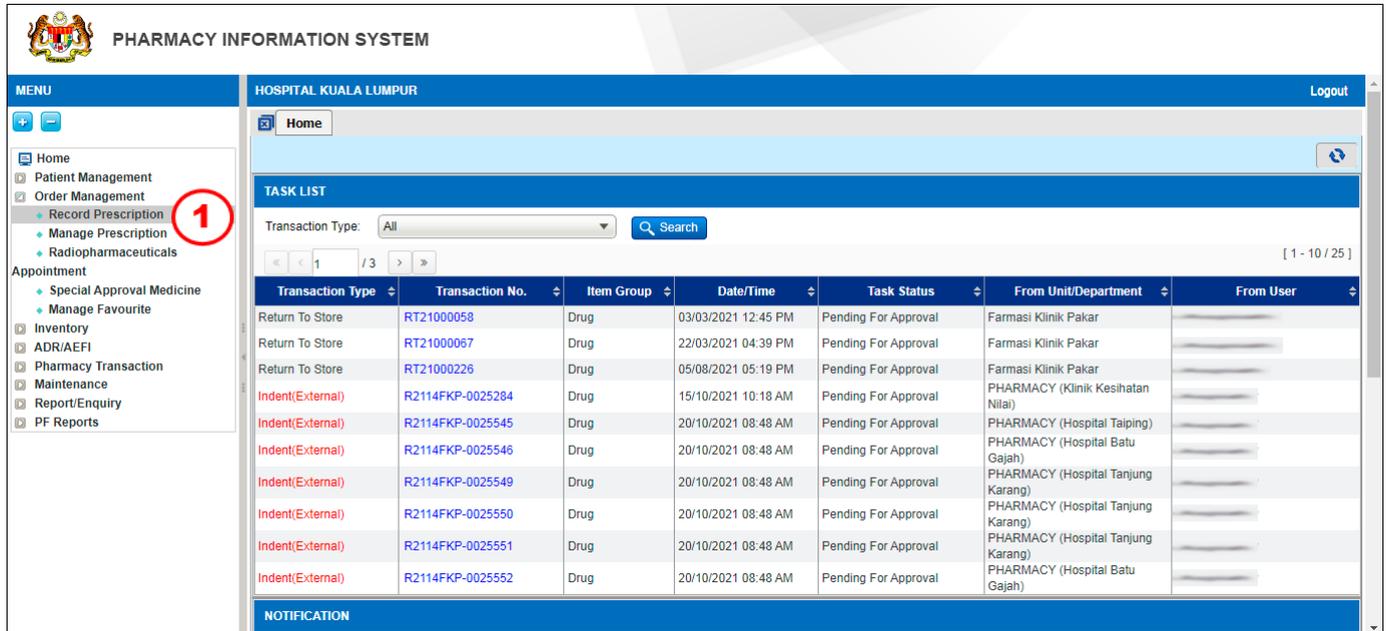
STEP 5

Double-click on the selected visit as per Figure 3.1-5

3.2 New Patient Registration

This page is used to register new patient

To register new patient into the system, perform the steps below:



Transaction Type	Transaction No.	Item Group	Date/Time	Task Status	From Unit/Department	From User
Return To Store	RT21000058	Drug	03/03/2021 12:45 PM	Pending For Approval	Farmasi Klinik Pakar	
Return To Store	RT21000067	Drug	22/03/2021 04:39 PM	Pending For Approval	Farmasi Klinik Pakar	
Return To Store	RT21000226	Drug	05/08/2021 05:19 PM	Pending For Approval	Farmasi Klinik Pakar	
Indent(External)	R2114FKP-0025284	Drug	15/10/2021 10:18 AM	Pending For Approval	PHARMACY (Klinik Kesihatan Nilai)	
Indent(External)	R2114FKP-0025545	Drug	20/10/2021 08:48 AM	Pending For Approval	PHARMACY (Hospital Taiping)	
Indent(External)	R2114FKP-0025546	Drug	20/10/2021 08:48 AM	Pending For Approval	PHARMACY (Hospital Batu Gajah)	
Indent(External)	R2114FKP-0025549	Drug	20/10/2021 08:48 AM	Pending For Approval	PHARMACY (Hospital Tanjung Karang)	
Indent(External)	R2114FKP-0025550	Drug	20/10/2021 08:48 AM	Pending For Approval	PHARMACY (Hospital Tanjung Karang)	
Indent(External)	R2114FKP-0025551	Drug	20/10/2021 08:48 AM	Pending For Approval	PHARMACY (Hospital Tanjung Karang)	
Indent(External)	R2114FKP-0025552	Drug	20/10/2021 08:48 AM	Pending For Approval	PHARMACY (Hospital Batu Gajah)	

Figure 3.2-1 PhIS Home Page

STEP 1

Click on 'Order Management' menu followed by 'Record Prescription' and screen will be displayed as per Figure 3.2-1

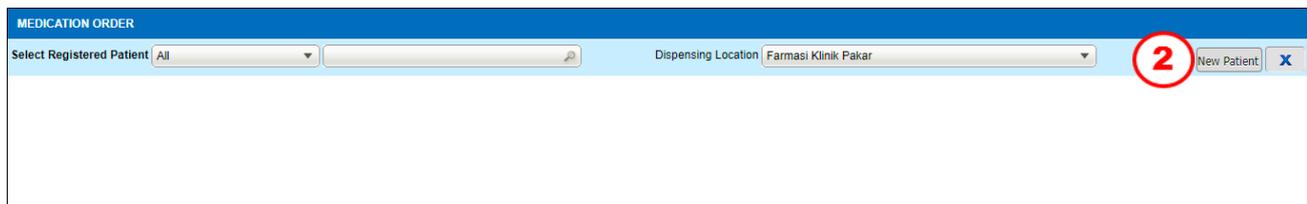


Figure 3.2-2 Transcribe Order Create New Patient

STEP 2

Click on the  to register for new patient

PATIENT REGISTRATION						
<input type="text" value="i"/> Full Registration  						
REGISTRATION INFORMATION						
MRN	<input type="text"/>	Date of Birth	<input type="text"/>			
Patient Name	<input type="text"/>	Age	<input type="text"/>			
Identification Card Number	MYKAD <input type="text"/>	Gender	<input type="text"/>			
Other Identification Number	-SELECT- <input type="text"/>	Contact Number(Mobile)	<input type="text"/>			
Pensioner	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>			
PATIENT DETAILS						
VISIT/ADMISSION						
					Click to Open Full Visit Screen <input type="button" value="Visit Management"/>	
Visit Type	Outpatient <input type="text"/>	<input type="checkbox"/> (MFlex In)	Department	Public Health <input type="text"/>		
Encounter No	<input type="text"/>		Location	<input type="text"/>		
Collection Mode	<input type="text"/>					
Facility RN Number	<input type="text"/>					
<input type="button" value="1"/> / <input type="button" value="1"/>						
Encounter No	Visit/Admission Date	Visit Type	Visit Location	Discharge Date	Medication Order	Renew Visit
No Records Found!						

Figure 3.2-3 Registration Information

STEP 3

Enter **Patient Name**

STEP 4

Select from **Identification Card Number** drop down box:

- MYKAD
- MYKID

and enter the relevant number

Note

- After entering the Identification Card Number, the below details will be displayed:
 - Date of Birth (dd/mm/yy)
 - Age (Y M D)
 - Gender (Male/Female/Unknown)
- If MYKAD/MYKID is unavailable, user is required to select the Other Identification Number dropdown box:
 - BIRTH CERTIFICATE
 - DRIVING LICENSE
 - FATHER IC
 - MILITARY CARD NUMBER
 - MOTHER IC
 - MYKAS
 - MYPR
 - OLD IC
 - OTHERS
 - PASSPORT
 - PENSION CARD
 - POLICE CARD NUMBER
 - UNHCR
 - UNKNOWN PATIENT
 - WORK PERMIT
 and enter the relevant number.

STEP 5

Enter **Contact Number (Mobile)**

PATIENT REGISTRATION						
<div style="float: right;">Full Registration  </div>						
REGISTRATION INFORMATION						
MRN	<input type="text"/>	Date of Birth	<input type="text"/>	9		
Patient Name	<input type="text"/>	Age	<input type="text"/>			
Identification Card Number	MYKAD <input type="text"/>	Gender	<input type="text"/>			
Other Identification Number	-SELECT- <input type="text"/>	Contact Number(Mobile)	<input type="text"/>			
Pensioner	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>			
PATIENT DETAILS						
VISIT/ADMISSION						
						Click to Open Full Visit Screen 
Visit Type	6 <input type="text" value="Outpatient"/>	<input type="checkbox"/> (MFlex In)	Department	7 <input type="text" value="Public Health"/>		
Encounter No	<input type="text" value=""/>		Location	<input type="text" value=""/>	8	
Collection Mode	<input type="text" value=""/>					
Facility RN Number	<input type="text" value=""/>					
<input type="button" value="1"/> / <input type="button" value="1"/>						
Encounter No	Visit/Admission Date	Visit Type	Visit Location	Discharge Date	Medication Order	Renew Visit
No Records Found!						

