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

System Design Document
(SDD)

Manufacturing

Parenteral Nutrition

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REVISION HISTORY

Version No	Date of Release	Prepared by	Reviewed by	List of changes from Previous Version
1.0	23/07/2018	Ilya Syarah	Chew Ming Ping	Document baseline

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1. Introduction

Pharmaniaga Logistics Sdn. Bhd. executes software development, enhancement and maintenance projects for its clients. The term “project” is used to describe the full set of activities from the time the proposal is accepted and project initiation note or contract is signed to the time all the software and services are delivered according to the acceptance of the proposal/contract.

This process is to ensure both user requirements and software requirements of the projects developments are gathered appropriately from stakeholders and are documented in User Requirements Specification (URS) and System Design Documentation (SDD) specifically.

2. Purpose

The purpose of the document is to describe the purpose and functionality of the software product requested by client. This document outlines the project's details, requirements, interface, design issues, and components to ensure that each requirement has been met.

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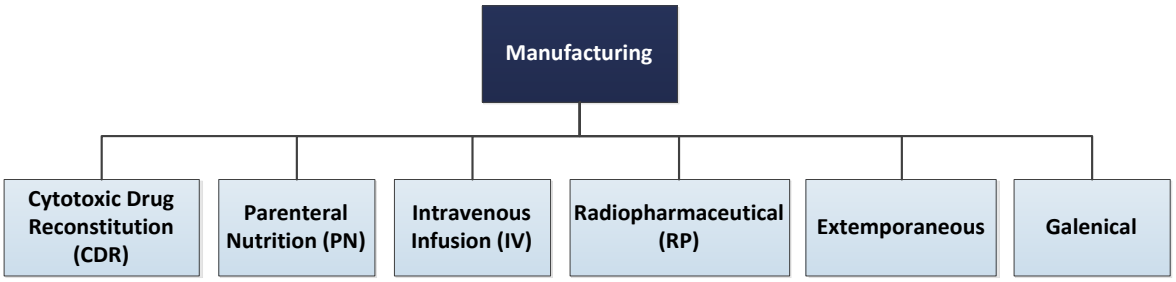
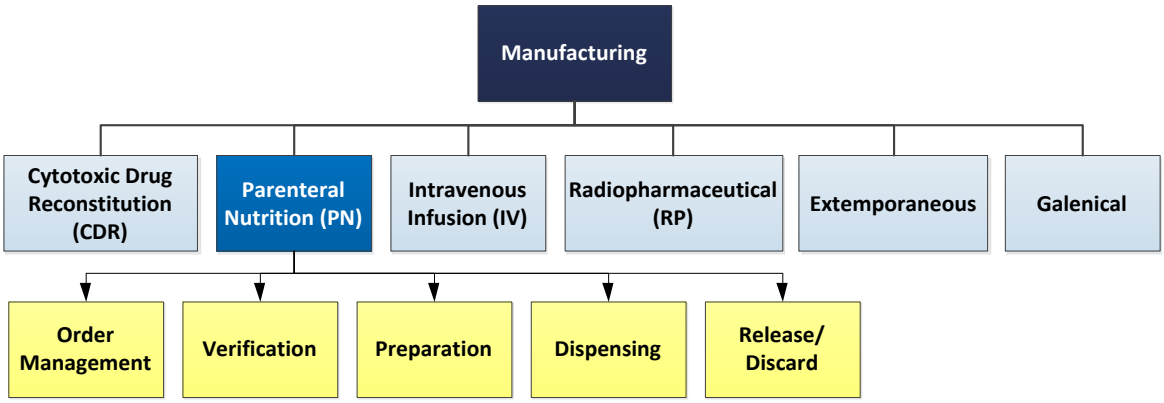
3. Detailed System Design

3.1 Manufacturing Overview



3.2 PN

3.2.1 Overview



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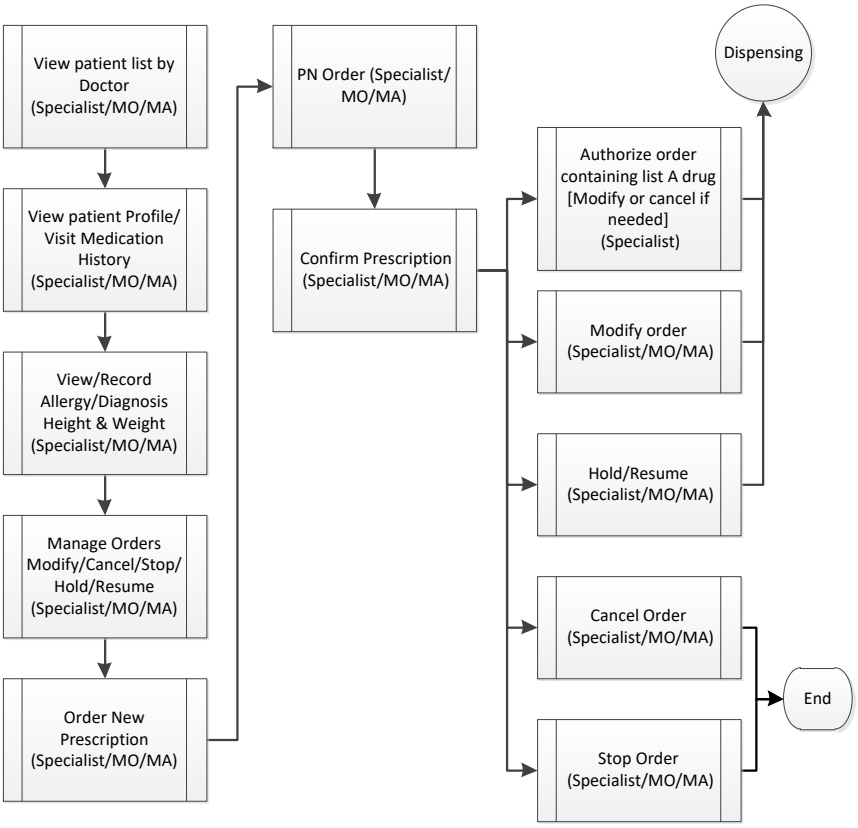
3.2.2 Block Diagram

3.2.2.1 Order Management - PN



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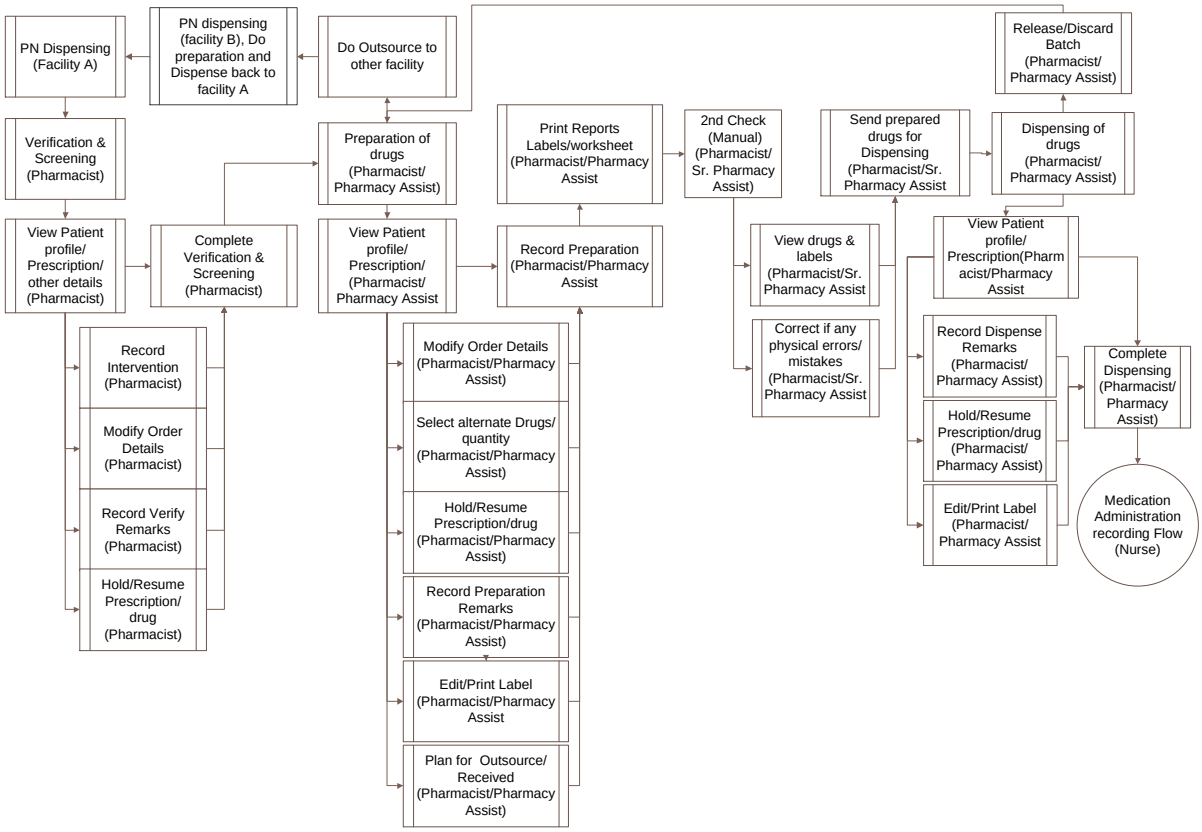
3.2.2.2 PN Verification/Preparation/Dispensing/Release/Discard Batch



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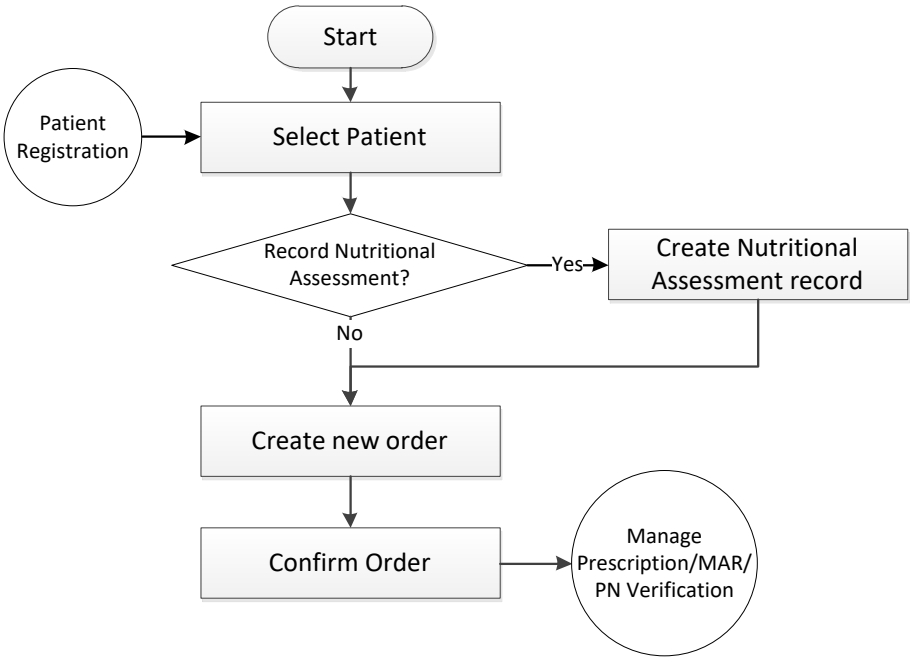
3.2.3 PN Medication Order

PN Medication Order screen allows prescribers to place parenteral nutrition order for patient with valid visit record. This screen is used by full based facilities. Confirmed order will be sent to pharmacists for the process of Verification, Preparation and Dispensing.

3.2.3.1 Screen Navigation Diagram



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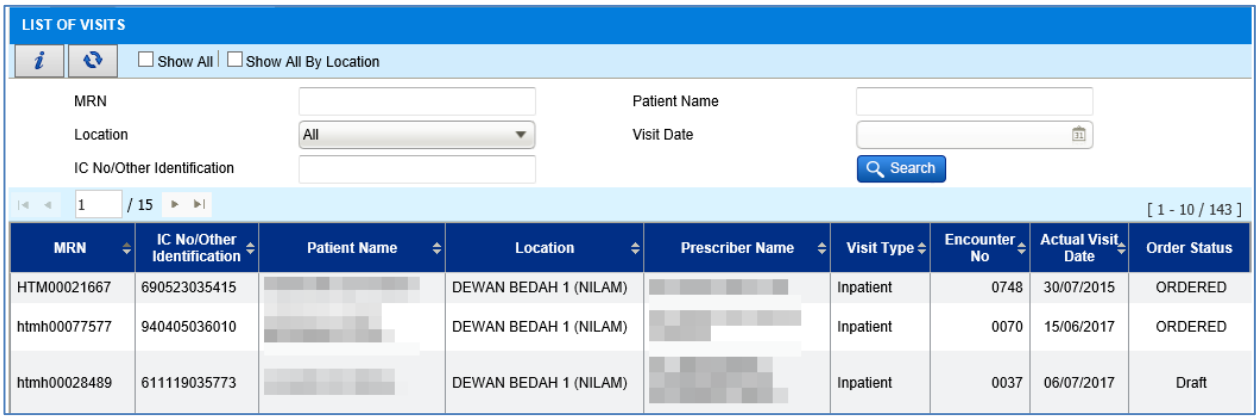
3.2.3.2 Detail Functionality and Screen

3.2.3.2.1 *Medication Order Listing*

3.2.3.2.1.1 ***Screen Design***

ID	PNOR.SD1
Description	To search patient with valid visit based on the visit location.
Diagram	
Notes	• Click on search button to search for the patient. • Click on patient record to add new medication order. • Click Show All checkbox to display patient records assigned to the login user. • Click Show All by Location to display patients records assigned to user's login location.
Cross References	None

3.2.3.2.1.2 ***Application Business Rules***

Refer #3.2.6.1 Medication Order Listing section in document PhIS_CPS_SDD_OM_FB_v1.0.

3.2.3.2.1.3 ***Input Validation Rules***

Refer #3.2.6.1 Medication Order Listing section in document PhIS_CPS_SDD_OM_FB_v1.0.

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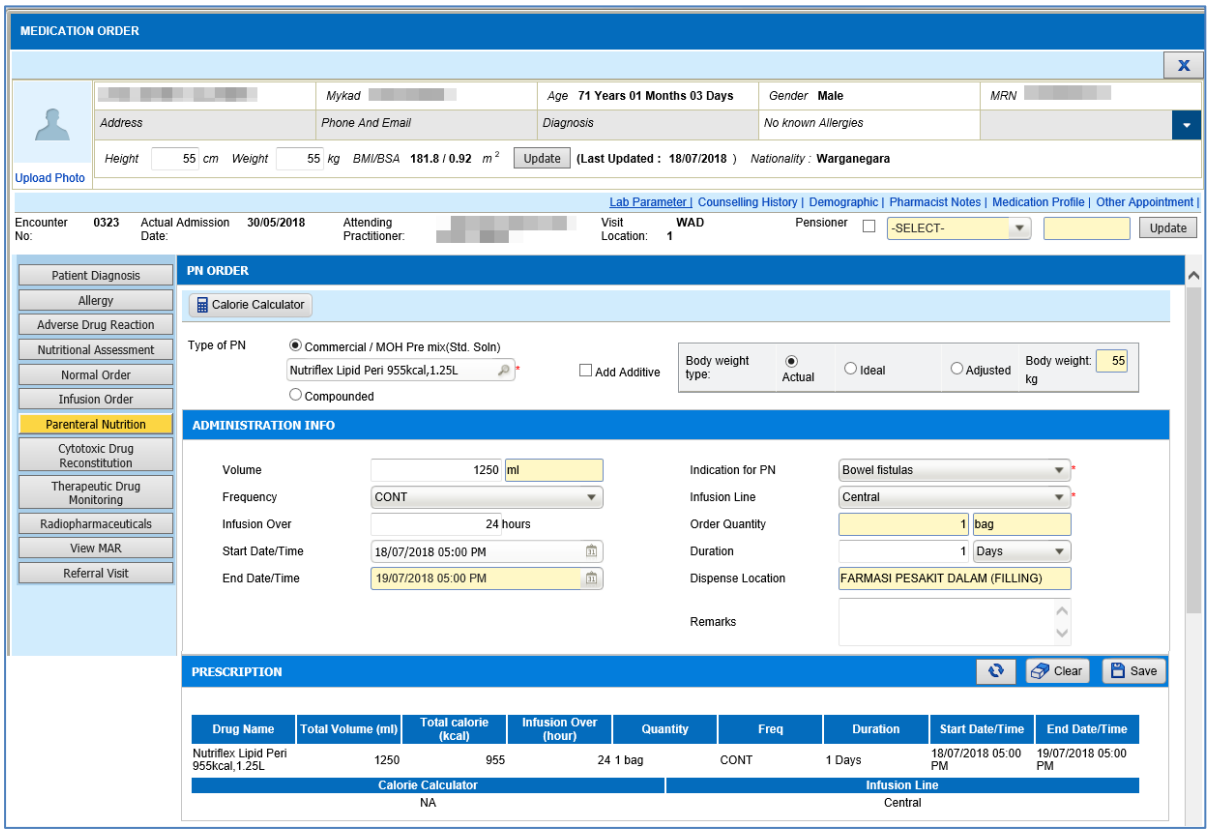
3.2.3.2.2 *PN Medication Order (Commercial)*

3.2.3.2.2.1 ***Screen Design***

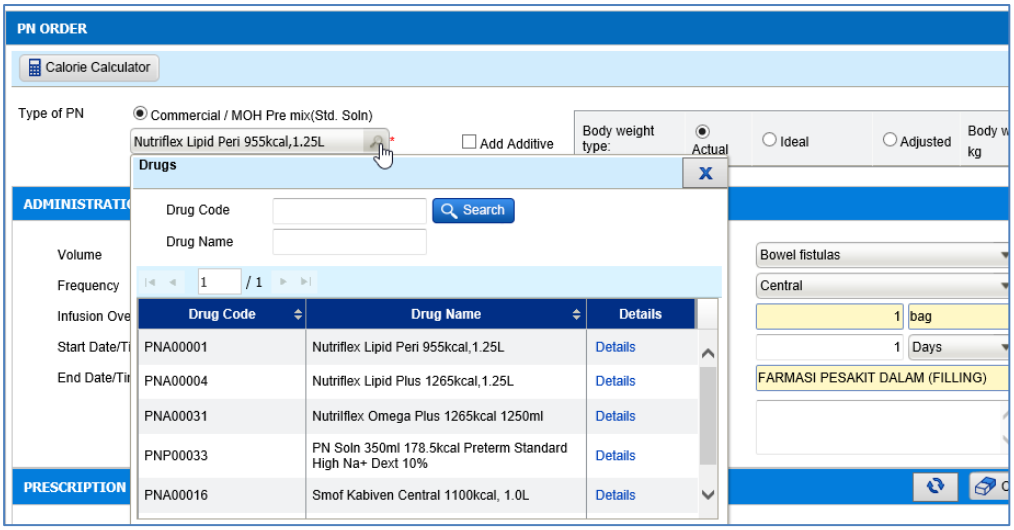
ID	PNOR.SD2
Description	To create new PN Commercial medication order record.

Diagram

i. Create new record:



ii. Search drug:



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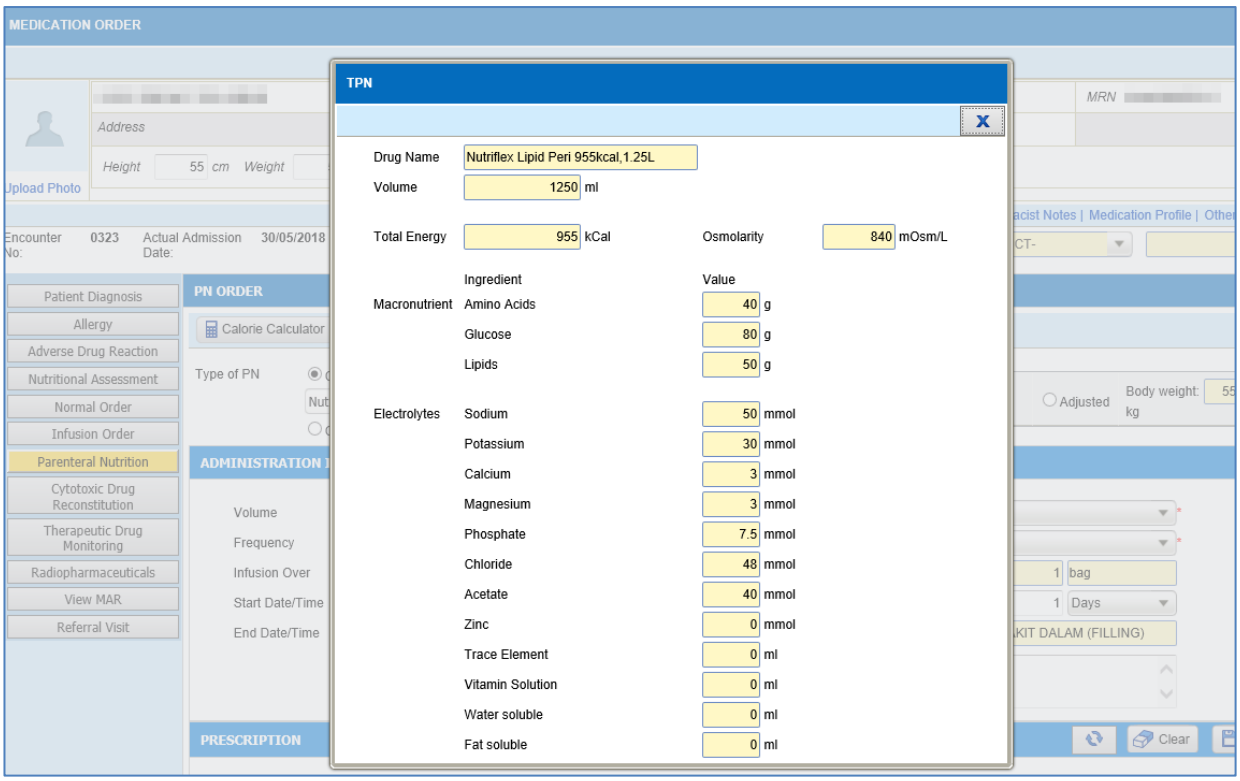
iii. Click on the 'Details' hyperlink:



Notes	• Click on 'Save' button to save the record. • Click on 'Delete' button to delete order or drug. • Click on 'Confirm' button to confirm order. • TPN information can be view only
Cross References	

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3.2.3.2.2.2 ***Application Business Rules***

No.	Name	Description
1.	New order	During creation of new order: After user select type of PN = commercial and select drug, all default information based on selected drug will be display
2.	Save order record	On click of Save button: i. Order status is updated to 'Draft'. ii. Order information will be displayed in the Prescription section. i. Delete, Confirm Order and Print button is enabled after saving the record.
3.	Drug Order Quantity Calculation	On saving the record, system will auto-calculate the drugs order quantity.
4.	Refresh order record	On click of Refresh button, modification on the Drug Details will be updated in order record and prescription list.
5.	Delete order record	On click of Delete button: i. Confirmation message will be displayed before user proceeds to delete the drug ii. Once user confirms to delete the record, system will delete order record. iii. Screen will refresh and user is allowed to create new PN order.
6.	Print Prescription	On click of Print button: i. Prescription with all the ordered drugs is displayed in PDF format. User able to print the displayed prescription.
7.	Confirm order record	On click of Confirm button: i. Alert message is displayed to ask user confirmation to confirm the order record. i. Once user confirms the record, system will update the status to 'Ordered' and all fields and buttons are disabled. Order will then proceed to PN Verification screen.

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3.2.3.2.2.3 ***Input Validation Rules***

No.	Name	Description	Mandatory	Format
PN Order				
1.	Type of PN	A value has to be selected from 2 available values, commercial or compounded. For this case, type of PN = commercial.	Yes	Radio button
2.	TPN Drug selection	Drug setup as TPN and active status only will be display. Value is based on the setup in Drug Master maintenance screen.	Yes	Searching field
3.	Add additive checkbox	This field only display if type of PN = commercial. User to select this checkbox for 'With Additive' order. For this case to not select this checkbox.	No	Checkbox
4.	Body weight type	Value has to be selected from 3 available values, actual, ideal and adjusted. Default to 'Actual'.	No	Radio button
5.	Body weight value	This field is auto display based on: BW Actual = Based on BW patient banner BW Ideal(Male) = [(Height-150)/30]*12*2.3+50 BW Ideal(Female)= [(Height-150)/30]*12*2.3+45.5 BW Adjusted = [BW Ideal(Male)/BW Ideal(Female)] + [0.4*(Weight-Ideal)]	No	Read-only
Administration Info				
6.	Volume	Volume is default based on the selected TPN drug quantity value (as setup in drug master maintenance screen) and value is editable. Maximum of 6 numeric values with 2 decimal points.	No	Text field
7.	Volume UOM	Default to ml. This field is not editable.	No	Read-only
8.	Frequency	Frequency is to be selected from the drop down list. Dropdown will be populated from drug frequency configured in Drug Master maintenance screen.	No	Drop down list
9.	Infusion Over	Infusion Over default to 24 and can be changed. Maximum of 11 numeric values with 2 decimal points.	No	Text field
10.	Infusion Over UOM	Default to hours. This field is not editable.	No	Read-only
11.	Start Date/Time	Start Date/Time is to be selected from calendar control. It will be in dd/mm/yyyy hh/mm format. Date default to current date and time always default to 05:00 PM.	No	Calendar
12.	End Date/Time	End Date/Time is auto generated based on 'Start Date/Time' and 'Infusion Over' value. Value is in dd/mm/yyyy hh/mm.	No	Read-only
13.	Indication for PN	Indication for PN is to be selected from the drop down list. Dropdown will be populated from reference codes table where domain = "INDICATION_FOR_PN".	Yes	Drop down list
14.	Infusion Line	Infusion Line is to be selected from the drop down list. Dropdown will be populated from reference codes table where domain = "INFUSION_LINE".	Yes	Drop down list

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No.	Name	Description	Mandatory	Format
15.	Order Quantity	Order Quantity auto displayed based on the order quantity formula. This field is not editable. UOM is displayed based on the SKU UOM configured in Drug Master maintenance screen.	No	Read-only
16.	Duration	Duration is to be entered in the text box. Maximum of 5 integers. UOM dropdown will be populated from reference codes table where domain = "PN_DURATION".	No	Text field
17.	Dispense Location	Refer to ward stock setup and order routing setup. This field is not editable. If order drug in requester unit of order location is ward stock drug. Dispense location = Order location. Else, follow order routing setup.	No	Read-only
18.	Remarks	Remarks are free text with a capacity of 300 characters.	No	Text field
Prescription				
19.	Drug Name	Refer TPN Drug selected in PN Order section.	No	Read-only
20.	Total Volume(ml)	Refer Volume specified in Administration Info section.	No	Read-only
21.	Total Calorie(kcal)	Auto calculated based on below formula: Total Calorie(kcal) = Order volume * Drug calorie (PN Content) / Drug volume (PN Content)	No	Read-only
22.	Infusion Over(hours)	Refer Infusion Over specified in Administration Info section.	No	Read-only
23.	Quantity	Refer Order Quantity specified in Administration Info section.	No	Read-only
24.	Freq	Refer Frequency specified in Administration Info section.	No	Read-only
25.	Duration	Refer Duration specified in Administration Info section.	No	Read-only
26.	Start Date/Time	Refer Start Date/Time specified in Administration Info section.	No	Read-only
27.	End Date/Time	Refer End Date/Time specified in Administration Info section.	No	Read-only
28.	Calorie Calculator	Refer Calorie Calculator type. Display value only if user used the Calorie Calculator function.	No	Read-only
29.	Infusion Line	Refer Infusion Line specified in Administration Info section.	No	Read-only

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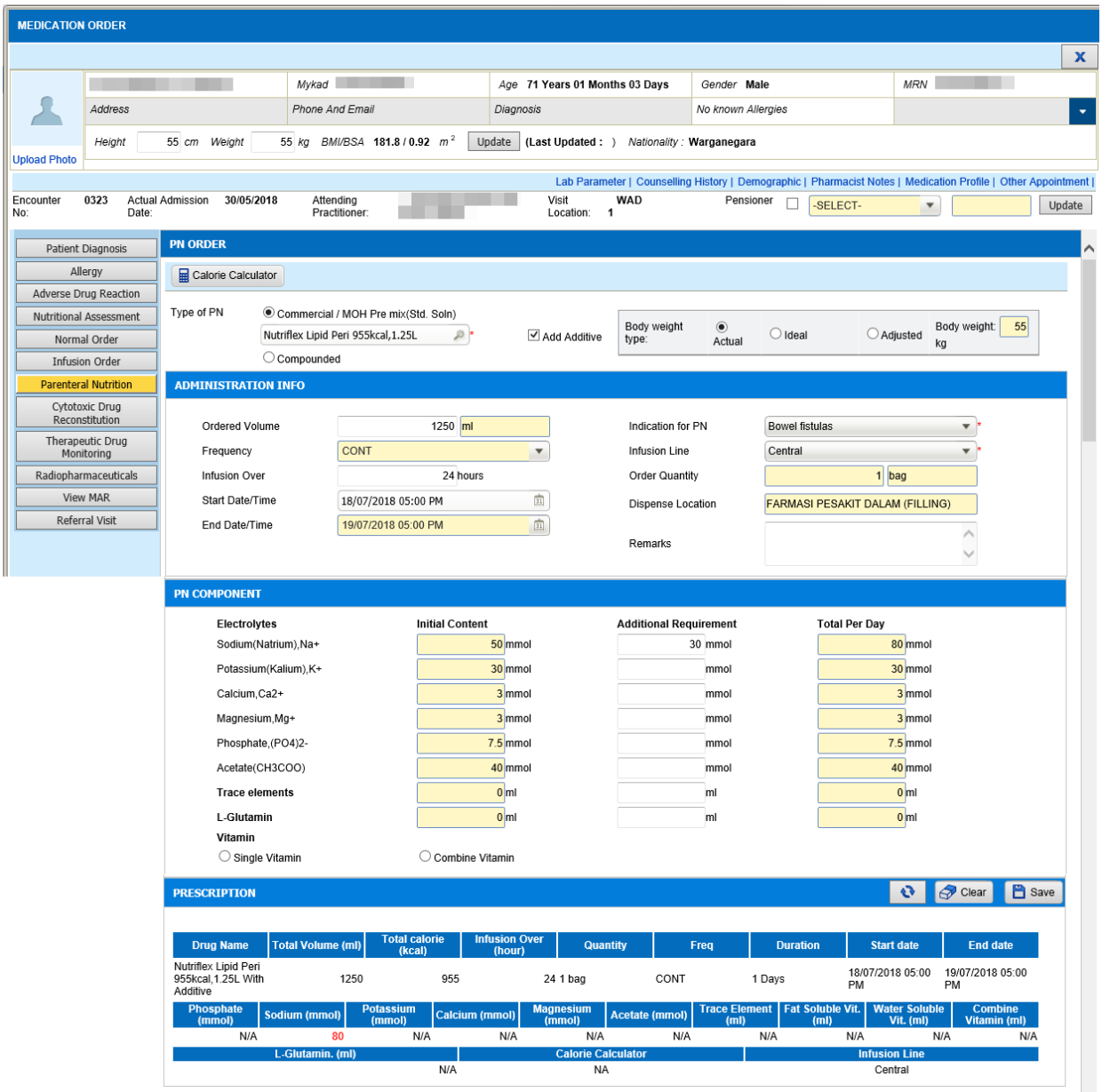
3.2.3.2.3 *PN Medication Order (Commercial with Additive)*

3.2.3.2.3.1 ***Screen Design***

ID	PNOR.SD3
Description	To create new PN Commercial with Additive medication order record.

Diagram

i. Create new record:



Notes	• Click on 'Save' button to save the record. • Click on 'Delete' button to delete order or drug. • Click on 'Confirm' button to confirm order.
Cross References	

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3.2.3.2.3.2 ***Application Business Rules***

No.	Name	Description
1.	New order	During creation of new order: After user select type of PN = commercial, select drug and select the 'Additive' checkbox, all default information based on selected drug will be display. User is also allowed to add details for the additional requirement.
2.	Save order record	On click of Save button: i. Order status is updated to 'Draft'. ii. Order information will be displayed in the Prescription section. ii. Delete, Confirm Order and Print button is enabled after saving the record.
3.	Prescription details	Additional PN requirement will be highlighted (red) in the prescription summary section.
4.	Refresh order record	On click of Refresh button, modification on the Drug Details will be updated in order record and prescription list.
5.	Delete order record	On click of Delete button: i. Confirmation message will be displayed before user proceeds to delete the drug ii. Once user confirms to delete the record, system will delete order record. iii. Screen will refresh and user is allowed to create new PN order.
6.	Print Prescription	On click of Print button: Prescription with all the ordered drugs is displayed in PDF format. User able to print the displayed prescription.
7.	Confirm order record	On click of Confirm button: ii. Alert message is displayed to ask user confirmation to confirm the order record. iii. Once user confirms the record, system will update the status to 'Ordered' and all fields and buttons are disabled. Order will then proceed to PN Verification screen.

