Prescribing and administration of insulin on EPMA - Full Paediatric Clinical Guideline – Derby Site Guideline

Reference no.: CH CLIN D16/ Sept 22/v004

Prescribing and administration of insulin on EPMA (Lorenzo). Full paediatric guideline Reference no.CH CLIN D16

Aim: to ensure safe prescribing of insulin for paediatric in-patients with Diabetes Mellitus

Purpose: To safely prescribe insulin for children and young people with diabetes when admitted as an inpatient, using Electronic Prescribing and Medicines Administration system (EPMA) Lorenzo

1. Main guideline

Background

Newly diagnosed patients with Type 1 diabetes who are **not** in diabetic ketoacidosis (or once DKA resolved) require the following prescriptions:

1. Novorapid pre meal – meal set dose
2. Long-acting insulin (Degludec or Detemir)

Newly diagnosed patients with Type 1 diabetes – once admitted to Puffin or Dolphin ward require the following prescription as advised by the paediatric diabetes team:

1. Novorapid pre meal –dose calculated by carbohydrate counting
   Instead of meal set dose
2. Novorapid pre meal – correction dose to correct high blood glucose
3. Long-acting insulin (Degludec or Detemir)

Established patients with diabetes mellitus on a multiple daily injection regime require the following prescriptions

Either….

For those that calculate meal dose by carbohydrate counting

1. Novorapid or fiasp pre meal –carbohydrate counting
2. Novorapid or fiasp pre meal – correction dose to correct high blood glucoses
3. Long-acting insulin (Degludec or Detemir or Glargine)

Or….

For those on fixed dose at each meal

1. Novorapid or Fiasp pre meal – meal set dose
2. Novorapid or Fiasp pre meal – correction dose to correct high blood glucoses
3. Long-acting insulin (Degludec or Detemir or Glargine)

Order sets

There are 3 'order sets' on EMPA (Lorenzo) to help with prescribing insulin for paediatric patients with diabetes

- Insulin for type 1 diabetes newly diagnosed under 1 year old
- Insulin for type 1 diabetes newly diagnosed 1 year and over
- Insulin for type 1 diabetes for established patients…. Which has all possible insulins used in paediatric diabetes patients.

Section 1:

How to prescribe insulin on EMPA (Lorenzo) for newly diagnosed patients with type 1 diabetes on day 1 of admission or when changing from DKA guideline

When prescribing for the first time, you can select both the Novorapid (meal set dose) and the long-acting insulin (Degludec or Detemir) from the same order set at the same time. Alternatively, you can select each insulin individually.

Please see Appendix 1: Screenshots to aid prescribing Novorapid Set Dose and Long-Acting Insulin on Lorenzo for newly diagnosed patient with type 1 diabetes

1. **Novorapid: meal set dose:**

Novorapid should be given by pen injection device 15 minutes before meals. These meal doses should be prescribed at 08:00, 12:00 and 17:00.

and

Long-acting insulins: Degludec or Detemir

Degludec and Detemir should be given when an inpatient, at 6pm.

Round doses up to nearest half unit for children under 5 years of age and to nearest whole unit for children over 5 years of age.

Step 1: Search for one of 'Insulin, Diabetes, Paediatric Diabetes, Newly Diagnosed" and tick 'Search order sets'

Step 2: Select either Insulin for type 1 diabetes newly diagnosed under 1 year old
OR Insulin for type 1 diabetes newly diagnosed 1 year and over

Step 3: Tick Insulin aspart - Novorapid Penfill 100 units/ml – Meal Set Dose

Step 4: Tick Insulin Degludec-Tresiba Cartridge 100 units/ml – Basal Insulin
OR Insulin Detemir – Levemir Penfill 100 units/ml – Basal Insulin Press OK

Step 5: NOVORAPID screen will be displayed.
Check the frequency is Three times Per Day – 8am, 12pm, 5pm

Step 6: Tick 'changing dose box' and then select 'Changing dose' in BLUE

Step 7: Enter the set mealtime doses in each time block on the 'changing dose mezzanine' table – Press OK
Step 8: NB – if you are asked if you wish to update the entered details in the grid – press yes

Step 9: Press UPDATE on main prescription page

Step 10: Press OK and acknowledge reason for prescription

Step 11: LONG-ACTING INSULIN PRESCRIPTION WILL APPEAR

Step 12: Enter long acting insulin dose

Step 13: Check administration time is 6pm

Step 14: Press OK and acknowledge reason for prescription

Step 15: Double check both prescriptions and press FINISH NOW

Amending doses: Open the prescription to amend. Follow Step 6 to Step 10. You may be asked to confirm 'reason for modification'. Complete prescription change, check prescription has been amended and press FINISH.
Alternatively Discontinue/cancel current prescription and re-prescribe with new set doses.

If prescribing long acting insulin separately:

Step 1: Search for one of 'Insulin, Diabetes, Paediatric Diabetes, Newly Diagnosed," and tick 'Search order sets'

Step 2: Select either Insulin for type 1 diabetes newly diagnosed under 1 years old
OR Insulin for type 1 diabetes newly diagnosed 1 years and over

Step 3: Tick Insulin Degludec – Tresiba Cartridge 100 units/ml – Basal Insulin
OR Insulin detemir – Levemir Penfill 100 units/ml – Basal Insulin

Step 4: Enter long acting insulin dose

Step 5: Check administration time is 6pm

Step 6: Press OK and acknowledge reason for prescription

Step 7: Double check prescription and press FINISH NOW

2. To prescribe Novorapid pre meal dose correction dose (also known as Insulin Sensitivity Factor)

Please see Appendix 2: Screenshots to aid prescribing Novorapid – Correction doses

Correction dose of Novorapid (or insulin sensitivity factor) = additional Novorapid given at meal times to correct blood glucose down to a normal blood glucose of 6 mmol/l.

Any blood glucose at mealtimes, above 6mmol/l can be corrected if there is a big enough difference to give a minimum of 0.5 units with the correction ratio.

Inpatients require a prescription for the 'correction dose' to be given before each meal expressed as

'1 unit of Novorapid is expected to reduce the blood glucose down by ***y mmol/l*****,** aiming for blood glucose of 6 mmol/l'

The nurse administering the Novorapid will calculate the correction dose from this formula at each meal.

Step 1: Search for one of 'Insulin, Diabetes, Paediatric Diabetes, Newly Diagnosed, Established" and tick 'Search order sets'

Step 2: Select one of the following:
Insulin for type 1 diabetes newly diagnosed under 1 year old **OR**
Insulin for type 1 diabetes newly diagnosed 1 years and over **OR**
Insulin for type 1 diabetes for established patients

Step 3: Tick Insulin aspart - Novorapid Penfill 100 units/ml – Correction Dose
Step 4: Press OK

Step 5: Tick the box beside 'Changing dose'

Step 6: Tick 'changing dose' in BLUE

Step7: 'Changing dose mezzanine' screen will appear. Press OK

Step 8: Prescribe correction dose by amending the 'variable dose instructions'

Correction: 15 minutes before breakfast, lunch and tea. Please calculate the dose using the formula: 1 unit of Novorapid is expected to reduce the blood glucose *by Y mmols/l*, aiming for blood glucose of 6 mmols/l. Amend Y and delete text in brackets

Step 9: Enter dose range (you need to specify a suitable range)

Minimum- 0.5 units.
Maximum – need to calculate likely maximum for individual patient

Corrections are worked out using the sum 100 ÷ by Total Daily Dose (long and fast acting insulin).

Example1: If Total Daily Dose = 20 units then correction dose will be
100 ÷ 20 = 5. Therefore 1 unit of Novorapid will reduce blood glucose by 5mmol/l.

If blood glucose is 26 mmol/l and aiming for a blood glucose of 6 mmol/l, the correction dose needs to reduce blood glucose by 20 mmol/l

If 1 unit of Novorapid will reduce blood glucose by 5 mmol/l then 20 ÷ 5 = 4.
4 units will reduce blood glucose by 20 mmol/l therefore a range of 0.5 units to 5 units would be appropriate.

Example 2: If Total Daily Dose = 8 units then correction dose will be
100 ÷ 8 = 12 (12.5). Therefore 1 unit of Novorapid will reduce blood glucose by 12mmol/l.

If blood glucose is 26 mmol/l and aiming for a blood glucose of 6 mmol/l, the correction dose needs to reduce blood glucose by 20 mmol/l

If 1 unit of Novorapid will reduce blood glucose by 12 mmol/l then 20 ÷ 12 = 1.6 – round to nearest half = 1.5. 1.5 units will reduce blood glucose by 20 mmol/l therefore a range of 0.5 units to 2 units would be appropriate.

Step 10: Press UPDATE – a screen might be displayed that advises to avoid entering a dose less than '1',do you wish to continue? – press yes

Step 11: 'Changing dose mezzanine' screen will appear again. Press OK

Step 12: Check – dose range is visible, frequency is TDS (8am, 12pm, 5pm) and correction ratio is visible in the 'variable dose instructions'

Step 13: Press OK and acknowledge reason – it may advise mandatory fields are missing. Press yes/OK

Step 14: Double check prescription and press FINISH NOW
Amending doses: Open the prescription to amend. Tick the small box beside the current dose range. Amend the 'variable dose instruction' to new correction ratio.
Follow Step 10 – Step 13.
You may be asked to confirm 'reason for modification'. Complete prescription change, check prescription has been amended and press FINISH.
Alternatively Discontinue/cancel current prescription and re-prescribe with new correction dose.

Section 2:

Prescribing for established patients or newly diagnosed when commenced on carbohydrate counting

Please see Appendix 3: **Screenshots to aid prescribing Novorapid for meals: dose to be calculated using carbohydrate counting**

1. To prescribe Novorapid pre meal dose calculated by carbohydrate counting technique

Novorapid should be given by pen injection device 15 minutes before meals. These meal doses should be prescribed at 08:00, 12:00 and 17:00.

Step 1: Search for one of 'Insulin, Diabetes, Paediatric Diabetes, Established" and tick 'Search order sets'

Step 2: Select Insulin for type 1 diabetes for established patients

Step 3: Tick Insulin aspart - Novorapid Penfill 100 units/ml – Carbohydrate Counting

Step 4: Press OK

Step 5: Tick the small box in the prescribing box – see screenshot

Step 6: Prescribe carbohydrate counting ratio's by amending the 'variable dose instructions'

'Calculate *by* carbohydrate counting: 15 minutes before breakfast 1unit of Novorapid per X grams of carbohydrate. 15 minutes before lunch 1unit of Novorapid per Y grams of carbohydrate. 15 minutes before tea 1unit of Novorapid per Z grams of carbohydrate. (**Amend X, Y, Z**). You might need to delete a word in the text box to enter the ratio's. We suggest delete 'by' – see above in itallics.