Figure 3.2-4 Visit/Admission

STEP 6

Select the **Visit Type** from dropdown box:

- Daycare
- Emergency
- Inpatient
- Outpatient
- Outsource
- PAC
- SPUB
- Walk-in

Note

- User able to use (MFlex In) checkbox. (MFlex In) is not necessary used to create new visit for Methadone patient but it's used to indicate that this patient as Methadone patient.
- User able to select Collection Mode
 - Appointment Card
 - Email and Take
 - Fax and Take
 - Normal Collection
 - Others
 - Comm. Apps in Smart Phone
 - Telephone And Take
 - UMP
 - Locker4U
 - Leave and Collect
 - Walk-in/Without Appointment

STEP 7

Select the **Department** from dropdown box:

Note

Department will tie to the selected **Visit Type**.

STEP 8

Select **Location** from dropdown box

Note

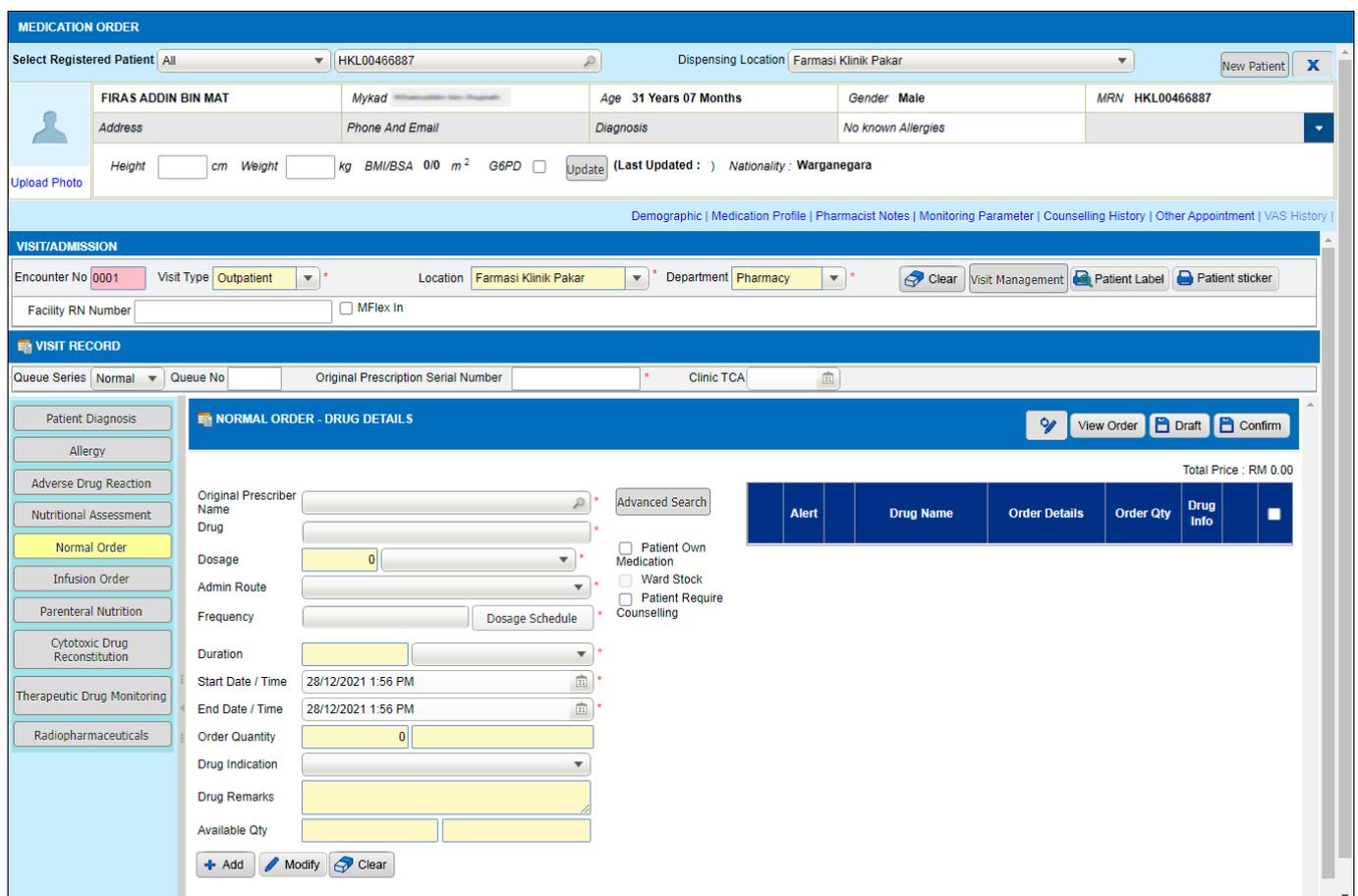
Location will tie to the selected **Department**.

STEP 9

Click on the  button to save the record and medication order screen will display as per Figure 3.2.5

Note

- After clicking the save button, system will automatically generate the MRN (Medical Record Number) and  and  buttons will be enabled.
- Click on the  button to assess 'Visit Management' Screen. (Refer to Appendix 2).
- Another option to register a new patient is to click on the  button located under Patient Quick Registration that will display the same screen as Figure 3.2-3.



The screenshot displays the 'MEDICATION ORDER' interface. At the top, it shows 'Select Registered Patient' with a dropdown menu and a search field containing 'HKL00466887'. The 'Dispensing Location' is set to 'Farmasi Klinik Pakar'. Below this, a patient profile for 'FIRAS ADDIN BIN MAT' is shown, including Mykad, Age (31 Years 07 Months), Gender (Male), and MRN (HKL00466887). The interface is divided into sections: 'VISIT/ADMISSION' with fields for Encounter No (0001), Visit Type (Outpatient), Location (Farmasi Klinik Pakar), and Department (Pharmacy); and 'VISIT RECORD' with fields for Queue Series (Normal) and Queue No. The main section is 'NORMAL ORDER - DRUG DETAILS', which includes a sidebar with categories like Patient Diagnosis, Allergy, and Therapeutic Drug Monitoring. The central area contains fields for Original Prescriber Name, Drug, Dosage (0), Admin Route, Frequency, Duration, Start Date / Time (28/12/2021 1:56 PM), End Date / Time (28/12/2021 1:56 PM), Order Quantity (0), Drug Indication, Drug Remarks, and Available Qty. A table on the right shows columns for Alert, Drug Name, Order Details, Order Qty, and Drug Info. The total price is listed as RM 0.00.

Figure 3.2-5 Medication Order

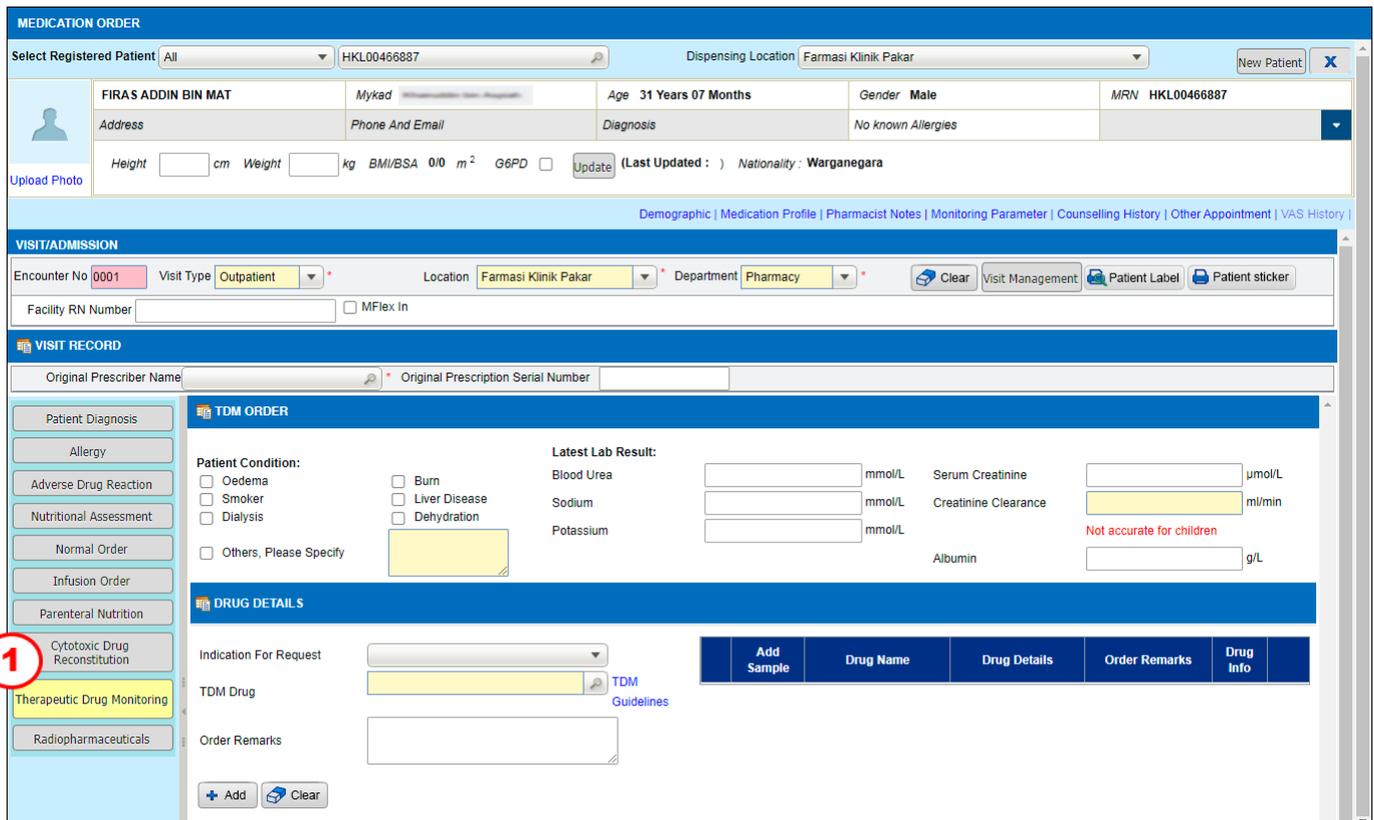
3.3 Therapeutic Drug Monitoring (TDM) Order