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3.2.3.2.3.3 ***Input Validation Rules***

No.	Name	Description	Mandatory	Format
PN Order				
1.	Type of PN	A value has to be selected from 2 available values, commercial or compounded. For this case, type of PN = commercial.	Yes	Radio button
2.	TPN Drug selection	Drug setup as TPN and active status only will be display. Value is based on the setup in Drug Master maintenance screen.	Yes	Searching field
3.	Add additive checkbox	This field only display if type of PN = commercial. User to select this checkbox for 'With Additive' order. For this case to select this checkbox.	No	Checkbox
4.	Body weight type	Value has to be selected from 3 available values, actual, ideal and adjusted. Default to 'Actual'.	No	Radio button
5.	Body weight value	This field is auto display based on: BW Actual = Based on BW patient banner BW Ideal(Male) = [(Height-150)/30]*12*2.3+50 BW Ideal(Female)= [(Height-150)/30]*12*2.3+45.5 BW Adjusted = [BW Ideal(Male)/BW Ideal(Female)] + [0.4*(Weight-Ideal)]	No	Read-only
Administration Info				
6.	Ordered Volume	Volume is default based on the selected TPN drug quantity value (as setup in drug master maintenance screen) and value is editable. Unable to exceed the original bag volume. Maximum of 6 numeric values with 2 decimal points.	No	Text field
7.	Volume UOM	Default to ml. This field is not editable.	No	Read-only
8.	Frequency	Frequency is always default to CONT which already specified in drug frequency section in Drug Master maintenance screen.	No	Read-only
9.	Infusion Over	Infusion Over default to 24 and can be changed. Maximum of 11 numeric values with 2 decimal points.	No	Text field
10.	Infusion Over UOM	Default to hours. This field is not editable.	No	Read-only
11.	Start Date/Time	Start Date/Time is to be selected from calendar control. It will be in dd/mm/yyyy hh/mm format. Date default to current date and time always default to 05:00 PM.	No	Calendar
12.	End Date/Time	End Date/Time is auto generated based on 'Start Date/Time' and 'Infusion Over' value. Value is in dd/mm/yyyy hh/mm.	No	Read-only
13.	Indication for PN	Indication for PN is to be selected from the drop down list. Dropdown will be populated from reference codes table where domain = "INDICATION_FOR_PN".	Yes	Drop down list
14.	Infusion Line	Infusion Line is to be selected from the drop down list. Dropdown will be populated from reference codes table where domain = "INFUSION_LINE".	Yes	Drop down list

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No.	Name	Description	Mandatory	Format
15.	Order Quantity	Order Quantity value always displayed as '1 bag'. This field is not editable. UOM is displayed based on the SKU UOM configured in Drug Master maintenance screen.	No	Read-only
16.	Dispense Location	Refer to ward stock setup and order routing setup. This field is not editable. If order drug in requester unit of order location is ward stock drug. Dispense location = Order location. Else, follow order routing setup.	No	Read-only
17.	Remarks	Remarks are free text with a capacity of 300 characters.	No	Text field
PN Component				
18.	Initial Content	This column display original value of each component as specified in PN Content for each TPN drug selected.	No	Read-only
19.	Additional Requirement	User to enter the additional value to be added into the initial content of the drug selected. Maximum of 8 numeric values with 2 decimal points.	No	Text field
20.	Total per Day	This column display auto calculated value based on the 'Initial Content' value added with value entered in 'Additional Requirement' column.	No	Read-only
Prescription				
21.	Drug Name	Refer TPN Drug selected in PN Order section.	No	Read-only
22.	Total Volume(ml)	Refer Volume specified in Administration Info section.	No	Read-only
23.	Total Calorie(kcal)	Auto calculated based on below formula: Total Calorie(kcal) = Order volume * Drug calorie (PN Content) / Drug volume (PN Content)	No	Read-only
24.	Infusion Over(hours)	Refer Infusion Over specified in Administration Info section.	No	Read-only
25.	Quantity	Refer Order Quantity specified in Administration Info section.	No	Read-only
26.	Freq	Refer Frequency specified in Administration Info section.	No	Read-only
27.	Duration	Refer Duration specified in Administration Info section.	No	Read-only
28.	Start Date	Refer Start Date/Time specified in Administration Info section.	No	Read-only
29.	End Date	Refer End Date/Time specified in Administration Info section.	No	Read-only
30.	Phosphate (mmol)	Refer Phosphate 'Total per Day' in PN Component section.	No	Read-only
31.	Sodium (mmol)	Refer Sodium 'Total per Day' in PN Component section.	No	Read-only
32.	Potassium (mmol)	Refer Potassium 'Total per Day' in PN Component section.	No	Read-only

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No.	Name	Description	Mandatory	Format
33.	Calcium (mmol)	Refer Calcium 'Total per Day' in PN Component section.	No	Read-only
34.	Magnesium (mmol)	Refer Magnesium 'Total per Day' in PN Component section.	No	Read-only
35.	Acetate (mmol)	Refer Acetate 'Total per Day' in PN Component section.	No	Read-only
36.	Trace Element (mmol)	Refer Trace Element 'Total per Day' in PN Component section.	No	Read-only
37.	Fat Soluble Vit.(ml)	Refer Fat soluble 'Total per Day' in PN Component section.	No	Read-only
38.	Water Soluble Vit(ml)	Refer Vitamin(Water and fat soluble) 'Total per Day' in PN Component section.	No	Read-only
39.	MultiVitamin (ml)	Refer Fat Multivitamin 'Total per Day' in PN Component section.	No	Read-only
40.	L-Glutamin (ml)	Refer L-Glutamine 'Total per Day' in PN Component section.	No	Read-only
41.	Calorie Calculator	Refer Calorie Calculator type. Display value only if user used the Calorie Calculator function.	No	Read-only
42.	Infusion Line	Refer Infusion Line specified in Administration Info section.	No	Read-only

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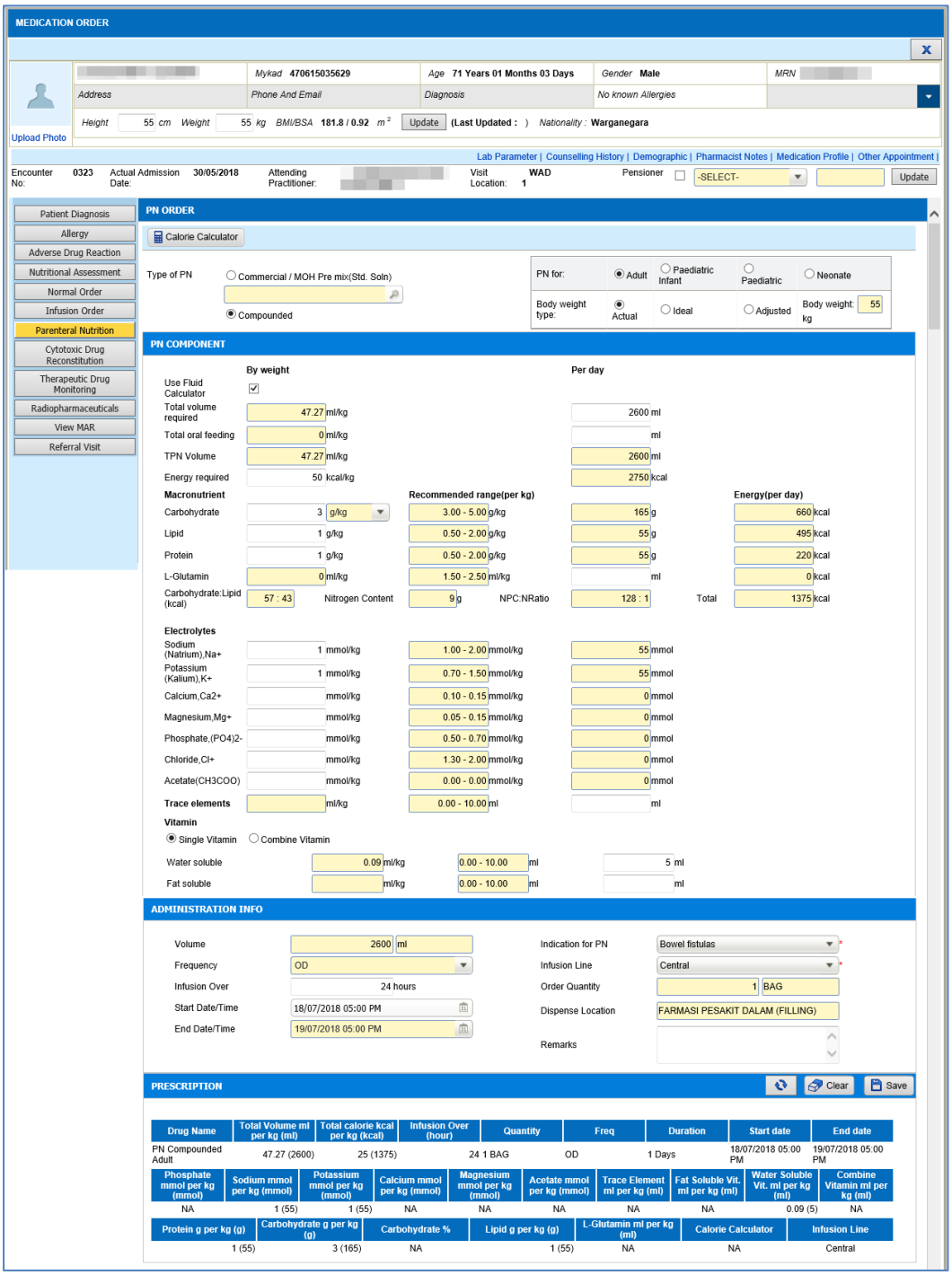
3.2.3.2.4 *PN Medication Order (Compounded)*

3.2.3.2.4.1 ***Screen Design***

ID	PNOR.SD4
Description	To create new PN Commercial Compounded medication order record.

Diagram

i. Create new record – Adult patient:



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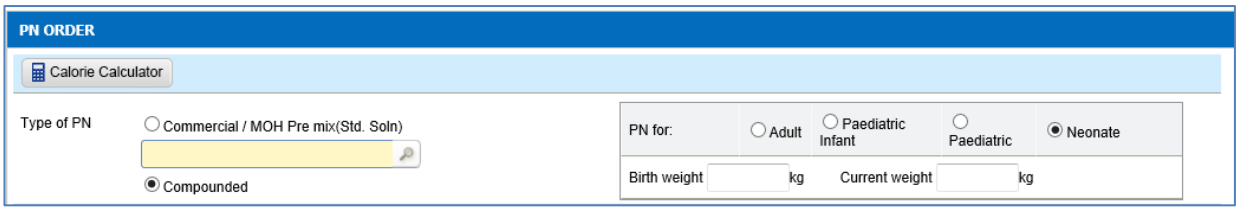
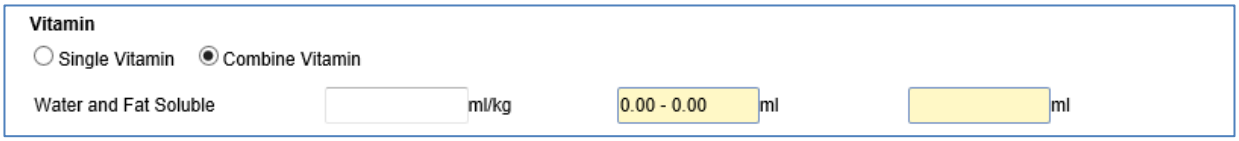
ii. Neonate case – Additional fields:



iii. Combine Vitamin:



Notes	• Click on 'Save' button to save the record. • Click on 'Delete' button to delete order or drug. • Click on 'Confirm' button to confirm order.
Cross References	

3.2.3.2.4.2 ***Application Business Rules***

No.	Name	Description
1.	New order	During creation of new order: After user select type of PN = Compounded, order for 'PN Compounded' will be based on patient age : Adult, Paediatric, Paediatric Infant, Neonate as per setup in PN Reference Range maintenance screen. Based on the patient age type, system will display value for 'Recommended Range (per kg) values. i. Adult: Total volume required ,Trace elements, Fat soluble vitamin, Water soluble vitamin and Multivitamin entered per day value. ii. Paediatric, Paediatric Infant, Neonate: Total volume required ,Trace elements, Fat soluble vitamin, Water soluble vitamin and Multivitamin entered per weight value. iii. For Neonate patient: Information of birth weight and current weight need to be entered instead of body weight type selection. The highest weight, either birth weight or current weight will be used for all calculations related with body weight.
1.	Save order record	On click of Save button: i. Order status is updated to 'Draft'. ii. Order information will be displayed in the Prescription section. iii. Delete, Confirm Order and Print button is enabled after saving the record.
2.	Prescription details	The entered order details will display in the prescription summary section.
3.	Refresh order record	On click of Refresh button, modification on the Drug Details will be updated in order record and prescription list.
4.	Delete order	On click of Delete button:

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No.	Name	Description
	record	i. Confirmation message will be displayed before user proceeds to delete the drug ii. Once user confirms to delete the record, system will delete order record. iii. Screen will refresh and user is allowed to create new PN order.
5.	Print Prescription	On click of Print button: i. Prescription with all the ordered drugs is displayed in PDF format. User able to print the displayed prescription.
6.	Confirm order record	On click of Confirm button: i. Alert message is displayed to ask user confirmation to confirm the order record. ii. Once user confirms the record, system will update the status to 'Ordered' and all fields and buttons are disabled. Order will then proceed to PN Verification screen.

3.2.3.2.4.3 ***Input Validation Rules***

No.	Name	Description	Mandatory	Format
PN Order				
1.	Type of PN	A value has to be selected from 2 available values, commercial or compounded. For this case, type of PN = Compounded.	Yes	Radio button
2.	TPN Drug selection	Field is not applicable for Compounded order.	No	Read-only
3.	PN For	Value has to be selected from 4 available values, adult, paediatric, paediatric infant and neonates. Default value based on patient's current age as compared with details from PN Reference maintenance screen. If user changed the type and the type is not compatible with user's current age, alert message will display, however user is allowed to proceed.	No	Radio button
4.	Body weight type	Value has to be selected from 3 available values, actual, ideal and adjusted. Default to 'Actual'.	No	Radio button
5.	Body weight value	This field is auto display based on: BW Actual = Based on BW patient banner BW Ideal(Male) = [(Height-150)/30]*12*2.3+50 BW Ideal(Female)= [(Height-150)/30]*12*2.3+45.5 BW Adjusted = [BW Ideal(Male)/BW Ideal(Female)] + [0.4*(Weight-Ideal)]	No	Read-only
6.	Birth weight	Birth weight is to be entered in the text box. Maximum of 6 numeric with 2 decimal points	No	Text field
7.	Current weight	Current weight is to be entered in the text box. Maximum of 6 numeric with 2 decimal points	No	Text field
PN Component				

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No.	Name	Description	Mandatory	Format
8.	Use Fluid Calculator	On selection of this checkbox, system will auto calculate the 'Total Volume Required (Per Day)' value based on below calculation: **Weight*** — **Baseline Daily Fluid Requirement** 1 to 10 kg (2.2 to 22 lbs) — 100 ml/kg 11 to 20 kg (23 to 44 lbs) — 1000 ml plus 50 ml/kg for each kg over 10 kg Over 20 kg (over 44 lbs) — 1500 ml plus 20 ml/kg for each kg over 20 kg *1 kg = 2.2 lbs, 1 ounce = 29.6 ml Example: A 30 lb child Convert to kilograms = 30 lbs / 2.2 kg/lb = 13.6 kg Choose formula from above = 1000 ml + (50 ml/kg x 3.6 kg) Calculate = 1000 ml + 180 ml = 1180 ml fluid daily Convert to ounces = 1180 ml / 29.6 ml/ounce = 39.8 ounces fluid daily Note: Body weight will refer to the selected body weight type in the PN Order section.	No	Checkbox
9.	Total volume required	PN for: Adult – User to enter value for 'Per Day' value and system will auto calculate the 'By Weight' value based on calculation of 'Per Day' / Patient's Weight (As per in PN Order section). PN for: Paediatric, Paediatric Infant, Neonate – User to enter value for 'By Weight' value and system will auto calculate the 'Per Day' value based on calculation of 'By Weight' * Patient's Weight (As per in PN Order section). Maximum of 6 numeric values with 2 decimal points.	No	Text field
10.	Total Oral Feeding	User to enter value for 'Per Day' value and system will auto calculate the 'By Weight' value based on calculation of 'Per Day' / Patient's Weight (As per in PN Order section). Maximum of 6 numeric values with 2 decimal points.	No	Text field
11.	TPN Volume	Auto calculated based on 'Total Volume Required' value minus with 'Total Oral Feeding' value. This value is the value that will be referred to when calculating the PN Worksheet in PN Preparation screen.	No	Read-only
12.	Energy Required	User to enter value for 'By Weight' value and system will auto calculate the 'Per Day' value based on calculation of 'By Weight' * Patient's Weight (As per in PN Order section). Maximum of 6 numeric values with 2 decimal points.	No	Text field
13.	Recommended Range	Data will be display based on PN constituent reference range (applicable for each PN component).	No	Read-only
14.	Carbohydrate	By weight & per Day: Data to be entered in the text box. Maximum of 6 numeric values with 2 decimal points. UOM drop down list is populated from reference codes table where domain = "CARBOHYDRATE_UNIT".	No	Text field

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No.	Name	Description	Mandatory	Format
		i. If select 'g/kg' (Default): Carbohydrate (Per Day) = Carbohydrate (By weight) * Patient's Weight from PN Order ii. If select '%(w/v)': No recommended range will be displayed. Value 'Per Day' and 'Energy (per Day)' will not be displayed and calculated. Calculation will be done at worksheet label in preparation screen once user already selects the drug for Carbohydrate component. iii. If select 'mg/kg/min': Carbohydrate (Per Day) = Carbohydrate (By weight) / 1000 * Patient's Weight from PN Order * 1440 Energy (Per Day): Auto calculated based on Carbohydrate (per day) * 4		
15.	Lipid	By Weight: Data to be entered in the text box. Maximum of 6 numeric values with 2 decimal points. Per Day: Lipid (By weight) * Patient's Weight from PN Order Energy (Per Day): Auto calculated based on Lipid (per day) * 9	No	Text field
16.	Protein	By Weight: Data to be entered in the text box. Maximum of 6 numeric values with 2 decimal points. Per Day: Protein (By weight) * Patient's Weight from PN Order Energy (Per Day): Auto calculated based on Protein (per day) * 4	No	Text field
17.	L-Glutamin	By Weight: This field is auto display based on calculation. L-Glutamin (per day) value / Patient's Weight from PN Order. Per Day: Data to be entered in the text box. Maximum of 6 numeric values with 2 decimal points. Energy (Per Day): Auto calculated based on [L-Glutamin (per day) * 20 / 100] * 4	No	Text field
18.	Carbohydrate: Lipid (kcal)	This field is auto display based on calculation: i. Carbohydrate value = [Carbohydrate (Energy/day) / (Carbohydrate (Energy/day) + Lipid (Energy/day))] x 100% ii. Lipid value = [Lipid (Energy/day) / (Carbohydrate (Energy/day) + Lipid (Energy/day))] x 100% iii. Calculate the ratio between carbohydrate value and lipid value.	No	Read-only
19.	Nitrogen Content	This field is auto display based on calculation: Nitrogen content = (Protein (g/kg) x BW selected) / 6.25 + (L-Glutamin (g/kg) x BW selected) If Neonate: (Protein (g/kg) x A) / 6.25 + (L-Glutamin (g/kg) x A)	No	Read-only

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No.	Name	Description	Mandatory	Format
		* A = Current weight or birth weight, the highest value		
20.	NPC:NRatio	This field is auto display based on calculation: NPC: N ratio (Non protein calory : Nitrogen) i. NPC = Lipid (Energy/day) + Carbohydrate (Energy/day) + L-Glutamin (Energy/day) ii. N = 'Nitrogen Content' iii. Find ratio NPC:N (N must be equal 1)	No	Read-only
21.	Total Energy (per day)	Auto calculated value based on the sum of Energy per Day columns for Carbohydrate, Lipid, Protein and L-Glutamin.	No	Read-only
22.	Sodium (Natrium),Na+	By Weight: Data to be entered in the text box. Maximum of 6 numeric with 2 decimal points Per Day: Auto calculated based on 'By Weight' * Patient's Weight (As per in PN Order section).	No	Text field
23.	Potassium (Kalium),K+	By Weight: Data to be entered in the text box. Maximum of 6 numeric with 2 decimal points Per Day: Auto calculated based on 'By Weight' * Patient's Weight (As per in PN Order section).	No	Text field
24.	Calcium,Ca2+	By Weight: Data to be entered in the text box. Maximum of 6 numeric with 2 decimal points Per Day: Auto calculated based on 'By Weight' * Patient's Weight (As per in PN Order section).	No	Text field
25.	Magnesium,Mg+	By Weight: Data to be entered in the text box. Maximum of 6 numeric with 2 decimal points Per Day: Auto calculated based on 'By Weight' * Patient's Weight (As per in PN Order section).	No	Text field
26.	Phosphate,(PO4)2-	By Weight: Data to be entered in the text box. Maximum of 6 numeric with 2 decimal points Per Day: Auto calculated based on 'By Weight' * Patient's Weight (As per in PN Order section).	No	Text field
27.	Chloride,Cl+	By Weight: Data to be entered in the text box. Maximum of 6 numeric with 2 decimal points Per Day: Auto calculated based on 'By Weight' * Patient's Weight (As per in PN Order section).	No	Text field
28.	Acetate(CH3COO)	By Weight: Data to be entered in the text box. Maximum of 6 numeric with 2 decimal points Per Day: Auto calculated based on 'By Weight' * Patient's Weight (As per in PN Order section).	No	Text field
29.	Trace Elements	PN for: Adult, Paediatric, Paediatric Infant – i. By Weight: Auto display based on calculation. 'Per day' value / Patient's Weight (As per in PN Order section). ii. Per Day: Data to be entered in the text box. Maximum of 6 numeric with 2 decimal points	No	Text field

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No.	Name	Description	Mandatory	Format
		PN for: Infant – i. By Weight: Data to be entered in the text box. Maximum of 6 numeric with 2 decimal points ii. Per Day: Auto calculated based on 'By Weight' * Patient's Weight (As per in PN Order section).		
30.	Single Vitamin: Water soluble	PN for: Adult, Paediatric, Paediatric Infant – i. By Weight: Auto display based on calculation. 'Per day' value / Patient's Weight (As per in PN Order section). ii. Per Day: Data to be entered in the text box. Maximum of 6 numeric with 2 decimal points PN for: Infant – i. By Weight: Data to be entered in the text box. Maximum of 6 numeric with 2 decimal points ii. Per Day: Auto calculated based on 'By Weight' * Patient's Weight (As per in PN Order section).	No	Text field
31.	Single Vitamin: Fat soluble	PN for: Adult, Paediatric, Paediatric Infant – i. By Weight: Auto display based on calculation. 'Per day' value / Patient's Weight (As per in PN Order section). ii. Per Day: Data to be entered in the text box. Maximum of 6 numeric with 2 decimal points PN for: Infant – i. By Weight: Data to be entered in the text box. Maximum of 6 numeric with 2 decimal points ii. Per Day: Auto calculated based on 'By Weight' * Patient's Weight (As per in PN Order section).	No	Text field
32.	Combine Vitamin: Water and Fat Soluble	PN for: Adult, Paediatric, Paediatric Infant – i. By Weight: Auto display based on calculation. 'Per day' value / Patient's Weight (As per in PN Order section). ii. Per Day: Data to be entered in the text box. Maximum of 6 numeric with 2 decimal points PN for: Infant – i. By Weight: Data to be entered in the text box. Maximum of 6 numeric with 2 decimal points ii. Per Day: Auto calculated based on 'By Weight' * Patient's Weight (As per in PN Order section).	No	Text field
Administration Info				
33.	Volume	Display Volume based on 'TPN Volume' field as configured in PN Component section.	No	Read-only
34.	Volume UOM	Default to ml. This field is not editable.	No	Read-only
35.	Frequency	Frequency is always default to 'OD' which already specified in drug frequency section in Drug Master	No	Read-only

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No.	Name	Description	Mandatory	Format
		maintenance screen.		
36.	Infusion Over	Infusion Over default to 24 and can be changed. Maximum of 11 numeric values with 2 decimal points.	No	Text field
37.	Infusion Over UOM	Default to hours. This field is not editable.	No	Read-only
38.	Start Date/Time	Start Date/Time is to be selected from calendar control. It will be in dd/mm/yyyy hh/mm format. Date default to current date and time always default to 05:00 PM.	No	Calendar
39.	End Date/Time	End Date/Time is auto generated based on 'Start Date/Time' and 'Infusion Over' value. Value is in dd/mm/yyyy hh/mm.	No	Read-only
40.	Indication for PN	Indication for PN is to be selected from the drop down list. Dropdown will be populated from reference codes table where domain = "INDICATION_FOR_PN".	Yes	Drop down list
41.	Infusion Line	Infusion Line is to be selected from the drop down list. Dropdown will be populated from reference codes table where domain = "INFUSION_LINE".	Yes	Drop down list
42.	Order Quantity	Order Quantity value always displayed as '1 bag'. This field is not editable. UOM is displayed based on the SKU UOM configured in Drug Master maintenance screen.	No	Read-only
43.	Dispense Location	Refer to ward stock setup and order routing setup. This field is not editable. If order drug in requester unit of order location is ward stock drug. Dispense location = Order location. Else, follow order routing setup.	No	Read-only
44.	Remarks	Remarks are free text with a capacity of 300 characters.	No	Text field
Prescription				
45.	Drug Name	Auto generated based on 'PN Compounded' + ('PN for' value selected).	No	Read-only
46.	Total Volume ml per kg (ml)	Refer to 'TPN Volume' (By weight) and 'TPN Volume' (Per Day) specified in PN Component section.	No	Read-only
47.	Total Calorie kcal per kg (kcal)	Refer to 'Total Energy' (Per Day) specified in PN Component section.	No	Read-only
48.	Infusion Over(hours)	Refer 'Infusion Over' specified in Administration Info section.	No	Read-only
49.	Quantity	Refer 'Order Quantity' specified in Administration Info section.	No	Read-only
50.	Freq	Refer 'Frequency' specified in Administration Info section.	No	Read-only
51.	Start Date	Refer 'Start Date/Time' specified in Administration Info section.	No	Read-only
52.	End Date	Refer 'End Date/Time' specified in Administration Info section.	No	Read-only

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No.	Name	Description	Mandatory	Format
53.	Phosphate mmol per kg(mmol)	Refer to 'Phosphate' (By weight) and 'Phosphate' (Per Day) specified in PN Component section.	No	Read-only
54.	Sodium mmol per kg(mmol)	Refer to 'Sodium' (By weight) and 'Sodium' (Per Day) specified in PN Component section.	No	Read-only
55.	Potassium mmol per kg(mmol)	Refer to 'Potassium' (By weight) and 'Potassium' (Per Day) specified in PN Component section.	No	Read-only
56.	Calcium mmol per kg(mmol)	Refer to 'Calcium' (By weight) and 'Calcium' (Per Day) specified in PN Component section.	No	Read-only
57.	Magnesium mmol per kg(mmol)	Refer to 'Magnesium' (By weight) and 'Magnesium' (Per Day) specified in PN Component section.	No	Read-only
58.	Acetate mmol per kg(mmol)	Refer to 'Acetate' (By weight) and 'Acetate' (Per Day) specified in PN Component section.	No	Read-only
59.	Trace Element ml per kg(ml)	Refer to 'Trace Element' (By weight) and 'Trace Element' (Per Day) specified in PN Component section.	No	Read-only
60.	Fat Soluble Vit. ml per kg(ml)	Refer to 'Fat Soluble' (By weight) and 'Fat Soluble' (Per Day) specified in PN Component section.	No	Read-only
61.	Water Soluble Vit. Ml per kg(ml)	Refer to 'Water Soluble' (By weight) and 'Water Soluble' (Per Day) specified in PN Component section.	No	Read-only
62.	MultiVitamin ml per kg(ml)	Refer to 'Water and Fat Soluble' (By weight) and 'Water and Fat Soluble' (Per Day) specified in PN Component section.	No	Read-only
63.	Protein per kg(g)	Refer to 'Protein' (By weight) and 'Protein' (Per Day) specified in PN Component section.	No	Read-only
64.	Carbohydrate per kg(g)	Refer to 'Carbohydrate' (By weight) and 'Carbohydrate' (Per Day) specified in PN Component section. Only applicable when Carbohydrate UOM selected as 'g/kg' or 'mg/kg/min'.	No	Read-only
65.	Carbohydrate %	Refer to 'Carbohydrate' (By weight) specified in PN Component section. Only applicable when Carbohydrate UOM selected as '%(w/v)'.	No	Read-only
66.	Lipid g per kg(g)	Refer to 'Lipid' (By weight) and 'Lipid' (Per Day) specified in PN Component section.	No	Read-only
67.	L-Glutamin ml per kg(ml)	Refer to 'L-Glutamin' (By weight) and 'L-Glutamin' (Per Day) specified in PN Component section.	No	Read-only
68.	Calorie Calculator	Refer Calorie Calculator type. Display value only if user used the Calorie Calculator function.	No	Read-only

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No.	Name	Description	Mandatory	Format
69.	Infusion Line	Refer 'Infusion Line' specified in Administration Info section.	No	Read-only

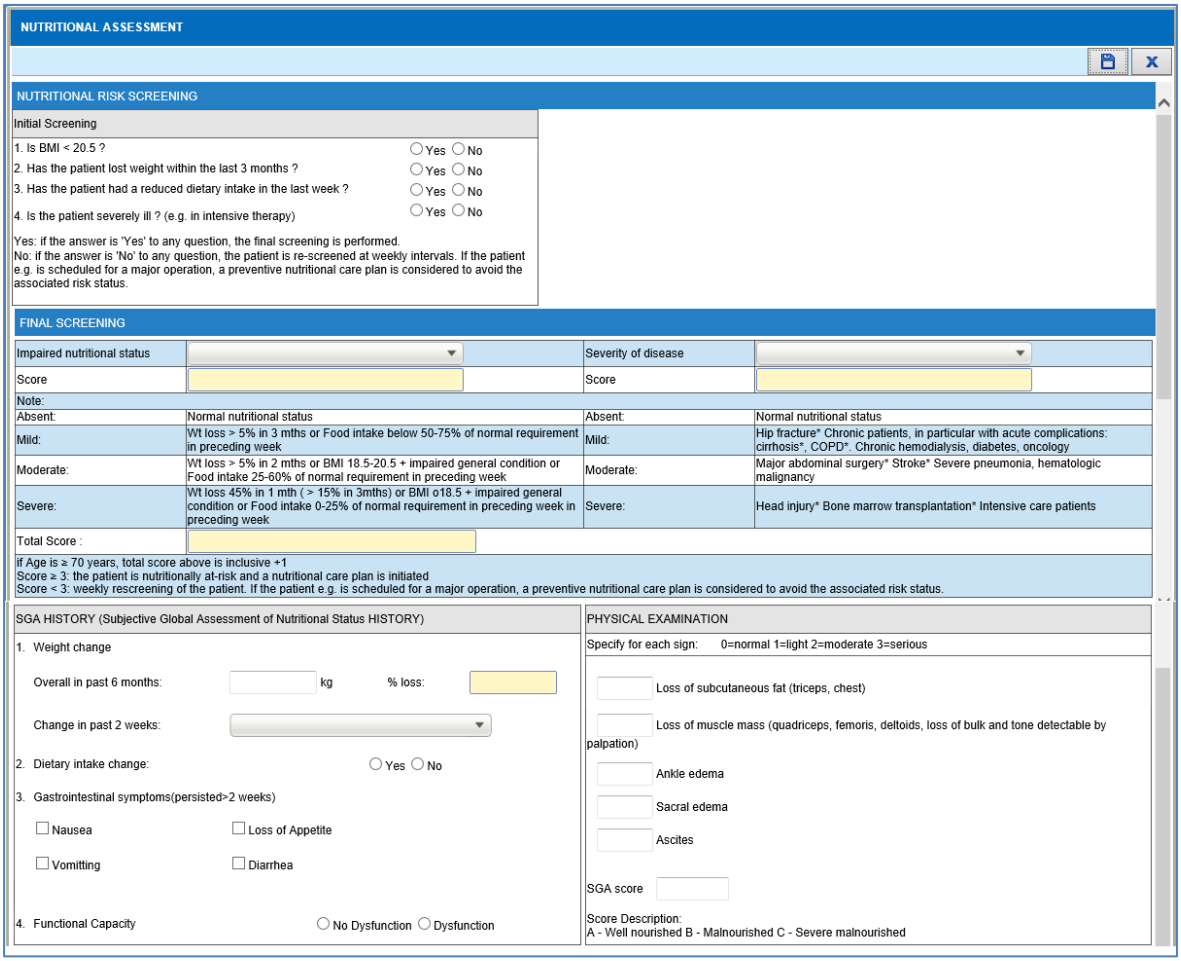
3.2.3.2.5 *Nutritional Assessment*

3.2.3.2.5.1 ***Screen Design***

ID	PNOR.SD5
Description	To create new PN Nutritional Assessment record.

Diagram

i. Nutritional Assessment screen:



ii. Listing page:

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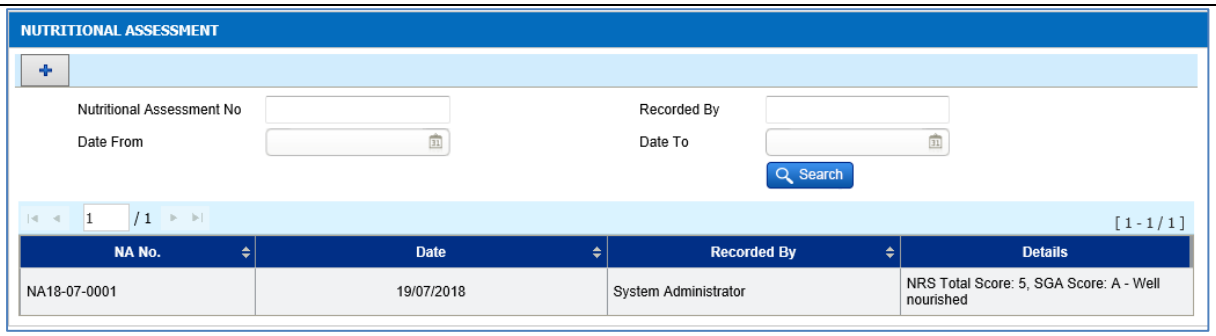

Notes	• Click on 'Save' button to save the record.
Cross References	

3.2.3.2.5.2 ***Application Business Rules***

No.	Name	Description
1.	New nutritional assessment record	During creation of new record: User to fill in the details. All fields are not mandatory, user to enter necessary values only. This function is for recording purposes only. User able to record multiple assessments per each patient.
2.	Save record	On click of Save button: Nutritional assessment record will be saved and user able to view the details in the listing page.

3.2.3.2.5.3 ***Input Validation Rules***

No.	Name	Description	Mandatory	Format
Nutritional Risk Screening –Initial Screening				
30.	Question 1	A value has to be selected from 2 available values, Yes /No	No	Radio button
31.	Question 2	A value has to be selected from 2 available values, Yes /No	No	Radio button
32.	Question 3	A value has to be selected from 2 available values, Yes /No	No	Radio button
33.	Question 4	A value has to be selected from 2 available values, Yes /No	No	Radio button
Final Screening				
34.	Impaired Nutritional Status	Data is to be selected from the drop down list. Dropdown will be populated from Reference Codes maintenance screen where domain = "IMP_NUTR_STATUS".	No	Drop down list
35.	Impaired Nutritional	Field is auto displayed based on 'Impaired Nutritional Status' data. This field is not editable.	No	Read-only

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No.	Name	Description	Mandatory	Format
	Status – Score			
36.	Severity of Disease	Data is to be selected from the drop down list. Dropdown will be populated from Reference Codes maintenance screen where domain = "SEV_OF_DISEASE".	No	Drop down list
37.	Severity of Disease - Score	Field is auto displayed based on Severity of Disease' data. This field is not editable.	No	Read-only
38.	Total score	Field is auto displayed based on calculation. This field is not editable. i. Age < 70 years = Impaired Nutritional Status (Score) + Severity of Disease (Score) ii. Age ≥ 70 years = [Impaired Nutritional Status (Score) + Severity of Disease (Score)] + 1	No	Read-only
SGA				
39.	Weight change: Overall past 6 months	Data is to be entered in the text box. Maximum of 8 numeric with 2 decimal points	No	Text field
40.	Weight change: Change past 2 weeks	Data is to be selected from the drop down list. Dropdown will be populated from Reference Codes maintenance screen where domain = "SGA_WEIGHT_CHG_HISTORY".	No	Drop down list
41.	% loss	Auto calculated value based on calculation: ('Overall in past 6 months' / Patient's weight from patient banner) * 100%	No	Read-only
42.	Dietary intake	A value has to be selected from 2 available values, Yes /No	No	Radio button
43.	Dietary intake – Type of change	Applicable only when 'Dietary Intake = Yes'. Data is to be selected from the drop down list. Dropdown will be populated from Reference Codes maintenance screen where domain = "SGA_DIETARY_CHG_TYPE".	No	Drop down list
44.	Gastrointestinal symptoms (persisted >2weeks)	Values can be selected from 4 available values, Nausea/Vomiting/Loss of Appetite/Diarrhea	No	Checkbox
45.	Functional capacity	A value has to be selected from 2 available values, No Dysfunction/Dysfunction	No	Radio button
46.	Functional capacity – Duration	Applicable when 'Functional Capacity = Dysfunction' only. Data is to be entered in the text box. Maximum of 8 numeric values with 2 decimal points.	No	Text field
47.	Functional capacity –	Applicable when 'Functional Capacity = Dysfunction' only. Data is to be selected from the drop down list. Dropdown	No	Drop down list

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No.	Name	Description	Mandatory	Format
	Note	will be populated from Reference Codes maintenance screen where domain = "SGA_FUNC_CAP".		
48.	Physical examination 1	Loss of subcutaneous fat (triceps, chest): Data is to be entered in the text box. Maximum of 50 characters capacity.	No	Text field
49.	Physical examination 2	Loss of muscle mass (quadriceps, femoris, deltoids, loss of bulk and tone detectable by palpation): Data is to be entered in the text box. Maximum of 8 numeric with 2 decimal points	No	Text field
50.	Physical examination 3	Ankle edema: Data is to be entered in the text box. Maximum of 8 numeric with 2 decimal points	No	Text field
51.	Physical examination 4	Sacral edema: Data is to be entered in the text box. Maximum of 8 numeric with 2 decimal points	No	Text field
52.	Physical examination 5	Ascites: Data is to be entered in the text box. Maximum of 8 numeric with 2 decimal points	No	Text field
53.	Physical examination – SGA score	Data is to be entered in the text box. Maximum of 50 characters capacity.	No	Text field

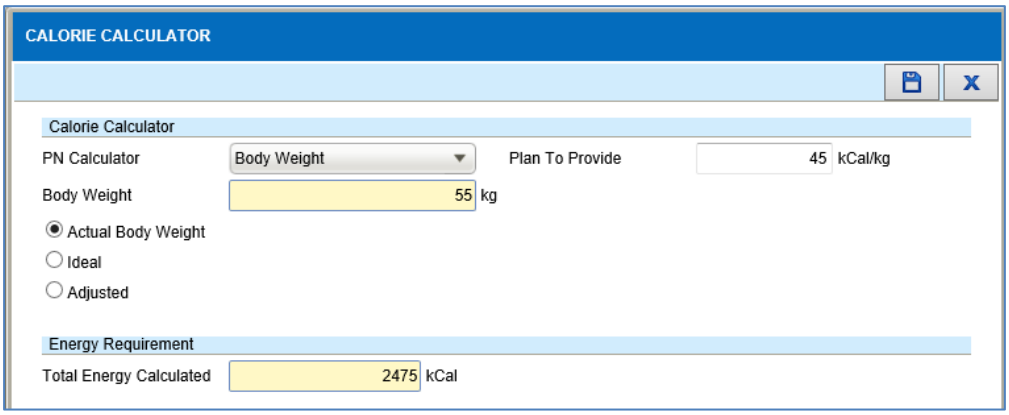
3.2.3.2.6 *Calorie Calculator*

3.2.3.2.6.1 ***Screen Design***

ID	PNOR.SD6
Description	To create new PN Calorie Calculator record.