Step 7: Enter a range of possible insulin doses in 'Dose'.
Minimum - 0.5 units.
Maximum - need to calculate likely maximum for individual patient.
E.g. If 1 unit of Novorapid for 10 g carbohydrates and eat 100g of carbohydrates then dose is 10 units

Step 8: Select 'unit' in UOM

Step 9: Press UPDATE

Step 10: If the dose range starts at 0.5 units – the system will ask if this is ok for safety – press yes
Step 11: 'Changing dose mezzanine' screen will appear again. Press OK

Step 12: Check – dose range is visible, frequency is TDS (8am, 12pm, 5pm) and carbohydrate ratios are complete in 'variable dose instructions' in the prescription box.

Step 13: Press OK and acknowledge reason for prescription

Step 14: Double check prescription and press FINISH NOW

Amending doses: Open the prescription to amend. Follow Step 5 (this is the small box beside the current dose range) to Step 13. You may be asked to confirm 'reason for modification'. Complete prescription change, check prescription has been amended and press FINISH.
Alternatively Discontinue/cancel current prescription and re-prescribe with new carbohydrate ratio's.

2. To prescribe Novorapid 'sick day rule' dose for blood ketones above 0.5 mmol/l

Please see CH CLIN D02 or CH CLIN D14 (insulin pump patients) for calculation **This must be prescribed as a STAT dose of Novorapid on Lorenzo:**

Step 1 : Search for one of 'Insulin, Diabetes, Paediatric Diabetes, Established" and tick 'Search order sets'

Step 2: Select Insulin for type 1 diabetes for established patients

Step 3: Tick Insulin aspart - Novorapid Penfill 100 units/ml – STAT Dose

Step 4: Prescribe dose – ensure frequency is 'STAT'

Step 5: Press OK and acknowledge reason for prescription

Step 6: Double check prescription and press FINISH NOW

3. To prescribe long-acting insulins: Degludec, Detemir and Glargine (established patients) if not been previously prescribed as part of Order Set

Degludec, Detemir and Glargine should be prescribed for all established patients. The system defaults administration time to 6pm. Patients may have it a later time in the evening when at home.

Round doses up to nearest half unit for children under 5 years of age and nearest whole unit for children over 5 years of age.

To prescribe on Lorenzo:

Step 1: Search for one of 'Insulin, Diabetes, Paediatric Diabetes, Established" and tick 'Search order sets'

Step 2: Select Insulin for type 1 diabetes for established patients

Step 3: Tick ONE of the following
Insulin Degludec - Tresiba penfill 100 units/ml **OR**
Insulin Detemir - Levemir penfill 100 units/ml **OR**
Insulin Glargine - Lantus cartridge 100 units/ml

Step 4: Prescribe dose

Step 5: Press OK and acknowledge reason for prescription

Step 6: Double check prescription and press FINISH NOW

3. To prescribe discharge medication for newly diagnosed patient with type 1 diabetes

Step 1: Search for one of 'Insulin, Diabetes, Paediatric Diabetes, Newly Diagnosed,' and tick 'Search order sets'

Step 2: Select either
Newly diagnosed diabetes under 1 year old
OR newly diagnosed 1 year and over

Step 3: Select 'Diabetic starter kit'.

Step 4: Press OK

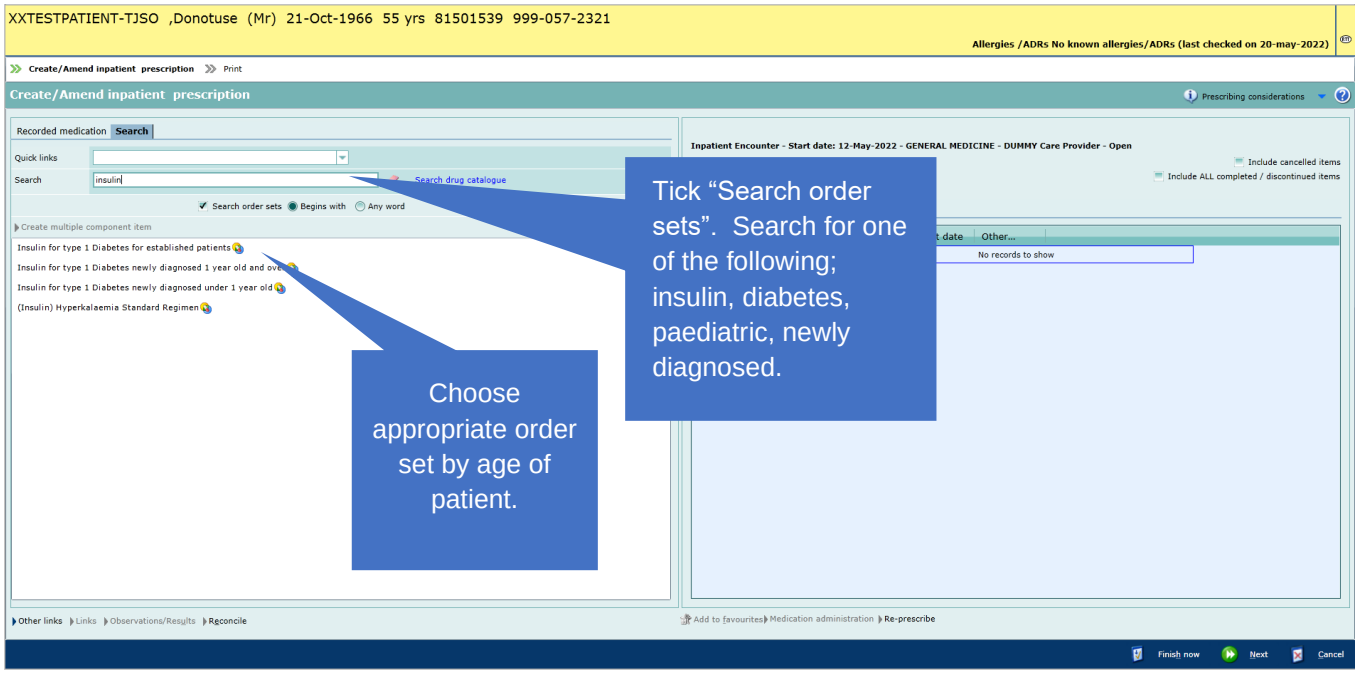
Step 5: Double check prescription and press FINISH NOW

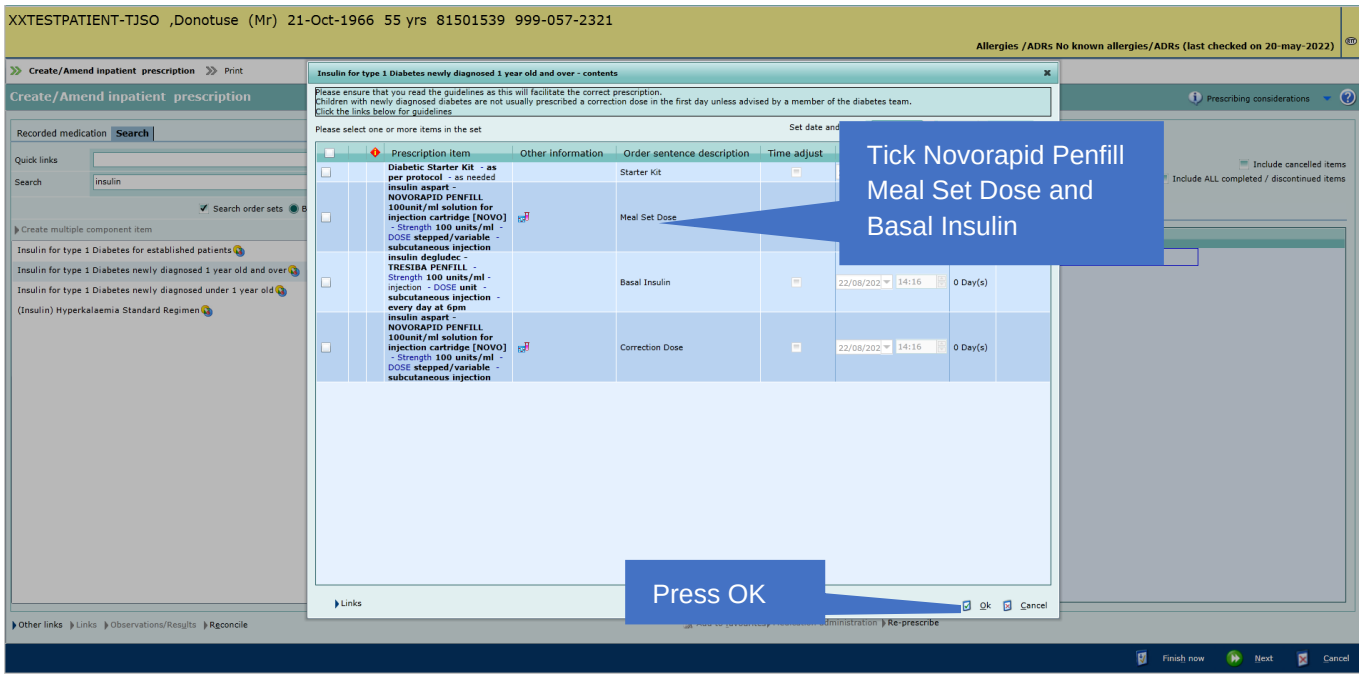
1. References (including any links to NICE Guidance etc.)