Perform these steps below to create new order for TDM

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

TDM Order User Groups:

- **Authorised Pharmacist**



MEDICATION ORDER

Select Registered Patient: All | HKL00466887 | Dispensing Location: Farmasi Klinik Pakar | New Patient X

Patient Information:
 Name: FIRAS ADDIN BIN MAT | Mykad: [Redacted] | Age: 31 Years 07 Months | Gender: Male | MRN: HKL00466887
 Address: [Redacted] | Phone And Email: [Redacted] | Diagnosis: [Redacted] | No known Allergies
 Height: [] cm | Weight: [] kg | BMI/BSA: 0/0 m² | G6PD: [] | Update (Last Updated:) | Nationality: Warganegara

VISIT/ADMISSION

Encounter No: 0001 | Visit Type: Outpatient | Location: Farmasi Klinik Pakar | Department: Pharmacy | Clear | Visit Management | Patient Label | Patient sticker
 Facility RN Number: [] | MFlex In: []

VISIT RECORD

Original Prescriber Name: [] | Original Prescription Serial Number: []

DRUG ORDER

Patient Condition:
 Oedema | Burn
 Smoker | Liver Disease
 Dialysis | Dehydration
 Others, Please Specify: []

Latest Lab Result:
 Blood Urea: [] mmol/L | Serum Creatinine: [] umol/L
 Sodium: [] mmol/L | Creatinine Clearance: [] ml/min
 Potassium: [] mmol/L | Albumin: [] g/L (Not accurate for children)

DRUG DETAILS

Indication For Request: [] | Add Sample | Drug Name | Drug Details | Order Remarks | Drug Info
 TDM Drug: [] | TDM Guidelines
 Order Remarks: []
 + Add | Clear

Figure 3.3-1 Medication Order

STEP 1

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

Note

- User is allowed to update patient's height and weight and click on the **Update** 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 allowing to do multiple TDM Order**

Figure 3.3-2 TDM Order

STEP 2

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 3

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 3.3-3 TDM Drug Details

STEP 4

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.

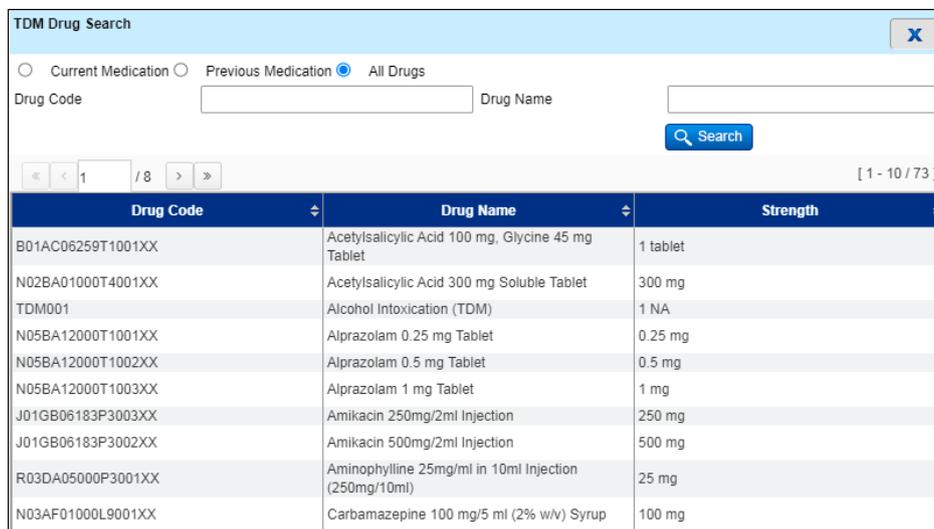
STEP 5

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 3.3-4.
- Click on [TDM Guidelines](#) hyperlink to view TDM Guideline details on the selected TDM Drug as per Figure 3.3-5.
- TDM Guideline master setup is controlled by HQ.
- Select any type of indication of request system will default to 'All Drugs'.
- The Drug Details field will be a free text field for user to enter the current dosage and frequency as per Figure 3.3-7.



Drug Code	Drug Name	Strength
B01AC06259T1001XX	Acetylsalicylic Acid 100 mg, Glycine 45 mg Tablet	1 tablet
N02BA01000T4001XX	Acetylsalicylic Acid 300 mg Soluble Tablet	300 mg
TDM001	Alcohol Intoxication (TDM)	1 NA
N05BA12000T1001XX	Alprazolam 0.25 mg Tablet	0.25 mg
N05BA12000T1002XX	Alprazolam 0.5 mg Tablet	0.5 mg
N05BA12000T1003XX	Alprazolam 1 mg Tablet	1 mg
J01GB06183P3003XX	Amikacin 250mg/2ml Injection	250 mg
J01GB06183P3002XX	Amikacin 500mg/2ml Injection	500 mg
R03DA05000P3001XX	Aminophylline 25mg/ml in 10ml Injection (250mg/10ml)	25 mg
N03AF01000L9001XX	Carbamazepine 100 mg/5 ml (2% w/v) Syrup	100 mg

Figure 3.3-4 Drug Search

TDM GUIDELINE

TDM Drug: Alprazolam 1 mg Tablet
 Time to monitor: None
 Total Cost of Analysis(RM):
 Remarks:

Calculator

- Digoxin
- Aminoglycoside Pre
- Carbamazepine
- Phenobarbitone
- Vancomycin Pre
- Theophylline
- Valproic Acid
- Vancomycin Post
- Vancomycin Pre -Post
- Aminoglycoside Post
- Aminoglycoside Pre -Post
- Aminoglycoside Post1-Post6
- Phenytoin

TDM GUIDELINE DETAIL

Sampling Type	After/Before	Default time	Lab Order	Therapeutic Range	UOM	Updated On
Random	AFTER	30 MINUTES	Benzodiazepine Random	Random: 10-1000 ng/ml	ng/ml	08/01/2020

Figure 3.3-5 TDM Guidelines

DRUG DETAILS

Indication For Request: Therapeutic Monitoring
 TDM Drug: Alprazolam 1 mg Tablet
 Order Remarks:
 Drug Details:
 (Please specify current Dosage, Frequency, Start Date & End Date)

Add Sample	Drug Name	Drug Details	Order Remarks	Drug Info
Add Sample	Alprazolam 1 mg Tablet	1mg tab	test	

Figure 3.3-6 Drug Details

DRUG DETAILS

Indication For Request:
 TDM Drug:
 Order Remarks:
 Drug Details:
 (Please specify current Dosage, Frequency, Start Date & End Date)

Add Sample	Drug Name	Drug Details	Order Remarks	Drug Info
Add Sample	Alprazolam 1 mg Tablet	1mg tab	test	

8, 6, 7, 9

Figure 3.3-7 Drug Details

STEP 6

Fill the **Order Remark** if necessarily.

STEP 7

Fill the **Drug Detail**.

Note

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

STEP 8

Click on the  button to added drug and will be display as Figure 3.3-7

Note

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

STEP 9

Click on the  to fill in sampling details, sampling details screen will be displayed as Figure 3.3-8

Note

- There are several sampling types 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 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 3.3-9.