Diagram

i. PN Calculator = Body Weight



ii. PN Calculator: Harris – Benedict Formula

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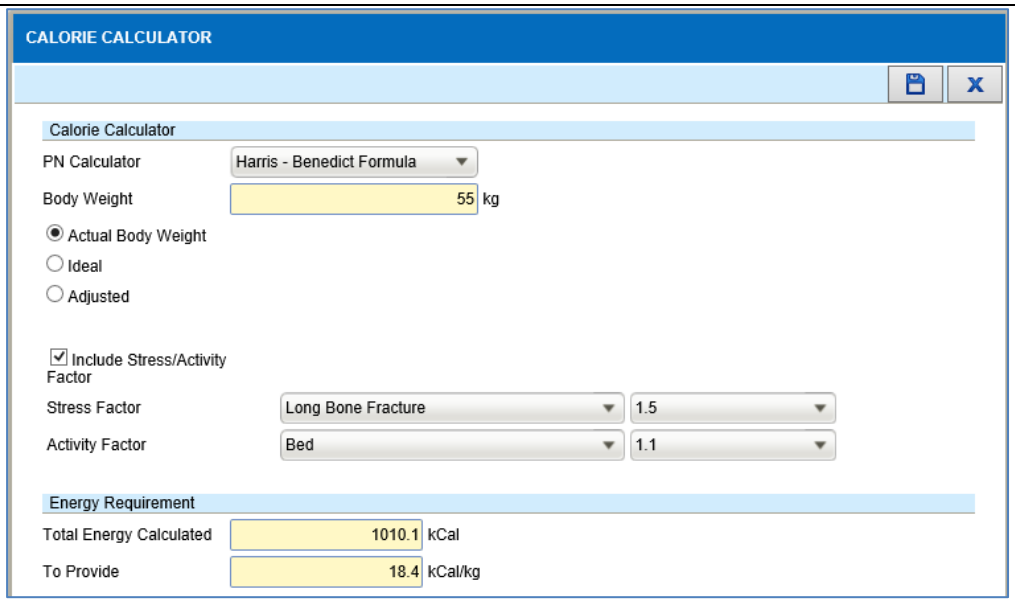
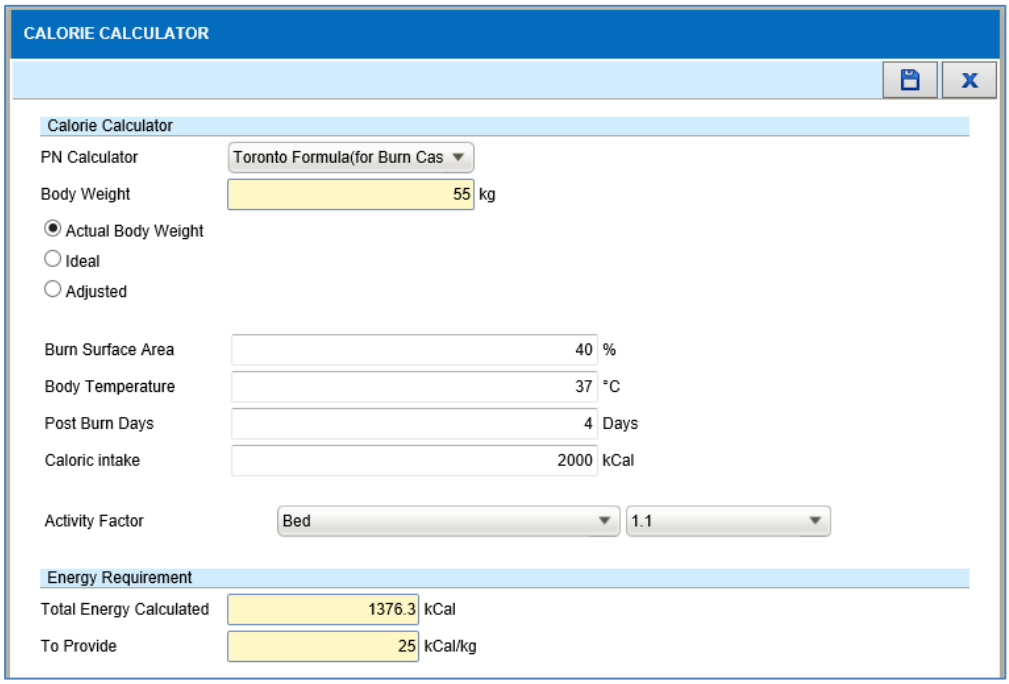


iii. PN Calculator: Toronto Formula(for Burn Cases)



Notes	• Select which PN Calculator to use and fill in required details. • Click on 'Save' button to save the record.
Cross References	

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3.2.3.2.6.2 *Application Business Rules*

No.	Name	Description
1.	New Calorie Calculator record	During creation of new record: User to select which PN Calculator to use and fill in required details. This function is for recording calorie calculation purposes only.
2.	Save record	On click of Save button: 'Total Energy Calculated' will auto load in 'Energy Required (Per Day)' field and 'To Provide' field will auto load in 'Energy Required (By Weight) field in PN Component section.

3.2.3.2.6.3 *Input Validation Rules*

No.	Name	Description	Mandatory	Format
PN Calculator = Body Weight				
54.	Body weight value	Data is to be selected from the drop down list. Dropdown will be populated from Reference Codes maintenance screen where domain = "BODY_WEIGHT_CATEGORY".	No	Read-only
55.	Body weight type	Value to be selected from 3 available values, Actual /Ideal/Adjusted	No	Radio button
56.	Plan to provide	Data is to be entered in the text box. Maximum of 8 numeric with 2 decimal points	No	Text field
57.	Total energy calculated	Field is auto displayed based on calculation. This field is not editable. Total Energy Calculated = Plan to provide * Body Weight	No	Read-only
PN Calculator = Harris –Benedict Formula				
58.	Body weight value	Data is to be selected from the drop down list. Dropdown will be populated from Reference Codes maintenance screen where domain = "BODY_WEIGHT_CATEGORY".	No	Read-only
59.	Body weight type	A value has to be selected from 3 available values, Actual/Ideal/Adjusted	No	Radio button
60.	Include stress/ activity factor	Field is to be selected or deselected.	No	Checkbox
61.	Stress factor 1	Data is to be selected from the drop down list. Dropdown will be populated from Reference Codes maintenance screen where domain = "STRESS_FACTOR".	No	Drop down list
62.	Stress factor 2	Data is to be selected from the drop down list. Dropdown will be populated based on the selected 'Stress Factor' value.	No	Drop down list
63.	Activity factor 1	Data is to be selected from the drop down list. Dropdown will be populated from Reference Codes maintenance screen where domain = "ACTIVITY_FACTOR"	No	Drop down list
64.	Activity factor 2	Data is to be selected from the drop down list. Dropdown will be populated based on the selected 'Activity Factor' value.	No	Drop down list

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No.	Name	Description	Mandatory	Format
65.	Total energy calculated	Field is auto displayed based on calculation. This field is not editable. Formula = BEE Male = 66.47 + (13.7 x Weight in kg) + (5.0 x Height in cm) – (6.8 x age in year) BEE Female = 655.1 +(9.6x Weight in kg) +(1.7 x Height in cm) – (4.7 x age in year) Total Energy = BEE x Activity Factor x Stress Factor	No	Read-only
66.	To provide	Field is auto displayed based on calculation. This field is not editable. Formulae = Total energy calculated / Body Weight	No	Read-only
PN Calculator = Toronto Formula				
67.	Body weight value	Data is to be selected from the drop down list. Dropdown will be populated from Reference Codes maintenance screen where domain = "BODY_WEIGHT_CATEGORY".	No	Read-only
68.	Body weight type	A value has to be selected from 3 available values, Actual/Ideal/Adjusted	No	Radio button
69.	Burn surface area	Data is to be entered in the text box. Maximum of 6 numeric with 2 decimal points	No	Text field
70.	Body temperature	Data is to be entered in the text box. Maximum of 8 numeric with 2 decimal points	No	Text field
71.	Post burn days	Data is to be entered in the text box. Maximum of 8 numeric with 2 decimal points	No	Text field
72.	Caloric intake	Data is to be entered in the text box. Maximum of 8 numeric with 2 decimal points	No	Text field
73.	Activity factor 1	Data is to be selected from the drop down list. Dropdown will be populated from Reference Codes maintenance screen where domain = "ACTIVITY_FACTOR"	No	Drop down list
74.	Activity factor 2	Data is to be selected from the drop down list. Dropdown will be populated based on the selected 'Activity Factor' value.	No	Drop down list
75.	Total energy calculated	Field is auto displayed based on calculation. This field is not editable. <u>Formula:</u> Total Energy = - 4343 + (10.5 x % burn surface area) + (0.23 x caloric intake) + (0.84 x Harris-Benedict BEE (for Male/Female) + (114 x body temperature) - (4.5 x post burn days) x [Activity Factor]	No	Read-only
76.	To provide	Field is auto displayed based on calculation. This field is not editable. Formulae = Total energy calculated / Body Weight	No	Read-only

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3.2.3.2.7 *Print Prescription*

3.2.3.2.7.1 ***Screen Design***

ID	PNOR.SD7
Description	To print PN Prescription.

Diagram

i. PN Commercial

Ministry Of Health, Malaysia

Hospital Tanah Merah

PARENTERAL NUTRITION

Patient Name:	[redacted]	**Patient ID:**	[redacted]
Age:	71 Years 01 Months 04 Days	**MRN:**	htm[redacted]
Gender:	Male	**Prescription :**	WAD10000364208
Height / Weight / BSA:	55 cm/55 kg/1.15 m²	**Order Date / Time :**	
Room No / Bed:		**Location:**	WAD 1
Diagnosis:	cerebral concussion right subconjuctival hemorrhage	**Allergy:**	

TPN Order:	Nutriflex Lipid Peri 955kcal,1.25L	**Order Quantity:**	1 bag
Start Date/Time:	18/07/2018 05:00 PM	**End Date/Time:**	19/07/2018 05:00 PM

		Content / kg	Content / bag
Volume	(ml)	22.73	1250
Calorie	(kCal)	17.36	955
Protein	(g)	0.73	40
Carbohydrate	(g)	1.45	80
Lipid	(g)	0.91	50
Sodium	(mmol)	0.91	50
Potassium	(mmol)	0.55	30
Calcium	(mmol)	0.05	3
Magnesium	(mmol)	0.05	3
Phosphate	(mmol)	0.14	7.5
Chloride	(mmol)	0.87	48
Acetate	(mmol)	0.73	40
Trace Element	(ml)	NA	NA
Combine Vitamin	(ml)	NA	NA
Water Soluble Vitamin	(ml)	NA	NA
Fat Soluble Vitamin	(ml)	NA	NA

Infusion Over:	24 hr	**Infusion Rate:**	52.08 ml/hr
Prescriber:	System Administrator	**Frequency:**	CONT
Designation:	Pegawai Farmasi UF44	**Infusion Route:**	Central
Department:	General Surgery	**Remarks:**	

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ii. PN Commercial with Additive

Ministry Of Health, Malaysia

Hospital Tanah Merah

PARENTERAL NUTRITION

Patient Name:	[redacted]	**Patient ID:**	[redacted]
Age:	71 Years 01 Months 04 Days	**MRN:**	html[redacted]
Gender:	Male	**Prescription :**	WAD10000364208
Height / Weight / BSA:	55 cm/55 kg/1.15 m²	**Order Date / Time :**	
Room No / Bed:		**Location:**	WAD 1
Diagnosis:	cerebral concussion right subconjuctival hemorrhage	**Allergy:**	

TPN Order:	Nutriflex Lipid Peri 955kcal,1.25L With additive	**Order Quantity:**	1 bag
Start Date/Time:	18/07/2018 05:00 PM	**End Date/Time:**	19/07/2018 05:00 PM

		Additional Requirement	Content/bag	Content/kg
Volume	(ml)	NA	1250	22.73
Calorie	(kCal)	NA	955	17.36
Protein	(g)	NA	40	0.73
Carbohydrate	(g)	NA	80	1.45
Lipid	(g)	NA	50	0.91
Sodium	(mmol)	35	85	1.55
Potassium	(mmol)	20	50	0.91
Calcium	(mmol)	NA	3	0.05
Magnesium	(mmol)	NA	3	0.05
Phosphate	(mmol)	NA	7.5	0.14
Chloride	(mmol)	NA	48	0.87
Acetate	(mmol)	NA	40	0.73
Trace Element	(ml)	NA	NA	NA
Combine Vitamin	(ml)	NA	NA	NA
Water Soluble Vitamin	(ml)	NA	NA	NA
Fat Soluble Vitamin	(ml)	NA	NA	NA
Glutamin	(ml)	NA	NA	NA

Infusion Over:	24 hr	**Infusion Rate:**	52.08 ml/hr
Prescriber:	System Administrator	**Frequency:**	CONT
Designation:	Pegawai Farmasi UF44	**Infusion Route:**	Central
Department:	General Surgery	**Remarks:**	

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iii. PN Compounded

Ministry Of Health, Malaysia
Hospital Tanah Merah
PARENTERAL NUTRITION

Patient Name:		**Patient ID:**	
Age:	71 Years 01 Months 04 Days	**MRN:**	htmh
Gender:	Male	**Prescription :**	WAD10000364208
Height / Weight /	55 cm/55 kg/1.15 m^2	**Order Date / Time**	
Room No / Bed:		**Location:**	WAD 1
Diagnosis:	cerebral concussion right subconjuctival hemorrhage	**Allergy:**	

TPN Order:	PN Compounded Adult	**Order**	1 bag
Start	18/07/2018 05:00 PM	**End**	19/07/2018 05:00 PM

		Content / kg	Content / bag
Volume	(ml)	47.27	2600
Calorie	(kCal)	45	2475
Protein	(g)	1	55
Carbohydrate	(g)	3	165
Lipid	(g)	1	55
Sodium	(mmol)	NA	NA
Potassium	(mmol)	NA	NA
Calcium	(mmol)	NA	NA
Magnesium	(mmol)	NA	NA
Phosphate	(mmol)	NA	NA
Chloride	(mmol)	NA	NA
Acetate	(mmol)	NA	NA
Trace Element	(ml)	NA	NA
Combine Vitamin	(ml)	NA	NA
Water Soluble Vitamin	(ml)	NA	NA
Fat Soluble Vitamin	(ml)	NA	NA
L-Glutamin	(ml)	NA	NA

Infusion Over:	24 hr	**Frequency:**	OD
Prescriber:	System Administrator	**Infusion Route:**	Central
Designation:	Pegawai Farmasi UF44	**Remarks:**	
Department:	General Surgery		

Notes	• Click on the Print button to view and print the prescription.
Cross References	

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3.2.3.2.7.2 ***Application Business Rules***

No.	Name	Description
1.	View and Print Prescription	Prescription can only be printed after user saves the order record. If no order record saved, no print button will be display. Once user save the order record and click on the print button, prescription containing all the order information is displayed in PDF format. User can print the prescription using the browser print function.
2.	Hospital Name	Hospital Name is displayed based on the Hospital and Clinic Information details.
3.	Patient Name	Patient Name is displayed based on the patient's record.
4.	Patient ID	Patient ID is displayed based on the patient's record.
5.	Age	Age will be auto calculated based on DOB *Age = Current date - DOB* Age format 999Y 99M 99D (E.g. 24Y 11M 25D, 02M 13D)
6.	MRN	MRN is displayed based on the patient's record.
7.	Gender	Gender is displayed based on the patient's record.
8.	Prescription	Prescription is displayed based on the Prescription No. based on the order record.
9.	Height/Weight/ BSA	Height and Weight is displayed based on patient's visit record. BSA (Body Surface Area) is displayed based on the calculation as below: (Height(cm) x Weight(kg) / 3600)½
10.	Order Date/Time	Value is displayed based on the order record.
11.	Room No./Bed	Value is displayed based on the patient's visit record.
12.	Location	Order Location is displayed based on the patient's visit location.
13.	Diagnosis	Value is displayed based on the patient's record.
14.	Allergy	Value is displayed based on the patient's record.
15.	TPN Order	Value is displayed based on the PN Order Type. i. Commercial: Display the selected drug name ii. Commercial with additive: Display the selected drug name + 'With Additive' iii. Compounded: Display 'PN Compounded' + PN For value in PN Order
16.	Order Quantity	Displayed based on Order Quantity in order screen.
17.	Start Date/Time	Start Date/Time is displayed based on order Start Date/Time.
18.	End Date/Time	End Date/Time is displayed based on order End Date/Time.
19.	Volume(ml)	Refer to Volume per day and Volume by weight value in the PN order details.
20.	Calorie(kcal)	Refer to Calorie (kcal) per day and by weight value in the PN order details.
21.	Protein(g)	Refer to Protein (g) per day and by weight value in the PN order details.
22.	Carbohydrate(g)	Refer to Carbohydrate (g) per day and by weight value in the PN order details.

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No.	Name	Description
23.	Lipid(g)	Refer to Lipid (g) per day and by weight value in the PN order details.
24.	Sodium(mmol)	Refer to Sodium (mmol) per day and by weight value in the PN order details.
25.	Potassium(mmol)	Refer to Potassium (mmol) per day and by weight value in the PN order details.
26.	Calcium(mmol)	Refer to Calcium (mmol) per day and by weight value in the PN order details.
27.	Magnesium(mmol)	Refer to Magnesium (mmol) per day and by weight value in the PN order details.
28.	Phosphate(mmol)	Refer to Phosphate (mmol) per day and by weight value in the PN order details.
29.	Chloride(mmol)	Refer to Chloride (mmol) per day and by weight value in the PN order details.
30.	Acetate(mmol)	Refer to Acetate (mmol) per day and by weight value in the PN order details.
31.	Trace Element(ml)	Refer to Trace Element (ml) per day and by weight value in the PN order details.
32.	Multivitamin(ml)	Refer to Multivitamin (ml) per day and by weight value in the PN order details.
33.	Water Soluble Vitamin(ml)	Refer to Water Soluble Vitamin (ml) per day and by weight value in the PN order details.
34.	Fat Soluble Vitamin(ml)	Refer to Fat Soluble Vitamin (ml) per day and by weight value in the PN order details.
35.	Infusion Over (hrs)	Refer to Infusion Over (hrs) value in the PN order details.
36.	Infusion rate(ml/hr)	Auto calculated based on: Volume (ml) / Infusion Over (Hrs) as per in PN Order screen.
37.	Frequency	Refer to Frequency value in the PN order details.
38.	Infusion Route	Refer to Infusion Line value in the PN order details.
39.	Prescriber	Prescribed By is displayed based on the order confirmed by value.
40.	Remarks	Remark is displayed based on order remarks.
41.	Designation	Designation is displayed based on the prescriber's user profile information.

3.2.3.2.7.3 ***Input Validation Rules***

None.

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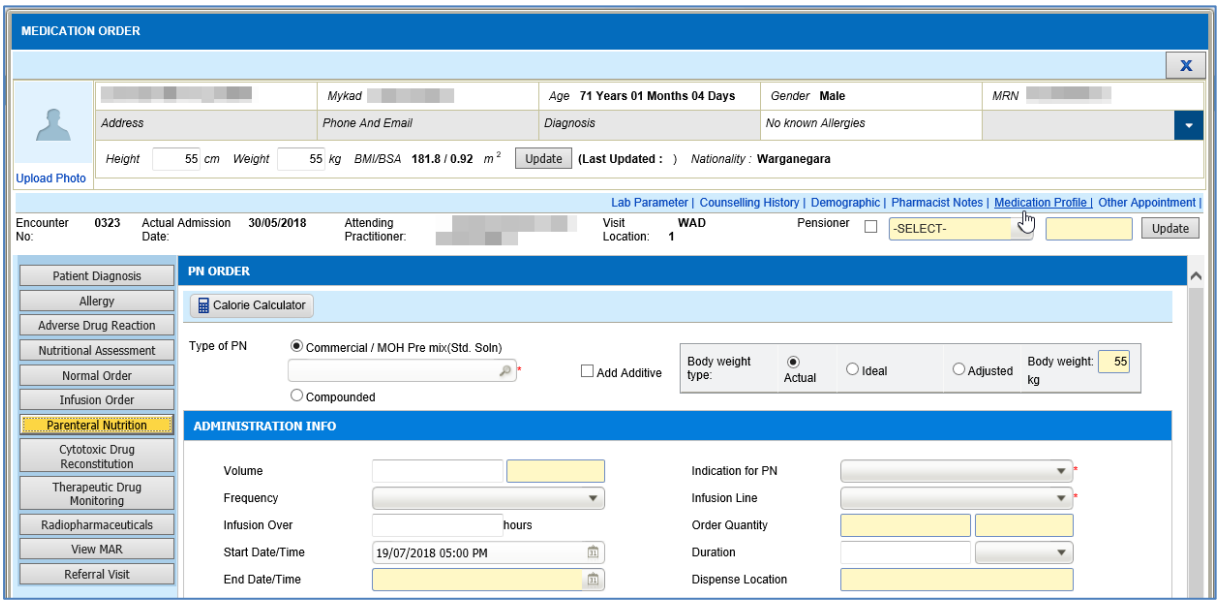
3.2.3.2.8 *Renew Prescription*

3.2.3.2.8.1 ***Screen Design***

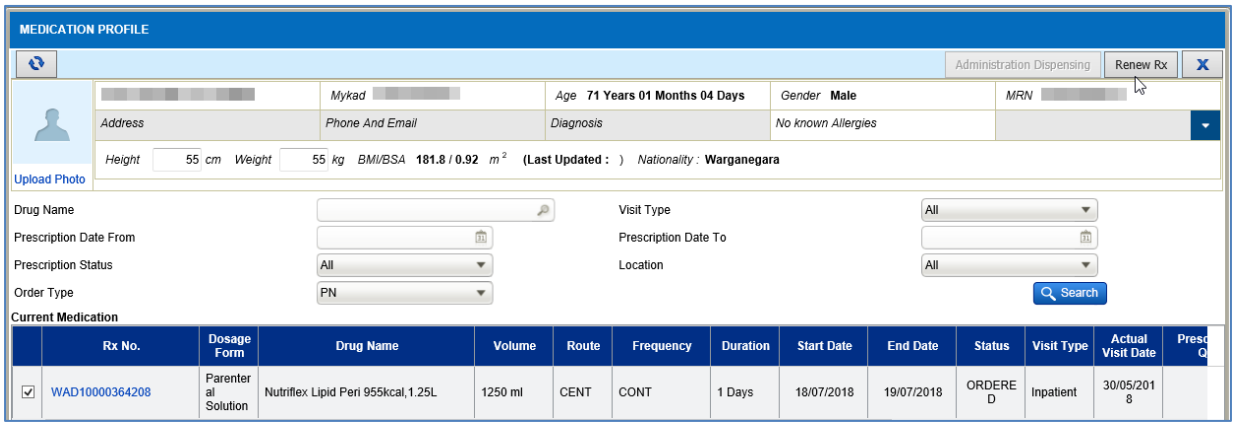
ID	PNOR.SD8
Description	To renew prescription.

Diagram

i. Click on the Medication Profile hyperlink



ii. View the PN Medication Profile, Renew Rx



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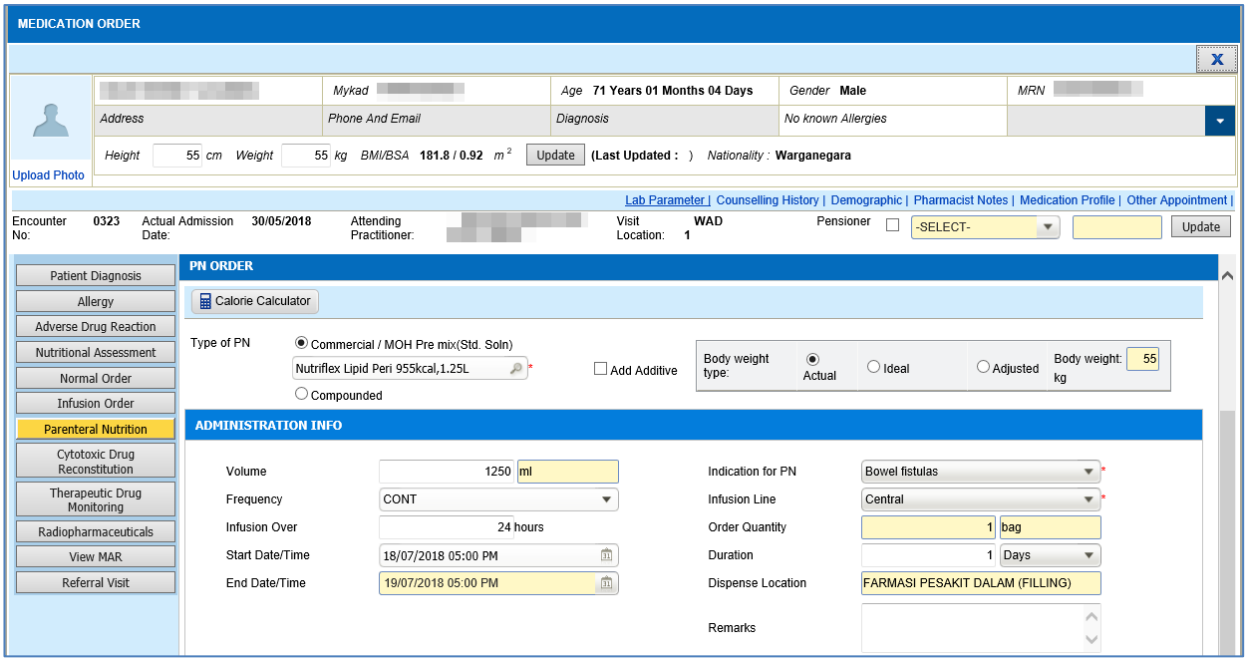
iii. Once click on 'Renew Rx' button, details will load in the PN Order screen



Notes	• View the PN Medication Profile, select the prescription and click on 'Renew Rx' button to renew the prescription
Cross References	

3.2.3.2.8.2 ***Application Business Rules***

No.	Name	Description
1.	Renew order	User able to renew order based on patient's current or previous medication in patient's medication profile screen. Renew Rx button is displayed only in medication profile screen in medication order.

3.2.3.2.8.3 ***Input Validation Rules***

None.

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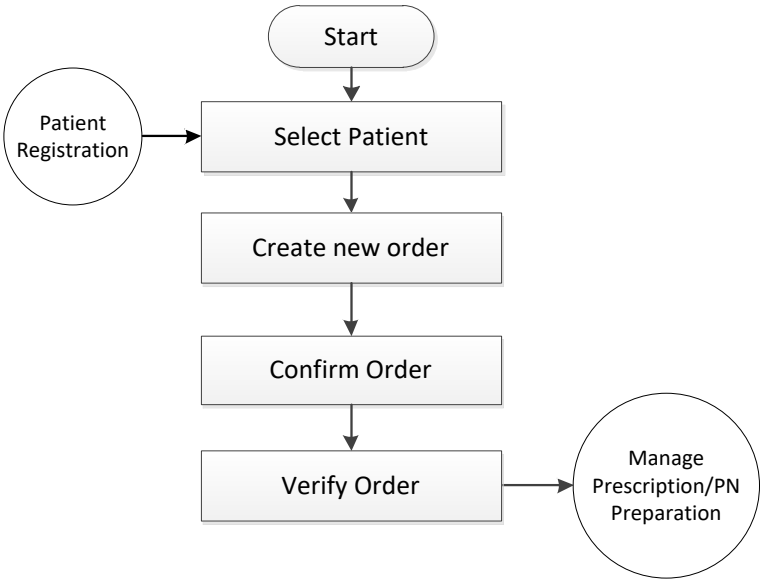
3.2.4 PN Record Prescription

PN Record Prescription screen allows pharmacist to transcribe cytotoxic drug medication as per ordered by prescriber for patient with valid visit record. This screen is used by pharmacy based facilities. Pharmacist to transcribe and verify the order. Order record will then proceed to Preparation and Dispensing screen.

3.2.4.1 Screen Navigation Diagram



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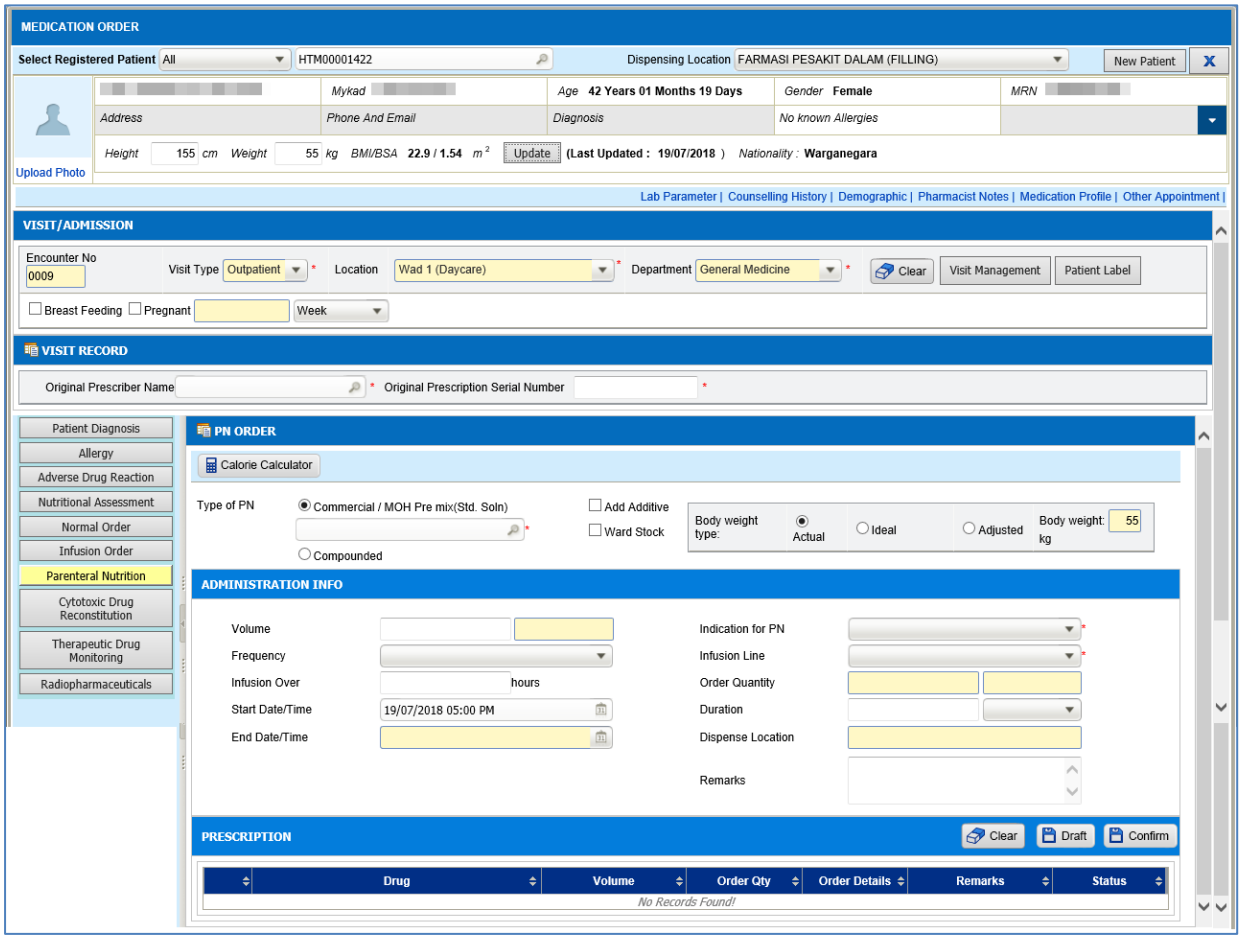
3.2.4.2 Detail Functionality and Screen

3.2.4.2.1 *New PN Record Prescription*

3.2.4.2.1.1 ***Screen Design***

ID	PN-RP.SD1
Description	To create new PN 'Record Prescription' record.

Diagram



Notes	• Click on 'Save' button to save the record. • Click on 'Print' button to print the prescription. • Click on 'Confirm' button to confirm order.
Cross References	

3.2.4.2.1.2 ***Application Business Rules***

Refer section #3.2.3 PN Medication Order for further details.

3.2.4.2.1.3 ***Input Validation Rules***

Refer section #3.2.3 PN Medication Order for further details.

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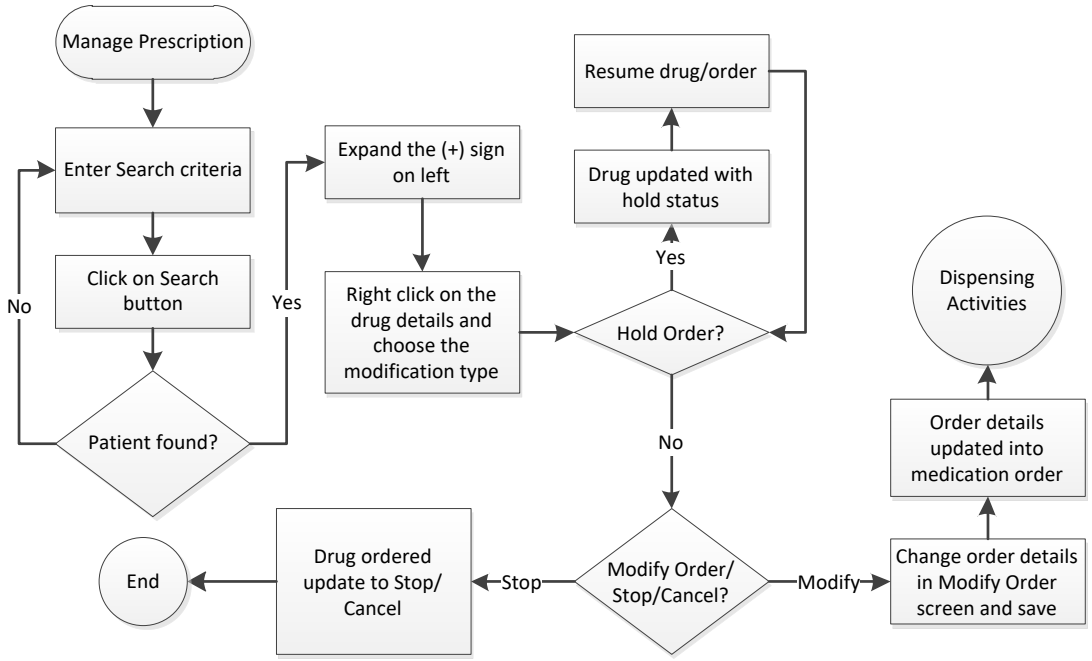
3.2.5 PN Manage Prescription

Once Medication Order/Record Prescription transaction already confirm, prescriber (full based) able to modify, hold/resume, cancel or stop order. While for transcriber (pharmacy based), able to cancel or stop order.