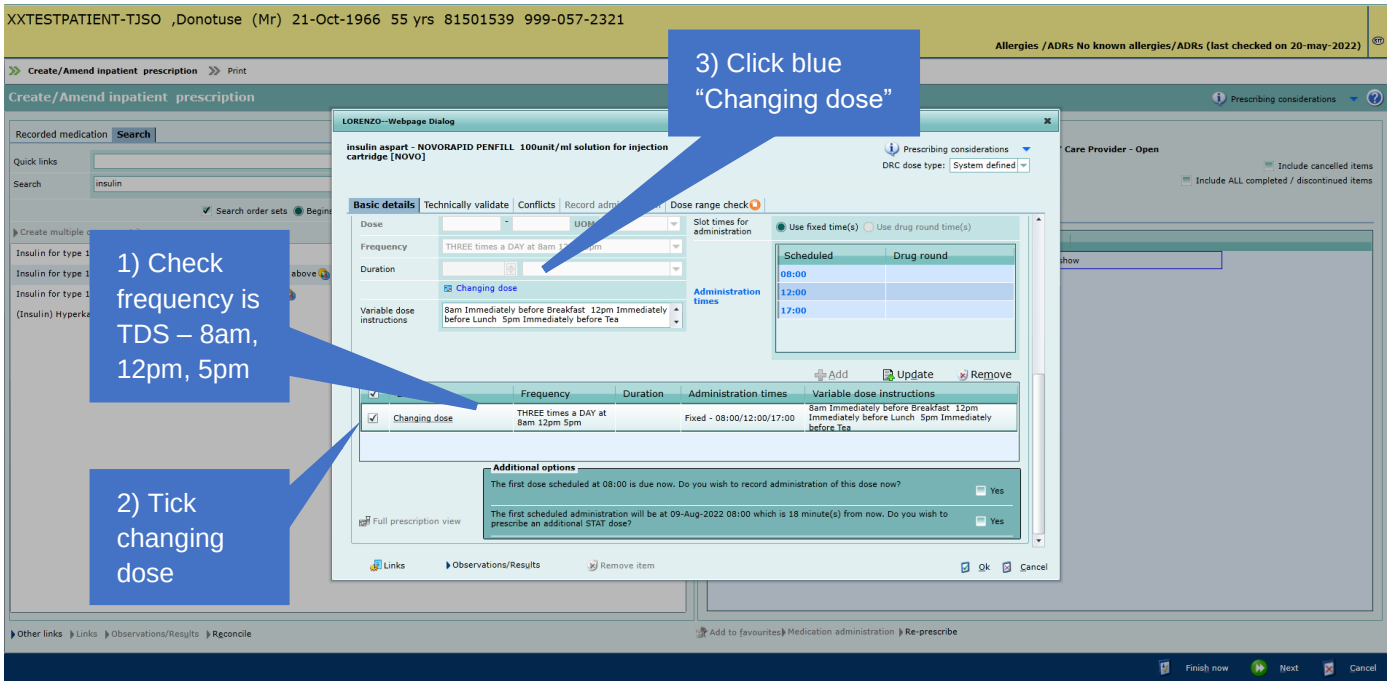
2. Documentation Controls

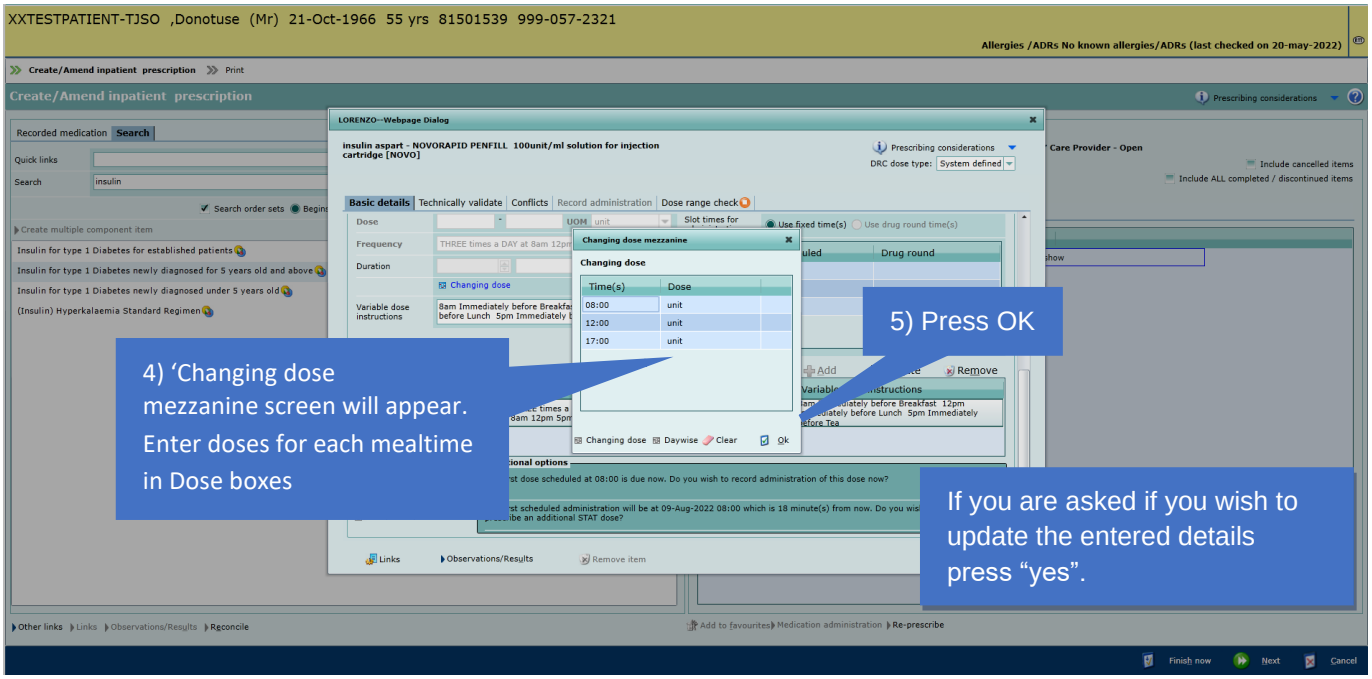
Development of Guideline:	Dr J Smith W Barber- Lead Children's Diabetes Dietitian (SP)
Guideline Updated 2022:	Dr K Kumar
Consultation with:	Paediatric diabetes team Paediatric pharmacist kevin Inglesant Anthony Johnson Project lead EPMA Mathew Elliot – Advanced Pharmacist
Approved By:	*Paediatric Business Unit Guidelines Group, Women and Children's Division.* *date*
Review Date:	May 2024
Key Contact:	Dr J Smith , Dr Kumar

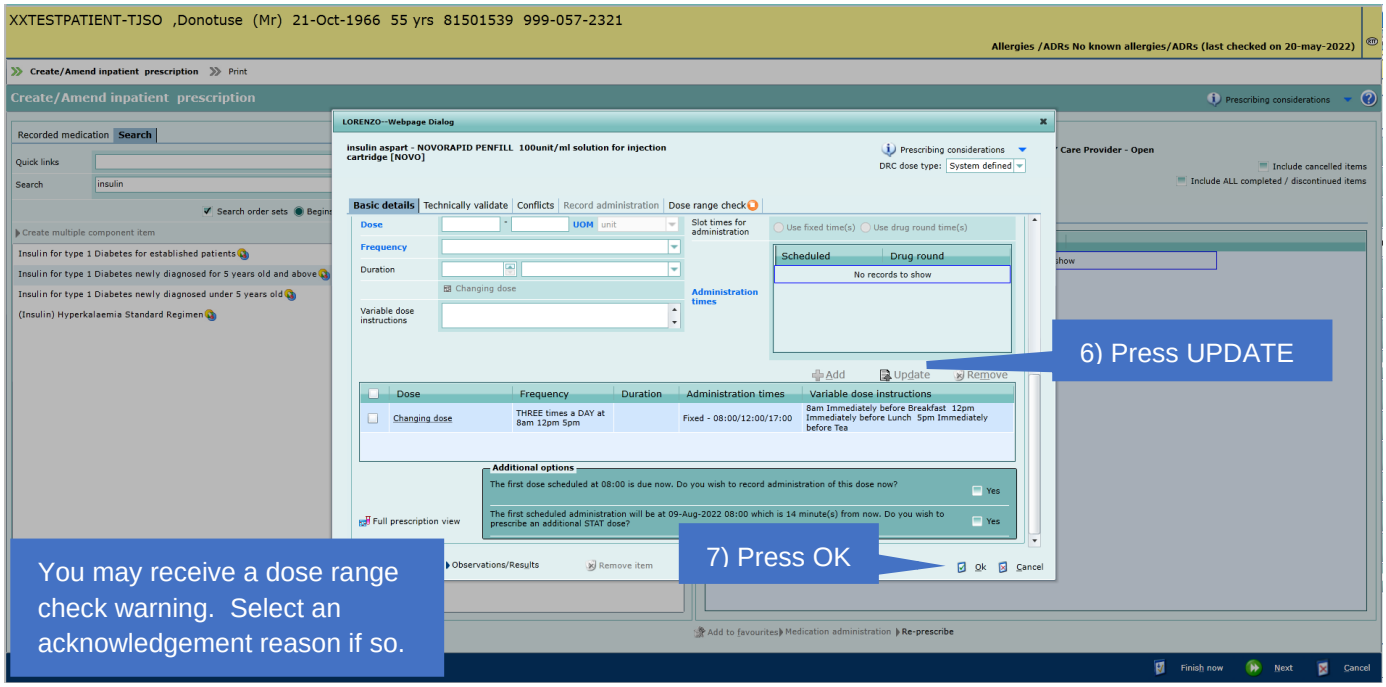
APPENDIX 1: Screenshots to aid prescribing Novorapid Set Dose and Long Acting Insulin