Figure 3.3-8 Sampling Details

STEP 10

Select **Sampling Type**

STEP 11

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

Note

Drug Administration Date/Time defaulted as empty with 12 hour time format

STEP 12

Click on the  button to select **Suggested Sampling Date/Time**

Note

User able to select **Suggested Sampling Date/Time** for **After** or **Before**

STEP 13

Click on  button to save the sampling details

DRUG DETAILS Clear Confirm

Indication For Request:

TDM Drug: TDM Guidelines

Order Remarks:

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

Add Sample	Drug Name	Drug Details	Order Remarks	Drug Info
<input type="button" value="Add Sample"/>	Alprazolam 1 mg Tablet	1mg tab	test	<input type="button" value="i"/> <input type="button" value="trash"/>

Sampling Type	Drug Administration Date/Time	Sampling Time	Suggested Sampling Date/Time	Lab Test Order
Random	28/12/2021 03:26 PM	8 Minutes	28/12/2021 03:34 PM	Benzodiazepine Random

Figure 3.3-9 Drug Details

STEP 14

Click on the  to view the sampling details added as Figure 3.3.9

STEP 15

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

Note

- Click on the button to confirm the record as Figure 3.3-10

CONFIRMATION

CONF0002: Are you sure you want to save?

Figure 3.3-10 Confirmation alert message

DRUG DETAILS 16 Verify

Indication For Request:

TDM Drug: TDM Guidelines

Order Remarks:

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

Add Sample	Drug Name	Drug Details	Order Remarks	Drug Info
<input type="button" value="Add Sample"/>	Alprazolam 1 mg Tablet	1mg tab	test	<input type="button" value="i"/>

Figure 3.3-11 Verify Sampling Details

STEP 16

Click on the  button to verify order

Note

- Order Status changed to “Verified” as Figure 3.3-12
- Users not allowed to update sampling details if order status is “Verified”.
- Click on the  button to verify the record.

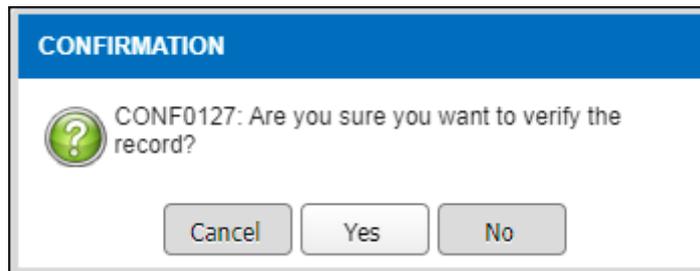


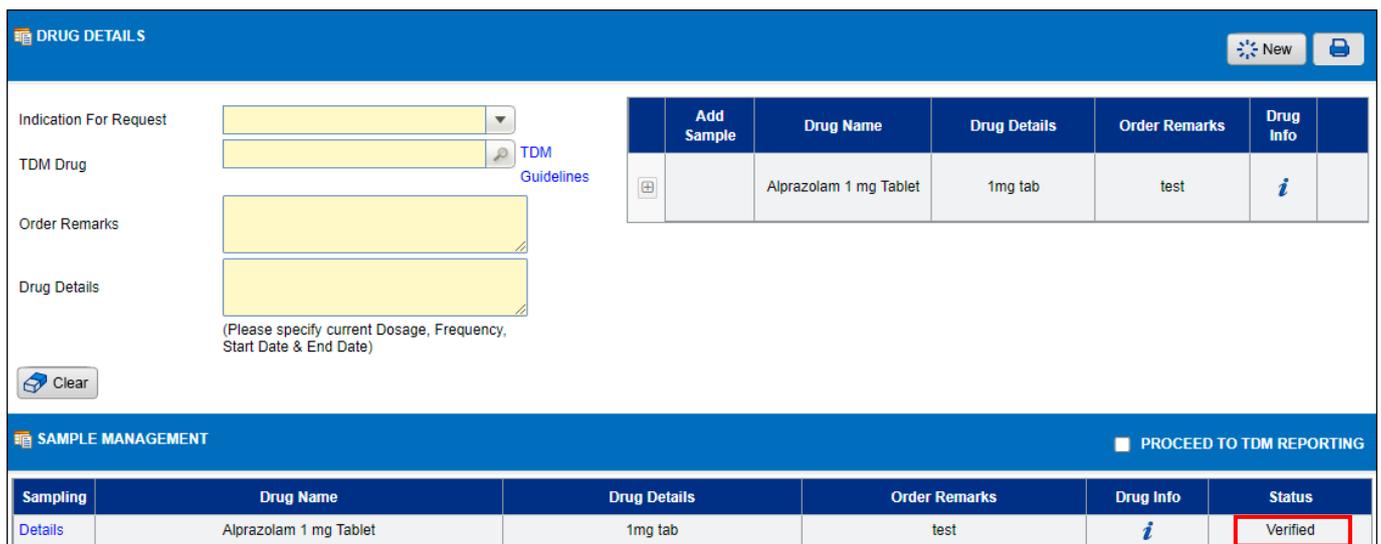
Figure 3.3-12 Confirmation Alert Message

STEP 17

Click on the  button to print TDM Request Form as per Figure 3.3-14

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 as Figure 3.3-13



The screenshot shows the "DRUG DETAILS" section of the TDM system. It includes fields for "Indication For Request", "TDM Drug", "Order Remarks", and "Drug Details". A "Clear" button is visible. To the right is a table with columns: "Add Sample", "Drug Name", "Drug Details", "Order Remarks", and "Drug Info". The table contains one entry for "Alprazolam 1 mg Tablet" with details "1mg tab" and "test". Below this is the "SAMPLE MANAGEMENT" section with a "PROCEED TO TDM REPORTING" button and a table with columns: "Sampling", "Drug Name", "Drug Details", "Order Remarks", "Drug Info", and "Status". The "Status" column for the Alprazolam entry is highlighted in red and contains the word "Verified".

Figure 3.3-13 Verified Sampling Details



CLINICAL PHARMACOKINETICS SERVICES
Therapeutic Drug Monitoring (TDM) Request Form

Ordered By _____ TDM Order No : TDM2100005249
Ordered Date/Time 28/12/2021 03:18 PM

PATIENT DETAILS					
Name:	FIRAS ADDIN BIN MAT	MRN NO:	HKL00466887	IC:	_____
				Race:	
Age:	31 Years 07 Months	Sex:	Male	Ward/Unit:	Farmasi Klinik Pakar
Weight:	80 kg	Height:	173 cm		
LATEST LAB RESULT :					
Blood Urea	Sodium	Potassium	Serum Creatinine	Creatinine Clearance	Albumin
PATIENT CONDITION					
Oedema:	YES	Smoker:	YES	Dehydration:	NO
Dialysis:	NO	Burn:	NO	Liver Disease:	NO
Others:	NO	Details:			
TDM DRUG DETAILS					
No	TDM No	Drug Name	Drug Details	Indication Request	Remarks
1	TDM2100005249	Alprazolam 1 mg Tablet	1mg tab	Therapeutic Monitoring	test
Sample Type	Lab Test Order	Drug Administration Date/Time	Suggested Sampling Date/Time	Interval	
RANDOM	Benzodiazepine Random	28/12/2021 03:26 PM	28/12/2021 03:34 PM	8 Minutes	

Figure 3.3-14 TDM Request Form

DRUG DETAILS
New

Indication For Request

TDM Drug [TDM Guidelines](#)

Order Remarks

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

Add Sample	Drug Name	Drug Details	Order Remarks	Drug Info
+	Alprazolam 1 mg Tablet	1mg tab	test	i

SAMPLE MANAGEMENT
PROCEED TO TDM REPORTING

Sampling	Drug Name	Drug Details	Order Remarks	Drug Info	Status
Details	Alprazolam 1 mg Tablet	1mg tab	test	i	Verified

18

Figure 3.3-15 Sampling Details

STEP 18

Click on the **Details** fill in sample management details, sample management details pop up screen will be displayed as Figure 3.3.16

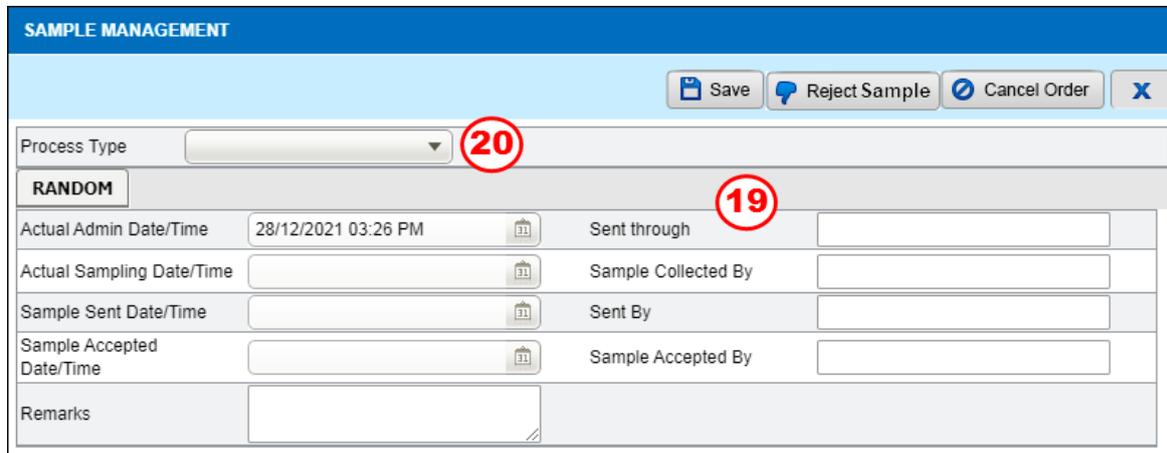


Figure 3.3-16 Sample Management

STEP 19

Enter details in these fields:

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

Note

- If have more than one sample, record will be display in the next tab.