3.2.5.1 Screen Navigation Diagram



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3.2.5.2 Detail Functionality and Screen

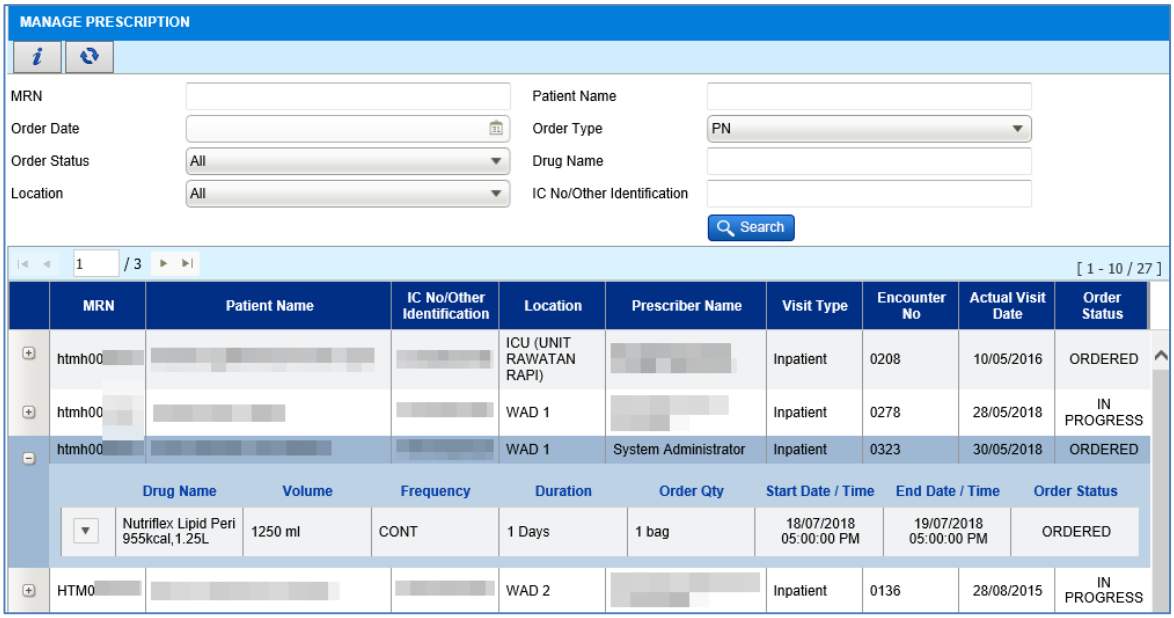
3.2.5.2.1 *Manage Prescription*

3.2.5.2.1.1 ***Screen Design***

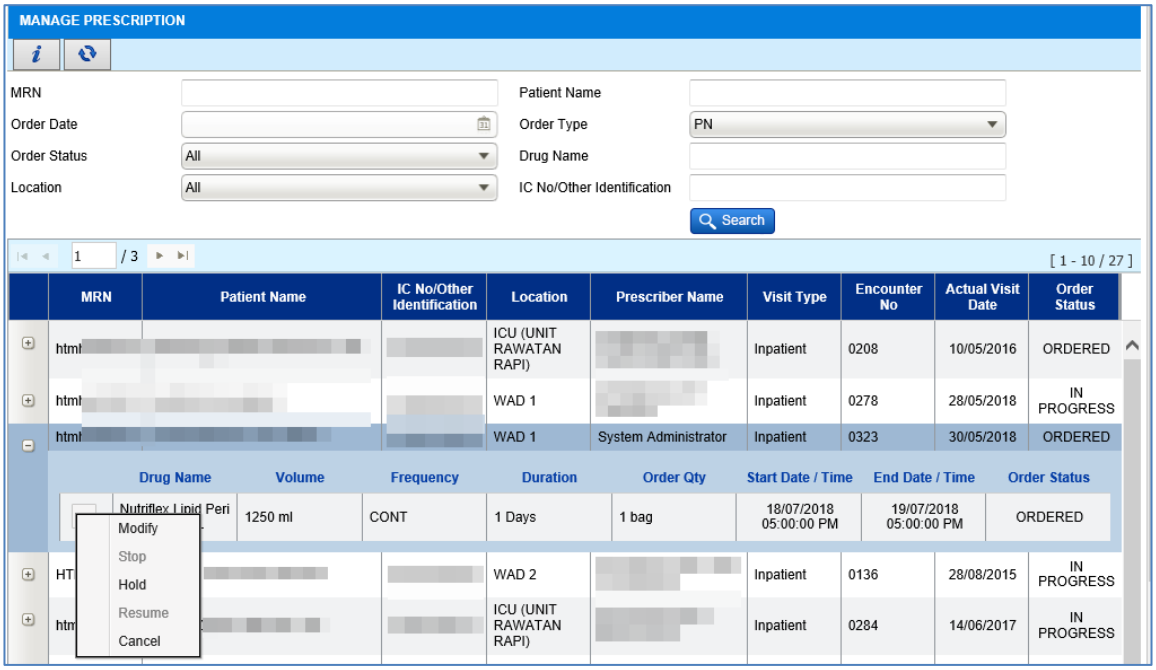
ID	PN-MP.SD1
Description	Manage Prescription screen

Diagram

1. Manage Prescription listing page



2. Manage Prescription: Context Menu



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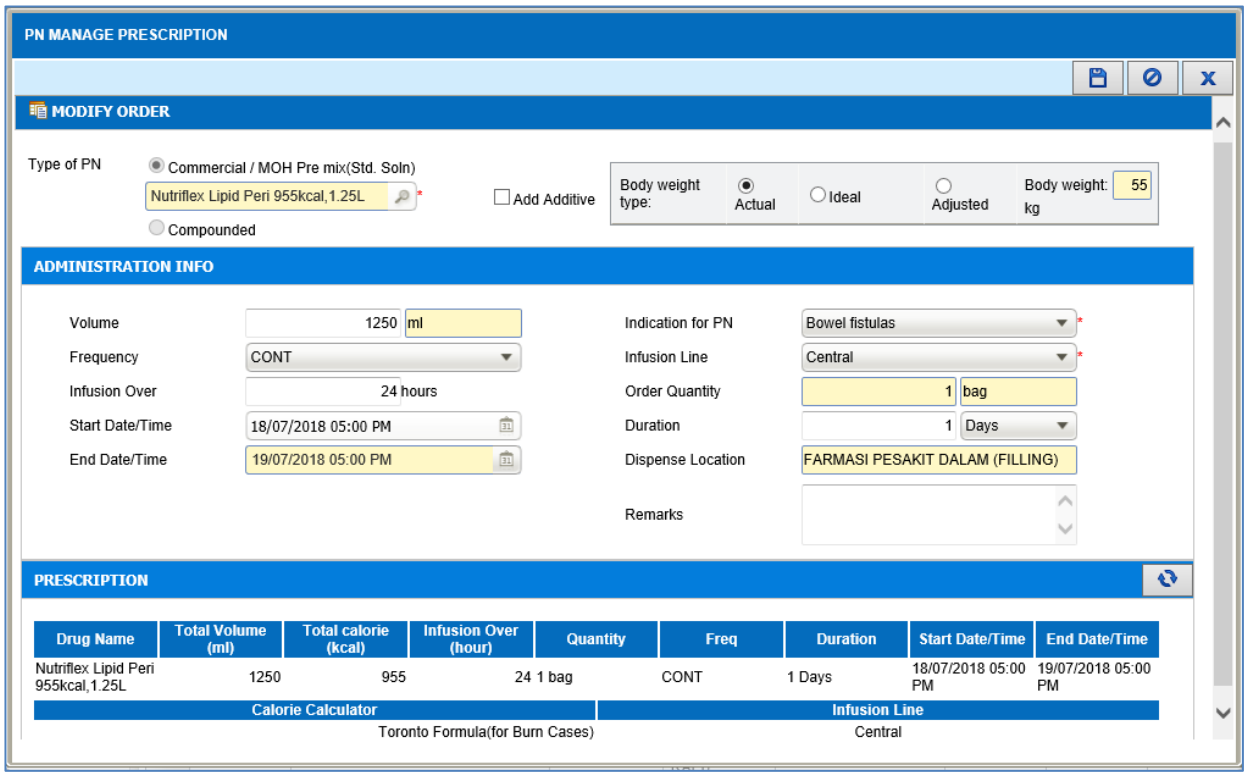
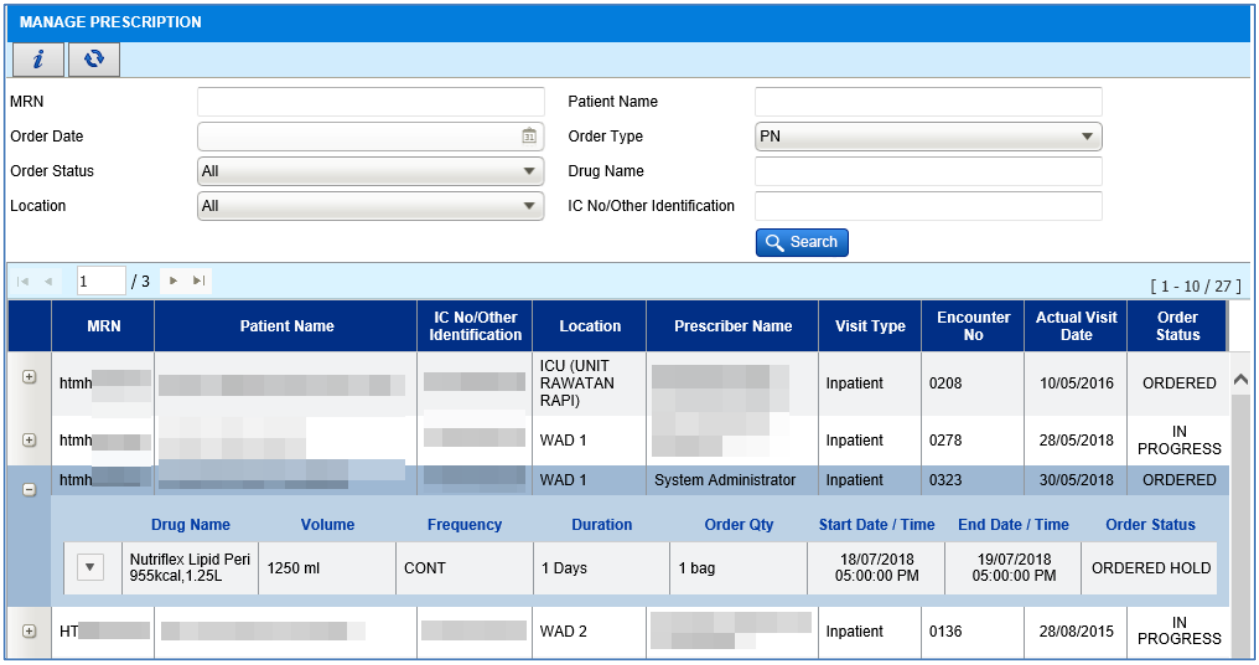
3. Manage Prescription: Modify order



4. Manage Prescription: Hold order



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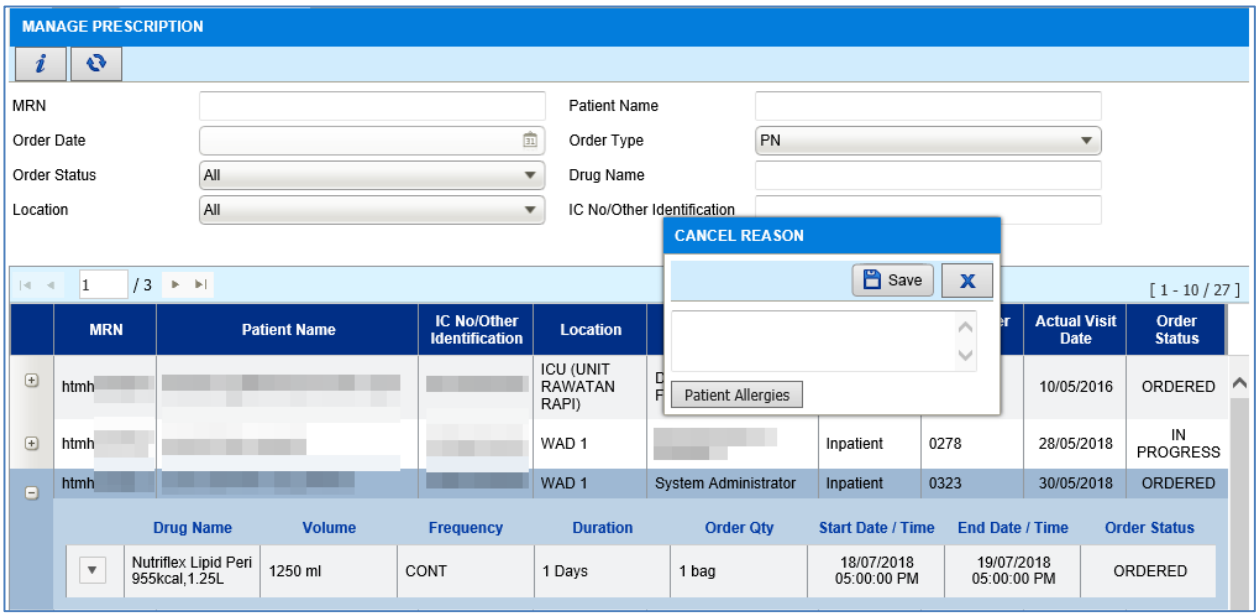
5. Manage Prescription: Cancel/Stop order



Notes	• Click on 'Search' button to search for the existing PN medication order record. • Click on Modify Order menu to display modify PN order screen. • Click on Hold Order menu to hold the PN order record. • Click on Resume Order menu to resume the PN order record. • Click on Cancel menu to cancel the PN order record. • Click on the Stop menu to discontinue the PN order record.
Cross References	None

3.2.5.2.1.2 ***Application Business Rules***

No.	Name	Description
1.	Search Order	Manage Order listing screen is displayed for user to select confirmed orders based on user's granted location, patient's visit location and order status. Only prescription with order status Ordered, In Progress, and Partially Dispensed is displayed in this listing. This screen will allow user to search by the following criteria: i. MRN – Manage order listing shall be retrieved from the database based on matching MRN. ii. Patient Name – Manage order listing shall be retrieved from the database based on matching Patient Name. iii. Order Date – Manage order listing shall be retrieved from the database based on matching order date. iv. Order Type – Manage order listing shall be retrieved from the database based on matching order type. v. Order Status – Manage order listing shall be retrieved from the database based on matching order status.

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No.	Name	Description
		vi. Drug Name – Manage order listing shall be retrieved from database based on matching drug name. vii. Location – By default, location is default to user's login location. The listed location values are based on the user's granted location as setup in User Profile screen. viii. IC No/Other Identification - Manage order listing shall be retrieved from the database based on matching Patient ID No. The orders are displayed based on the order type as below: i. Normal: Medication orders created using Normal order screen. ii. CDR: Medication orders created using CDR order screen. iii. IV: Medication orders created using Infusion order screen. iv. PN: Medication orders created using PN order screen. v. Radiopharmaceuticals: Medication orders created using Radiopharma order screen.
2.	Patient List	Results of the search will listed below the search criteria section. The patient list will contain the following information: i. MRN ii. Patient Name iii. IC No/Other Identification iv. Location v. Prescriber Name vi. Visit Type vii. Encounter Number viii. Actual Visit Date ix. Order Status
3.	Refresh Listing	Click on the Refresh button to reset all searched records and searching criteria to default value.
4.	Modify Order	Modify order is allowed only when the drug status is Ordered. Once the drug status is in Verified onward, prescriber is not allowed to modify the order. On click of Modify Order menu, modify order screen is displayed, unable to edit the PN Type, other field functions remain as in PN order screen.
5.	Save Modify Order record	On click of Save button on Modify Order screen: i. System will update all order information and the latest prescription is displayed on the Manage Order listing screen. ii. No changes on the drug status.
6.	Hold Order	Hold order is allowed for drug status Ordered, Verified, and Prepared only. Hold function will update the drug status to Hold. Prescriber and pharmacist are not allowed to do any transaction once the drug is in Hold status. Hold function will update the drug status to [Current status]/Hold. Prescriber and pharmacist are not allowed to do any transaction once the drug is in Hold status.
7.	Resume Order	Resume order is enabled only when the drug status is Hold. Resume order function will update the drug status back to the previous status before hold.

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No.	Name	Description
		Resume order is enabled only when the drug status is Hold. Resume order function will update the drug status back to the previous status before hold. Pharmacist is not allowed to resume order hold by prescriber and vice versa.
8.	Cancel Order	i. Cancel order is allowed only when the drug status is Ordered, Verified and Prepared. ii. This function will update the drug status to Cancelled and will remove the drug from the Manage Order listing screen. No transaction allowed for the cancelled drug. iii. Cancelling the drugs will update the drug status to Cancelled.
9.	Stop Order	i. Stop order is allowed only when the drug status is Partial Dispensed. ii. This function will update the drug status to Discontinued and will remove the drug from the Manage Order listing screen. No transaction allowed for the discontinued drug. iii. Discontinue the drugs will update the drug status to Discontinue.

3.2.5.2.1.3 ***Input Validation Rules***

Refer #3.3.5.1 Manage Prescription Listing section in document PhIS_CPS_SDD_OM_FB_v1.0.

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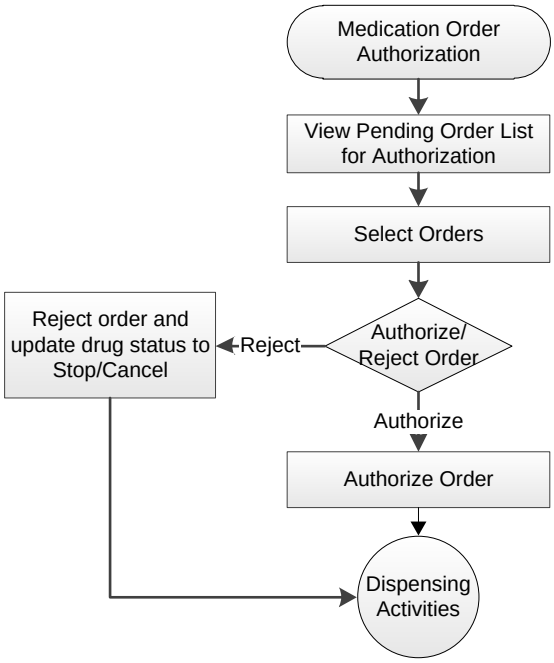
3.2.6 PN Authorization

Once medication order record created and the order involves drugs which the user is not authorized to prescribe then the order has to be authorized. Authorization of order will be done on this screen.

Authorization process is applicable for full based facility only, where by for pharmacy based the authorization process is conducted manually and pharmacist will record authorized prescription only into PhIS.

3.2.6.1 Screen Navigation Diagram



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3.2.6.2 Detail Functionality and Screen

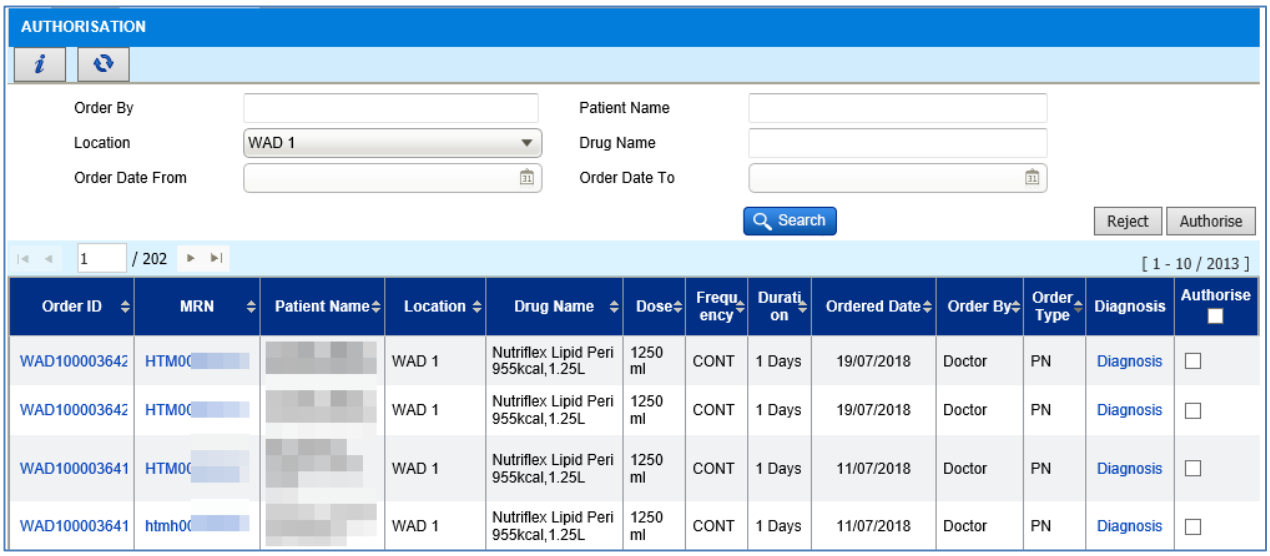
3.2.6.2.1 *Drug Authorization*

3.2.6.2.1.1 ***Screen Design***

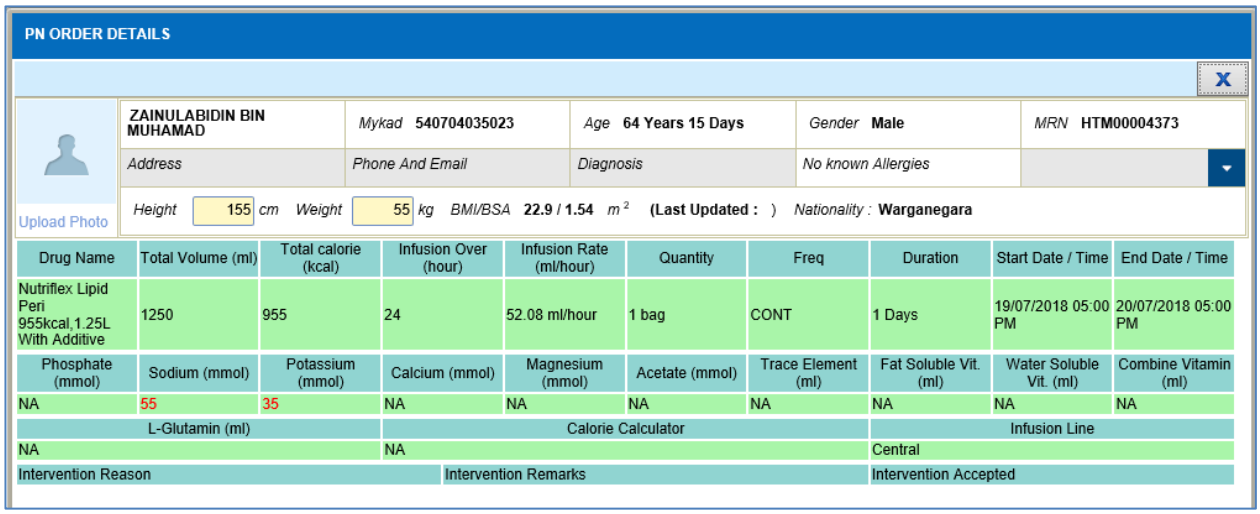
ID	PN-DA.SD1
Description	Authorization screen

Diagram

1. Order Authorisation screen



2. Order details, on click of Order ID hyperlink



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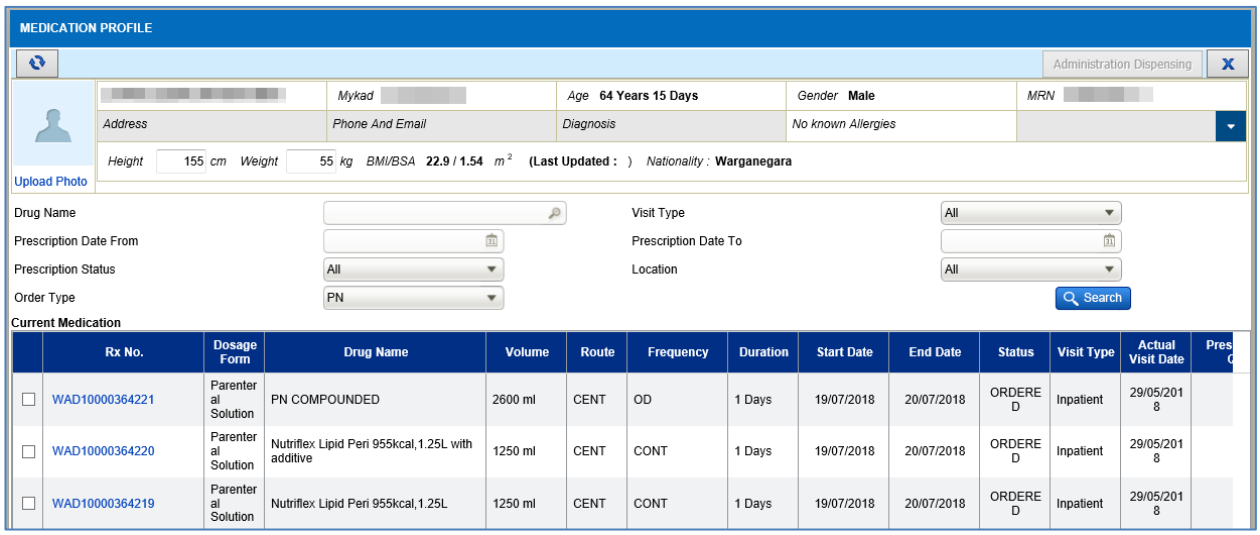
3. Patient Medication Profile on click of Patient MRN hyperlink



4. Example of Authorised order in PN Verification

Notes	• Click on the search button to search for the confirmed order that needs authorization. • Click on Order ID hyperlink to view order details. • Click on MRN hyperlink to view patient medication profile. • Select which drug to authorize and click Authorize button to authorize the drug. • Select which drug to reject and click Reject button.
Cross References	None

3.2.6.2.1.2 ***Application Business Rules***

No.	Name	Description
1.	Search Order	Order Authorisation listing screen is displayed based on user's granted location and patient's visit location. This screen will allow user to search by the following criteria: i. Order By – Authorisation listing shall be retrieved from the database based on order by value. ii. Patient Name – Authorisation listing shall be retrieved from the database based on matching Patient Name. iii. Location – By default, location is default to user's login location. The listed location values are based on the user's granted location as setup in User Profile screen. iv. Drug Name – Authorisation listing shall be retrieved from database

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No.	Name	Description
		based on matching drug name. v. Order Date range – Authorisation listing shall be retrieved from database where order date within the selected range. The confirmed orders are displayed based on the order type as below: i. Normal: Medication orders created using Normal order screen. ii. CDR: Medication orders created using CDR order screen. iii. IV: Medication orders created using Infusion order screen. iv. PN: Medication orders created using PN order screen. v. Radiopharmaceuticals: Medication orders created using Radiopharma order screen.
2.	Authorize Order	Once a medication order is placed and the order involves drugs which the user is not authorized to prescribe then the Order has to be authorized. Authorization of order will be done on this screen. It will involve: ***i. Criteria 1*** • Order of all category A/KK, A and A* • Order of all category B drugs ***ii. Criteria 2*** • This only applies for first order of the drug with same active ingredient. No authorization required for subsequent orders of the same active ingredient. • No limit on duration to allow repeating orders of the same active ingredient except as below: a. Authorization given for a particular admission/visit and expired once the patient is discharged/checkout. (Drug Authorization Category = A#). b. If patient is admitted/visit again and the same active ingredient is used, a new authorization is required for that same active ingredient. ***iii. Criteria 3*** • Not Outsource order (pharmacist transcribe Outsource order or drug comes from Online Outsource, no authorizations required for any type of drugs). Lower category of prescriber are allowed to prescribe higher level of drugs but it requires authorization from higher category of prescriber (with authorization to access medication authorization screen) before the status is updated to 'Authorized'. e.g.: i. 'Category B of prescriber' can prescribe 'Category A*,A, A/KK of drugs' but it requires authorization from 'Category A*,A, A/KK of prescriber'. ii. 'Category C of prescriber' can prescribe 'Category A*,A, A/KK or B of drugs' but it requires authorization from 'Category A*,A, A/KK or B of prescriber'. iii. Authorization is not required for drug category C and below even prescribes by lower category of prescriber.

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No.	Name	Description
		Only authorized user will be allowed to authorize the medication order. Patient encounters (visit) are unique by encounter number and encounter date. Select which drug to authorize and click Authorize button to authorize the drug. All ordered drugs required authorization will flow to pharmacy (for dispensing) with status Ordered (PA). To differentiate whether this drug needs authorization or not, and already been authorized or not is based on authorization_status in Order CDR (Normal or Infusion Drug) tables. i. Authorization Status is 'Y', when the order requires authorization. ii. Authorization Status is 'N', when authorization is not required. iii. Authorization Status is 'A', when order already authorized by upper level prescriber. Pharmacist can proceed to dispense the drug. Status of pending authorization the drug will be same with other drug that not require authorization (ordered, verified, and prepared) but with additional 'PA' (Pending Authorization) status.
3.	Reject Order	Once order is rejected, drug status will change status to Stop/Cancel. Record will be removed from the pending list and no more status PA (Pending Authorisation) appear at dispensing screen.
4.	Refresh Listing	Click on the Refresh button to reset all searched records and searching criteria to default value.

3.2.6.2.1.3 ***Input Validation Rules***

No.	Name	Description	Mandatory	Format
1.	Order By	Order By can be search through user ID by name. It can filter any username based on input value as minimum as 1 character.	No	Text field
2.	Location	Default value was set to All. Location will be listed in a drop down format and display based on user granted location.	No	Drop down
3.	Patient Name	Medication order listing shall be retrieved from the database for all registered patients with visit based on matching Patient Name.	No	Text field
4.	Drug Name	Drug name can be search by Active Ingredient, Drug Name and Trade Name. Trade Name is common brand name for this drug. Information defined in drug master.	Yes	Text field
5.	Order Date From	To be selected from calendar control. It will be in dd/mm/yyyy format. Search criteria for start order from which date.	No	Calendar
6.	Order Date To	To be selected from calendar control. It will be in dd/mm/yyyy format. Search criteria for start order to what date.	No	Calendar

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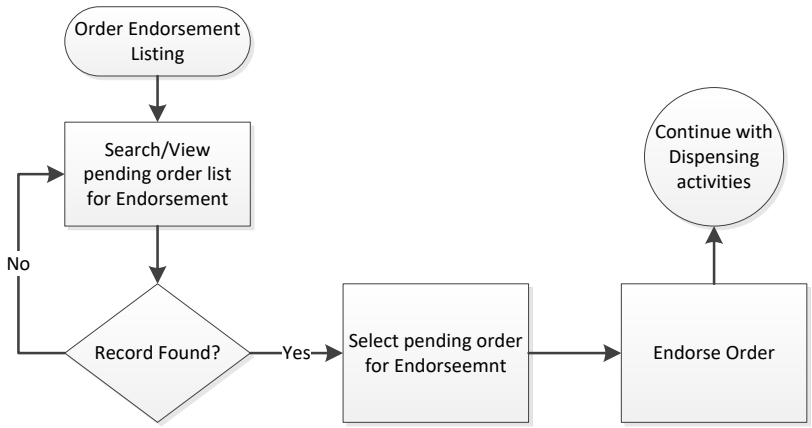
3.2.7 PN Endorsement

All orders modified by Pharmacists or Pharmacy Assistants after consulting the prescriber must be endorsed by the prescriber. Endorsement of order will be done on this Order Endorsement screen.

Only authorized user will be allowed to endorse the medication order. Pharmacist can continue to dispense the order even without endorsement.

3.2.7.1 Screen Navigation Diagram



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3.2.7.2 Detail Functionality and Screen

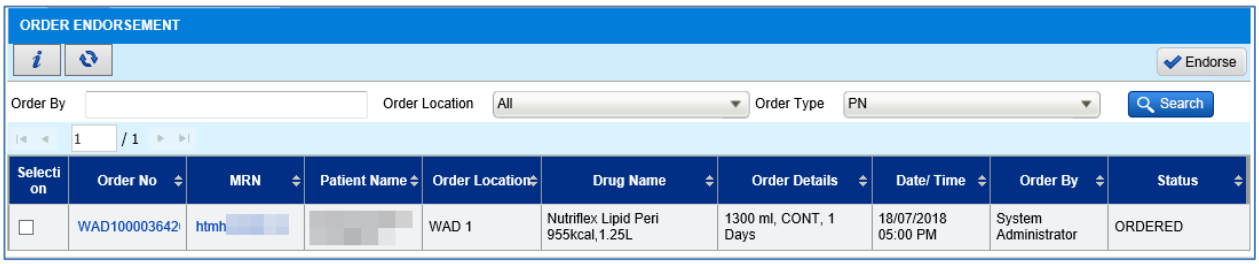
3.2.7.2.1 *Order Endorsement*

3.2.7.2.1.1 ***Screen Design***

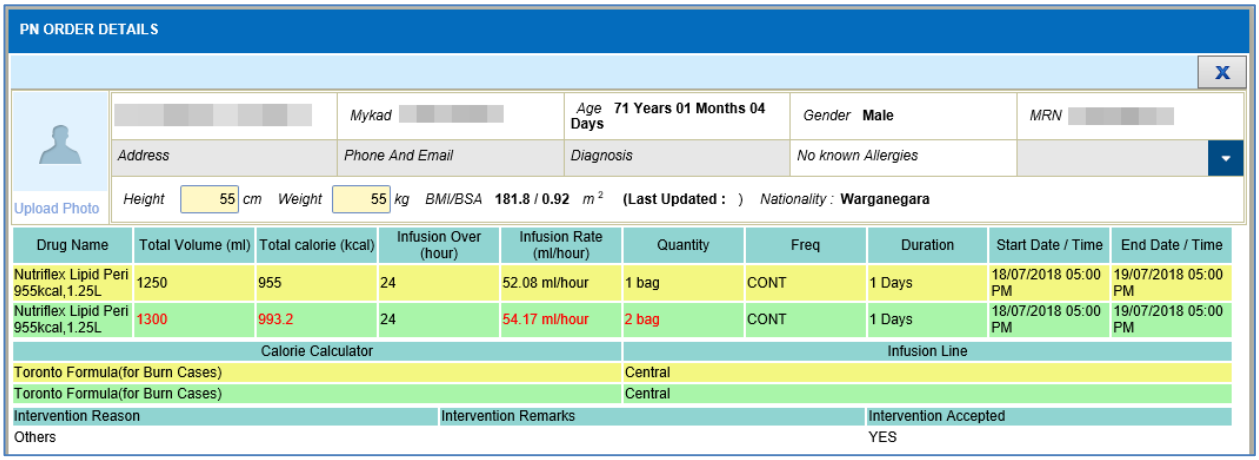
ID	PN-OE.SD1
Description	Order Endorsement screen

Diagram

1. Order Endorsement screen



2. Order Details



Notes	• Click on the search button to search for the order that needs prescriber endorsement. • Click on MRN hyperlink to display patient medication profile. • Select which drug to endorse and click Endorse button to endorse the order. • Click on Order No hyperlink to display the Order Details screen
Cross References	None

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3.2.7.2.1.2 ***Application Business Rules***

No.	Name	Description
1.	Search Order	Order Endorsement listing screen is displayed based on user's granted location and patient's visit location. This screen will allow user to search by the following criteria: i. Order By – Order endorsement listing shall be retrieved from the database based on order by value. ii. Order Location – By default, location is default to 'All'. The listed location values are based on the user's granted location as setup in User Profile screen. iii. Order Type – Order endorsement listing shall be retrieved from the database based on matching order type. The orders that needs endorsement are displayed based on the order type as below: i. Normal: Medication orders created using Normal order screen. ii. CDR: Medication orders created using CDR order screen. iii. IV: Medication orders created using Infusion order screen. iv. PN: Medication orders created using PN order screen. v. Radiopharmaceuticals: Medication orders created using Radiopharma order screen.
2.	Endorse Order	Select which drug to endorse and click Endorse button to endorse the order. All orders required endorsement will flow to pharmacy for dispensing. Pharmacist is allowed to modify order (intervention) in Verification and Preparation screen. Once order is modified, system will sent the order to endorsement screen. Pharmacist can proceed to dispense the drug. Status of pending endorsement orders will be same with other orders that not require endorsement (ordered, verified, and prepared).
3.	Order Details	Order details are displayed based on: Yellow coloured row display the original value ordered by prescriber. Green coloured row will display the modification done by pharmacist during order intervention in PN Verification or Preparation screen.
4.	Refresh Listing	Click on the Refresh button to reset all searched records and searching criteria to default value.

3.2.7.2.1.3 ***Input Validation Rules***

No.	Name	Description	Mandatory	Format
1.	Order By	Order By can be search through user ID by name. It can filter any username based on input value as minimum as 1 character.	No	Text field
2.	Order Location	Default value was set to All. Location will be listed in a drop down format and display based on user granted location.	No	Drop down
3.	Order Type	Default value set to Normal. Order Type will be listed in a drop down menu and consists of data (CDR, IV, Normal, PN, and Radiopharmaceutical).	No	Drop down

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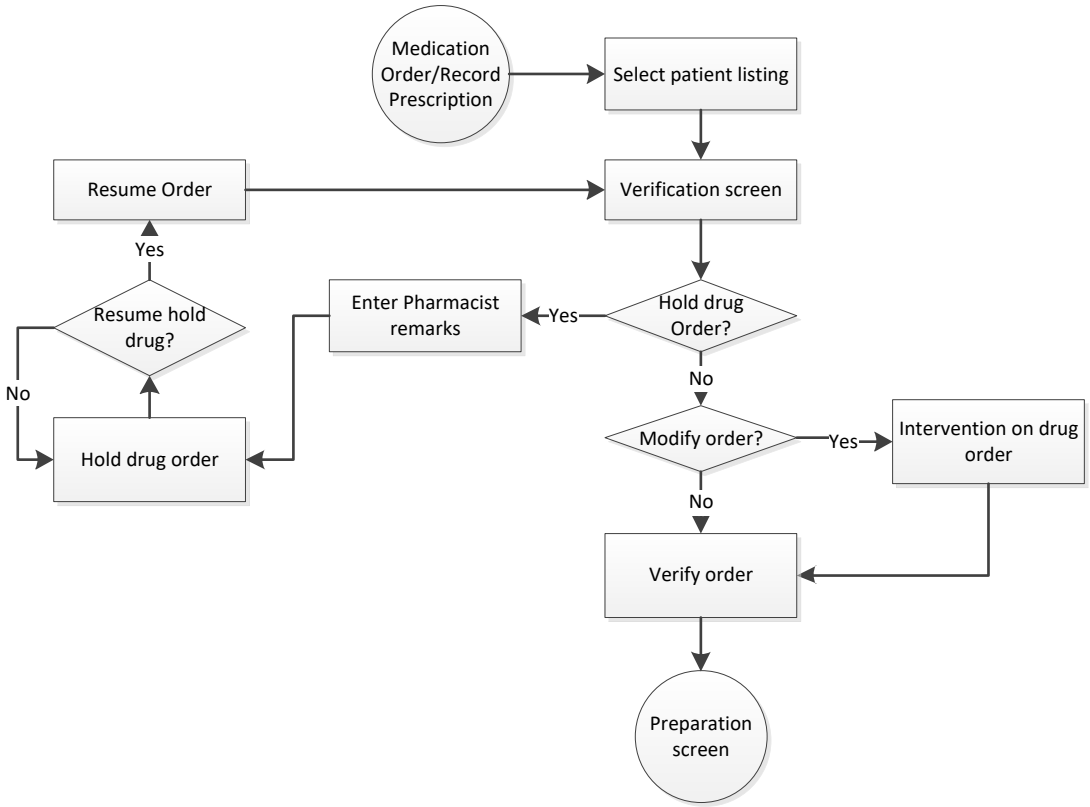
3.2.8 PN Verification

All confirmed PN orders from Medication Order screen will flow to PN Verification. Pharmacist will screen and verify the order to proceed to PN Preparation screen. This screen is applicable for full based facility only, for pharmacy based, verification screen is included in Record Prescription screen.