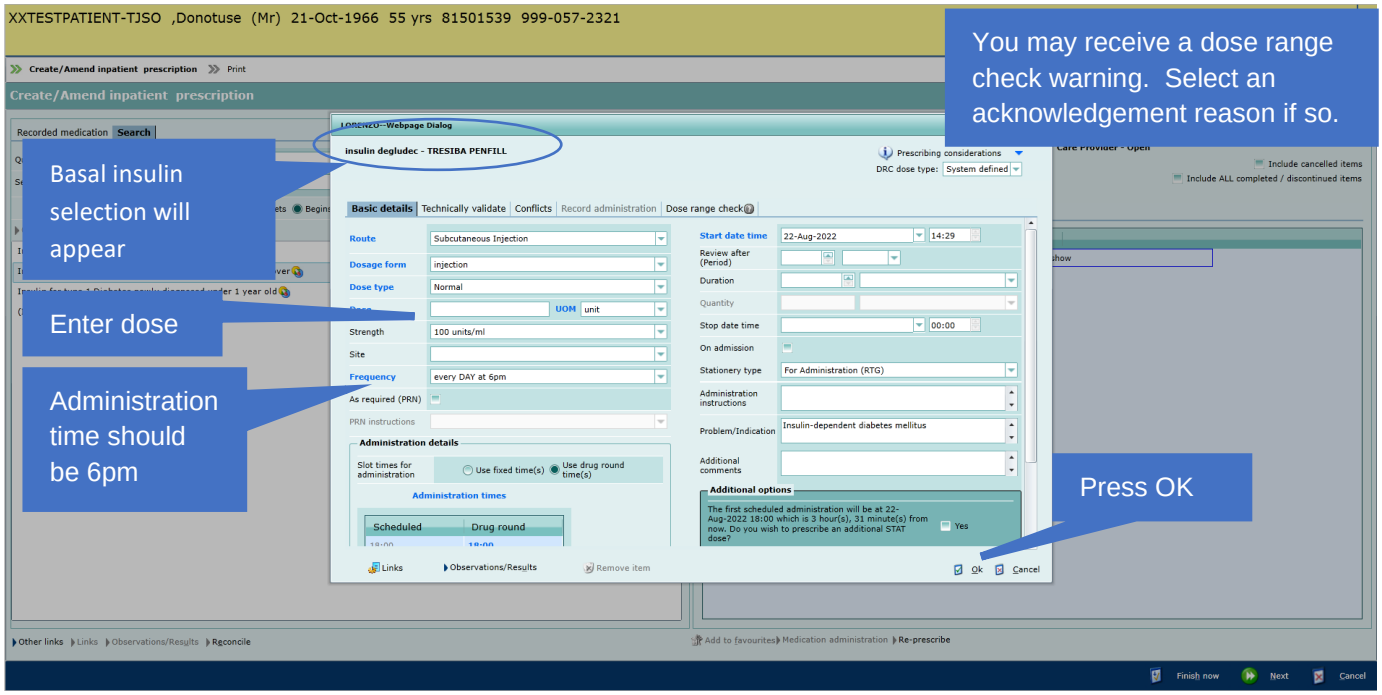


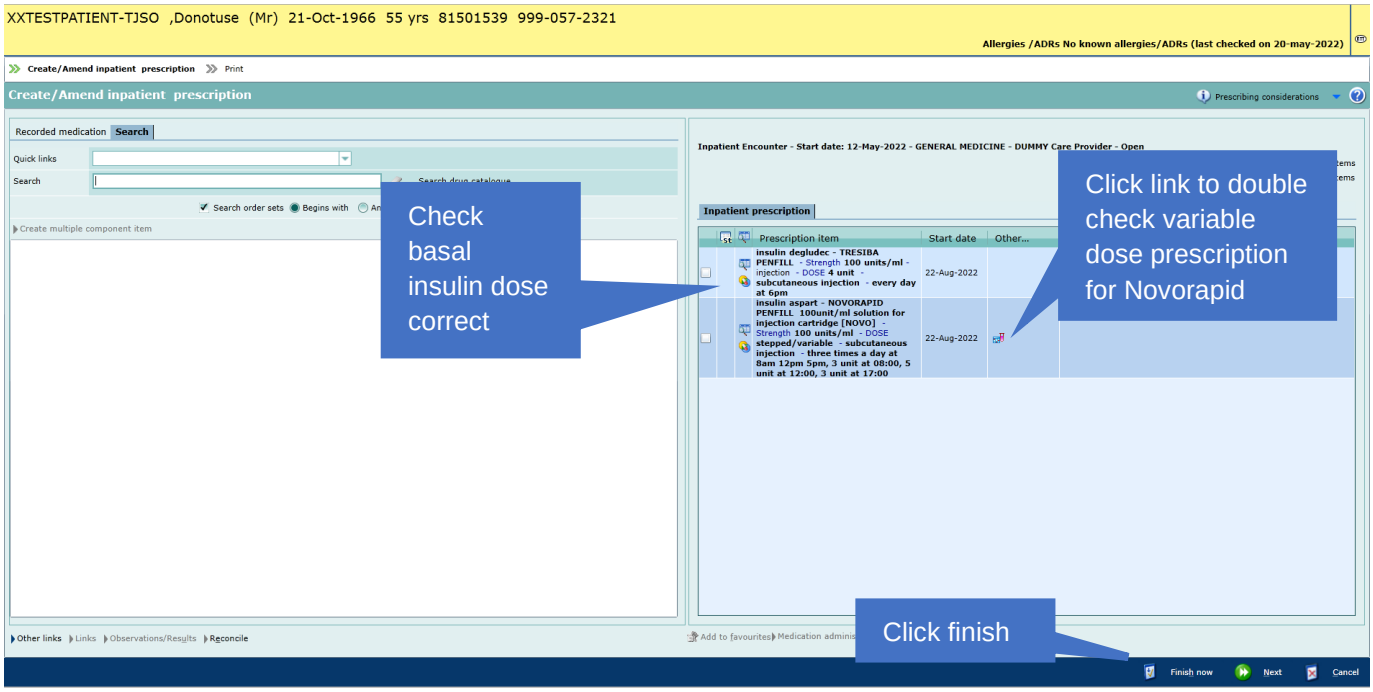



3) Click blue "Changing dose"
1) Check frequency is TDS – 8am, 12pm, 5pm
2) Tick changing dose

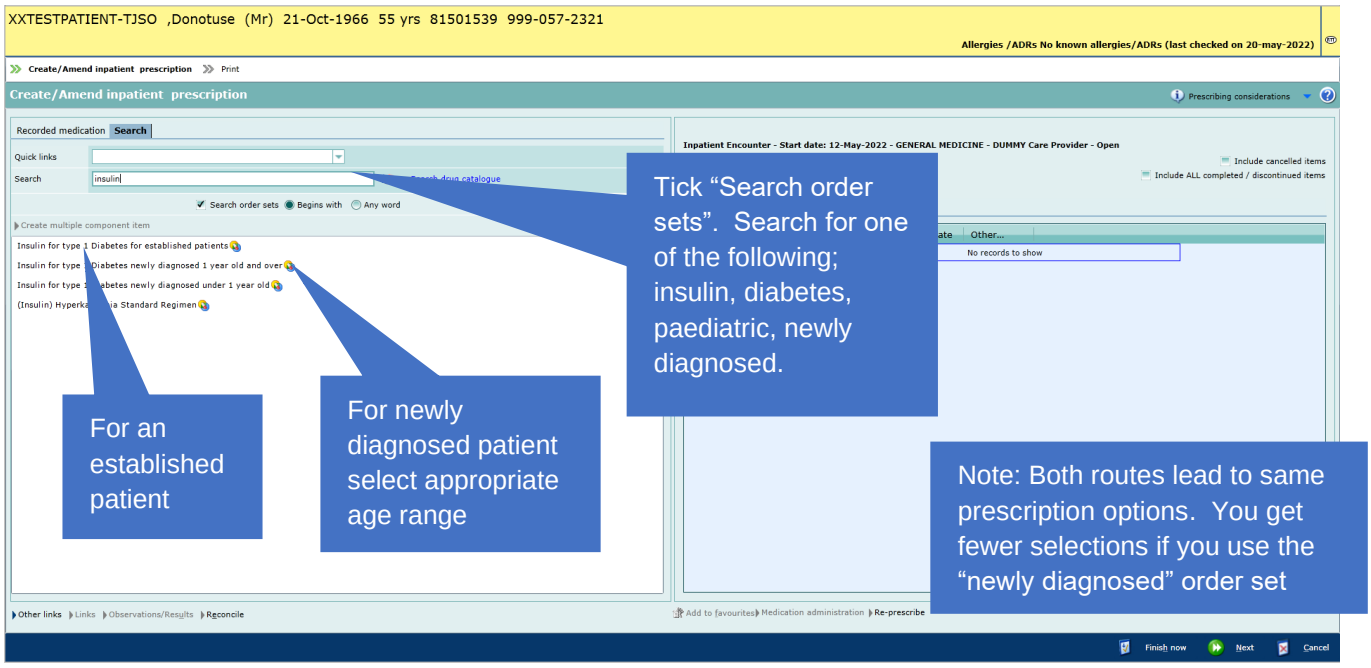

5) Press OK
4) 'Changing dose mezzanine screen will appear. Enter doses for each mealtime in Dose boxes
If you are asked if you wish to update the entered details press "yes".

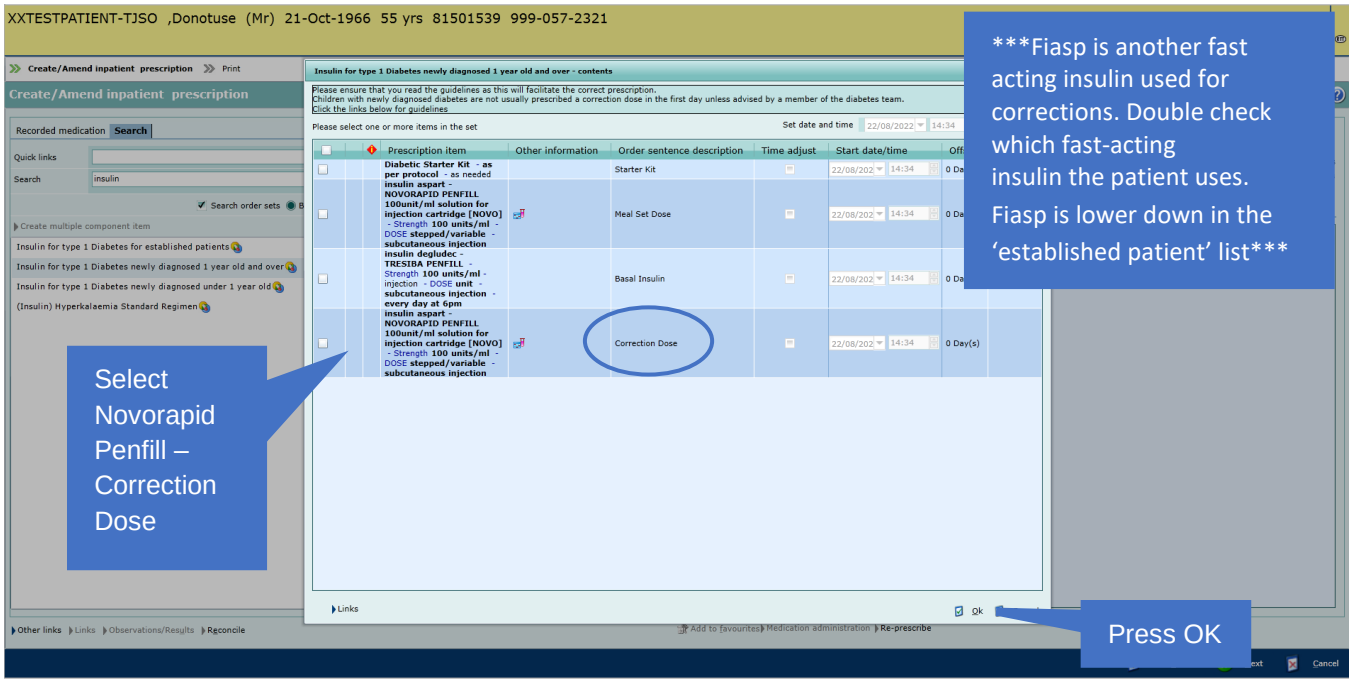

6) Press UPDATE
You may receive a dose range check warning. Select an acknowledgement reason if so.
7) Press OK