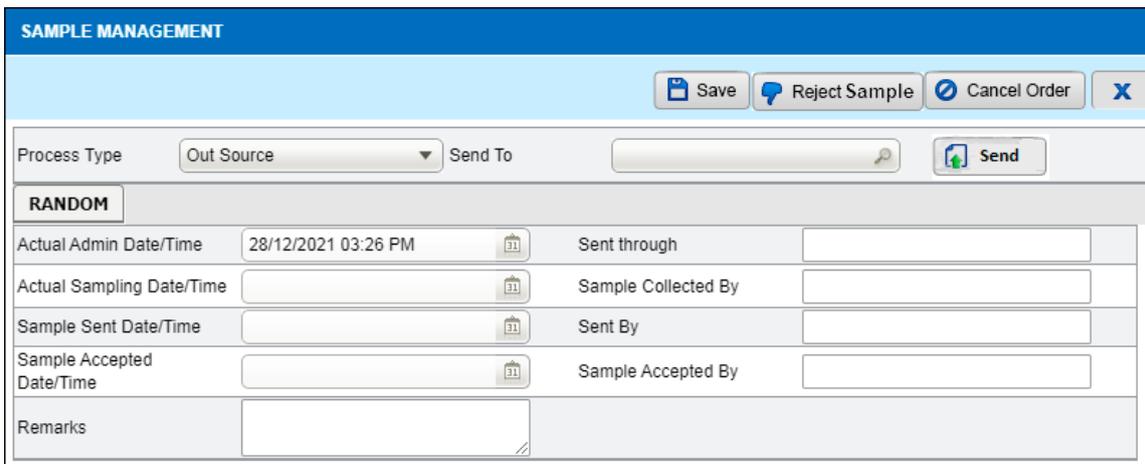
STEP 20

Select **Process Type** from dropdown box:

- Lab Based
- Outsource
- Pharmacy Based

Note

- If Process Type is "Outsource", user needs to select which facility to send the order to under Auto complete search drop down and click on the  button.



SAMPLE MANAGEMENT

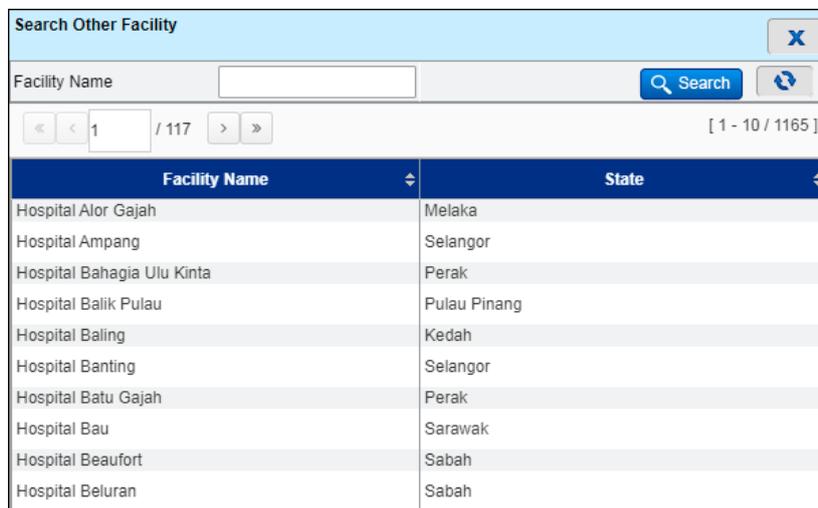
Save Reject Sample Cancel Order X

Process Type: Out Source Send To: [] Send

RANDOM

Actual Admin Date/Time	28/12/2021 03:26 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 3.3-17 Sample Management – Out Source



Search Other Facility

Facility Name: [] Search []

<< < 1 / 117 > >> [1 - 10 / 1165]

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 3.3-18 search Other Facility

- 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.

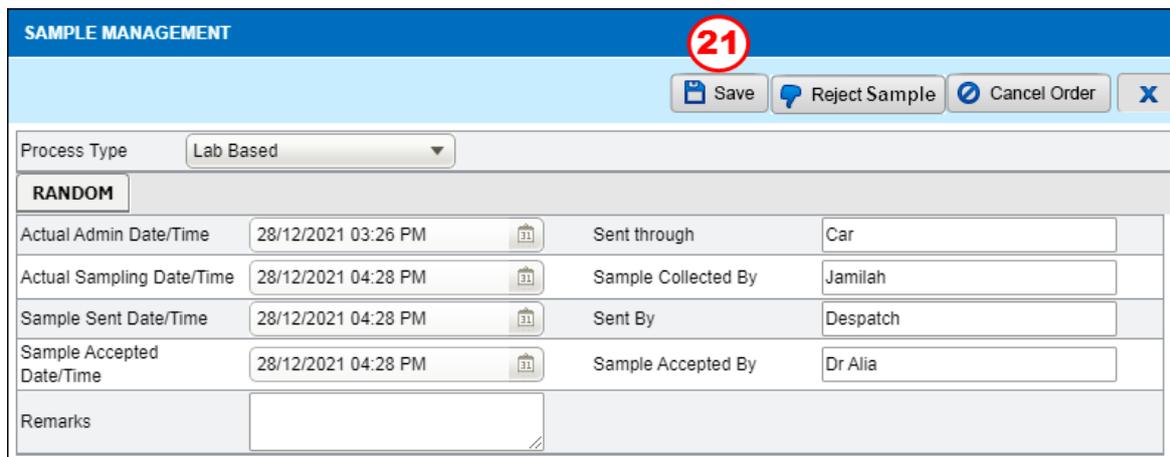
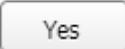


Figure 3.3-19 Save Sample Management

STEP 21

Click on the  button to save record

Note

- Click on the  button to save the record.
- Order Status changed to “Sample Accepted” as Figure 3.3-21

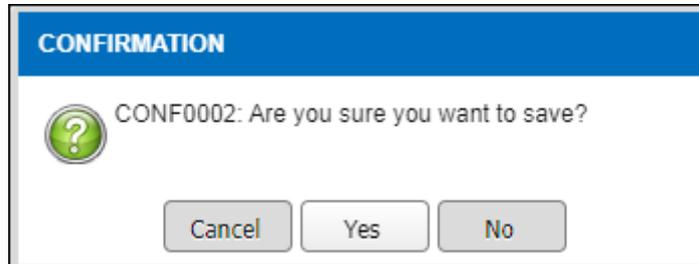


Figure 3.3-20 Confirmation Alert Message

DRUG DETAILS
New

Indication For Request

TDM Drug [TDM Guidelines](#)

Order Remarks

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

Add Sample	Drug Name	Drug Details	Order Remarks	Drug Info
	Alprazolam 1 mg Tablet	1mg tab	test	i

SAMPLE MANAGEMENT
22
PROCEED TO TDM REPORTING

Sampling	Drug Name	Drug Details	Order Remarks	Drug Info	Status
Details	Alprazolam 1 mg Tablet	1mg tab	test	i	Sample Accepted

Figure 3.3-21 Proceed to Reporting

STEP 22

Select the PROCEED TO TDM REPORTING to perform the TDM reporting.

Note

- Click on the button to proceed to the TDM reporting and screen will be displayed as Figure 3.3-23

CONFIRMATION

CONF0152: Are you sure you want to proceed to TDM reporting?