Pharmacist is allowed to intervene / modify order, or hold order in PN Verification screen. Intervention details will be displayed in Order Endorsement screen for doctor to endorse the order.

3.2.8.1 Screen Navigation Diagram



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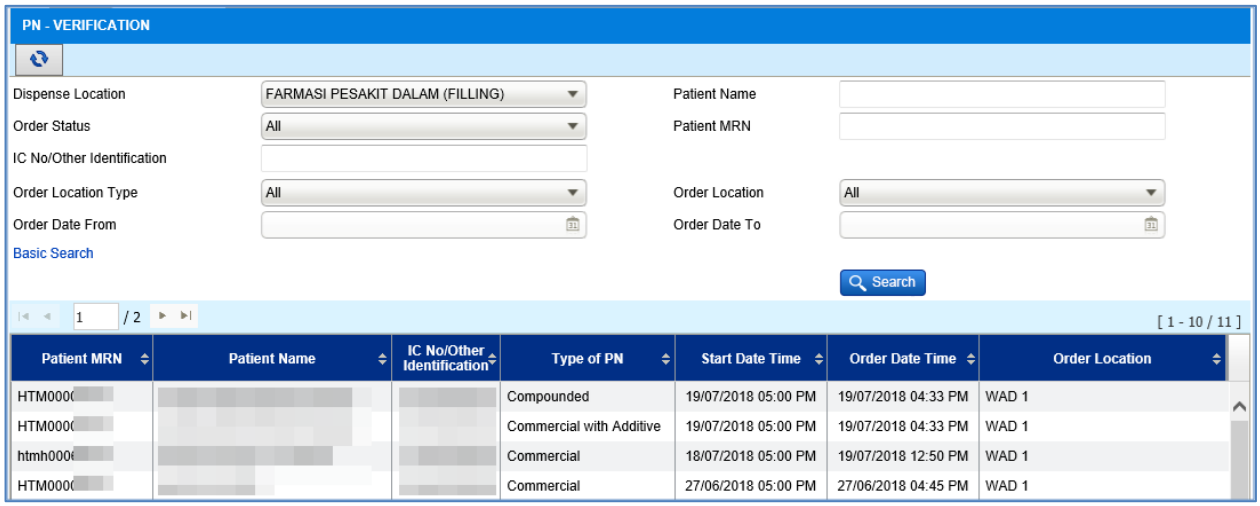
3.2.8.2 Detail Functionality and Screen

3.2.8.2.1 *PN Verification Listing*

3.2.8.2.1.1 ***Screen Design***

ID	PNVER.SD1
Description	PN Verification Listing

Diagram



Notes	• Click on the search button to search confirmed order for pharmacist to screen and verify. • Double click which order to verify and view the order details.
Cross References	None

3.2.8.2.1.2 ***Application Business Rules***

No.	Name	Description
1.	Search Order	PN Verification listing screen is displayed based on all PN confirmed orders and user's login location. This screen will allow user to search by the following criteria: i. Dispense Location – By default, dispense location is default to user's login location. The listed location values are based on the user's granted location as setup in User Profile screen and location specified as dispense location in Location Setup screen. ii. Order Status – Verification listing shall be retrieved from the database based on matching order status. By default, value is default to 'All'. Values are from lookup table, domain 'CDR Order Status'. iii. Patient Name – Verification listing shall be retrieved from the database based on matching Patient Name. iv. Patient MRN – Verification listing shall be retrieved from the database based on matching Patient MRN.

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No.	Name	Description
		v. IC No/Other Identification - Verification listing shall be retrieved from the database based on matching Patient ID No. vi. Order Location Type – Verification listing shall be retrieved from the database based on matching location type. By default, value is default to 'All'. Values are from Reference Codes maintenance screen, domain 'Loc Type'. vii. Order Location – Verification listing shall be retrieved from the database based on matching location. By default, value is default to 'All'. Values are from location setup maintenance screen. viii. Order Date range – Verification listing shall be retrieved from database where order date within the selected range. Specify search criteria and click on the Search button to search the orders.
2.	Refresh Listing	Click on the Refresh button to reset all searched records and searching criteria to default value.

3.2.8.2.1.3 ***Input Validation Rules***

None.

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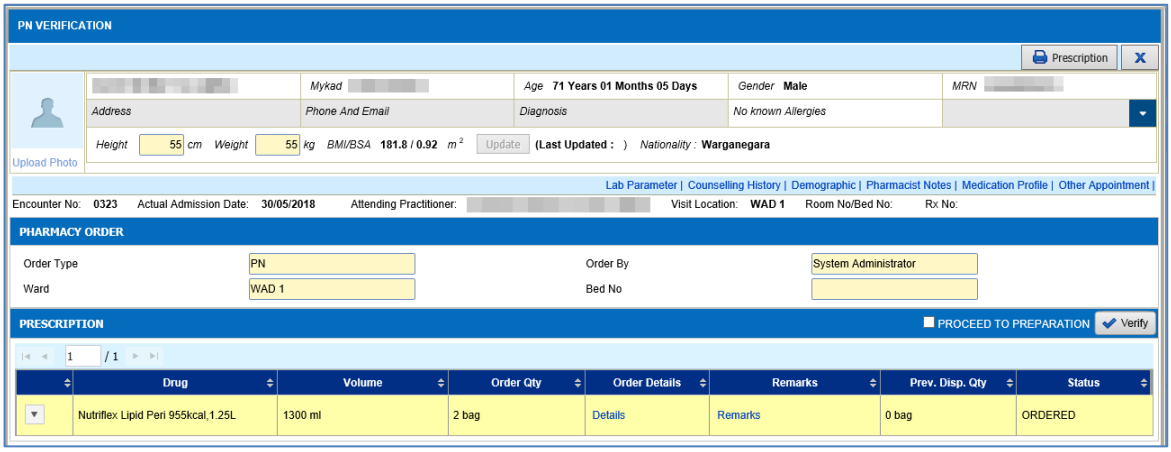
3.2.8.2.2 *PN Verification*

3.2.8.2.2.1 ***Screen Design***

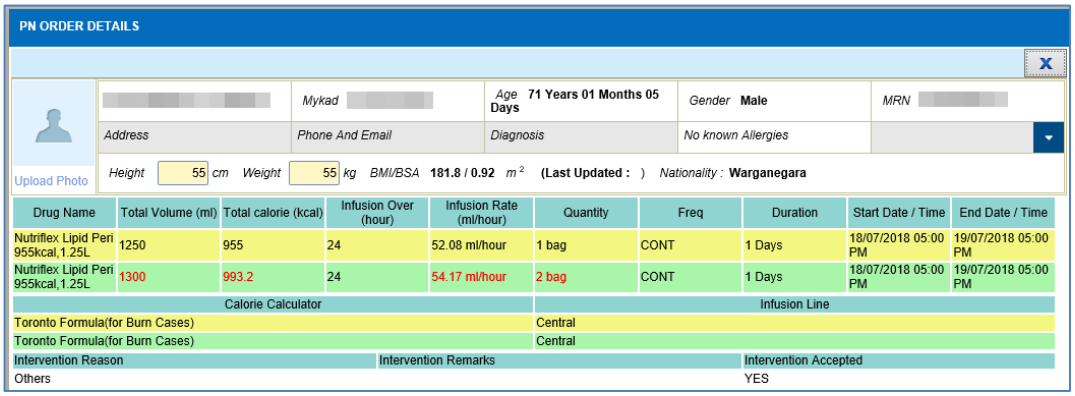
ID	PNVER.SD2
Description	PN Verification screen

Diagram

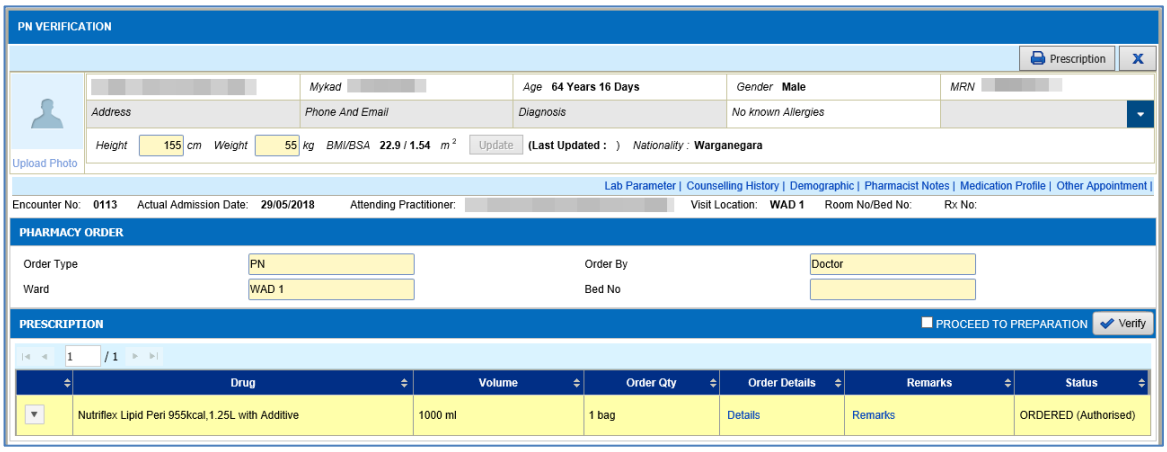
1. PN Commercial



Order details: On click of 'Order Details hyperlink



2. PN Commercial with Additive



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Order details: On click of 'Order Details hyperlink

PN ORDER DETAILS

Upload Photo | Mykad | Age 64 Years 16 Days | Gender Male | MRN
Address | Phone And Email | Diagnosis | No known Allergies
Height 155 cm Weight 55 kg BMI/BSA 22.9 / 1.54 m^2 (Last Updated :) Nationality : Warganegara

Drug Name	Total Volume (ml)	Total calorie (kcal)	Infusion Over (hour)	Infusion Rate (ml/hour)	Quantity	Freq	Duration	Start Date / Time	End Date / Time
Nutriflex Lipid Peri 955kcal,1.25L With Additive	1250	955	24	52.08 ml/hour	1 bag	CONT	1 Days	19/07/2018 05:00 PM	20/07/2018 05:00 PM
Nutriflex Lipid Peri 955kcal,1.25L With Additive	1000	764	24	41.67 ml/hour	1 bag	CONT	1 Days	19/07/2018 05:00 PM	20/07/2018 05:00 PM

Phosphate (mmol)	Sodium (mmol)	Potassium (mmol)	Calcium (mmol)	Magnesium (mmol)	Acetate (mmol)	Trace Element (ml)	Fat Soluble Vit. (ml)	Water Soluble Vit. (ml)	Combine Vitamin (ml)
NA	55	35	8	NA	NA	NA	NA	NA	NA
NA	55	35	8	NA	NA	NA	NA	NA	NA

L-Glutamin (ml)	Calorie Calculator	Infusion Line
NA	NA	Central
NA	NA	Central

Intervention Reason	Intervention Remarks	Intervention Accepted
Others		YES

3. PN Compounded

PN VERIFICATION

Prescription

Upload Photo | Mykad | Age 64 Years 16 Days | Gender Male | MRN
Address | Phone And Email | Diagnosis | No known Allergies
Height 155 cm Weight 55 kg BMI/BSA 22.9 / 1.54 m^2 Update (Last Updated :) Nationality : Warganegara

Lab Parameter | Counselling History | Demographic | Pharmacist Notes | Medication Profile | Other Appointment |

Encounter No: 0113 Actual Admission Date: 29/05/2018 Attending Practitioner: Visit Location: WAD 1 Room No/Bed No: Rx No:

PHARMACY ORDER

Order Type: PN | Order By: Doctor
Ward: WAD 1 | Bed No:

PRESCRIPTION PROCEED TO PREPARATION Verify

1 / 1

Drug	Volume	Order Qty	Order Details	Remarks	Status
PN Compounded Adult	2000 ml	1 Bag	Details	Remarks	ORDERED

Order details: On click of 'Order Details hyperlink

PN ORDER DETAILS

Upload Photo | Mykad | Age 64 Years 16 Days | Gender Male | MRN
Address | Phone And Email | Diagnosis | No known Allergies
Height 155 cm Weight 55 kg BMI/BSA 22.9 / 1.54 m^2 (Last Updated :) Nationality : Warganegara

Drug Name	Total Volume ml per kg (ml)	Total calorie kcal per kg (kcal)	Infusion Over (hour)	Infusion Rate (ml/hour)	Quantity	Freq	Duration	Start Date / Time	End Date / Time
PN Compounded Adult	47.27 (2600)	25 (1375)	24	NA	1 BAG	OD	1 Days	19/07/2018 05:00 PM	20/07/2018 05:00 PM
PN Compounded Adult	36.36 (2000)	25 (1375)	24	83.33 ml/hour	1 BAG	OD	1 Days	19/07/2018 05:00 PM	20/07/2018 05:00 PM

Phosphate mmol per kg (mmol)	Sodium mmol per kg (mmol)	Potassium mmol per kg (mmol)	Calcium mmol per kg (mmol)	Magnesium mmol per kg (mmol)	Acetate mmol per kg (mmol)	Trace Element ml per kg (ml)	Fat Soluble Vit. ml per kg (ml)	Water Soluble Vit. ml per kg (ml)	Combine Vitamin ml per kg (ml)
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

L-Glutamin ml per kg (ml)	Protein g per kg (g)	Carbohydrate g per kg (g)	Lipid g per kg (g)	Calorie Calculator	Infusion Line
NA	1 (55)	3 (165)	1 (55)	NA	Central
NA	1 (55)	3 (165)	1 (55)	NA	Central

Intervention Reason	Intervention Remarks	Intervention Accepted
Others		YES

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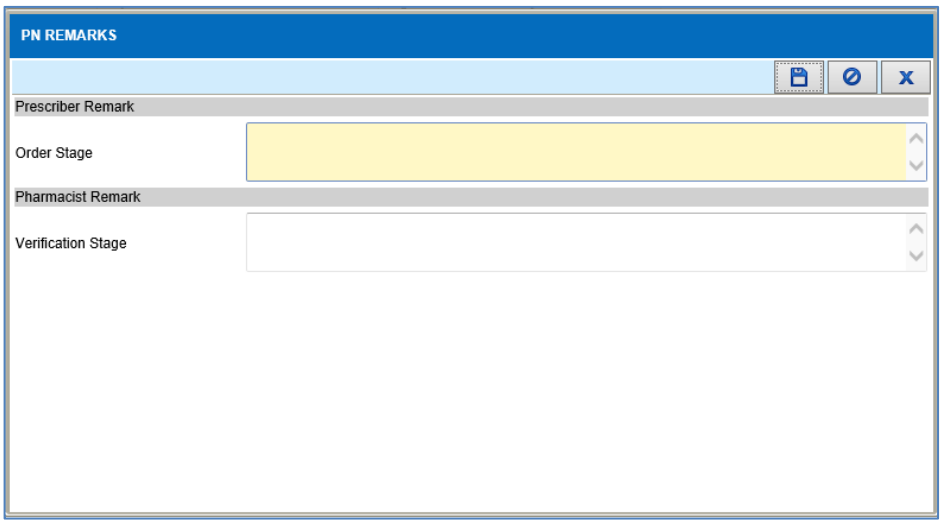
4. Pharmacist Remarks (On click of 'Remarks' hyperlink)



Notes	• Double click on order row to view Order Details screen for each drugs. • Click on Order Details hyperlink to view the order details screen. • Click on Remarks hyperlink to view remarks screen. • Click on Verify button to verify order.
Cross References	None

3.2.8.2.2.2 ***Application Business Rules***

No.	Name	Description
1.	Drug Name	Drug Name display based on the PN Type: i. Commercial – Display the ordered 'Drug Name'. ii. Commercial with Additive – Display the ordered 'Drug Name' +'with additive' iii. Compounded – Display as 'PN Compounded' + 'PN for' value selected during order Eg: PN Compounded Adult
2.	Volume	Volume column displays based on ordering volume. Value is displayed up to 2 decimal places.
3.	Order Qty	Display value based on the ordering order quantity.
4.	Remarks	Pharmacist remarks screen displays the remarks by both prescriber and pharmacist. Order stage remarks will display value if any drug remarks entered during order by prescriber. In verification screen, only verification stage remark field is enabled, other remarks are view-only.
5.	Prev. Disp. Qty	Prev. Disp. Qty display based on previous dispenses quantity. Applicable only for PN Commercial order.
6.	Status	Status column displays the drug status. Only drug with Ordered or Ordered/Hold status will be displayed in verification screen.

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No.	Name	Description
7.	Verify order	Click on Verify button to verify order and drug status will be updated 'Verified' and record will display in Preparation listing screen. System will also update the verified date and verified by values in database.
Order details (On click of 'Order Details hyperlink)		
8.	Order Details	Click on 'Order Details' column hyperlink to view Order Details screen. Screen will display the latest order details including any modification done by pharmacist during intervention.
Prescription (On click of 'Prescription' button)		
9.	Print Prescription	On click of the Prescription button, able to print the prescription.

3.2.8.2.2.3 *Input Validation Rules*

No.	Name	Description	Mandatory	Format
1.	Verification Stage	Verification stage remark is to be entered in the text box. Maximum of 250 characters capacity.	No	Text field

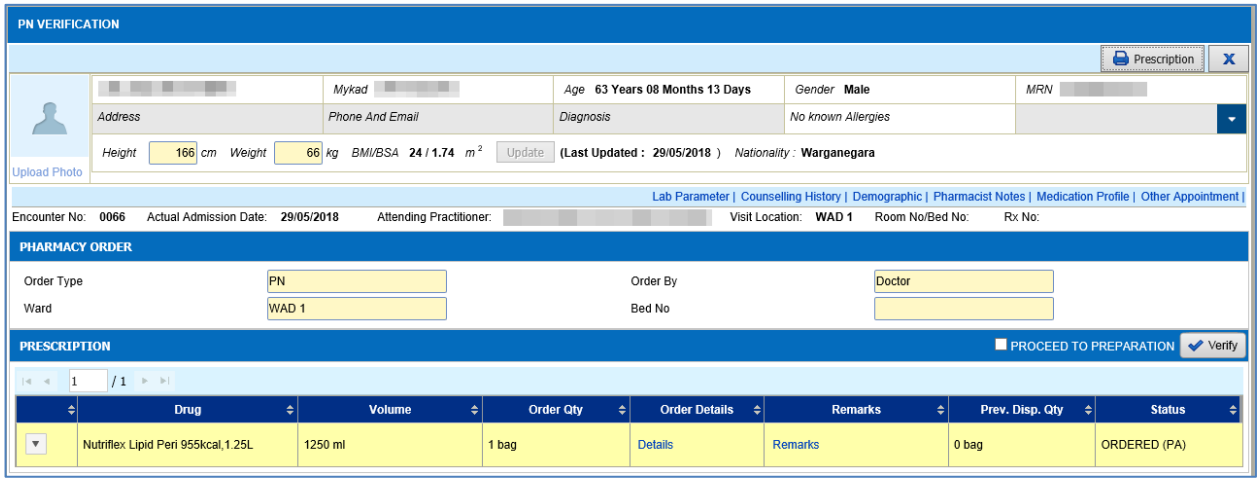
3.2.8.2.3 *PN Verification – Pending Authorization*

3.2.8.2.3.1 *Screen Design*

ID	PNVER.SD3
Description	PN Verification – Pending Authorization

Diagram

1. Pending Authorization Drug



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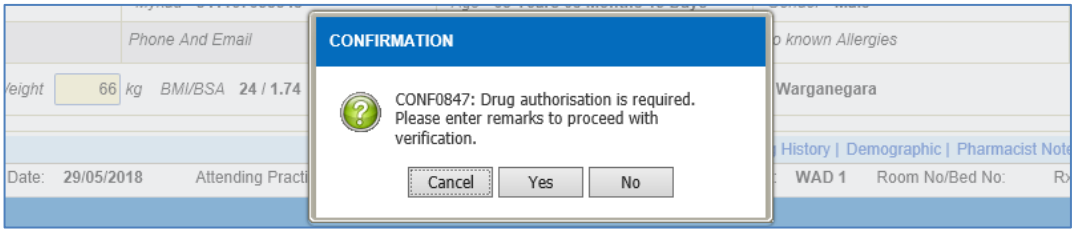
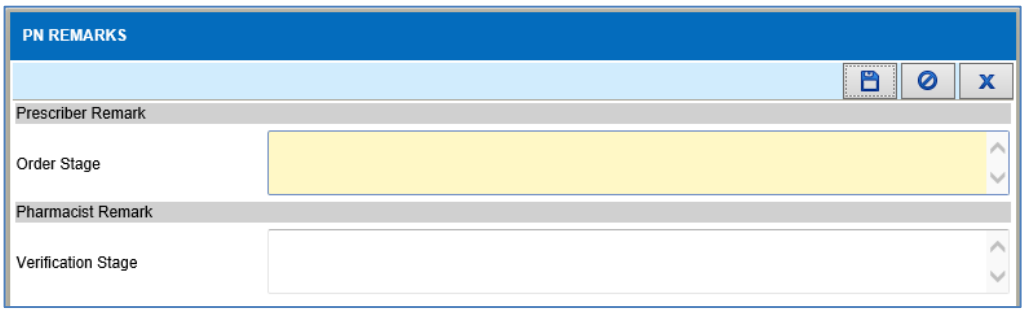
2. Authorisation alert after click Verify button



3. Verification Remarks



Notes	• Click on Verify button. Authorisation alert is displayed if any of the drugs in the prescription is pending authorization from specialist.
Cross References	None

3.2.8.2.3.2 ***Application Business Rules***

No.	Name	Description
1.	Pending Authorisation remarks	Once user clicks on Verify button, alert message will be displayed if any of the drugs in the prescription is pending authorization from specialist and verification remarks is mandatory to proceed to PN Preparation screen. Once user saves the verification remarks, system will append the remarks for all pending authorization drug. If verification remarks already entered before user clicks Verify button, alert message will not be displayed. This process is applicable only for full based facility.

3.2.8.2.3.3 ***Input Validation Rules***

None.

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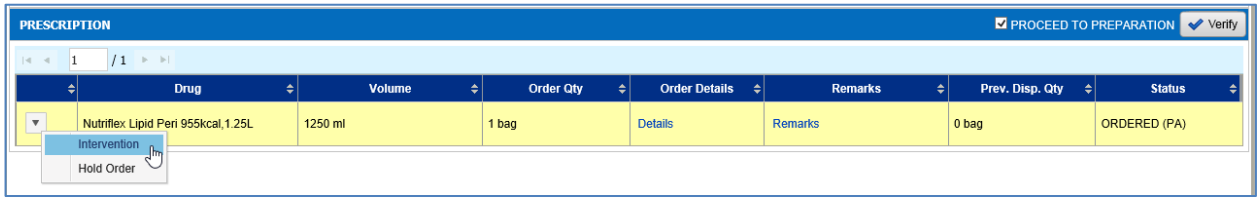
3.2.8.2.4 *PN Verification – Intervention*

3.2.8.2.4.1 ***Screen Design***

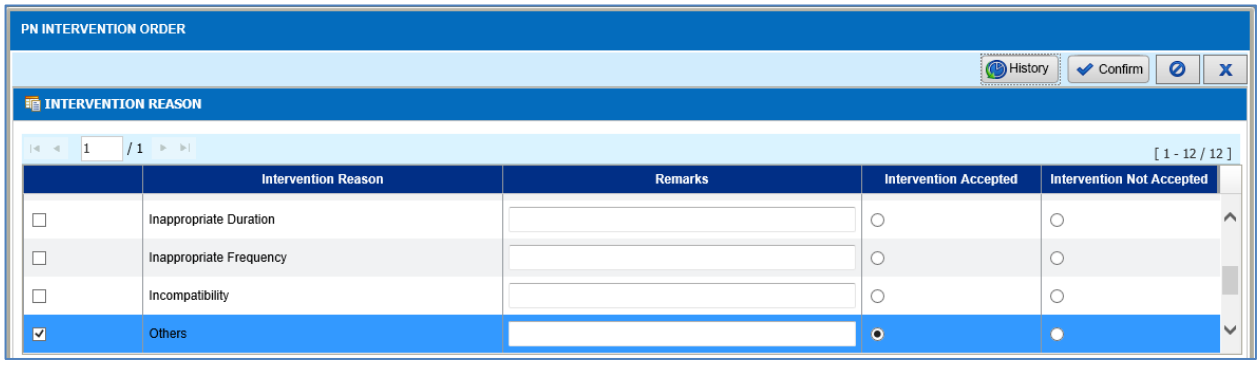
ID	PNVER.SD3
Description	PN Verification – Intervention screen

Diagram

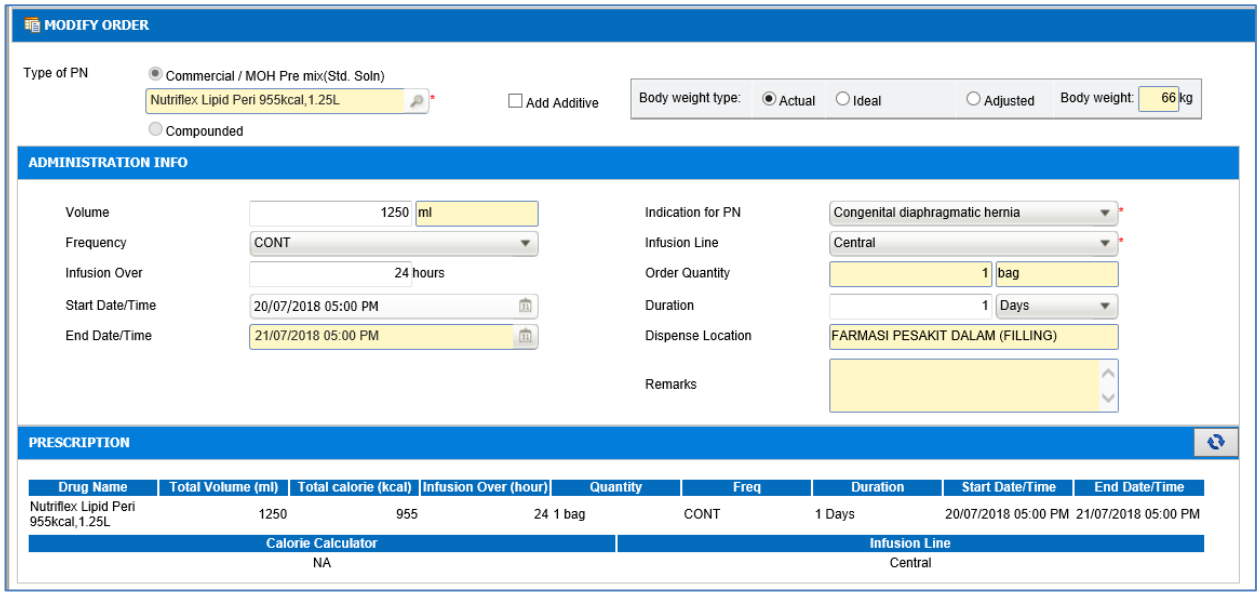
1. Intervention menu



2. Intervention screen: Intervention Reason



3. Intervention screen: PN Commercial



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4. Intervention screen: PN Commercial with Additive

MODIFY ORDER

Type of PN: Commercial / MOH Pre mix(Std. Soln) — Nutriflex Lipid Peri 955kcal,1.25L *; Compounded

Add Additive

Body weight type: Actual / Ideal / Adjusted — Body weight: 55 kg

ADMINISTRATION INFO

Ordered Volume	1000 ml	Indication for PN	Congenital diaphragmatic hernia *
Frequency	CONT	Infusion Line	Central *
Infusion Over	24 hours	Order Quantity	1 bag
Start Date/Time	19/07/2018 05:00 PM	Dispense Location	FARMASI PESAKIT DALAM (FILLING)
End Date/Time	20/07/2018 05:00 PM	Remarks	

PN COMPONENT

Electrolytes	Initial Content	Additional Requirement	Total Per Day
Sodium(Natrium),Na+	50 mmol	5 mmol	55 mmol
Potassium(Kalium),K+	30 mmol	5 mmol	35 mmol
Calcium,Ca2+	3 mmol	5 mmol	8 mmol
Magnesium,Mg+	3 mmol	mmol	3 mmol
Phosphate,(PO4)2-	7.5 mmol	mmol	7.5 mmol
Acetate(CH3COO)	40 mmol	mmol	40 mmol
Trace elements	0 ml	ml	0 ml
L-Glutamin	0 ml	ml	0 ml

Vitamin

Single Vitamin — Combine Vitamin

PRESCRIPTION

Drug Name	Total Volume (ml)	Total calorie (kcal)	Infusion Over (hour)	Quantity	Freq	Duration	Start date	End date
Nutriflex Lipid Peri 955kcal,1.25L With Additive	1000	764	24	1 bag	CONT	1 Days	19/07/2018 05:00 PM	20/07/2018 05:00 PM

Phosphate (mmol)	Sodium (mmol)	Potassium (mmol)	Calcium (mmol)	Magnesium (mmol)	Acetate (mmol)	Trace Element (ml)	Fat Soluble Vit. (ml)	Water Soluble Vit. (ml)	Combine Vitamin (ml)
N/A	55	35	8	N/A	N/A	N/A	N/A	N/A	N/A

L-Glutamin. (ml)	Calorie Calculator	Infusion Line
N/A	NA	Central

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5. Intervention screen: PN Compounded

MODIFY ORDER

Type of PN: Commercial / MOH Pre mix(Std. Soln) / Compounded

PN for: Adult | Paediatric Infant | Paediatric | Neonate

Body weight type: Actual | Ideal | Adjusted | Body weight: 55 kg

PN COMPONENT

	By weight		Per day	
Use Fluid Calculator	☑			
Total volume required	36.36	ml/kg	2000	ml
Total oral feeding	0	ml/kg		ml
TPN Volume	36.36	ml/kg	2000	ml
Energy required	40	kcal/kg	2200	kcal

Macronutrient			Recommended range(per kg)				Energy(per day)	
Carbohydrate	3	g/kg	3.00 - 5.00	g/kg	165	g	660	kcal
Lipid	1	g/kg	0.50 - 2.00	g/kg	55	g	495	kcal
Protein	1	g/kg	0.50 - 2.00	g/kg	55	g	220	kcal
L-Glutamin	0	ml/kg	1.50 - 2.50	ml/kg		ml	0	kcal
Carbohydrate:Lipid (kcal)	57 : 43	Nitrogen Content	9	g	NPC:NRatio	128 : 1	Total	1375 kcal

Electrolytes						
Sodium (Natrium),Na+		mmol/kg	1.00 - 2.00	mmol/kg	0	mmol
Potassium (Kalium),K+		mmol/kg	0.70 - 1.50	mmol/kg	0	mmol
Calcium,Ca2+		mmol/kg	0.10 - 0.15	mmol/kg	0	mmol
Magnesium,Mg+		mmol/kg	0.05 - 0.15	mmol/kg	0	mmol
Phosphate,(PO4)2-		mmol/kg	0.50 - 0.70	mmol/kg	0	mmol
Chloride,Cl+		mmol/kg	1.30 - 2.00	mmol/kg	0	mmol
Acetate(CH3COO)		mmol/kg	0.00 - 0.00	mmol/kg	0	mmol
Trace elements		ml/kg	0.00 - 10.00	ml		ml

Vitamin: ○ Single Vitamin ○ Combine Vitamin

ADMINISTRATION INFO

Volume	2000 ml	Indication for PN	Necrotizing enterocolitis (NEC) *
Frequency	OD	Infusion Line	Central *
Infusion Over	24 hours	Order Quantity	1 BAG
Start Date/Time	19/07/2018 05:00 PM	Dispense Location	FARMASI PESAKIT DALAM (FILLING)
End Date/Time	20/07/2018 05:00 PM	Remarks	

PRESCRIPTION

Drug Name	Total Volume ml per kg (ml)	Total calorie kcal per kg (kcal)	Infusion Over (hour)	Quantity	Freq	Duration	Start date	End date
PN Compounded Adult	36.36 (2000)	25 (1375)	24	1 BAG	OD	1 Days	19/07/2018 05:00 PM	20/07/2018 05:00 PM

Phosphate mmol per kg (mmol)	Sodium mmol per kg (mmol)	Potassium mmol per kg (mmol)	Calcium mmol per kg (mmol)	Magnesium mmol per kg (mmol)	Acetate mmol per kg (mmol)	Trace Element ml per kg (ml)	Fat Soluble Vit. ml per kg (ml)	Water Soluble Vit. ml per kg (ml)	Combine Vitamin ml per kg (ml)
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Protein g per kg (g)	Carbohydrate g per kg (g)	Carbohydrate %	Lipid g per kg (g)	L-Glutamin ml per kg (ml)	Calorie Calculator	Infusion Line
1 (55)	3 (165)	NA	1 (55)	NA	NA	Central

6. Intervention History screen

INTERVENTION REASON HISTORY LISTING

1 / 1 [1 - 1 / 1]

Date/Time	Intervention Reason	Remarks	Updated By
19/07/2018 05:00 PM	Others		System Administrator

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Notes	• Click on the Intervention menu to view Intervention and modify order screen. • Intervention screen is displayed according to PN Type. • Click on History button to display Intervention History screen.
Cross References	None

3.2.8.2.4.2 ***Application Business Rules***

No.	Name	Description
1.	Intervention screen	Intervention screen is displayed according to order prescription. Order modification is allowed but not mandatory for intervention. Order modification will send record to Endorsement screen. No need endorsement if pharmacist didn't modify any fields in the order details. Please refer #3.2.3 PN Medication Order section for details on each field.
2.	Save intervention record	Click on Save button to save intervention record. User is required to select intervention reason and accepted/not accepted by prescriber before saving the intervention record. Alert message will be displayed if no reason selected or accepted/not accepted not selected.
3.	Cancel intervention record	Click on Cancel button to reset the entered data back to original values before editing.
4.	View intervention history	Click on History button to view intervention history. Record is displayed after user saves the intervention record. The same record will also be displayed in patient's medication profile.