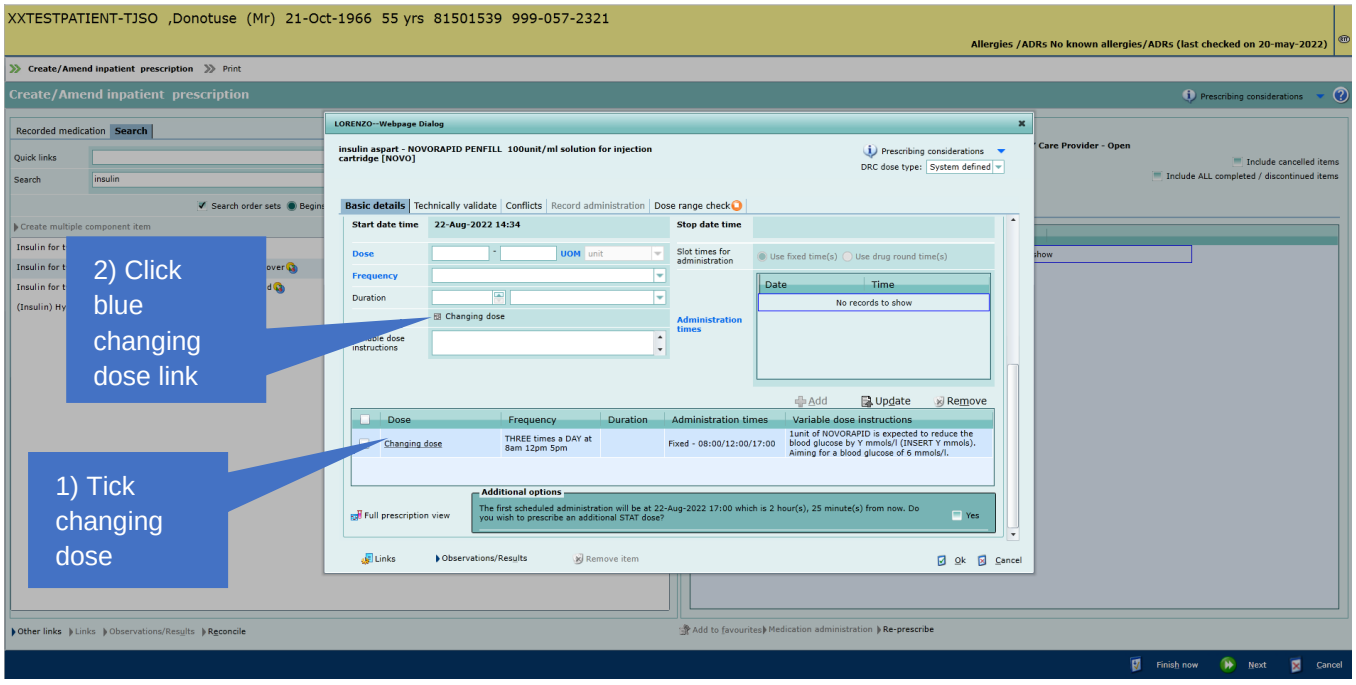

You may receive a dose range check warning. Select an acknowledgement reason if so.
Basal insulin selection will appear
Enter dose
Administration time should be 6pm
Press OK

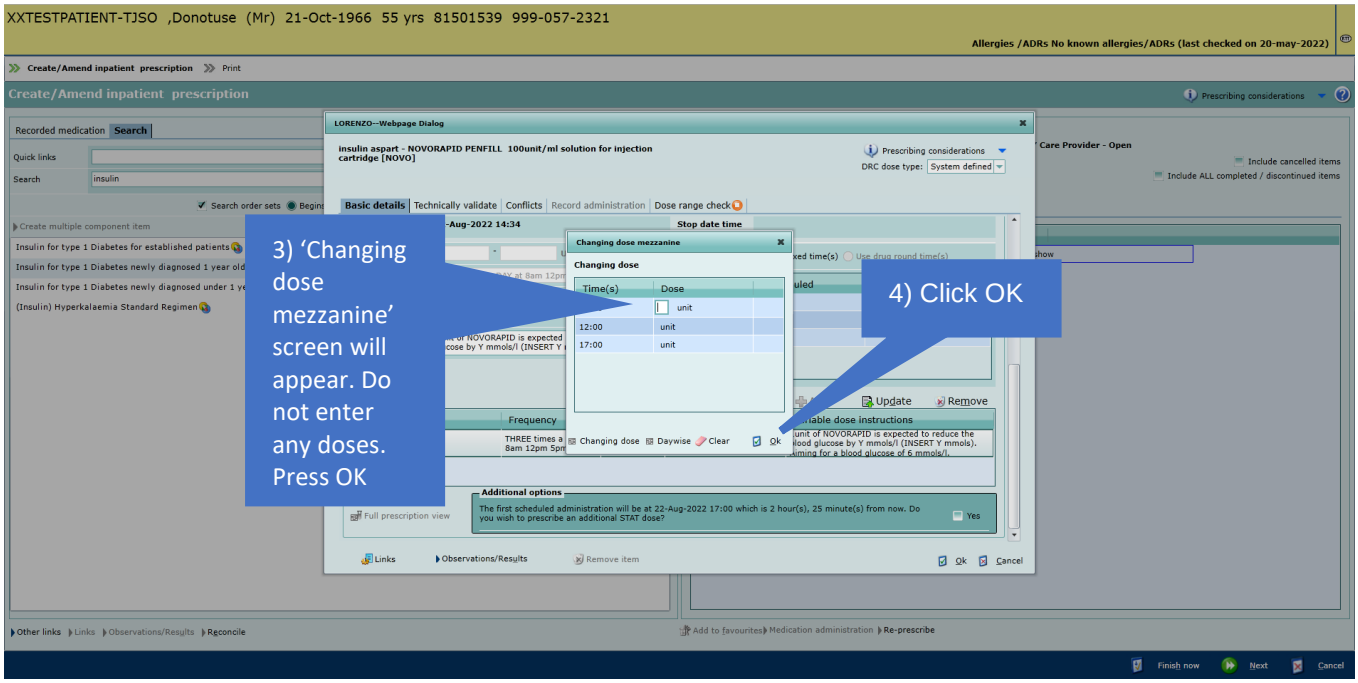


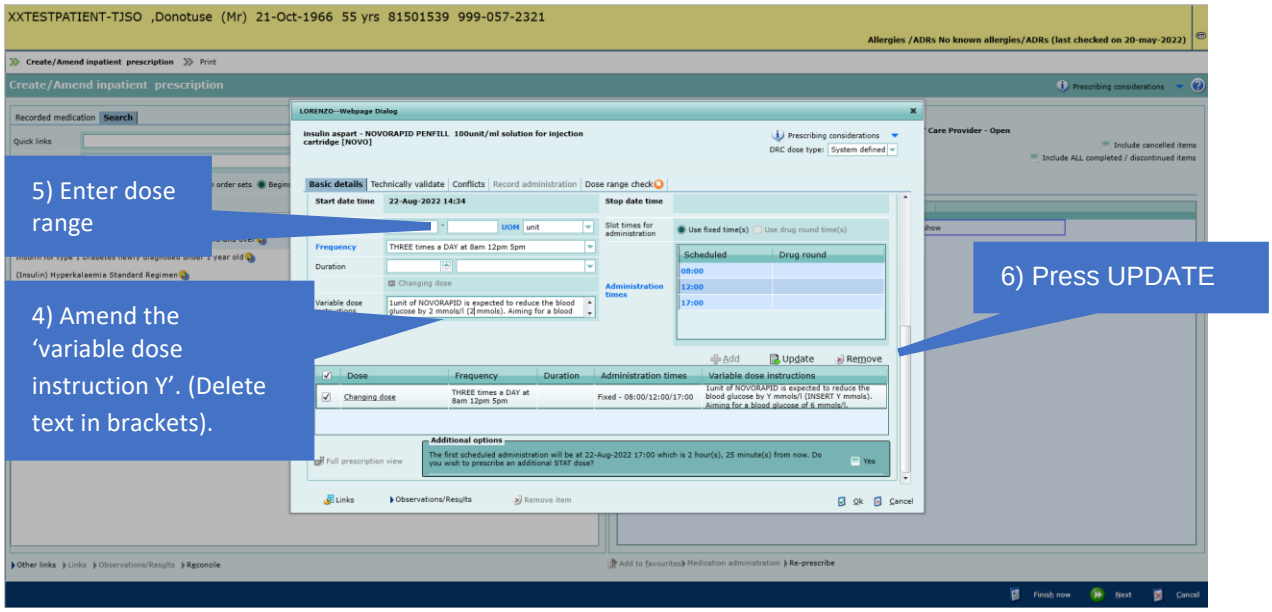
Appendix 2: Screenshots to aid prescribing Novorapid:correction dose with meals