Figure 3.3-22 Confirmation Alert Message

REPORTING

X

FIRAS ADDIN BIN MAT	Mykad [Redacted]	Age 31 Years 07 Months	Gender Male	MRN HKL00466887
Address	Phone And Email	Diagnosis	No known Allergies	

Upload Photo
Height cm Weight kg BMI/BSA 26.7 / 1.96 m² Update (Last Updated : 28/12/2021) Nationality : Warganegara

[Demographic](#) | [Medication Profile](#) | [Pharmacist Notes](#) | [Monitoring Parameter](#) | [TDM Guidelines](#)

Encounter No: 0001 Actual Visit Date: 28/12/2021 Visit Location: Farmasi Klinik Pakar Ordered By: [Redacted]

+ Add CP2

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

TDM No.	Drug Name	Drug Details	Order Remarks	Actual Sampling Time	Actual Drug Admin Date/Time	Reporting	Pre	Post
TDM2100005249	Alprazolam 1 mg Tablet	1mg tab	Remarks	28/12/2021 04:28 PM	28/12/2021 03:26 PM	Details		

23

Pharmacist Note

Remarks

Total Cost of Analysis

TDM service Charge in RM

Save Report Confirm

+ Place TDM Order Save

Figure 3.3-23 TDM Reporting

STEP 23

Click on Details hyperlink to display Reporting screen

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

REPORTING

X

<p>Pre Sample</p> <p>Result Value <input style="width: 100px;" type="text"/> ▼</p> <p>Reported By <input style="width: 100px;" type="text"/> Details</p>	<p>Latest Lab Result:</p> <p>Blood Urea <input style="width: 100px;" type="text"/> mmol/L</p> <p>Sodium <input style="width: 100px;" type="text"/> mmol/L</p> <p>Potassium <input style="width: 100px;" type="text"/> mmol/L</p> <p>Serum Creatinine <input style="width: 100px;" type="text"/> µmol/L</p> <p>Creatinine Clearance <input style="width: 100px;" type="text"/> ml/min Not accurate for Children</p>
<p>Post Sample</p> <p>Result Value <input style="width: 100px;" type="text"/> ▼</p> <p>Reported By <input style="width: 100px;" type="text"/> Details</p>	<p>Albumin <input style="width: 100px;" type="text"/> g/L</p>
<p>Random Sample</p> <p>Result Value <input style="width: 100px;" type="text"/> ▼</p> <p>Reported By <input style="width: 100px;" type="text"/> Details</p> <p>Calculator ▼</p>	<p>Pharmacokinetics Profile</p> <div style="border: 1px solid gray; height: 100px; width: 100%;"></div>
<p>Recommendation Type ▼</p> <p>Toxic <input type="checkbox"/> No <input checked="" type="checkbox"/></p>	<p style="text-align: right;">Ok</p>

Figure 3.3-24 Reporting Detail

DETAILS

X

Reference Range	:	Random: 10-1000 ng/ml
Sample Collected Date/Time	:	28/12/2021 04:28
Actual Drug Admin Date/Time	:	28/12/2021 03:26
Out Source	:	NO

Figure 3.3-25 Sample Details

STEP 24

Enter sample details as below:

- Result Value
- Reported By

Note

Click on [Details](#) hyperlink to view sample details. Sample Details consists of:

- Reference Range
- Sample Collected Date/Time
- Actual Drug Admin Date/Time
- Outsource

STEP 25

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

STEP 26

Enter **Pharmacokinetics Profile**

Notes

Pharmacokinetics Profile field will display data entered from the TDM calculator and also can be edited.

STEP 27

Select **Recommendation Type** from dropdown box:

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

Notes

Recommendation Type will be copied and displayed in Pharmacist Notes.

STEP 28

Select **Toxic**:

- Yes
- No

STEP 29

Click on the  button to proceed with TDM reporting process

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.

REPORTING

X

	FIRAS ADDIN BIN MAT	Mykad	Age 31 Years 07 Months	Gender Male	MRN HKL00466887
	Address	Phone And Email	Diagnosis	No known Allergies	

Upload Photo
Height cm Weight kg BMI/BSA 26.7 / 1.96 m² Update (Last Updated : 28/12/2021) Nationality : Warganegara

Encounter No: 0001 Actual Visit Date: 28/12/2021 Visit Location: Farmasi Klinik Pakar Ordered By:

+ Add
CP2

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

TDM No.	Drug Name	Drug Details	Order Remarks	Actual Sampling Time	Actual Drug Admin Date/Time	Reporting	Pre	Post
TDM2100005249	Alprazolam 1 mg Tablet	1mg tab	Remarks	28/12/2021 04:28 PM	28/12/2021 03:26 PM	Details		

Pharmacist Note

TDM2100005249 - Alprazolam 1 mg Tablet - Maintain The Dose
 Result Value :-
 Random :0.8 - 2.0 ng/ml

1852 characters allowed

Remarks

Total Cost of Analysis

TDM service Charge in RM

Save Report
 Confirm

Place TDM Order
 Save

Figure 3.3-26 TDM Reporting

STEP 30

Click on the button to save report

STEP 31

Click on the button to confirm report

Note

- Click on the button to proceed to the TDM reporting and screen will be displayed as Figure 3.3-27

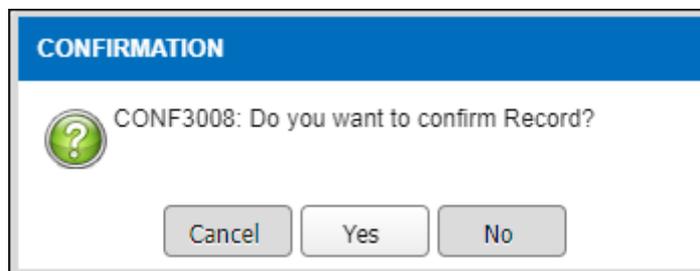


Figure 3.3-27 Confirmation Alert Message

- Information alert message will be shown in Figure 3.3-28

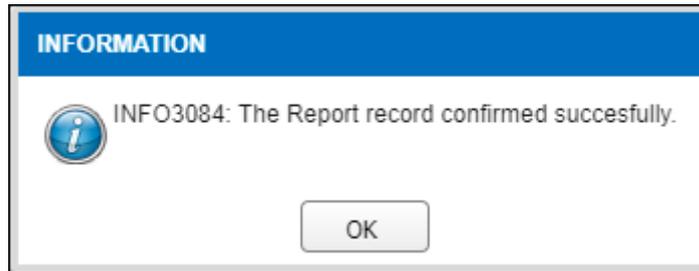


Figure 3.3-28 Information Alert Message

- Once click on confirm record will be update as shown in Figure 3.3-29

REPORTING

Info *Print* X

	FIRAS ADDIN BIN MAT	<i>Mykad</i> XXXXXXXXXX	<i>Age</i> 31 Years 07 Months	<i>Gender</i> Male	<i>MRN</i> HKL00466887
	<i>Address</i>	<i>Phone And Email</i>	<i>Diagnosis</i>	<i>No known Allergies</i>	
<i>Upload Photo</i>	<i>Height</i> 173 cm	<i>Weight</i> 80 kg	<i>BMI/BSA</i> 26.7 / 1.96 m ²	<i>(Last Updated : 28/12/2021) Nationality : Warganegara</i>	

[Demographic](#) | [Medication Profile](#) | [Pharmacist Notes](#) | [Monitoring Parameter](#) | [TDM Guidelines](#)

Encounter No: 0001 Actual Visit Date: 28/12/2021 Visit Location: Farmasi Klinik Pakar Ordered By: XXXXXXXXXX

+ Add CP2

[1 - 1 / 1]

Order Remarks	Actual Sampling Time	Actual Drug Admin Date/Time	Reporting	Pre	Post	Post1	Post2	Random	Toxic	Recommendation Type	Recommendation accepted
Remarks	28/12/2021 04:28 PM	28/12/2021 03:26 PM	Details					0.8 - 2.0	NO	Maintain The Dose	Yes

Pharmacist Note

TDM Completed : 28/12/2021 05:05 PM
TDM2100005249 - Alprazolam 1 mg Tablet - Maintain The Dose
Result Value :-
Random :0.8 - 2.0 ng/ml

Remarks

1852 characters allowed

Total Cost of Analysis

TDM service Charge in RM

32

33

Save Report Confirm

+ Place TDM Order Save

Figure 3.3-29 TDM Reporting

Note

The  **Save** button and  **Place TDM Order** button will be enabled.

STEP 32

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

STEP 33

Click on the  **Save Report** button to authorize the report

3.4 External TDM

3.4.1 External TDM Online

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.

External Notification			
External TDM Request Received:	<input type="text" value="1"/>	Online Issue Request Received:	<input type="text" value="0"/>
Online External CDR Request Received:	<input type="text" value="0"/>	Online External CDR Result Received:	<input type="text" value="0"/>
Online External PN Request Received:	<input type="text" value="0"/>	Online External PN Result Received:	<input type="text" value="0"/>

Figure 3.4.1-1 External Notification

STEP 1

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

OUTSOURCE LISTING									
Hosp/Clinic	TDM Order No	MRN No	Patient Name	Patient ID	TDM Drug	Sample Type	Date/Time	Register	
<input type="checkbox"/> Hospital Tuanku Jaafar, Seremban	TDM2100001697	HTJ00033405	[Redacted]	[Redacted]	Lithium Carbonate 300 mg Tablet	RANDOM	28/09/2021 12:46 PM	Register	<input type="button" value="2"/>
<input type="checkbox"/> Hospital Rehabilitasi Cheras	TDM2100000038	HRC00084644	[Redacted]	[Redacted]	Vancomycin HCl 500mg/10ml Injection	POST	21/09/2021 02:42 PM	Register	

Figure 3.4.1-2 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 3.4.1-2

OUTSOURCE LISTING									
Hosp/Clinic	TDM Order No	MRN No	Patient Name	Patient ID	TDM Drug	Sample Type	Date/Time	Register	
<input checked="" type="checkbox"/> Hospital Tuanku Jaafar, Seremban	TDM2100001697	HTJ00033405	[Redacted]	[Redacted]	Lithium Carbonate 300 mg Tablet	RANDOM	28/09/2021 12:46 PM	Registered	<input type="button" value="4"/>
<input type="checkbox"/> Hospital Rehabilitasi Cheras	TDM2100000038	HRC00084644	[Redacted]	[Redacted]	Vancomycin HCl 500mg/10ml Injection	POST	21/09/2021 02:42 PM	Register	<input type="button" value="3"/>