3.2.8.2.4.3 ***Input Validation Rules***

No.	Name	Description	Mandatory	Format
1.	Intervention Reason	Intervention reason values are populated from reason maintenance screen where reason type = M. User to select any reason to proceed save intervention.	Yes	Checkbox
2.	Remarks	Remark is to be entered in the textbox. Maximum of 300 characters capacity.	No	Text field
3.	Intervention Accepted or Not Accepted	For each selected intervention reason, to select either accepted or not accepted radio button. This field is for reporting/statistics purposes.	Yes	Radio button

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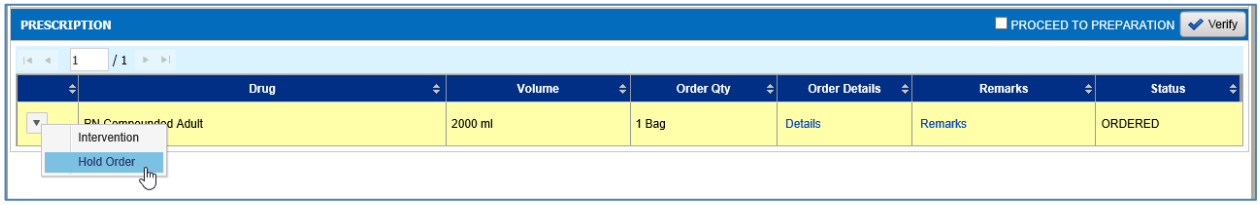
3.2.8.2.5 *PN Verification – Hold/Resume*

3.2.8.2.5.1 ***Screen Design***

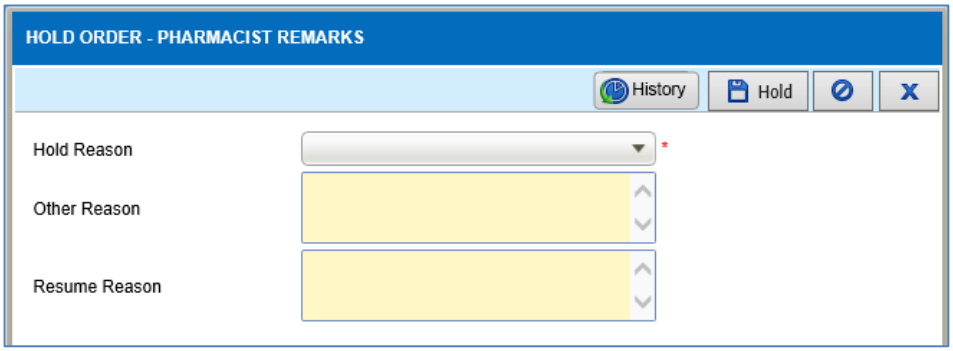
ID	PNVER.SD5
Description	PN Verification – Hold/Resume screen

Diagram

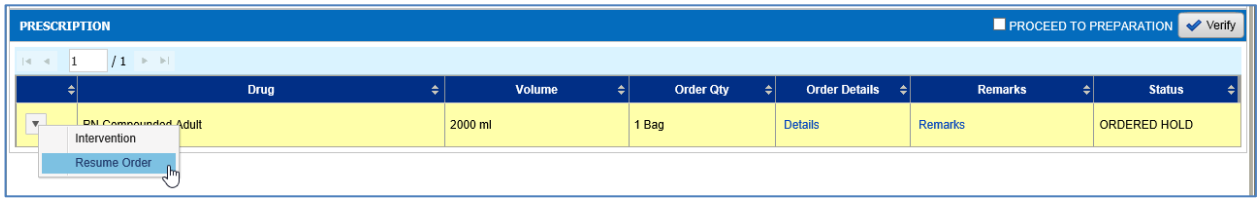
1. Hold order menu



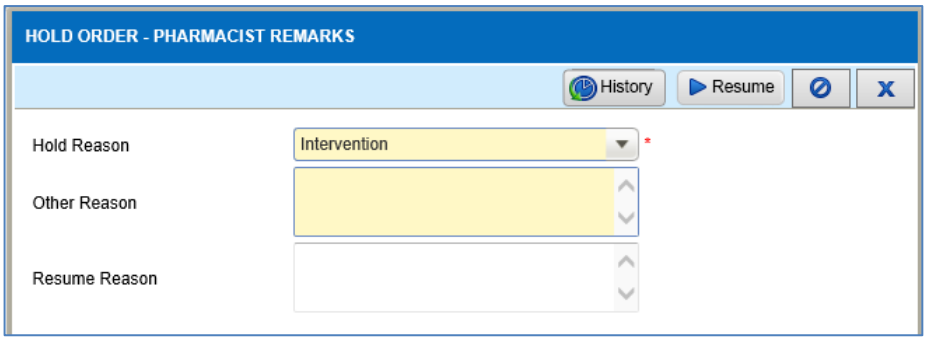
2. Hold order screen



3. Resume order menu



4. Resume order screen



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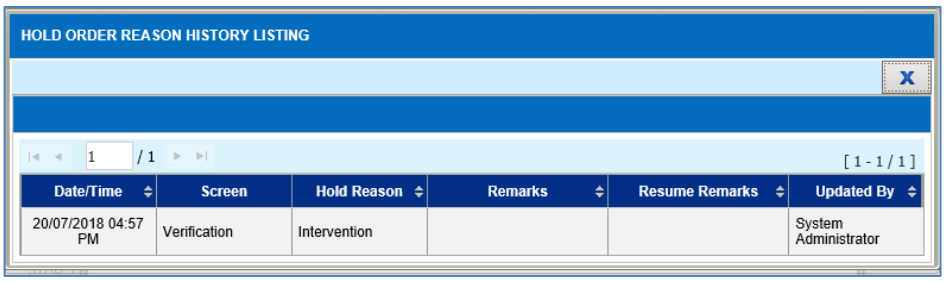
5. Hold/Resume history listing



Notes	• Click on Hold Order menu to view hold order options and screen. • Click on Resume Order menu to view resume order options and screen. • Click on History button to view Hold and Resume history.
Cross References	None

3.2.8.2.5.2 ***Application Business Rules***

No.	Name	Description
1.	Hold order	Click on Hold button to hold record. User is required to select hold reason before saving record. Alert message will be displayed if no reason selected. Hold function will update the drug status to [Current status]/Hold. Prescriber and pharmacist are not allowed to do any transaction once the drug is in Hold status.
2.	Resume order	Resume order is enabled only when the drug status is Hold. Click on Resume button to resume record. Hold reason and remarks is disabled in resume order screen. Resume order function will update the drug status back to the previous status before hold. Prescriber is not allowed to resume order hold by pharmacist and vice versa.
3.	View Hold/Resume order history	Click on History button to view hold/resume history. Record is displayed after user hold/resume record. The same record will also be displayed in patient's medication profile.

3.2.8.2.5.3 ***Input Validation Rules***

No.	Name	Description	Mandatory	Format
1.	Hold Reason	Hold reason is to be selected from the drop down list. Values are populated from reason maintenance screen where reason type = H. Field is disabled when user wants to resume the record.	Yes	Drop down list
2.	Hold Remarks	Hold remark is to be entered in the textbox. Maximum of 300 characters capacity. This field is optional to be entered. Field is disabled when user wants to resume the record.	No	Text field

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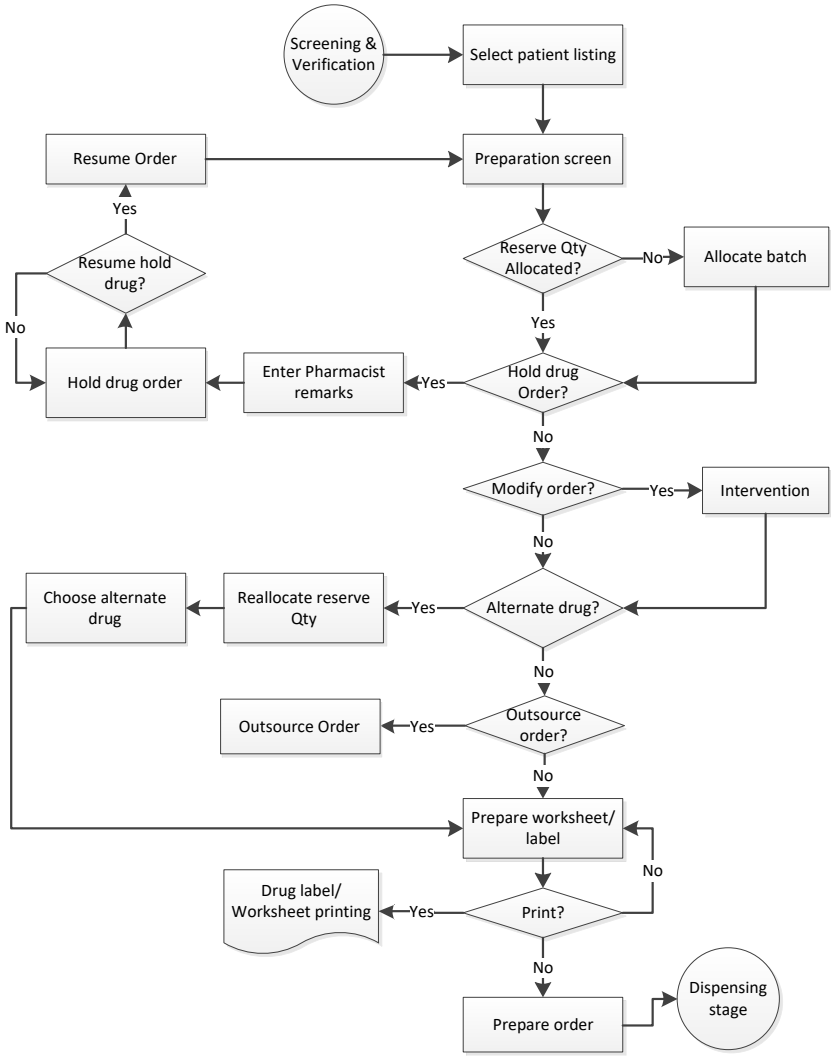
No.	Name	Description	Mandatory	Format
3.	Resume Remarks	Resume remark is to be entered in the textbox. Maximum of 300 characters capacity. This field is optional to be entered. Field is displayed only when user wants to resume the record.	No	Text field

3.2.9 PN Preparation

All verified PN orders from PN Verification screen will flow to PN Preparation screen. Pharmacist will generate worksheet, print label and prepare the order to proceed to PN Dispensing screen.

Pharmacist is allowed to intervene / modify order, hold order, allocate item batch quantity, or alternate drug (PN Commercial only) to prepare in PN Preparation screen.

3.2.9.1 Screen Navigation Diagram



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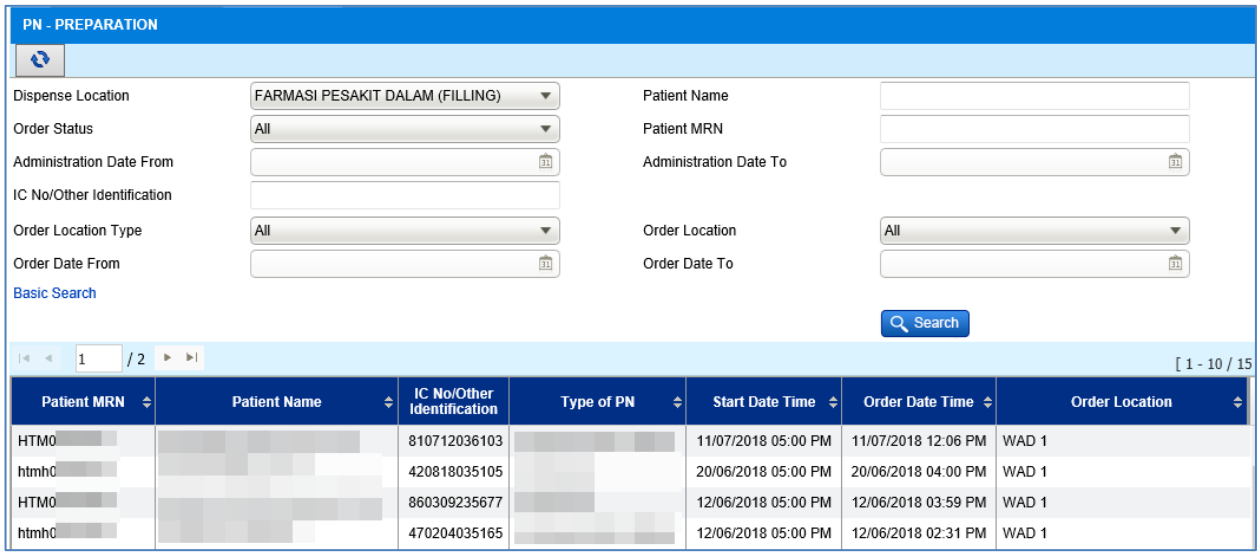
3.2.9.2 Detail Functionality and Screen

3.2.9.2.1 *PN Preparation Listing*

3.2.9.2.1.1 ***Screen Design***

ID	PNPRE.SD1
Description	PN Preparation Listing

Diagram



Notes	• Click on the search button to search verified order for pharmacist to proceed with drug preparation. • Double click which order to prepare and view the order details.
Cross References	None

3.2.9.2.1.2 ***Application Business Rules***

No.	Name	Description
1.	Search Order	PN Preparation listing screen is displayed based on all CDR verified orders and user's login location. This screen will allow user to search by the following criteria: i. Dispense Location – By default, dispense location is default to user's login location. The listed location values are based on the user's granted location as setup in User Profile screen and location specified as dispense location in Location Setup screen. ii. Order Status – Preparation listing shall be retrieved from the database based on matching order status. By default, value is default to 'All'. Values are from lookup table, domain 'CDR Order Status'. iii. Patient Name – Preparation listing shall be retrieved from the database based on matching Patient Name.

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No.	Name	Description
		iv. Patient MRN – Preparation listing shall be retrieved from the database based on matching Patient MRN. v. Administration Date range – Preparation listing shall be retrieved from database where administration/schedule date within the selected range. vi. IC No/Other Identification – Preparation listing shall be retrieved from the database based on matching Patient ID No. vii. Order Location Type – Preparation listing shall be retrieved from the database based on matching location type. By default, value is default to 'All'. Values are from lookup table, domain 'Loc Type'. viii. Order Location – Preparation listing shall be retrieved from the database based on matching location. By default, value is default to 'All'. Values are from location setup maintenance screen. ix. Order Date range – Preparation listing shall be retrieved from database where order date within the selected range. Specify search criteria and click on the Search button to search the orders.
2.	Refresh Order Listing	Click on the Refresh button to reset all searched records and searching criteria to default value.

3.2.9.2.1.3 ***Input Validation Rules***

None.

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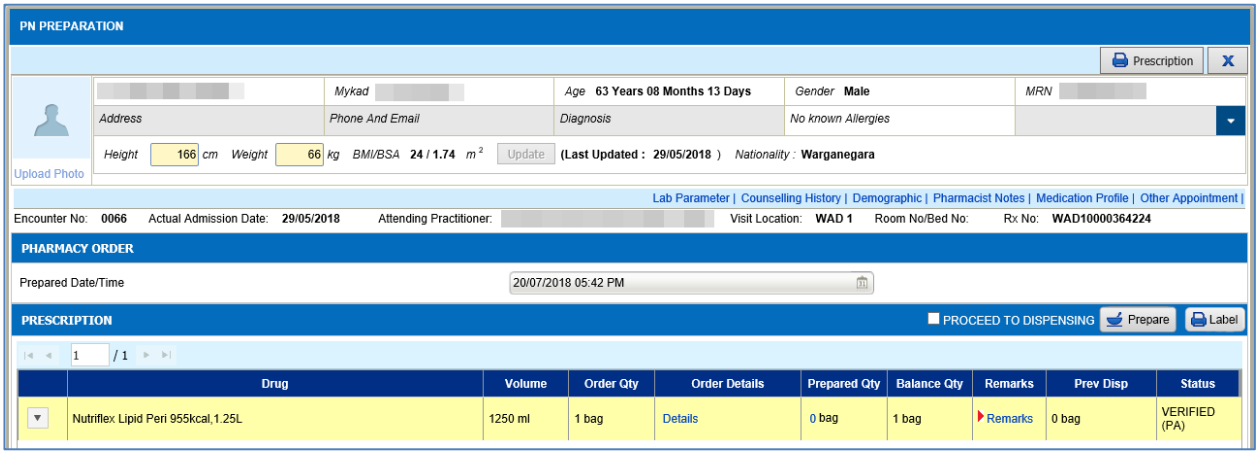
3.2.9.2.2 *PN Preparation*

3.2.9.2.2.1 ***Screen Design***

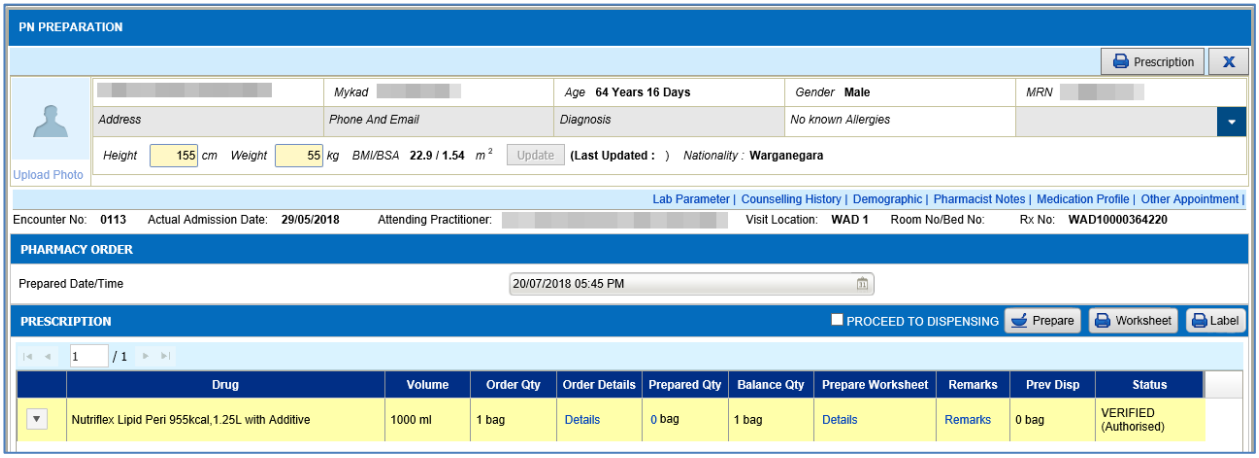
ID	PNPRE.SD2
Description	PN Preparation screen

Diagram

1. PN Preparation screen: PN Commercial



2. PN Preparation screen: PN Commercial with Additive



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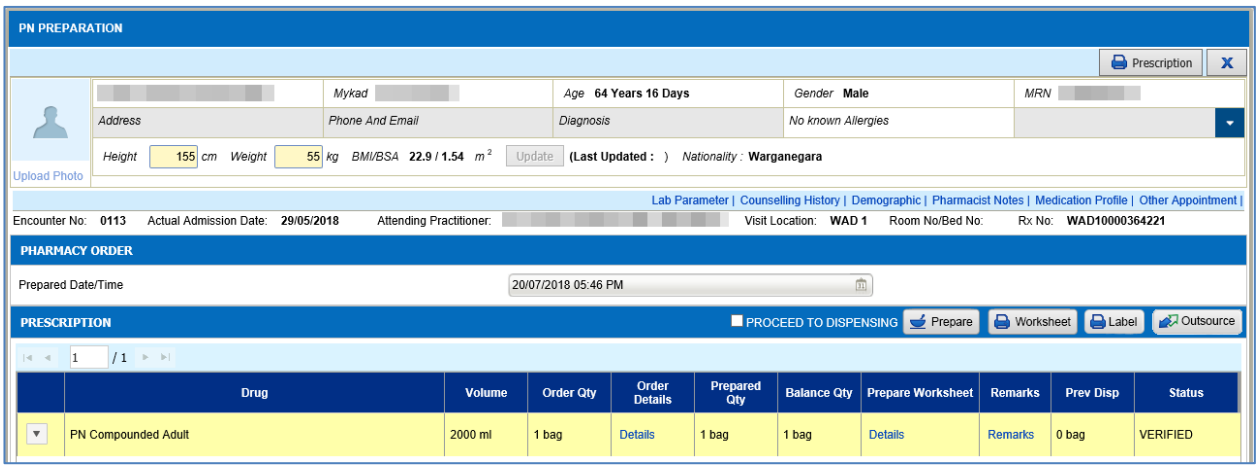
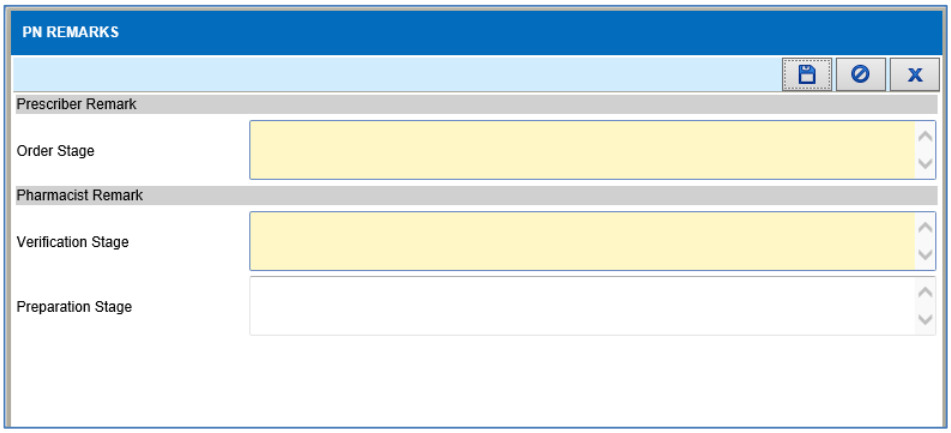
3. PN Preparation screen: PN Compounded



4. Pharmacist Remarks (On click of 'Remarks' hyperlink)



Notes	• Click on Prepare button to prepare order.
Cross References	None

3.2.9.2.2.2 ***Application Business Rules***

No.	Name	Description
1.	Prepare Qty	Prepare quantity column displays 0 values by default for both drug and diluent, user able to click on the hyperlink to allocate batch quantity. To refer 3.2.9.2.3 PN Preparation – Batch Allocation for drug allocation details.
2.	Balance Qty	Balance quantity column displays calculated values based on Total Order Qty – Previous Dispense Qty. Column will update after user dispense the drug and diluent partially.
3.	Prepare Worksheet	This column will display for PN Commercial with Additive and PN Compounded only. Click on 'Details' hyperlink to view and generate worksheet. Mandatory to prepare worksheet before can proceed to click on the Prepare button.
4.	Prev. Disp. Qty	Previous dispense quantity column displays the previous dispense qty updated after user dispense the drug partially.

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No.	Name	Description
5.	View prescriber and pharmacist remarks	Pharmacist remarks screen displays the remarks by both prescriber and pharmacist. Order stage remarks will display value if any drug remarks entered during order by prescriber. In preparation screen, only preparation stage remark field is enabled, other remarks are view-only.
6.	Status	Status column displays the drug status. Only drug with Verified or Verified/Hold status will be displayed in verification screen.
7.	Order intervention and view Original Rx details	Please refer 3.2.8.2.4 PN Verification – Intervention section for the details.
8.	Hold/Resume Order	Please refer 3.2.8.2.5 PN Verification – Hold/Resume.
9.	Outsource Order	Applicable only for PN Compounded order. User to select which drug to outsource for other facility to prepare the drug.
10.	Prepare order	Click on Prepare button to proceed to Dispensing and drug status will be updated 'Prepared' and record will display in Dispensing listing screen. System will also update the prepared date and prepared by values in database.

3.2.9.2.2.3 ***Input Validation Rules***

No.	Name	Description	Mandatory	Format
1.	Preparation Stage	Preparation stage remark is to be entered in the text box. Maximum of 250 characters capacity.	No	Text field

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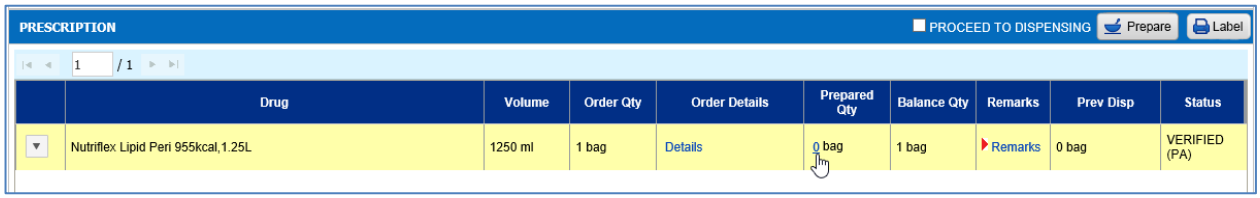
3.2.9.2.3 *PN Preparation – Batch Allocation*

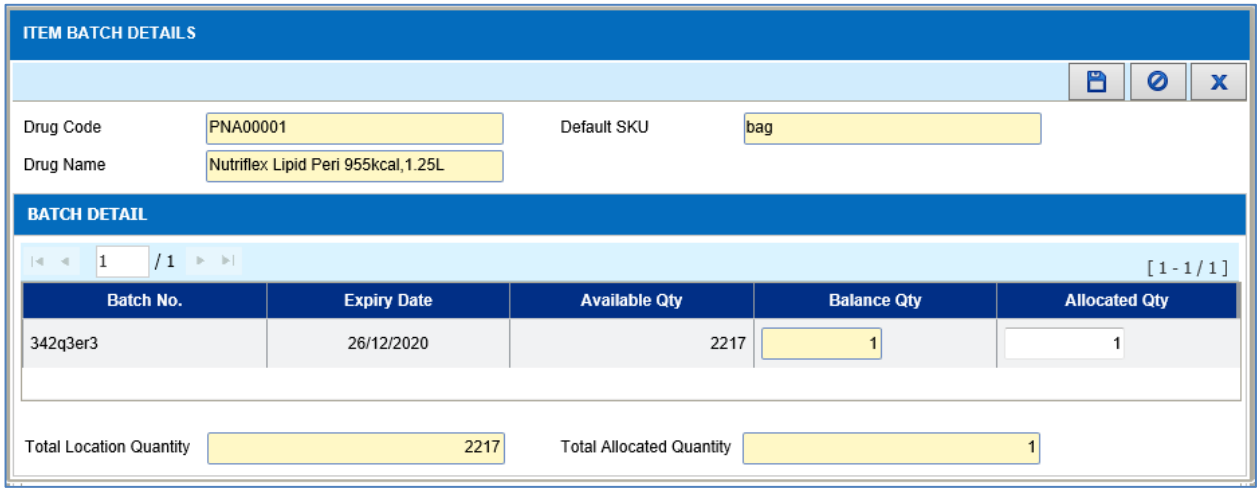
3.2.9.2.3.1 ***Screen Design***

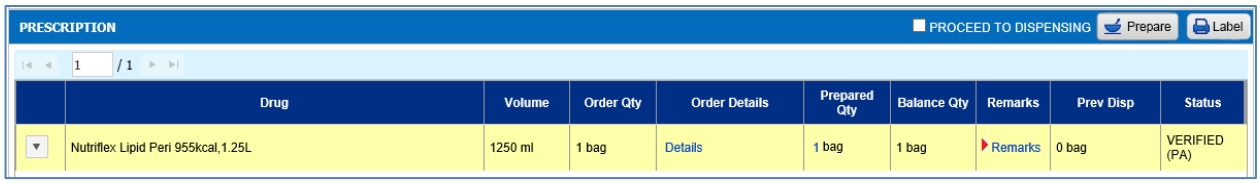
ID	PNPRE.SD3
Description	PN Preparation – Batch Allocation

Diagram

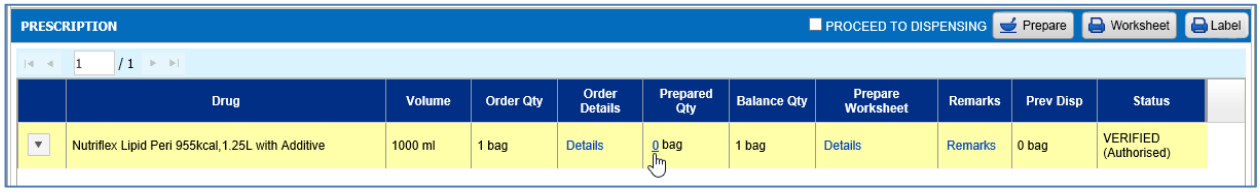
1. PN Commercial







2. PN Commercial with Additive



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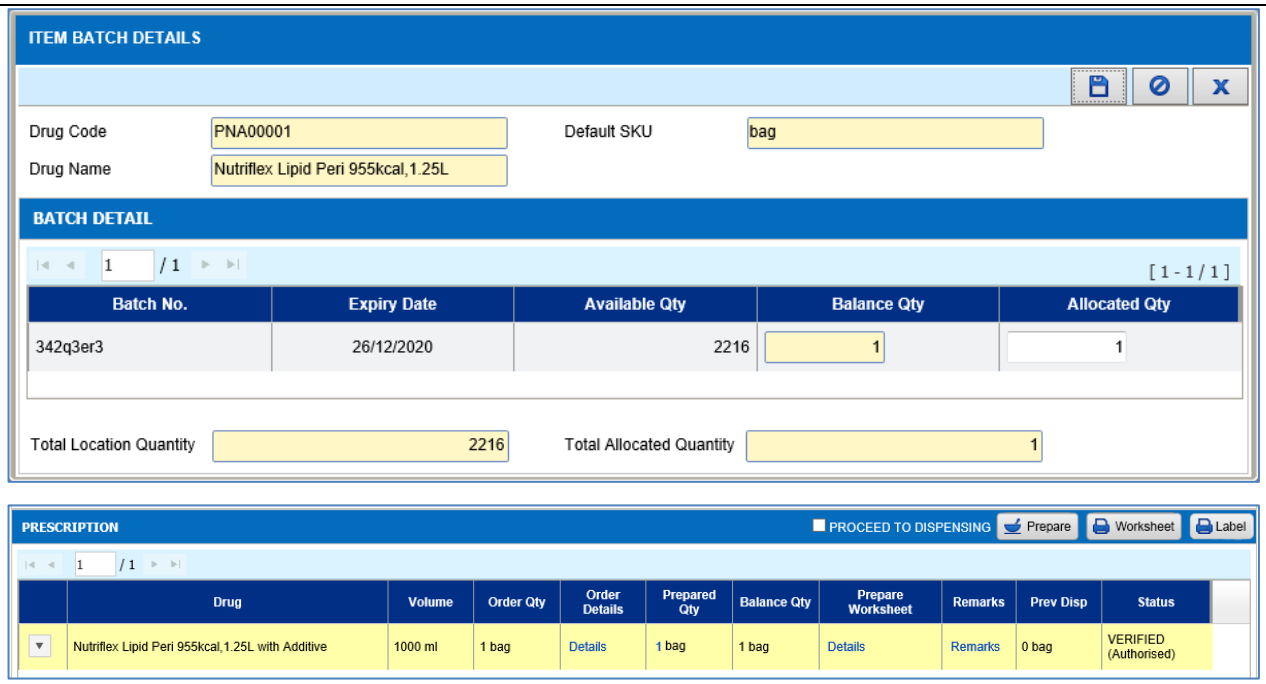

Notes	• Click on Prepare Qty hyperlink to view Item Batch Details screen and allocate batch quantity to prepare drug.
Cross References	None

3.2.9.2.3.2 ***Application Business Rules***

No.	Name	Description
1.	Item Batch Details screen	Drug batch allocation is applicable only for PN Commercial and PN Commercial with Additive order. For PN Compounded, batch allocation is done in Prepare Worksheet screen. Item batch details screen will allow user to allocate PN bag quantity to dispense.
2.	Total Location Quantity	Total location quantity field displays the total available quantity in user's unit location for all batches.
3.	Total Allocated Quantity	Total location quantity field displays the total allocated quantity for all selected batches.
4.	Save Allocation Details	Click on Save button to save the allocation record. System will display the allocated quantity on the prescription. User is still allowed to change the allocation by clicking on Prepare Qty hyperlink again.

3.2.9.2.3.3 ***Input Validation Rules***

No.	Name	Description	Mandatory	Format
1.	Allocated Qty	Allocated Qty is to be entered in the textbox. Maximum of 8 integer capacity. Default value is displayed based on the Order Quantity.	No	Text field

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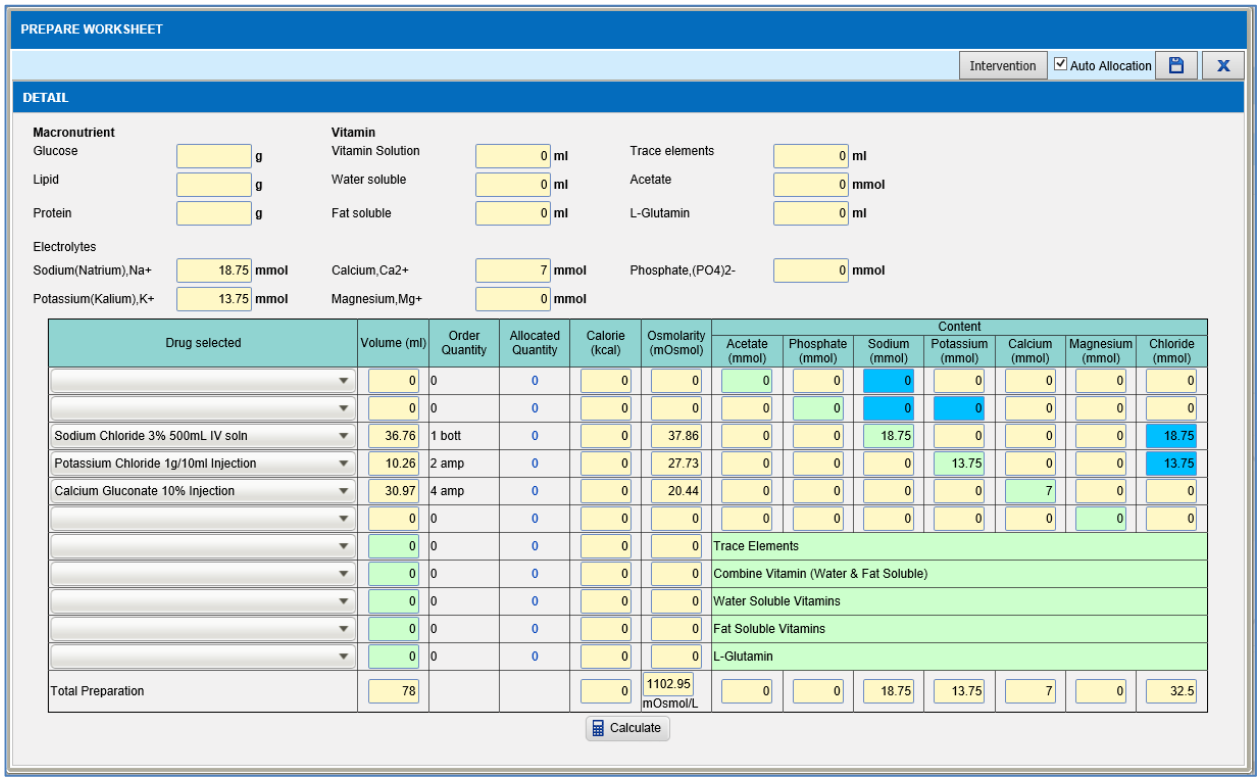
3.2.9.2.4 *PN Preparation – Prepare Worksheet*

3.2.9.2.4.1 ***Screen Design***

ID	PNPRE.SD4
Description	PN Preparation – Prepare Worksheet

Diagram

1. Commercial Additive



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2. Compounded (3 in 1)

PREPARE WORKSHEET

Intervention | Auto Allocation

DETAIL

TPN volume	2000 ml	Energy required	880 kcal	**Product category**	3 in 1 / 2 in 1
Macronutrient		**Vitamin**			
Glucose	165 g	Vitamin Solution	ml	Trace elements	ml
Lipid	0 g	Water soluble	5 ml	Acetate	0 mmol
Protein	55 g	Fat soluble	ml	L-Glutamin	ml
Electrolytes					
Sodium(Natrium),Na+	0 mmol	Calcium,Ca2+	0 mmol	Phosphate,(PO4)2-	0 mmol
Potassium(Kalium),K+	0 mmol	Magnesium,Mg+	0 mmol		

Drug selected	Volume (ml)	Order Quantity	Allocated Quantity	Calorie (kcal)	Osmolarity (mOsmol)	Content: Lipid (g)	Glucose (g)	Protein (g)	Acetate (mmol)	Phosphate (mmol)	Sodium (mmol)	Potassium (mmol)	Calcium (mmol)	Magnesium (mmol)	Chloride (mmol)
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dextrose 50% IV soln 500ml	330	1 bott	0	660	917.4	0	165	0	0	0	0	0	0	0	0
Amino acid 6.53% (Vaminolact) 100ml IV Soln	842.27	9 bott	0	220	412.71	0	0	55	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	Trace Elements									
	0	0	0	0	0	Combine Vitamin (Water & Fat Soluble)									
Vitamin B and C (P-Trovite) 10mL Inj	5	1 pair	0	0	0	Water Soluble Vitamins									
	0	0	0	0	0	Fat Soluble Vitamins									
	0	0	0	0	0	L-Glutamin									
Sterile Water for Injection 500mL	822.73	2 bott	0	0	0	Water For Injection									
Total Preparation	2000			880	665.05 mOsmol/l	0	165	55	0	0	0	0	0	0	0

Calculate

	NPC:N Ratio	73 : 1	
TOTAL content of Calcium and Phosphate	Calcium + Phosphate=	0	mmol/100ml
TOTAL content of Magnesium and Calcium	Calcium + Magnesium=	0	mmol/100ml

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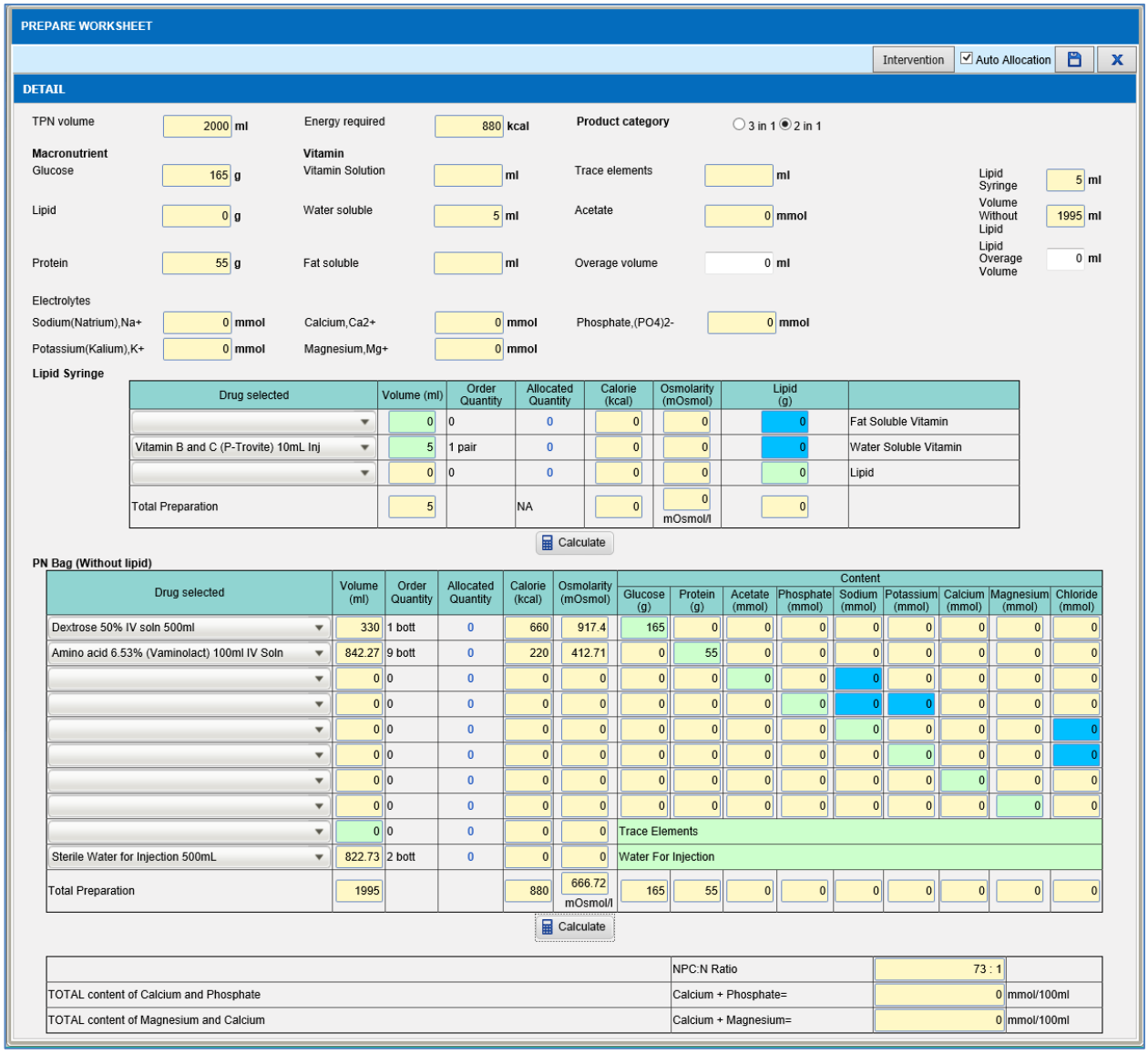
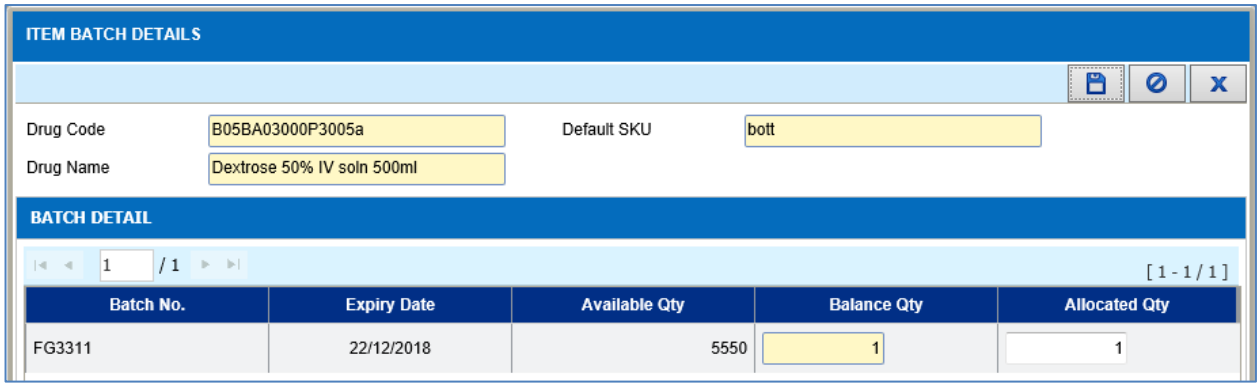
3. Compounded (2 in 1)



4. Manual batch allocation screen



Notes	• Click on Prepare Worksheet 'Details' hyperlink to generate the worksheet.