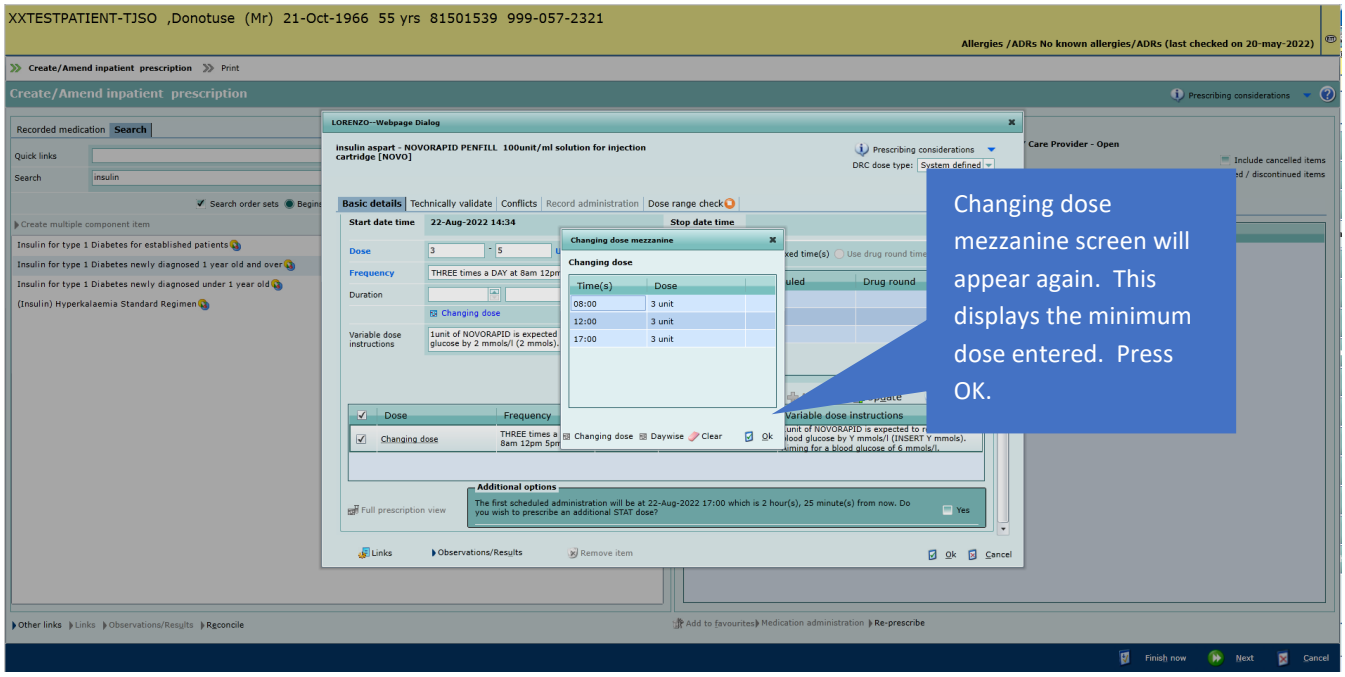


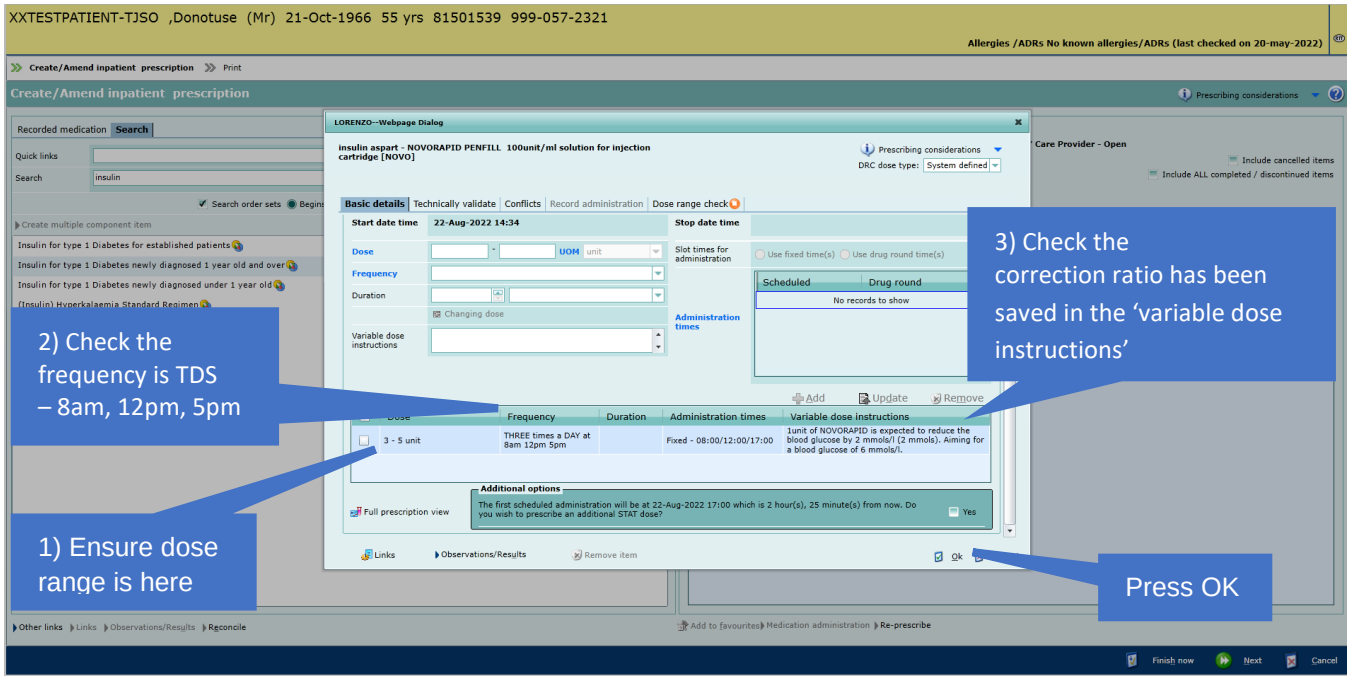

XXTESTPATIENT-TJSO ,Donotuse (Mr) 21-Oct-1966 55 yrs 81501539 999-057-2321
Fiasp is another fast acting insulin used for corrections. Double check which fast-acting insulin the patient uses. Fiasp is lower down in the 'established patient' list
Select Novorapid Penfill – Correction Dose
Press OK

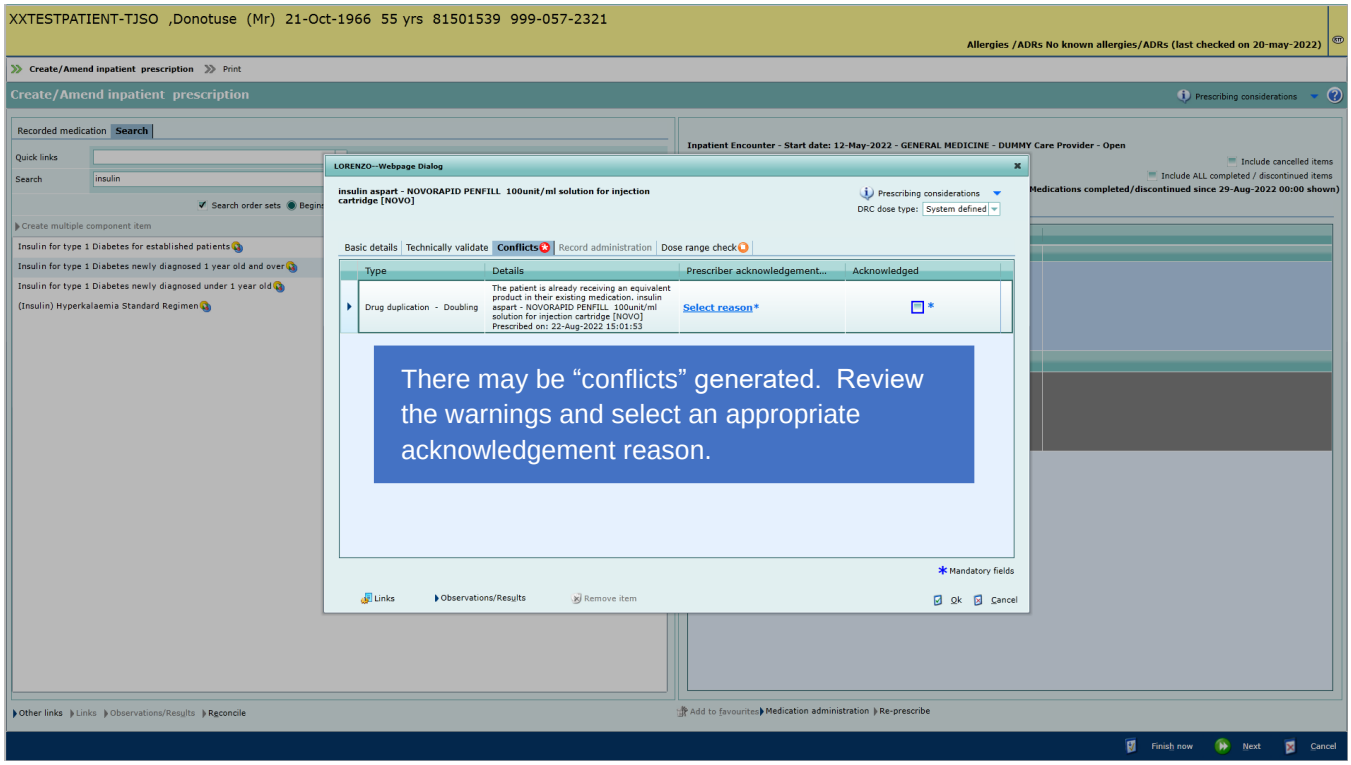

XXTESTPATIENT-TJSO ,Donotuse (Mr) 21-Oct-1966 55 yrs 81501539 999-057-2321
2) Click blue changing dose link
1) Tick changing dose

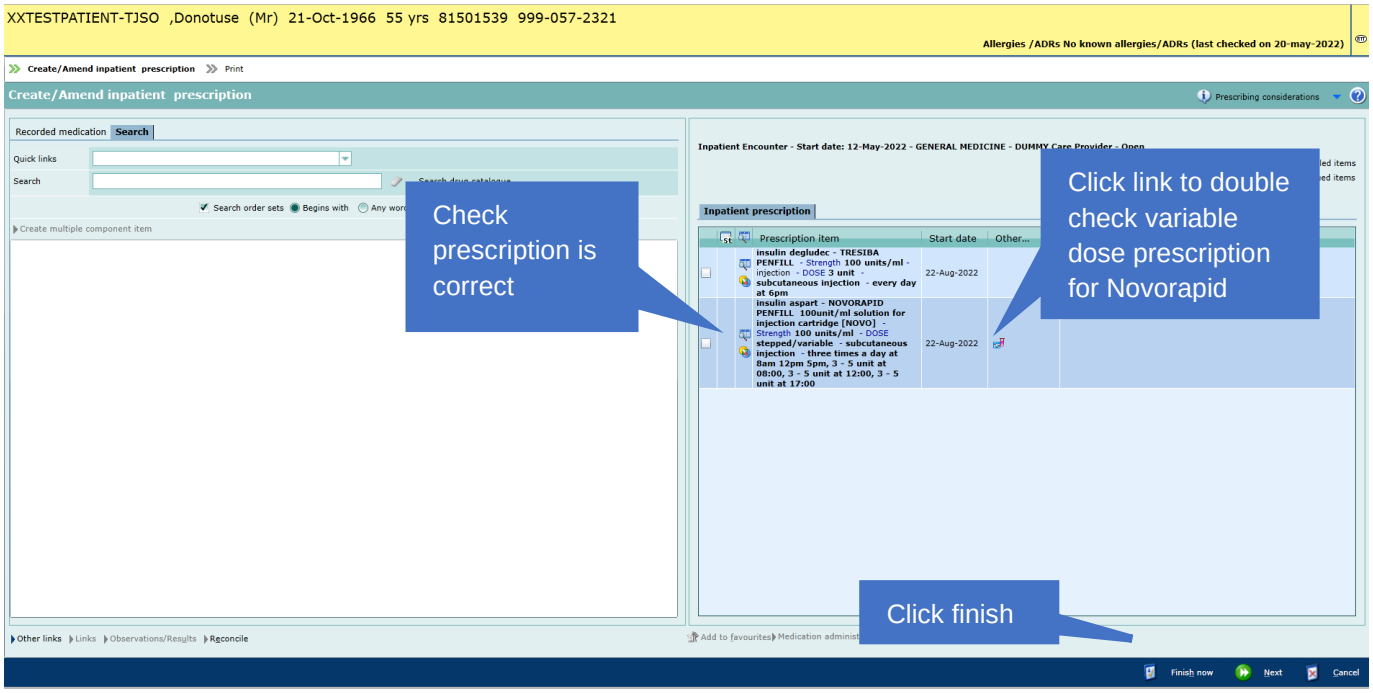

3) 'Changing dose mezzanine' screen will appear. Do not enter any doses. Press OK
4) Click OK


5) Enter dose range
4) Amend the 'variable dose instruction Y'. (Delete text in brackets).
6) Press UPDATE