Figure 3.4.1-3 Outsource Listing – Registered Patient

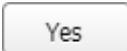
STEP 3

Click on the checkbox for selected patient

STEP 4

Click on the button to save the record

Note

- Once click on save button, alert message will be shown in Figure 3.4.1-4 and click on  button to confirm

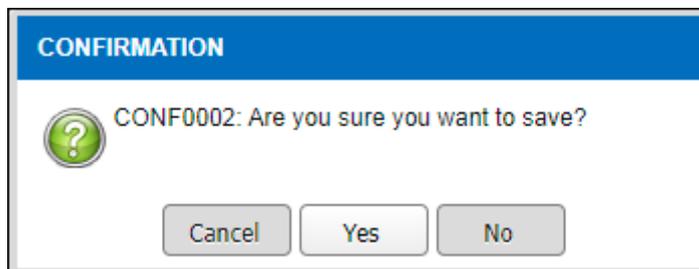
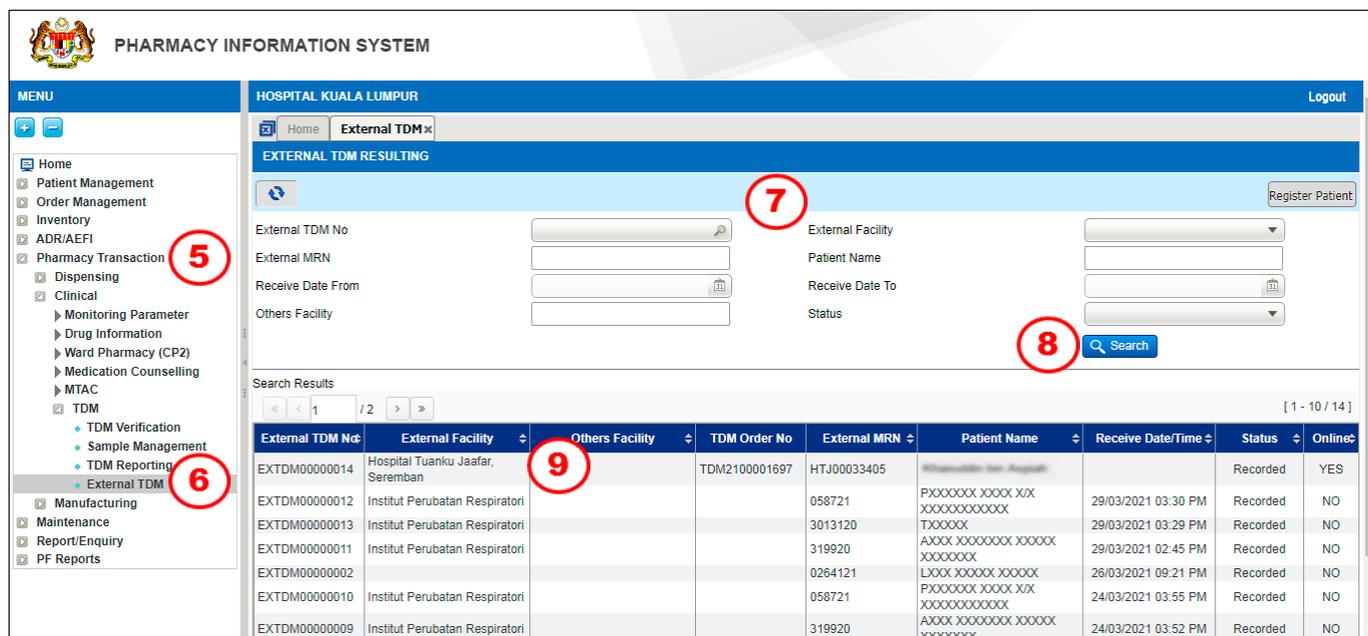


Figure 3.4.1-4 Confirmation Alert Message

- Registered patient will be uploaded to the External TDM listing page as shown in Figure 3.4.1-5



PHARMACY INFORMATION SYSTEM

HOSPITAL KUALA LUMPUR

Logout

Home External TDM

EXTERNAL TDM RESULTING

Register Patient

External TDM No: External Facility:

External MRN: Patient Name:

Receive Date From: Receive Date To:

Others Facility: Status:

Search

Search Results [1 - 10 / 14]

External TDM No	External Facility	Others Facility	TDM Order No	External MRN	Patient Name	Receive Date/Time	Status	Online
EXTDM00000014	Hospital Tuanku Jaafar, Seremban		TDM2100001697	HTJ00033405	XXXXXXXXXX XXXXXXXXXXXXXXXX	29/03/2021 03:30 PM	Recorded	YES
EXTDM00000012	Institut Perubatan Respiratori			058721	XXXXXXXXXX XXXXXXXXXXXXXXXX	29/03/2021 03:29 PM	Recorded	NO
EXTDM00000013	Institut Perubatan Respiratori			3013120	XXXXXXXXXX XXXXXXXXXXXXXXXX	29/03/2021 02:45 PM	Recorded	NO
EXTDM00000011	Institut Perubatan Respiratori			319920	XXXXXXXXXX XXXXXXXXXXXXXXXX	29/03/2021 02:45 PM	Recorded	NO
EXTDM00000002				0264121	XXXXXXXXXX XXXXXXXXXXXXXXXX	26/03/2021 09:21 PM	Recorded	NO
EXTDM00000010	Institut Perubatan Respiratori			058721	XXXXXXXXXX XXXXXXXXXXXXXXXX	24/03/2021 03:55 PM	Recorded	NO
EXTDM00000009	Institut Perubatan Respiratori			319920	XXXXXXXXXX XXXXXXXXXXXXXXXX	24/03/2021 03:52 PM	Recorded	NO

Figure 3.4.1-5 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

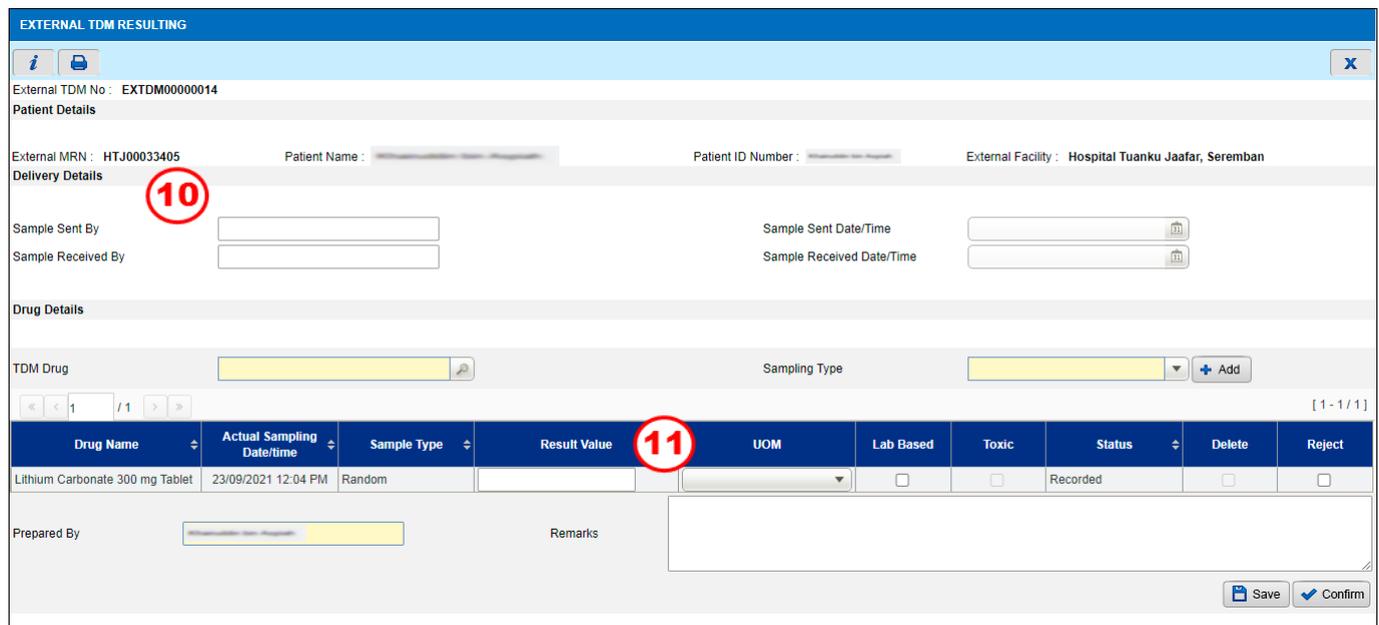
Click on the  button to search for patient records

STEP 9

Double-click on the selected patient and External TDM Resulting screen will be displayed as per Figure 3.4.1-6

Note

 button is for offline External TDM (refer to [section 3.4.2 External TDM Offline](#))



EXTERNAL TDM RESULTING

External TDM No : EXTDM00000014

Patient Details

External MRN : HTJ00033405 Patient Name : [Redacted] Patient ID Number : [Redacted] External Facility : Hospital Tuanku Jaafar, Seremban

Delivery Details

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

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

Drug Details

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

Drug Name	Actual Sampling Date/time	Sample Type	Result Value	UOM	Lab Based	Toxic	Status	Delete	Reject
Lithium Carbonate 300 mg Tablet	23/09/2021 12:04 PM	Random	[Text Box]	[Dropdown]	<input type="checkbox"/>	<input type="checkbox"/>	Recorded	<input type="checkbox"/>	<input type="checkbox"/>

Prepared By : [Text Box] Remarks : [Text Area]

Save Confirm

Figure 3.4.1-6 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.