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	• Click on each component Allocated Qty column hyperlink to allocate batch manually.
Cross References	None

3.2.9.2.4.2 ***Application Business Rules***

No.	Name	Description
1.	Prepare Worksheet	Prepare Worksheet column is displayed only for PN Commercial with Additive and PN Compounded order. On click of 'Details' hyperlink system will display the Prepare Worksheet screen.
2.	Calculate button	Before can click on the 'Calculate' button, mandatory to select the drug for each ordered PN component. On click on 'Calculate' button system will auto calculate the Volume (ml), Order Quantity, Allocated Quantity, Calorie, Osmolarity and Content section.
3.	Save Worksheet	Click on the save button to proceed with batch allocation for each component and save the worksheet details. All fields will display as read-only.
4.	Intervention button	After worksheet is saved, user is still allowed to do intervention. Once user click on the 'Intervention' button and proceed with to modify the order, system will reset all previous batch allocation details and display the Intervention screen. Once successfully intervene the order, user able to recalculate and reallocate the batch in the worksheet.

3.2.9.2.4.3 ***Input Validation Rules***

No.	Name	Description	Mandatory	Format
Order Details				
1.	TPN Volume	This field value is auto display from order.	No	Read-only
2.	Energy Required	This field value is auto display from order.	No	Read-only
3.	Product Category	For PN Compounded for Adult, default to 3 in 1 but editable. For PN Compounded for Paediatric, Paediatric-Infant and Neonate, default to 2 in 1.	No	Read-only
4.	Glucose	Default to 0.	No	Read-only
5.	Lipid	Default to 0.	No	Read-only
6.	Protein	Default to 0.	No	Read-only
7.	Vitamin Solution	This field value is auto display from order.	No	Read-only
8.	Water Soluble	This field value is auto display from order.	No	Read-only
9.	Fat Soluble	This field value is auto display from order.	No	Read-only
10.	Trace Elements	This field value is auto display from order.	No	Read-only
11.	Acetate	This field value is auto display from order.	No	Read-only
12.	L-Glutamin	This field value is auto display from order.	No	Read-only

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No.	Name	Description	Mandatory	Format
13.	Sodium	This field value is auto display from order.	No	Read-only
14.	Potassium	This field value is auto display from order.	No	Read-only
15.	Calcium	This field value is auto display from order.	No	Read-only
16.	Magnesium	This field value is auto display from order.	No	Read-only
17.	Phosphate	This field value is auto display from order.	No	Read-only
Calculator Details				
18.	Acetate: Content	This field value is auto display from order section.	No	Read-only
19.	Acetate: Drug selected	This field will show all data in a combo box based on the drug generic = Acetate (in PN Source Content), active in dispense location unit catalogue and active in facility. Default to default Acetate drug in PN source content maintenance screen.	No	Drop down list
20.	Acetate: Volume	This field is auto display based on calculation. Acetate volume = Acetate content * volume (drug selected) / Acetate content (drug selected)	No	Read-only
21.	Acetate: Order Quantity	This field is auto display based on calculation. Acetate order quantity = Acetate volume / conversion factor Acetate order quantity UOM = SKU UOM (Drug selected)	No	Read-only
22.	Acetate: Calorie	Default to 0.	No	Read-only
23.	Acetate: Osmolarity	This field is auto display based on calculation. Acetate osmolarity (mOsmol) = Acetate volume * osmolarity (Drug selected) / 1000	No	Read-only
24.	Acetate (sodium) content	This field is auto display based on calculation. Acetate(sodium) content = Acetate volume * sodium content (Drug selected) / volume (Drug selected)	No	Read-only
25.	Phosphate: Content	This field auto display from order section.	No	Read-only
26.	Phosphate: Drug selected	This field will show all data in a combo box based on the drug generic = Phosphate (in PN Source Content), active in dispense location unit catalogue and active in facility. Default to default Phosphate drug in PN source content maintenance screen.	No	Drop down list
27.	Phosphate: Volume	This field is auto display based on calculation. Phosphate volume = Phosphate content * volume (Drug selected) / Phosphate content (Drug selected).	No	Read-only
28.	Phosphate: Order quantity	This field is auto display based on calculation. Phosphate order quantity = Phosphate volume / conversion factor.	No	Read-only

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No.	Name	Description	Mandatory	Format
		Phosphate order quantity UOM = SKU UOM (Drug selected).		
29.	Phosphate: Calorie	Default to 0.	No	Read-only
30.	Phosphate: Osmolarity	This field is auto display based on calculation. Phosphate osmolarity (mOsmol) = Phosphate volume * osmolarity (Drug selected) / 1000.	No	Read-only
31.	Phosphate (sodium) content	This field is auto display based on calculation. Phosphate (sodium) content = Phosphate volume * sodium content (Drug selected) / volume (Drug selected)	No	Read-only
32.	Phosphate (potassium) content	This field is auto display based on calculation. Phosphate(potassium) = Phosphate volume * potassium content (Drug selected) / volume (Drug selected)	No	Read-only
33.	Sodium: Content	This field auto display based on calculation. Sodium content = [Sodium – (Acetate(sodium) content +Phosphate(sodium) content]	No	Read-only
34.	Sodium: Drug selected	This field will show all data in a combo box based on the drug generic = Sodium (in PN Source Content), active in dispense location unit catalogue and active in facility. Default to default Sodium drug in PN source content maintenance screen.	No	Drop down list
35.	Sodium: Volume	This field is auto display based on calculation. Sodium volume = Sodium content * volume (drug selected) / Sodium content (drug item selected)	No	Read-only
36.	Sodium: Order quantity	This field is auto display based on calculation. Sodium order quantity = Sodium volume / conversion factor Sodium order quantity UOM = SKU UOM (Drug selected)	No	Read-only
37.	Sodium: Calorie	Default to 0	No	Read-only
38.	Sodium: Osmolarity	This field is auto display based on calculation. Glucose osmolarity (mOsmol) = Glucose volume * osmolarity (Drug selected) / 1000	No	Read-only
39.	Sodium (chloride) content	This field is auto display based on calculation. Sodium(chloride) content = Sodium volume * chloride content (Drug selected) / volume (Drug selected)	No	Read-only
40.	Potassium: Content	This field is auto display based on calculation. Potassium content= Potassium - Phosphate (potassium) content	No	Read-only
41.	Potassium:	This field will show all data in a combo box based on	No	Drop down

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No.	Name	Description	Mandatory	Format
	Drug selected	the drug generic = Potassium (in PN Source Content), active in dispense location unit catalogue and active in facility. Default to default Potassium drug in PN source content maintenance screen.		list
42.	Potassium: Volume	This field is auto display based on calculation. Potassium volume = Potassium content * volume (drug item selected) / Potassium content (drug selected).	No	Read-only
43.	Potassium: Order Quantity	This field is auto display based on calculation. Potassium order quantity = Potassium volume / conversion factor Potassium order quantity UOM = SKU UOM (Drug selected)	No	Read-only
44.	Potassium: Calorie	Default to 0.	No	Read-only
45.	Potassium: Osmolarity	This field is auto display based on calculation. Potassium osmolarity (mOsmol) = Potassium volume * osmolarity (Drug selected) / 1000	No	Read-only
46.	Potassium (chloride) content	This field is auto display based on calculation. Potassium (chloride) content = Potassium volume * chloride content (Drug selected) / volume (Drug selected)	No	Read-only
47.	Calcium: Content	This field auto display from order section.	No	Read-only
48.	Calcium: Drug selected	This field will show all data in a combo box based on the drug generic = Calcium (in PN Source Content), active in dispense location unit catalogue and active in facility. Default to default Calcium drug in PN source content maintenance screen.	No	Drop down list
49.	Calcium: Volume	This field is auto display based on calculation. Calcium volume = Calcium content * volume (drug selected) / Calcium content (drug selected)	No	Read-only
50.	Calcium: Order quantity	This field is auto display based on calculation. Calcium order quantity = Calcium volume / conversion factor Calcium order quantity UOM = SKU UOM (Drug selected)	No	Read-only
51.	Calcium: Calorie	Default to 0.	No	Read-only
52.	Calcium: Osmolarity	This field is auto display based on calculation. Calcium osmolarity(mOsmol) = Calcium volume * osmolarity (item selected) / 1000	No	Read-only
53.	Magnesium: Content	This field auto display from order section.	No	Read-only
54.	Magnesium:	This field will show all data in a combo box based on	No	Drop down

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No.	Name	Description	Mandatory	Format
	Drug selected	the drug generic = Magnesium (in PN Source Content), active in dispense location unit catalogue and active in facility. Default to default Magnesium drug in PN source content maintenance screen.		list
55.	Magnesium: Volume	This field is auto display based on calculation. Magnesium volume = Magnesium content * volume (drug selected) / Magnesium content (drug selected)	No	Read-only
56.	Magnesium: Order quantity	This field is auto display based on calculation. Magnesium order quantity = Magnesium volume / conversion factor. Magnesium order quantity UOM = SKU UOM(Item selected).	No	Read-only
57.	Magnesium: Calorie	Default to 0.	No	Read-only
58.	Magnesium: Osmolarity	This field is auto display based on calculation. Magnesium osmolarity(mOsmol) = Magnesium volume * osmolarity (item selected) / 1000.	No	Read-only
59.	Trace elements: Volume	This field auto display from order section.	No	Read-only
60.	Trace elements: Drug selected	This field will show all data in a combo box based on the drug generic = Trace Element (in PN Source Content), active in dispense location unit catalogue and active in facility. Default to default Trace Element drug in PN source content maintenance screen.	No	Drop down list
61.	Trace elements: Order quantity	This field is auto display based on calculation. Trace elements order quantity = Trace elements volume / conversion factor Trace elements order quantity UOM = SKU UOM (Drug selected)	No	Read-only
62.	Trace elements: Osmolarity	This field is auto display based on calculation. Trace elements osmolarity(mOsmol) = Trace elements volume * osmolarity (item selected) / 1000	No	Read-only
63.	Combine Vitamin: Volume	This field auto display from order section.	No	Read-only
64.	Combine Vitamin: Drug selected	This field will show all data in a combo box based on the drug generic = Vitamin Solution (in PN Source Content), active in dispense location unit catalogue and active in facility. Default to default Vitamin Solution drug in PN source content maintenance screen.	No	Drop down list
65.	Combine	This field is auto display based on calculation.	No	Read-only

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No.	Name	Description	Mandatory	Format
	Vitamin: Order quantity	Vitamin solutions order quantity = Vitamin solutions volume / conversion factor Vitamin solutions order quantity UOM = SKU UOM (Item selected)		
66.	Combine Vitamin: Osmolarity	This field is auto display based on calculation. Vitamin solutions osmolarity (mOsmol) = Vitamin solutions volume * osmolarity (item selected) / 1000	No	Read-only
67.	Water soluble: Volume	This field auto display from order section.	No	Read-only
68.	Water soluble: Drug selected	This field will show all data in a combo box based on the drug generic = Water Soluble (in PN Source Content), active in dispense location unit catalogue and active in facility. Default to default Water Soluble drug in PN source content maintenance screen.	No	Drop down list
69.	Water soluble: Order quantity	This field is auto display based on calculation. Water soluble vitamin order quantity = Water soluble vitamin volume / conversion factor Water soluble vitamin order quantity UOM = SKU UOM (Drug selected)	No	Read-only
70.	Water soluble: Osmolarity	This field is auto display based on calculation. Water soluble vit osmolarity(mOsmol) = Water soluble vit volume * osmolarity (item selected) / 1000	No	Read-only
71.	Fat soluble: Volume	This field auto display from order section.	No	Read-only
72.	Fat soluble: Drug selected	This field will show all data in a combo box based on the drug generic = Fat Soluble (in PN Source Content), active in dispense location unit catalogue and active in facility. Default to default Fat Soluble drug in PN source content maintenance screen.	No	Drop down list
73.	Fat soluble: Order quantity	This field is auto display based on calculation. Fat soluble vit. volume order quantity = Fat soluble vit. volume / conversion factor Fat soluble vit. volume order quantity UOM = SKU UOM (Drug selected)	No	Read-only
74.	Fat soluble: Osmolarity	This field is auto display based on calculation. Fat soluble vit. volume osmolarity (mOsmol) = Fat soluble vit. volume * osmolarity (drug selected) / 1000	No	Read-only
75.	L-Glutamin: Volume	This field auto display from order section.	No	Read-only
76.	L-Glutamin:	This field will show all data in a combo box based on the drug generic = L-Glutamin (in PN Source Content),	No	Drop down

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No.	Name	Description	Mandatory	Format
	Drug selected	active in dispense location unit catalogue and active in facility. Default to default L-Glutamin drug in PN source content maintenance screen.		list
77.	L-Glutamin: Order quantity	This field is auto display based on calculation. L-Glutamin order quantity = L-Glutamin volume / conversion factor L-Glutamin order quantity UOM = SKU UOM (Drug selected)	No	Read-only
78.	L-Glutamin: Calorie	This field is auto display based on calculation. L-Glutamin calorie = (L-Glutamin volume * 20 / 100) * 4	No	Read-only
79.	L-Glutamin: Osmolarity	This field is auto display based on calculation. L-Glutamin osmolarity(mOsmol) = L-Glutamin volume * osmolarity (item selected) / 1000	No	Read-only
80.	Water for injection: Volume	This field is auto display based on calculation. Water for injection volume = Total order volume – (lipid volume+ glucose volume+ protein volume + acetate volume +phosphate volume +sodium volume +potassium volume +calcium volume +magnesium volume+ trace element volume+ vitamin solution volume + water soluble vit. volume+ fat soluble vit volume + L-Glutamin volume)	No	Read-only
81.	Water for injection: Drug selected	This field will show all data in a combo box based on the drug generic = Water for Injection (in PN Source Content), active in dispense location unit catalogue and active in facility. Default to default Water for Injection drug in PN source content maintenance screen.	No	Drop down list
82.	Water for injection: Order quantity	This field is auto display based on calculation. Water for injection order quantity = Water for injection volume / conversion factor Water for injection order quantity UOM = SKU UOM (Drug selected)	No	Read-only
83.	Water for injection: Osmolarity	This field is auto display based on calculation. Water for injection osmolarity (mOsmol) = Water for injection volume * osmolarity (item selected) / 1000	No	Read-only
84.	Total preparation Volume	This field is auto display based on calculation. Total preparation volume = sum of item selected volume	No	Read-only
85.	Total calorie(kcal)	This field is auto display based on calculation. Total calorie(kcal) = lipid calorie + glucose calorie + protein calorie + glutamine calorie	No	Read-only
86.	Total osmolarity	This field is auto display based on calculation. Total osmolarity = [(lipid osmolarity+ glucose osmolarity + protein osmolarity + acetate osmolarity +phosphate osmolarity +sodium osmolarity +potassium osmolarity +calcium osmolarity	No	Read-only

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No.	Name	Description	Mandatory	Format
		+magnesium osmolarity + trace element osmolarity + vitamin solution osmolarity + water soluble vit. osmolarity + fat soluble vit osmolarity + L-Glutamin osmolarity + water for injection osmolarity) * 1000 / Total preparation volume]		
87.	Total lipid content	This field is auto display based on calculation. Total lipid content = lipid content	No	Read-only
88.	Total glucose content	This field is auto display based on calculation. Total glucose content = glucose content	No	Read-only
89.	Total protein content	This field is auto display based on calculation. Total protein content = protein content	No	Read-only
90.	Total acetate content	This field is auto display based on calculation. Total acetate content = acetate content	No	Read-only
91.	Total phosphate content	This field is auto display based on calculation. Total phosphate content = phosphate content	No	Read-only
92.	Total sodium content	This field is auto display based on calculation. Total sodium content = sodium content + acetate(sodium) content +phosphate(sodium) content	No	Read-only
93.	Total potassium content	This field is auto display based on calculation. Total potassium content = potassium content+ phosphate(potassium) content	No	Read-only
94.	Total calcium content	This field is auto display based on calculation. Total potassium content = calcium content	No	Read-only
95.	Total magnesium content	This field is auto display based on calculation. Total potassium content = magnesium content	No	Read-only
96.	Total chloride content	This field is auto display based on calculation. Total potassium content = sodium(chloride) content + potassium(chloride) content	No	Read-only
97.	NPC:N Ratio	This field is auto display based on calculation. Same calculation as in order screen, but value should refer to Calorie (kCal) value. Same as in order screen, except this value will take the latest value after intervention. Nitrogen Content = [Round up to next integer, display in integer, no decimal][ph_pn_order_regimen .protein_weight_perkg * ph_pn_order_regimen.body_weight / 6.25] + [ph_pn_order_regimen. glutamin_weight_perkg * ph_pn_order_regimen.body_weight / 6.25] If neonate : [ph_pn_order_regimen . protein_weight_perkg *A / 6.25] + [ph_pn_order_regimen	No	Read-only

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No.	Name	Description	Mandatory	Format
		.glutamin_weight_perkg * A / 6.25] A = ph_pn_order_regimen.current_weight or ph_pn_order_regimen. birth_weight , the highest one NPC = ph_pn_order_regimen. carbohydrate_energy + ph_pn_order_regimen. lipid_energy + ph_pn_order_regimen. glutamin_energy N : Nitrogent Content NPC: NRatio = NPC : 1		
98.	Total content of Calcium and Phosphate	Calcium + Phosphate (mmol/100ml) = [(Calcium (mmol) + Phosphate(mmol))/Total Preparation Volume (ml)] * 100 ml	No	Read-only
99.	Total content of Magnesium and Calcium	Calcium + Magnesium (mmol/100ml) [(Calcium (mmol) + Magnesium(mmol))/Total Preparation Volume (ml)] * 100 ml	No	Read-only

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3.2.9.2.5 *PN Preparation – Print Worksheet*

3.2.9.2.5.1 ***Screen Design***

ID	PNPRE.SD5
Description	PN Preparation – Print Worksheet

Diagram

1. Commercial Additive

PARENTERAL NUTRITION WORKSHEET

MINISTRY OF HEALTH

Hospital Tanah Merah

Patient Name : [redacted]
MRN : [redacted]
Ward/Bed No : WAD 1
Age : 71 Years 05 Months 19 Days
Gender : Male
Body Weight : 77 kg

Worksheet : A001-170718
Prepared Date/Time : 23/07/2018 11:50 AM
Prescription # : WAD10000364226

DRUG NAME	VOLUME (ml)	QUANTITY	BATCH NO	COMPONENT DETAIL (PER DAY)
Nutriflex Lipid Peri 955kcal,1.25L	**1250**	1 bag	34234234	-
Sodium Chloride 3% 500mL IV soln	**19.61**	1 bottle	T2127019	10 mmol
N(2)-L-alanyl-L-glutamine 20% (Dipeptivan) 100ml IV Soln	**200**	2 bottle	45234523	200
TPN Volume Bag	**1469.61**	1 Bag		

Worksheet Generated By : system Administrator
Date : 23/07/2018
Worksheet and Label Checked By :
Supervised By :
Bag Prepared By :
Final Product Checked By :

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2. Compounded (3 in 1)

ADULT PARENTERAL NUTRITION WORKSHEET

MINISTRY OF HEALTH

Hospital Tanah Merah

Patient Name : [redacted]
MRN : [redacted]
Ward/Bed No : WAD 1
Age : 71 Years 05 Months 19 Days
Gender : Male
Body Weight : 77 kg

Worksheet : A003-230718
Prepared Date/Time : 23/07/2018 11:41 AM
Prescription # : WAD10000364127

DRUG NAME	VOLUME (ml)	QUANTITY	BATCH NO	COMPONENT DETAIL (PER DAY)
Amino acid 6.53% (Vaminolact) 100ml IV Soln	**1179.17**	12 bottle	32342342	77 g
Dextrose 50% IV soln 500ml	**154**	1 bottle	34124141	77 g
Sterile Water for Injection 500mL	**788.38**	2 bottle	23524624	NA
Sodium Chloride 3% 500mL IV soln	**150.98**	1 bottle	T2127019	77 mmol
Potassium Chloride 1g/10ml Injection	**57.46**	6 ampoule	HAF60035	77 mmol
Vitamin B and C (Soluvit N) in 10 ml WFI	**10**	1 vial	BF332222	10 ml
TPN Volume Bag	**2340**	1 Bag		

Worksheet Generated By : system Administrator
Date : 23/07/2018
Worksheet and Label Checked By :
Supervised By :
Bag Prepared By :
Final Product Checked By :

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3. Compounded (2 in 1)

ADULT PARENTERAL NUTRITION WORKSHEET

MINISTRY OF HEALTH

Hospital Tanah Merah

Patient Name : [redacted]
MRN : [redacted]
Ward/Bed No : WAD 1
Age : 71 Years 05 Months 19 Days
Gender : Male
Body Weight : 77 kg

Worksheet : A004-230718
Prepared Date/Time : 23/07/2018 11:45 AM
Prescription # : WAD10000364127

DRUG NAME	VOLUME (ml)	QUANTITY	BATCH NO	COMPONENT DETAIL (PER DAY)
Amino acid 6.53% (Vaminolact) 100ml IV Soln	**1179.17**	12 bottle	32342342	77 g
Dextrose 50% IV soln 500ml	**154**	1 bottle	34124141	77 g
Sterile Water for Injection 500mL	**788.39**	2 bottle	23524624	NA
Sodium Chloride 3% 500mL IV soln	**150.98**	1 bottle	T2127019	77 mmol
Potassium Chloride 1g/10ml Injection	**57.46**	6 ampoule	HAF60035	77 mmol
Total Volume	**2330**	1 Bag		

DRUG NAME	VOLUME (ml)	QUANTITY	BATCH NO	COMPONENT DETAIL (PER DAY)
Vitamin B and C (Soluvit N) in 10 ml WFI	**10**	1 vial	BF332222	10 ml
Total Volume	**10**	1 Syringe		

Worksheet Generated By : system Administrator
Date : 23/07/2018
Worksheet and Label Checked By :
Supervised By :
Bag Prepared By :
Final Product Checked By :

Notes	• Click on Print Worksheet button to print worksheet.
Cross References	None

3.2.9.2.5.2 ***Application Business Rules***

No.	Name	Description
1.	Print Worksheet	Worksheet can only be printed once user already saved the Prepare Worksheet details. Click on the print Worksheet button and worksheet will be displayed in PDF format based on the PN order type. Applicable only for PN Commercial with Additive and PN Compounded only. Details displayed in the worksheet are based on the value calculated in Prepare Worksheet screen.

3.2.9.2.5.3 ***Input Validation Rules***

None.

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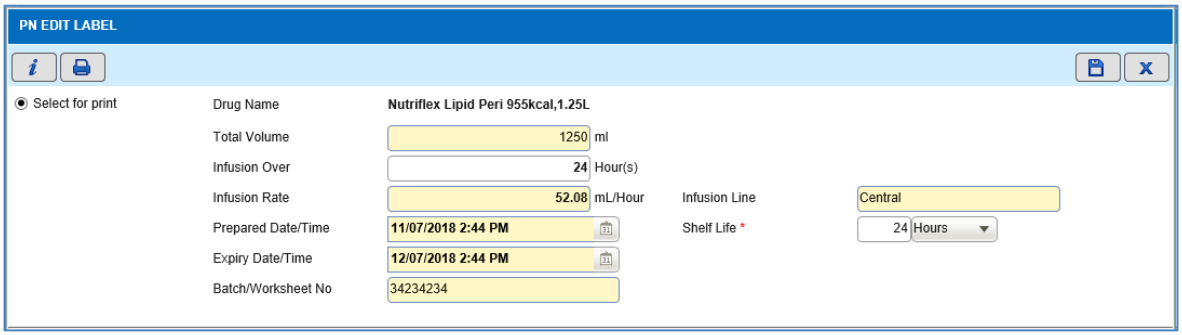
3.2.9.2.6 *PN Preparation – Label*

3.2.9.2.6.1 ***Screen Design***

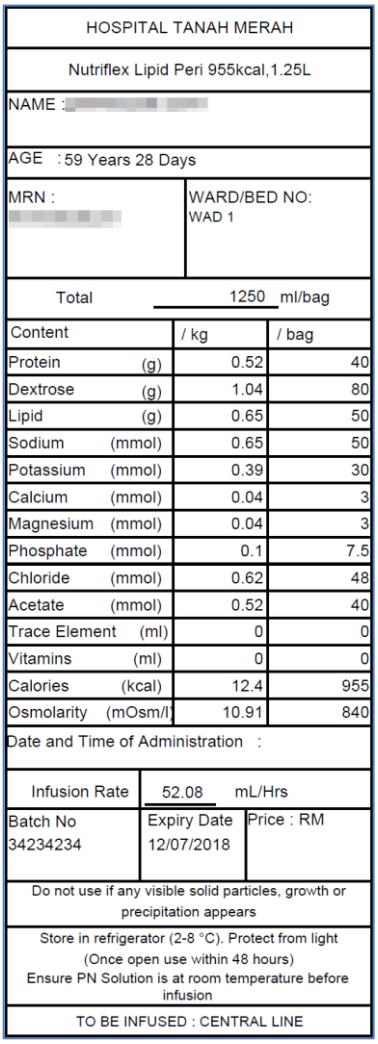
ID	PNPRE.SD6
Description	PN Preparation – Edit and Print Label

Diagram

1. Commercial – Edit Label



2. Commercial – Printed Label



HOSPITAL TANAH MERAH

Nutriflex Lipid Peri 955kcal,1.25L

NAME :

AGE : 59 Years 28 Days

MRN :

WARD/BED NO: WAD 1

Total 1250 ml/bag

Content	/ kg	/ bag
Protein (g)	0.52	40
Dextrose (g)	1.04	80
Lipid (g)	0.65	50
Sodium (mmol)	0.65	50
Potassium (mmol)	0.39	30
Calcium (mmol)	0.04	3
Magnesium (mmol)	0.04	3
Phosphate (mmol)	0.1	7.5
Chloride (mmol)	0.62	48
Acetate (mmol)	0.52	40
Trace Element (ml)	0	0
Vitamins (ml)	0	0
Calories (kcal)	12.4	955
Osmolarity (mOsm/l	10.91	840

Date and Time of Administration :

Infusion Rate 52.08 mL/Hrs

Batch No 34234234

Expiry Date 12/07/2018

Price : RM

Do not use if any visible solid particles, growth or precipitation appears

Store in refrigerator (2-8 °C). Protect from light
(Once open use within 48 hours)
Ensure PN Solution is at room temperature before infusion

TO BE INFUSED : CENTRAL LINE

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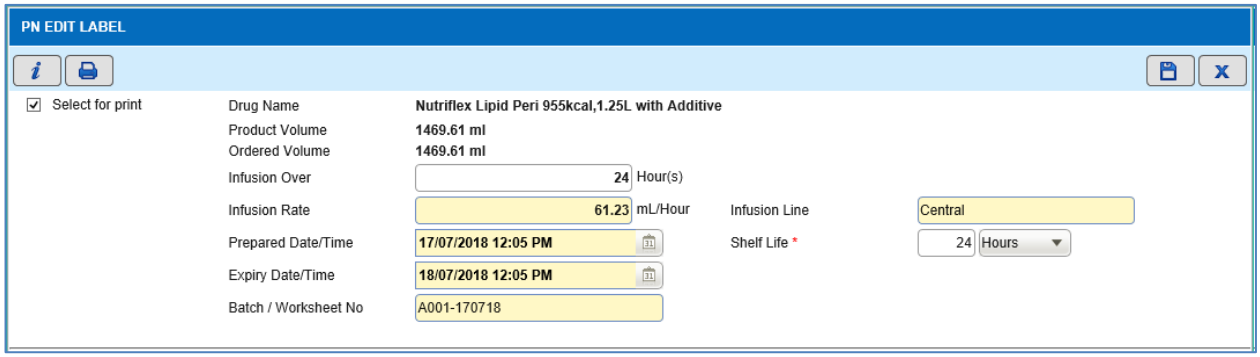
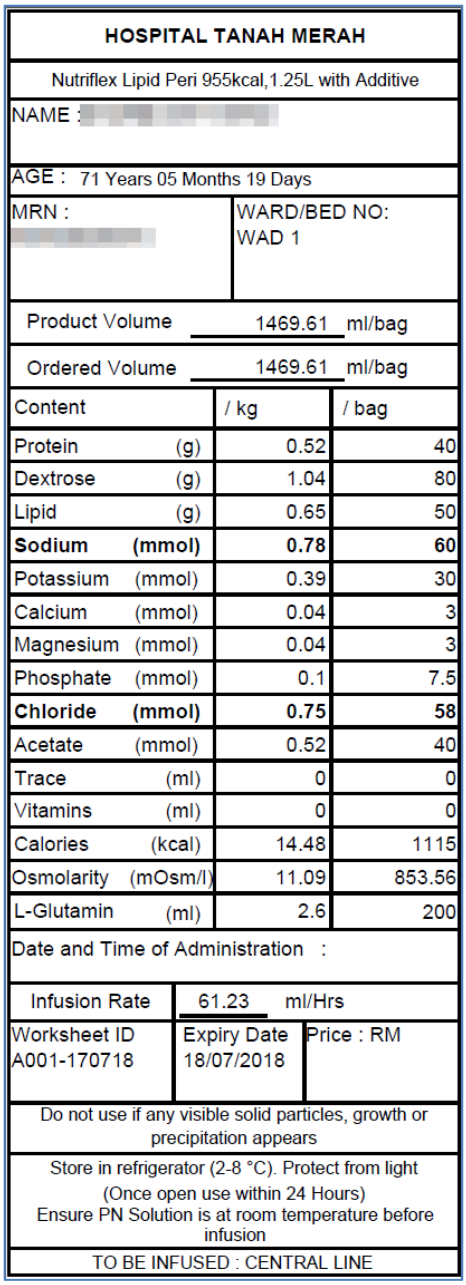
3. Commercial with Additive – Edit Label



4. Commercial with Additive – Printed Label



HOSPITAL TANAH MERAH

Nutriflex Lipid Peri 955kcal,1.25L with Additive

NAME :

AGE : 71 Years 05 Months 19 Days

MRN :

WARD/BED NO: WAD 1

Product Volume 1469.61 ml/bag

Ordered Volume 1469.61 ml/bag

Content		/ kg	/ bag
Protein	(g)	0.52	40
Dextrose	(g)	1.04	80
Lipid	(g)	0.65	50
Sodium	**(mmol)**	**0.78**	**60**
Potassium	(mmol)	0.39	30
Calcium	(mmol)	0.04	3
Magnesium	(mmol)	0.04	3
Phosphate	(mmol)	0.1	7.5
Chloride	**(mmol)**	**0.75**	**58**
Acetate	(mmol)	0.52	40
Trace	(ml)	0	0
Vitamins	(ml)	0	0
Calories	(kcal)	14.48	1115
Osmolarity	(mOsm/l)	11.09	853.56
L-Glutamin	(ml)	2.6	200

Date and Time of Administration :

Infusion Rate 61.23 ml/Hrs

Worksheet ID A001-170718

Expiry Date 18/07/2018

Price : RM

Do not use if any visible solid particles, growth or precipitation appears

Store in refrigerator (2-8 °C). Protect from light
(Once open use within 24 Hours)
Ensure PN Solution is at room temperature before infusion