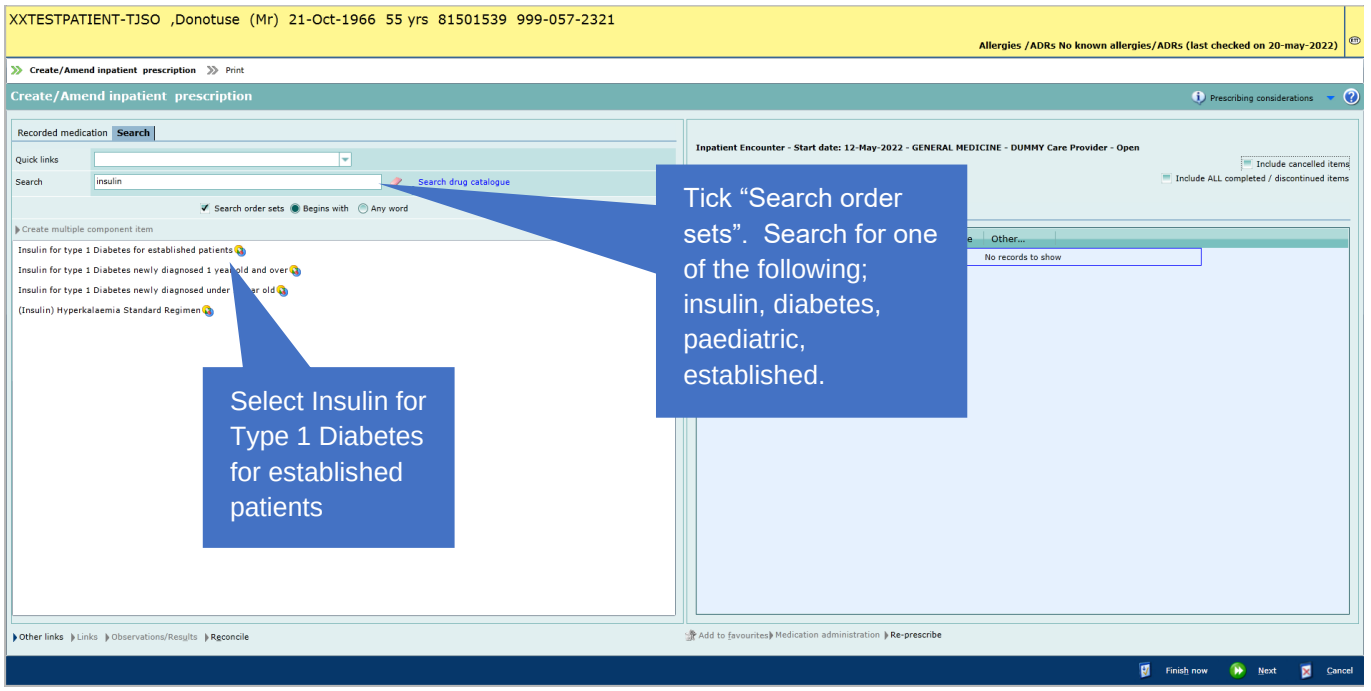

Changing dose mezzanine screen will appear again. This displays the minimum dose entered. Press OK.

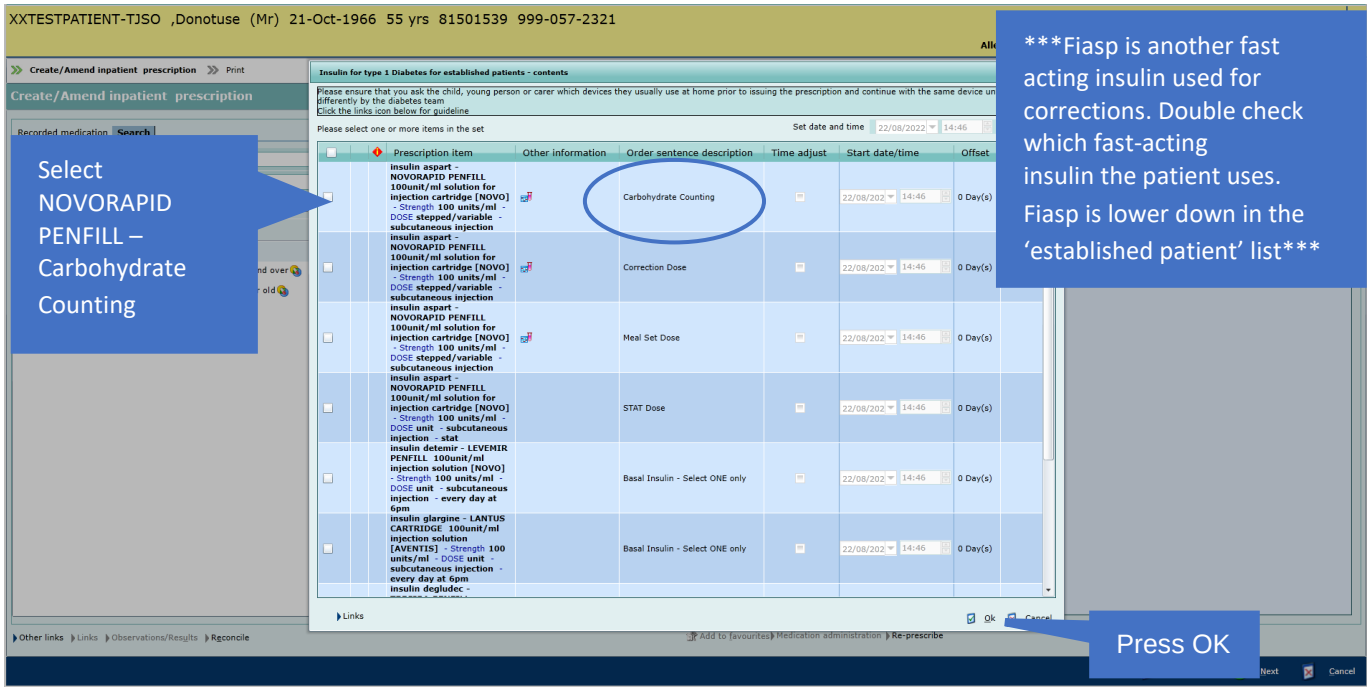

2) Check the frequency is TDS – 8am, 12pm, 5pm
3) Check the correction ratio has been saved in the 'variable dose instructions'
1) Ensure dose range is here
Press OK

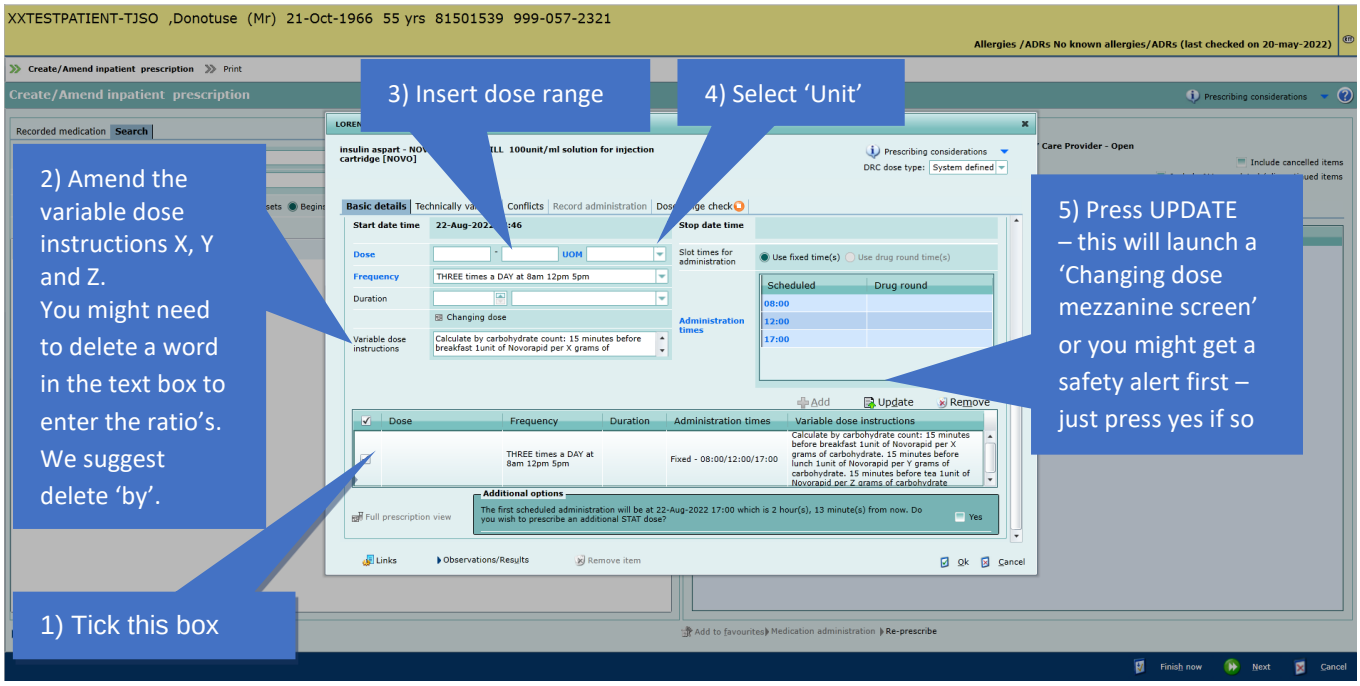

There may be “conflicts” generated. Review the warnings and select an appropriate acknowledgement reason.

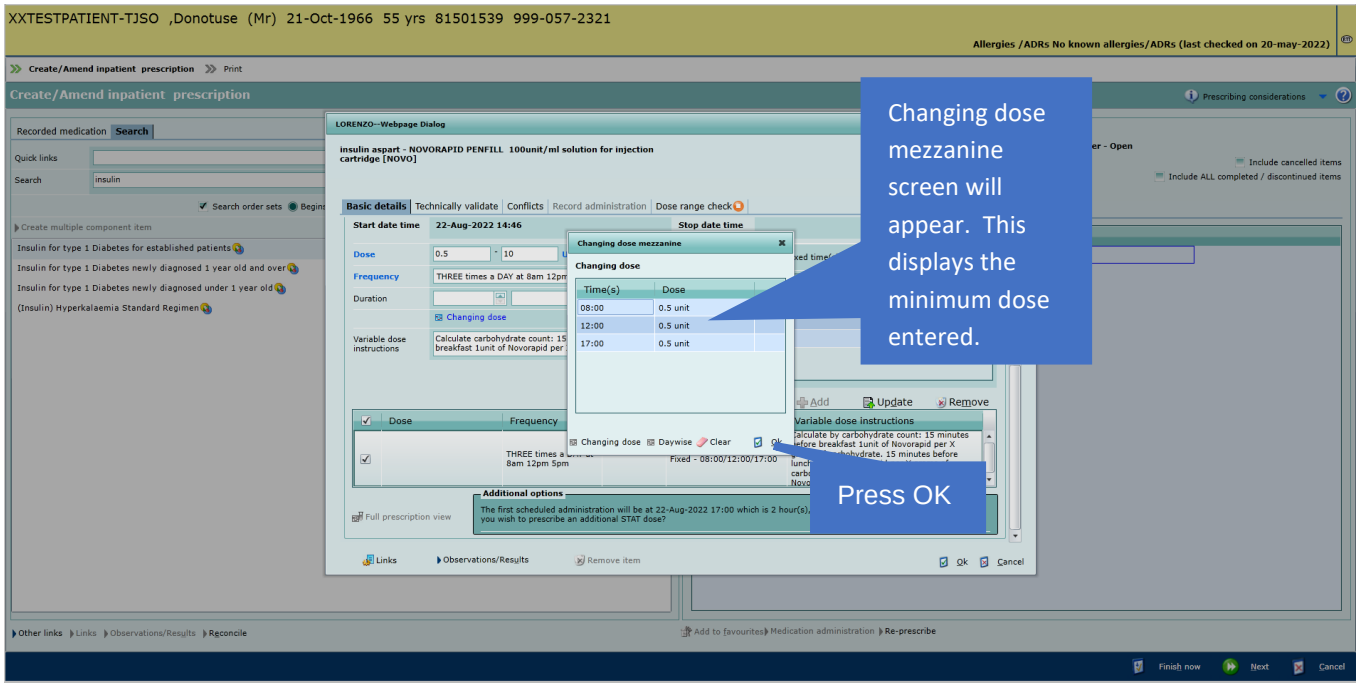

Check prescription is correct
Click link to double check variable dose prescription for Novorapid
Click finish