EXTERNAL TDM RESULTING

X

External TDM No : EXTDM0000014

Patient Details

External MRN : HTJ00033405 Patient Name : XXXXXXXXXX Patient ID Number : XXXXXXXXXX External Facility : Hospital Tuanku Jaafar, Seremban

Delivery Details

Sample Sent By : Sample Sent Date/Time :

Sample Received By : Sample Received Date/Time :

Drug Details

TDM Drug : Sampling Type : + Add

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

Drug Name	Actual Sampling Date/time	Sample Type	Result Value	UOM	Lab Based	Toxic	Status	Delete	Reject
Lithium Carbonate 300 mg Tablet	23/09/2021 12:04 PM	Random			<input type="checkbox"/>	<input type="checkbox"/>	Recorded	<input type="checkbox"/>	<input type="checkbox"/>

Prepared By : Remarks :

12 13

Save Confirm

Figure 3.4.1-7 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 3.3 Therapeutic Drug Monitoring \(TDM\) Order](#))

External Notification

External TDM Request Received: 1	External TDM Result Received: 1
Online SPUB R1 Request Received: 0	

Figure 3.4.1-8 External Notification



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

Figure 3.4.1-9 Outsource Listing

3.4.2 External TDM Offline

PHARMACY INFORMATION SYSTEM

HOSPITAL KUALA LUMPUR

EXTERNAL TDM RESULTING

Register Patient

External TDM No:

External Facility:

External MRN:

Patient Name:

Receive Date From:

Receive Date To:

Others Facility:

Status:

Search

Search Results [1 - 10 / 14]

External TDM No	External Facility	Others Facility	TDM Order No	External MRN	Patient Name	Receive Date/Time	Status	Online
EXTDM00000014	Hospital Tuanku Jaafar, Seremban		TDM2100001697	HTJ00033405	XXXXXXXXXX	29/03/2021 03:30 PM	Recorded	YES
EXTDM00000012	Institut Perubatan Respiratori			058721	XXXXXXXXXX	29/03/2021 03:29 PM	Recorded	NO
EXTDM00000013	Institut Perubatan Respiratori			3013120	XXXXXXXXXX	29/03/2021 02:45 PM	Recorded	NO
EXTDM00000011	Institut Perubatan Respiratori			319920	XXXXXXXXXX	26/03/2021 09:21 PM	Recorded	NO
EXTDM00000002	Institut Perubatan Respiratori			0264121	XXXXXXXXXX	24/03/2021 03:55 PM	Recorded	NO
EXTDM00000010	Institut Perubatan Respiratori			058721	XXXXXXXXXX	24/03/2021 03:52 PM	Recorded	NO
EXTDM00000009	Institut Perubatan Respiratori			319920	XXXXXXXXXX		Recorded	NO

Figure 3.4.2-1 External TDM Listing Page

External TDM module is for user to record external TDM resulting (Outsource) via online and offline. It is recorded offline if one of the facility used PhIS to perform TDM processes.

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

Manage Sample

External MRN: *

Patient Name: *

External Facility: *

Patient ID Number: *

Others Facility:

ID Type: *

Date of Birth: *

Gender: *

Figure 3.4.2-2 External TDM Registration

STEP 4

Enter details in the fields below:

- External MRN
- Patient Name
- External Facility
- Patient Id Number
- Other Facility

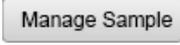
(If the sample come from private sector or facility which is not listed under MOH facilities)

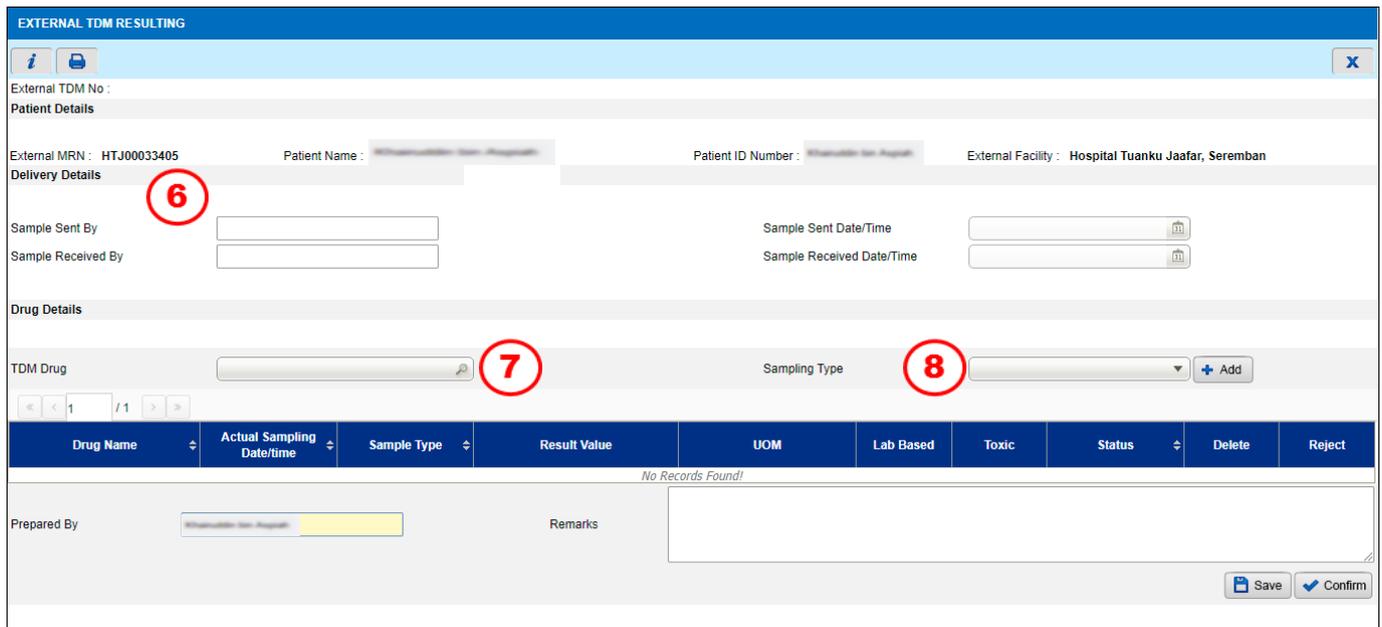
f. Id Type

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 3.4.2-3



EXTERNAL TDM RESULTING

External TDM No :
Patient Details

External MRN : HTJ00033405 Patient Name : Patient ID Number : External Facility : Hospital Tuanku Jaafar, Seremban

Delivery Details

Sample Sent By Sample Sent Date/Time

Sample Received By Sample Received Date/Time

Drug Details

TDM Drug  Sampling Type 

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

Prepared By Remarks

Figure 3.4.2-3 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:

- POST 1
- POST 2
- Pre
- Post
- Random
- Random_2

and click on the  button to add the information

EXTERNAL TDM RESULTING

X

External TDM No :
Patient Details

External MRN : HSM000006 Patient Name : [Redacted] Patient ID Number : [Redacted] External Facility : Hospital Seri Manjung

Delivery Details

Sample Sent By : [Text: Maon] Sample Sent Date/Time : 09/10/2019 05:07 PM

Sample Received By : [Text: Mail] Sample Received Date/Time : 09/10/2019 05:07 PM

Drug Details

TDM Drug : [Text: Sodium Valproate 200 mg/5 ml Syrup] Sampling Type : [Dropdown]

Drug Name	Sample Type	Result Value	UOM	Lab Based	Toxic	Status	Delete	Reject
Sodium Valproate 200 mg/5 ml Syrup	Post	10	mcmol/L	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>

Prepared By : [Text: [Redacted]] Remarks : [Text Area]

9
10
11

Figure 3.4.2-4 External TDM Resulting

STEP 9

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

- mcg/ml
- mcmol/L
- mg/dL
- mmol/L
- ng/ml
- nmol/L

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

4.0 Acronyms

Abbreviation	Definition
PhIS	Pharmacy Information System
CPS	Clinical Pharmacy System
MOH	Ministry Of Health
TDM	Therapeutic Drug Monitoring

5.0 Links to Clinical Modules

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