TO BE INFUSED : CENTRAL LINE

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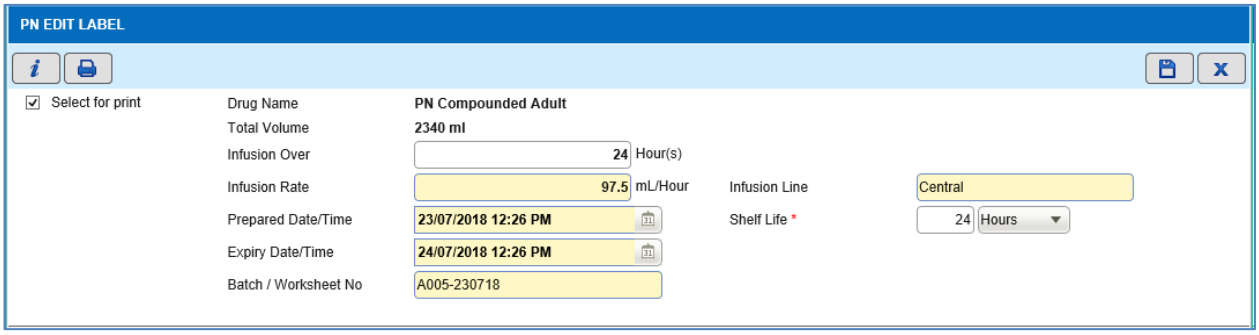
5. Compounded (3 in 1) – Edit Label



6. Compounded (3 in 1) – Printed Label

HOSPITAL TANAH MERAH

PARENTERAL NUTRITION (Adult)

NAME :

AGE : 71 Years 05 Months 19 Days

MRN :

WARD/BED NO: WAD 1

Total Volume 2340 ml/bag

Content		/ kg	/ bag
Protein	(g)	1	77
Dextrose	(g)	1	77
Lipid	(g)	0	0
Sodium	(mmol)	1	77
Potassium	(mmol)	1	77
Calcium	(mmol)	0	0
Magnesium	(mmol)	0	0
Phosphate	(mmol)	0	0
Chloride	(mmol)	2	154
Acetate	(mmol)	0	0
Trace	(ml)	0	0
Vitamins	(ml)	0.13	10
Calories	(kcal)	8	616
Osmolarity	(mOsm/l)	7.34	564.8
L-Glutamin	(ml)	0	0

Date and Time of Administration :

Infusion Rate 97.5 ml/Hrs

Worksheet ID A005-230718

Expiry Date 24/07/2018

Price : RM

Do not use if any visible solid particles, growth or precipitation appears

Store in refrigerator (2-8 °C). Protect from light
(Once open use within 24 Hours)
Ensure PN Solution is at room temperature before infusion

TO BE INFUSED : CENTRAL LINE

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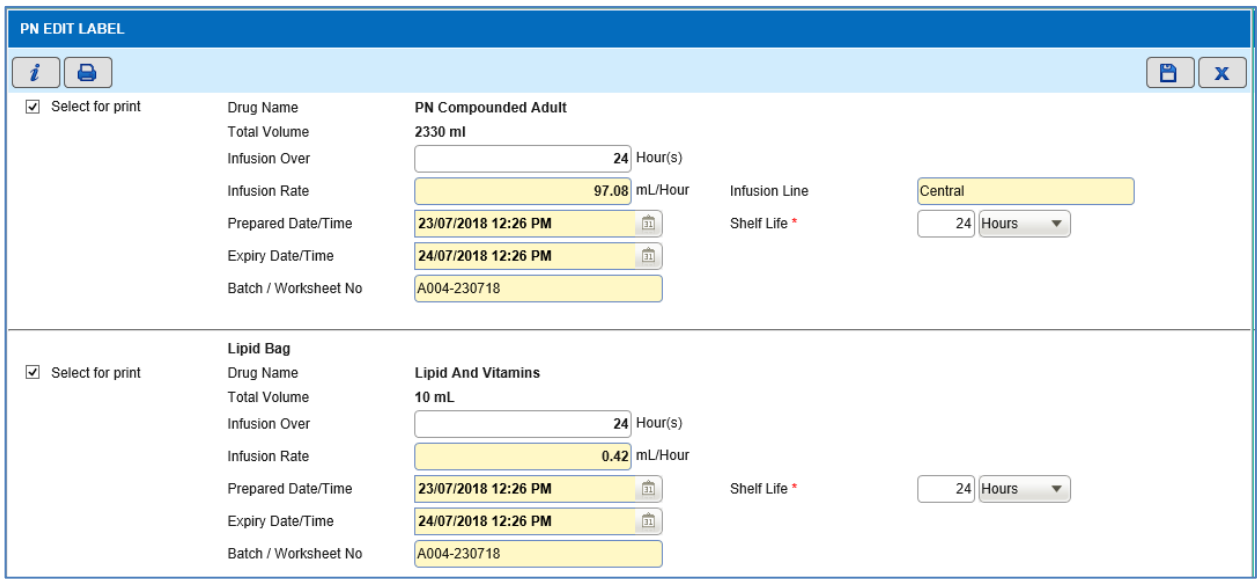
7. Compounded (2 in 1) – Edit Label



8. Compounded (2 in 1) – Printed Label

HOSPITAL TANAH MERAH		
PARENTERAL NUTRITION (Adult)		
NAME :		
AGE : 71 Years 05 Months 19		
MRN :	WARD/BED NO : WAD 1	
Total	2330 ml/bag	
Content	/ kg	/ bag
Protein (g)	1	77
Dextrose (g)	1	77
Sodium (mmol)	1	77
Potassium (mmol)	1	77
Calcium (mmol)	0	0
Magnesium (mmol)	0	0
Phosphate (mmol)	0	0
Chloride (mmol)	2	154
Acetate (mmol)	0	0
Trace Element (ml)	0	0
Vitamins (ml)	0.13	10
Calories (kcal)	8	616
Osmolarity (mOsm/l)	7.34	565.12
Date and Time of Administration :		
Infusion Rate	97.08 ml/hrs	
Worksheet ID	Expiry Date	Price : RM
A004-230718	24/07/2018	
Do not use if any visible solid particles, growth or precipitation appears		
Store in refrigerator (2-8 °C). Protect from light (Once open use within 24 Hours) Ensure PN Solution is at room temperature before infusion		
TO BE INFUSED : CENTRAL LINE		

HOSPITAL TANAH MERAH			
NAME			
MRN			
WARD	WAD 1		
LIPID	0 mL	Infusion rate	0.42 ml/hr
VITALIPID	0 mL	Worksheet ID	A004-230718
SOLUVIT	10 mL	Exp date	24/07/2018 12:26 PM
Total Vol	10 mL	Date Prepared	23/07/2018 12:26 PM
Calories	18 kcal	Price(RM)	
(Keep refrigerated)			

HOSPITAL TANAH MERAH			
NAME			
MRN			
WARD	WAD 1		
LIPID	0 mL	Infusion rate	0.42 ml/hr
VITALIPID	0 mL	Worksheet ID	A004-230718
SOLUVIT	10 mL	Exp date	24/07/2018 12:26 PM
Total Vol	10 mL	Date Prepared	23/07/2018 12:26 PM
Calories	18 kcal	Price(RM)	
(Keep refrigerated)			

HOSPITAL TANAH MERAH			
NAME			
MRN			
WARD	WAD 1		
LIPID	0 mL	Infusion rate	0.42 ml/hr
VITALIPID	0 mL	Worksheet ID	A004-230718
SOLUVIT	10 mL	Exp date	24/07/2018 12:26 PM
Total Vol	10 mL	Date Prepared	23/07/2018 12:26 PM
Calories	18 kcal	Price(RM)	
(Keep refrigerated)			

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Notes	• Click on Label button to edit and print label. • PN label is categorized in 4 types: PN Commercial, PN Commercial with Additive, PN Compounded 3 in 1 and PN Compounded 2 in 1.
Cross References	None

3.2.9.2.6.2 ***Application Business Rules***

No.	Name	Description
1.	Edit label screen	Edit label screen is displayed when user allocated batch quantity and click on the Label button. Screen is displayed according to the category as below: i. PN Commercial ii. PN Commercial with Additive iii. PN Compounded 3 in 1 iv. PN Compounded 2 in 1 Click on Print button to view the label in PDF format.
2.	Save label record	Click on Save button to save the label record. Once user click on Print button, system will display the updated label on the PDF print preview.

3.2.9.2.6.3 ***Input Validation Rules***

No.	Name	Description	Mandatory	Format
Edit Label screen – PN Commercial				
1.	Drug Name	Drug name is displayed based on the ordered drug name.	No	Read-only
2.	Total Volume	Total volume is displayed based on the order information. Value is displayed up to 1 decimal place.	No	Read-only
3.	Infusion Over	Default value is displayed based on the order information.	No	Text field
4.	Infusion Rate	Value is auto calculated based on Total Volume / Infusion Over. Value is in mL/Hour unit.	No	Read-only
5.	Infusion Line	Value is displayed based on the order information.	No	Read-only
6.	Prepared Date/Time	Value is displayed based on system current date and time.	No	Read-only
7.	Shelf Life	Default value to 24 Hours. User able to change the value. UOM able to select either Hours or Days.	Yes	Text field
8.	Expiry Date/Time	Value is auto display based on the Prepared Date/Time + Shelf Life.	No	Read-only
9.	Batch/ Worksheet No.	Display the selected and allocated drug batch no.	No	Read-only

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No.	Name	Description	Mandatory	Format
Edit Label screen – PN Commercial with Additive				
10.	Drug Name	Drug name is displayed based on the ordered drug name + 'with Additive'.	No	Read-only
11.	Product Volume	Display based on: Initial bag volume + Total preparation volume (from worksheet)	No	Read-only
12.	Ordered Volume	Display based on: Ordered volume + [(Total preparation volume (from worksheet) x Ordered Volume) / Initial bag volume]	No	Read-only
13.	Infusion Over	Default value is displayed based on the order information.	No	Text field
14.	Infusion Rate	Value is auto calculated based on Total Volume / Infusion Over. Value is in mL/Hour unit.	No	Read-only
15.	Infusion Line	Value is displayed based on the order information.	No	Read-only
16.	Prepared Date/Time	Value is displayed based on system current date and time.	No	Read-only
17.	Shelf Life	Default value to 24 Hours. User able to change the value. UOM able to select either Hours or Days.	Yes	Text field
18.	Expiry Date/Time	Value is auto display based on the Prepared Date/Time + Shelf Life.	No	Read-only
19.	Batch/ Worksheet No.	Display the Worksheet No. as per the generate worksheet.	No	Read-only
Edit Label screen – Compounded (Bag)				
20.	Drug Name	Drug name is displayed based on: 'PN Compounded' + Adult/Paediatric/Paediatric-Infant/Neonate	No	Read-only
21.	Total Volume	Total volume is displayed based on the order information. Value is displayed up to 1 decimal place.	No	Read-only
22.	Infusion Over	Default value is displayed based on the order information.	No	Text field
23.	Infusion Rate	Value is auto calculated based on Total Volume / Infusion Over. Value is in mL/Hour unit.	No	Read-only
24.	Infusion Line	Value is displayed based on the order information.	No	Read-only
25.	Prepared Date/Time	Value is displayed based on system current date and time.	No	Read-only
26.	Shelf Life	Default value to 24 Hours. User able to change the value. UOM able to select either Hours or Days.	Yes	Text field
27.	Expiry Date/Time	Value is auto display based on the Prepared Date/Time + Shelf Life.	No	Read-only

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No.	Name	Description	Mandatory	Format
28.	Batch/ Worksheet No.	Display the Worksheet No. as per the generate worksheet.	No	Read-only
Edit Label screen – Compounded (Lipid Bag/Syringe)				
29.	Drug Name	Drug name is default to 'Lipid and Vitamins'.	No	Read-only
30.	Total Volume	Total volume is displayed based on calculated lipid total volume from worksheet.	No	Read-only
31.	Infusion Over	Default value is displayed based on the order information.	No	Text field
32.	Infusion Rate	Value is auto calculated based on Total Volume / Infusion Over. Value is in mL/Hour unit.	No	Read-only
33.	Prepared Date/Time	Value is displayed based on system current date and time.	No	Read-only
34.	Shelf Life	Default value to 24 Hours. User able to change the value. UOM able to select either Hours or Days.	Yes	Text field
35.	Expiry Date/Time	Value is auto display based on the Prepared Date/Time + Shelf Life.	No	Read-only
36.	Batch/ Worksheet No.	Display the Worksheet No. as per the generate worksheet.	No	Read-only

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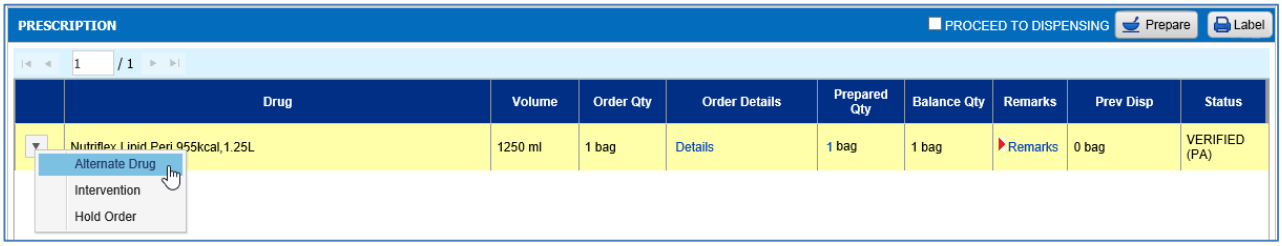
3.2.9.2.7 *PN Preparation – Alternate Drug*

3.2.9.2.7.1 ***Screen Design***

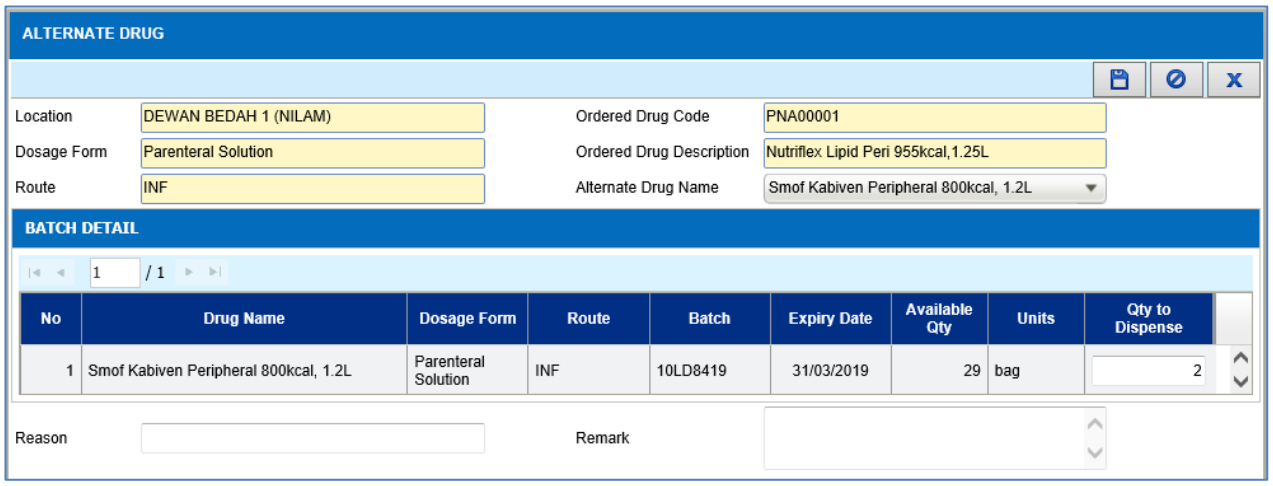
ID	PNPRE.SD7
Description	PN Preparation – Alternate Drug

Diagram

1. Combination Drug menu



2. Alternate Drug screen



Notes	• Click on the Combination Drug menu to view the Combination Drug screen.
Cross References	None

3.2.9.2.7.2 ***Application Business Rules***

No.	Name	Description
1.	Alternate drug screen	Combination drug menu is displayed only for PN Commercial order. Condition to display the drug in the alternate drug list is list all PN drugs (based on settings in Drug Master), drugs are active in facility and active in dispense location unit catalog.
2.	Batch Details	Batch details column display the stock information based on user's unit location. Only stock available in user's current unit location will be displayed. The displayed batch number must also not an expired batch and available stock quantity must be greater than 0.

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No.	Name	Description
3.	Save alternate drug record	Click on Save button to save alternate drug record. System will update the preparation prescription listing with additional combination drug row.
4.	Cancel combination drug record	User is able to cancel/delete the saved combination drug record by clicking on Prepare Qty hyperlink of the original drug. System will then display alert message whether user wants to cancel the combination drug record. Once cancelled, combination drug row will be removed from screen and user able to allocate new batches for the ordered drug.

3.2.9.2.7.3 ***Input Validation Rules***

No.	Name	Description	Mandatory	Format
1.	Alternate Drug Name	User to select the alternate drug name.	No	Drop down list
2.	Qty to Dispense	Qty to Dispense is to be entered in the textbox. Maximum of 8 integer capacity.	No	Text field
3.	Reason	Reason is to be entered in the text box. Maximum of 300 characters capacity.	No	Text field
4.	Remark	Remark is to be entered in the text box. Maximum of 300 characters capacity.	No	Text field

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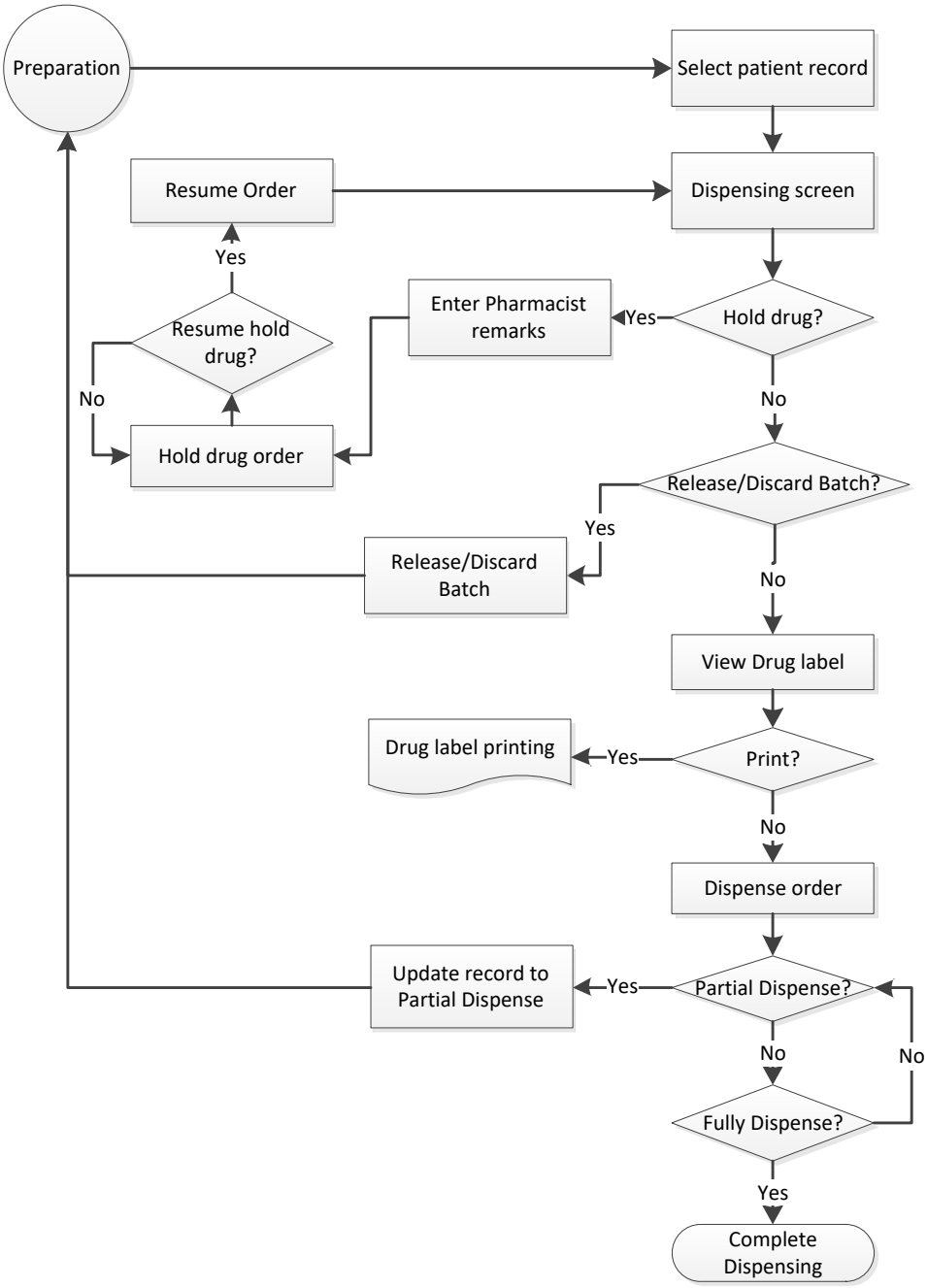
3.2.10 PN Dispensing

All prepared PN orders from PN Preparation screen will flow to PN Dispensing screen. Pharmacist able to re-print label and prescription if needed then proceed with drug dispensing.

3.2.10.1 Screen Navigation Diagram



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3.2.10.2 Detail Functionality and Screen

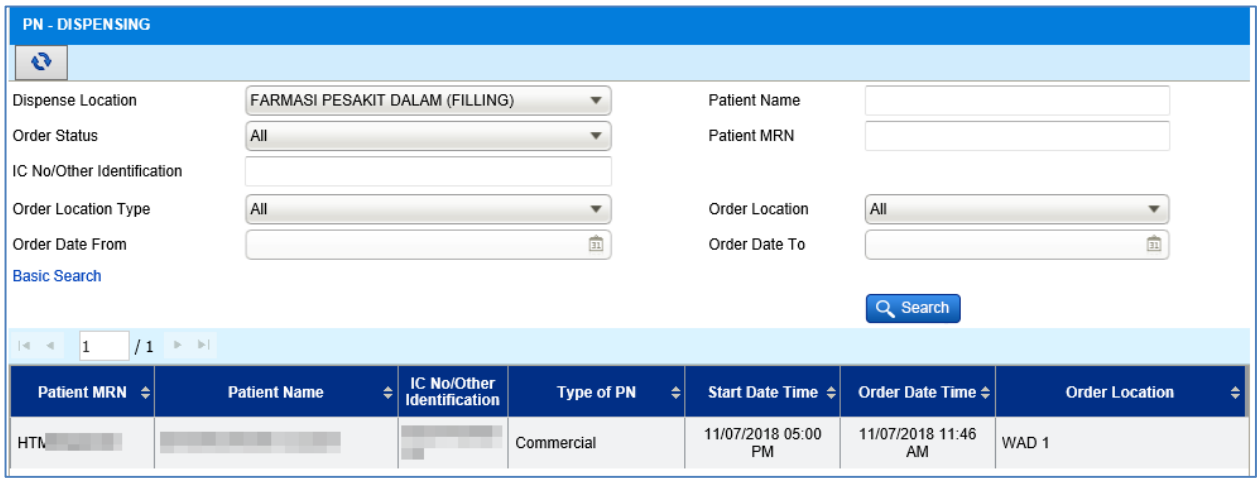
3.2.10.2.1 *PN Dispensing Listing*

3.2.10.2.1.1 ***Screen Design***

ID	PNDISP.SD1
Description	PN Dispensing Listing

Diagram

1. PN Dispensing Listing



Notes	• Click on the search button to search the prepared order for pharmacist to proceed with drug dispensing. • Double click which order to dispense and view the order details and click on Dispense button to dispense the record.
Cross References	None

3.2.10.2.1.2 ***Application Business Rules***

No.	Name	Description
1.	Search Order	PN Dispensing listing screen is displayed based on all PN prepared orders and user's login location. This screen will allow user to search by the following criteria: i. Dispense Location – By default, dispense location is default to user's login location. The listed location values are based on the user's granted location as setup in User Profile screen and location specified as dispense location in Location Setup screen. ii. Order Status – Dispensing listing shall be retrieved from the database based on matching order status. By default, value is default to 'All'. Values are from lookup table, domain 'PN Order Status'. iii. Patient Name – Dispensing listing shall be retrieved from the database based on matching Patient Name.

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No.	Name	Description
		iv. Patient MRN – Dispensing listing shall be retrieved from the database based on matching Patient MRN. ix. IC No/Other Identification – Dispensing listing shall be retrieved from the database based on matching Patient ID No. v. Order Location Type – Dispensing listing shall be retrieved from the database based on matching location type. By default, value is default to 'All'. Values are from lookup table, domain 'Loc Type'. vi. Order Location – Dispensing listing shall be retrieved from the database based on matching location. By default, value is default to 'All'. Values are from location setup maintenance screen. vii. Order Date range – Dispensing listing shall be retrieved from database where order date within the selected range. Specify search criteria and click on the Search button to search the orders.
2.	Refresh Order Listing	Click on the Refresh button to reset all searched records and searching criteria to default value.

3.2.10.2.1.3 ***Input Validation Rules***

None.

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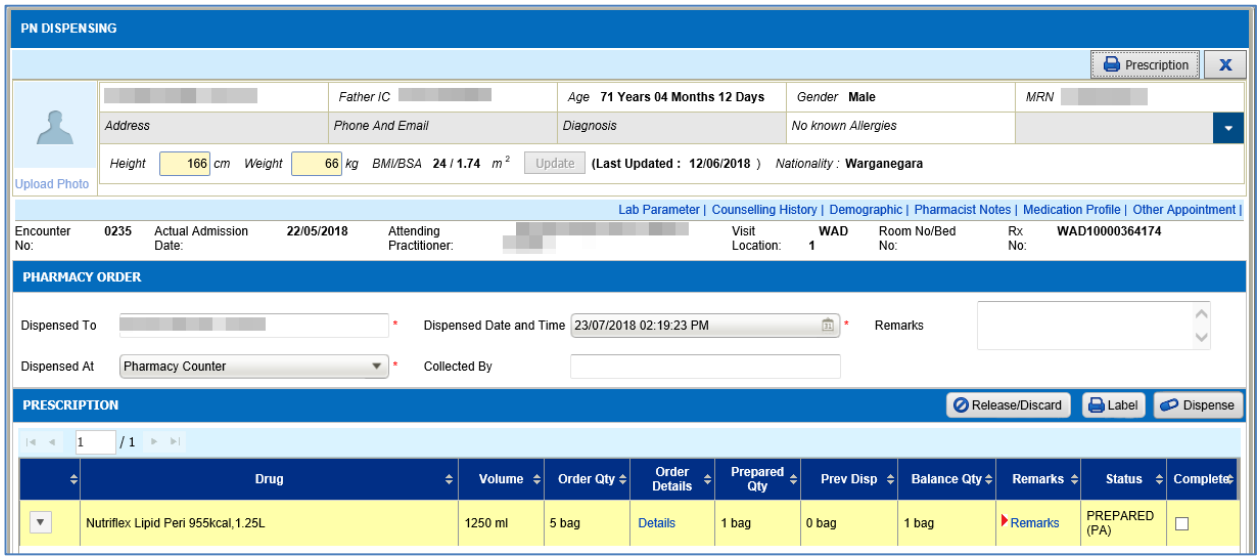
3.2.10.2.2 *PN Dispensing*

3.2.10.2.2.1 ***Screen Design***

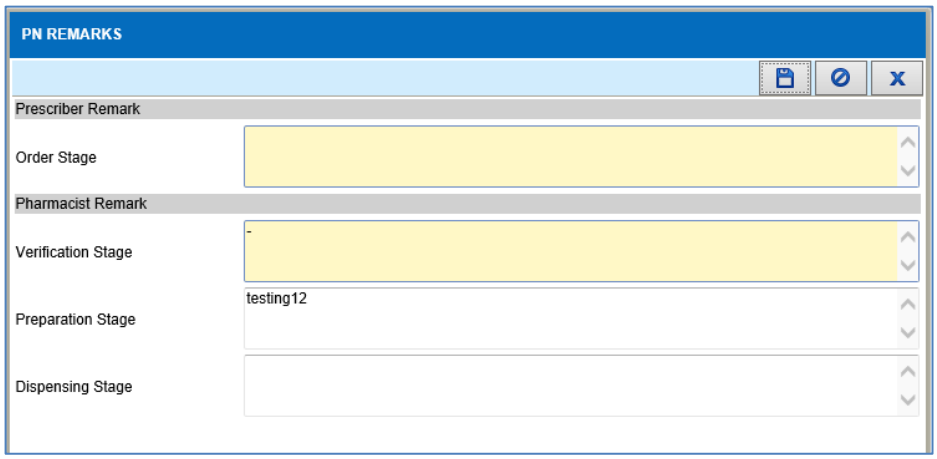
ID	PNDISP.SD2
Description	PN Dispensing screen

Diagram

1. PN Dispensing screen



2. Pharmacist Remarks screen



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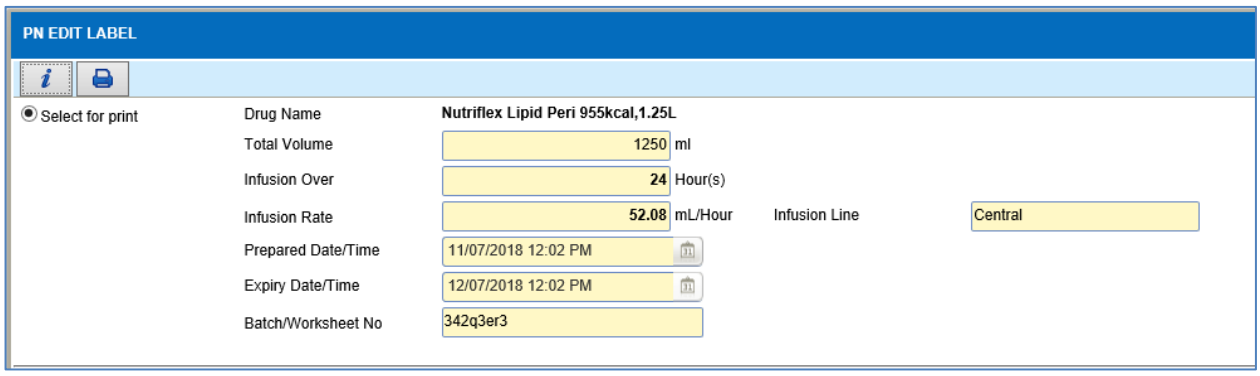
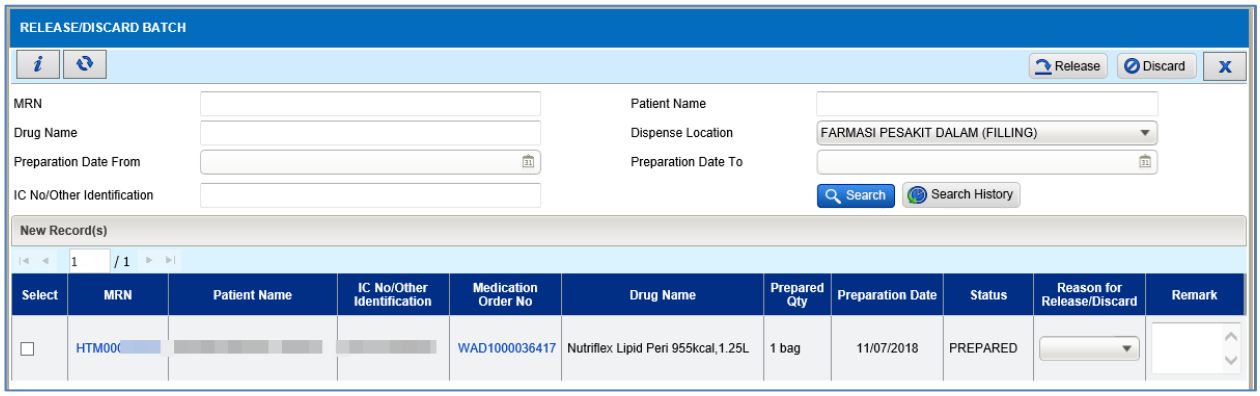
3. Re-print label



4. Release/Discard screen after Release/Discard button is clicked



Notes	• Click on Label button to view edit label screen and print label. Fields are read-only. • Click on Remarks hyperlink to view Pharmacist Remark screen. • Click on Print Prescription button to reprint prescription. • Click on Release/Discard button to release/discard batch. • Click on Dispense button to dispense order.
Cross References	None

3.2.10.2.2.2 *Application Business Rules*

No.	Name	Description
1.	View prescriber and pharmacist remarks	Pharmacist remarks screen displays the remarks by both prescriber and pharmacist. Order stage, verification stage and preparation stage remarks will display value if any drug remarks entered by prescriber or pharmacist. In dispensing screen, only dispensing stage remark field is enabled, other remarks are view-only.
2.	View edit label screen	Edit label screen is read-only in Dispensing screen, user only able to reprint the label.

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No.	Name	Description
3.	Release Batch	Release batch function is for user to return back allocated stock into user's unit location in the case of drug already proceed to dispensing stage but cannot dispense to patient due to several reasons and drug is not yet prepared (still in raw material form). Select which drug to release and the release reason then click on Release Batch button to release/update the drug allocated quantity to 0. Drug will then flow back to Preparation screen for user to re-allocate the batch quantity for new preparation.
4.	Discard Batch	Discard batch function is for user to remove/discard the allocated stock into user's unit location in the case of drug already proceed to dispensing stage but cannot dispense to patient due to several reasons and drug already prepared or in final product form. Select which drug to discard and the discard reason then click on Discard Batch button to discard/update the drug allocated quantity to 0 and minus the stock in current stock available quantity. Drug will then flow back to Preparation screen for user to re-allocate the batch quantity for new preparation.
5.	Dispense Order	Click on the Dispense button, system will update the selected order and drug status to 'Dispensed' and remove the order from the Dispensing listing.

3.2.10.2.2.3 ***Input Validation Rules***

No.	Name	Description	Mandatory	Format
1.	Dispense To	Dispense To is to be entered in the textbox. Maximum of 130 characters capacity. Default value is displayed based on the patient's name.	Yes	Text field
2.	Dispense Date and Time	Dispense Date and Time is to be selected from calendar control. It will be in dd/mm/yyyy hh:mm AM/PM format. Default value is current system date.	Yes	Calendar
3.	Dispense At	Dispense At is to be selected from the drop down list. Dropdown will be populated from lookup table where domain = 'Collection At'.	Yes	Drop down list
4.	Collected By	Collected By is to be entered in the textbox. Maximum of 130 characters capacity. This field is not mandatory.	No	Text field
5.	Remarks	Remark is to be entered in the textbox. Maximum of 100 characters capacity. This field is not mandatory.	No	Text field
6.	Dispensing Stage	Dispensing stage remark is to be entered in the text box. Maximum of 250 characters capacity.	No	Text field

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3.2.10.2.3 *PN Dispensing – Force Close Order*

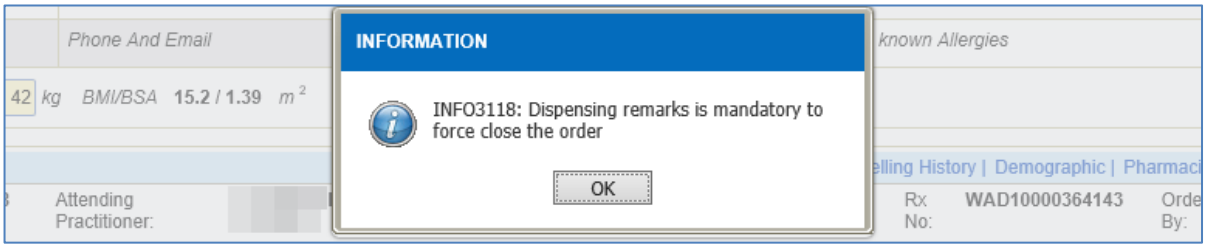
3.2.10.2.3.1 ***Screen Design***

ID	PNDISP.SD3
Description	PN Dispensing – Force Close Order

Diagram

1. Completed checkbox

2. Alert message displayed when user click on Complete checkbox



Notes	• Click on completed checkbox to force close order and user is required to enter remarks to proceed.
Cross References	None

3.2.10.2.3.2 ***Application Business Rules***

No.	Name	Description
1.	Force close order	Click on Completed checkbox to close the order. Once user clicks on completed checkbox, system will check if no value entered in Dispensing stage remarks, alert message will be displayed for user to enter the dispensing remarks value. After dispensing remarks has been entered and user save the record. System will update the drug balance quantity to 0. Once user dispense the order, drug will be fully dispensed not partial dispensed.

3.2.10.2.3.3 ***Input Validation Rules***

None.

3.2.11 Integration

No.	Name	Type	Description
1.	Outsource	Internal	Outsource between multiple facilities.

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4. References

List out the documents in which the stated procedures in this document refer to.

Document	Description/ Expansion

5. Acronyms

Item	Description
UOM	Unit of Measurement
BPF	Bahagian Perkhidmatan Farmasi
HQ	Headquarters

6. Appendix

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