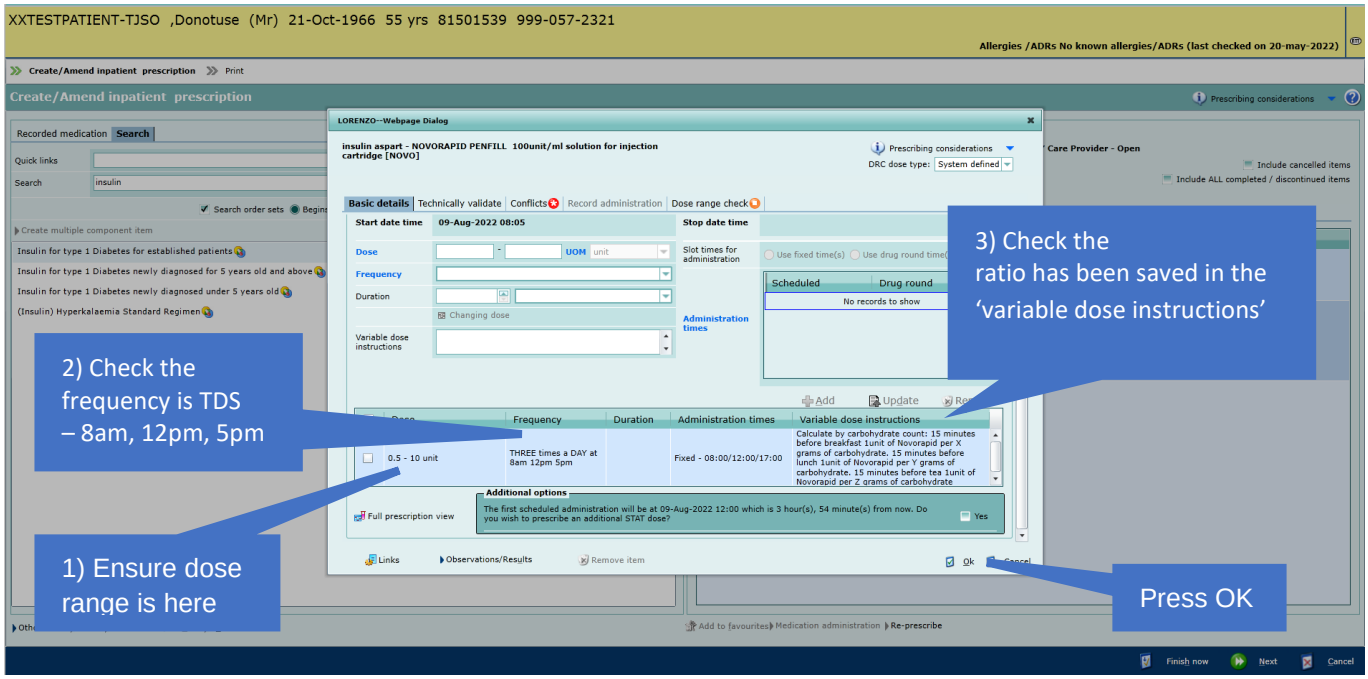
Appendix3: Screenshots to aid prescribing Novorapid for meals: dose to be calculated using carbohydrate counting

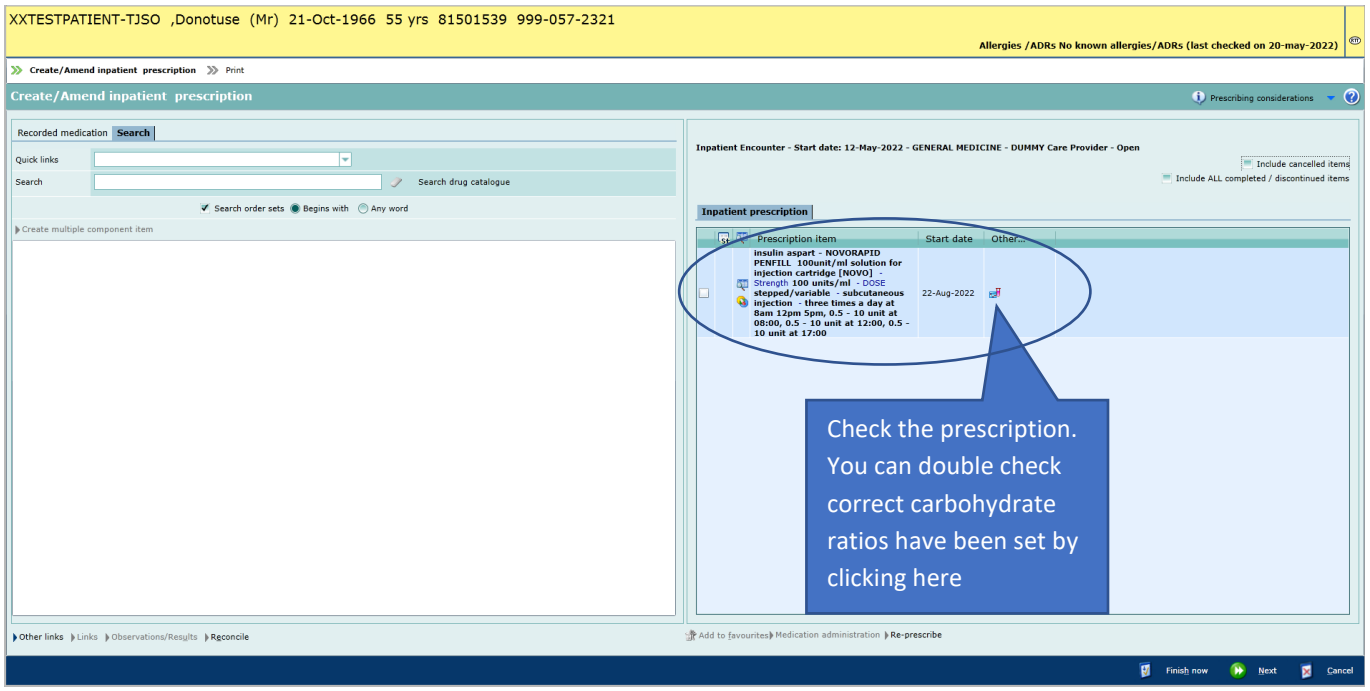


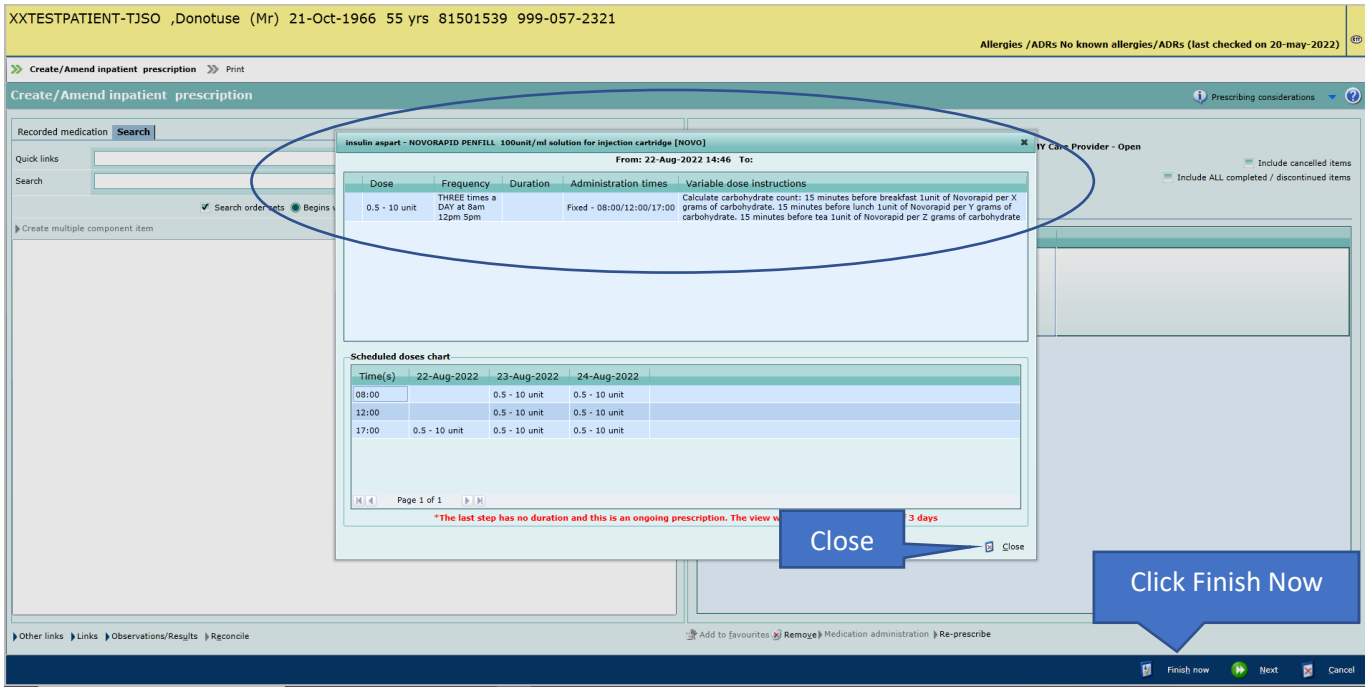



3) Insert dose range
4) Select 'Unit'
2) Amend the variable dose instructions X, Y and Z.
You might need to delete a word in the text box to enter the ratio's.
We suggest delete 'by'.
5) Press UPDATE – this will launch a 'Changing dose mezzanine screen' or you might get a safety alert first – just press yes if so
1) Tick this box

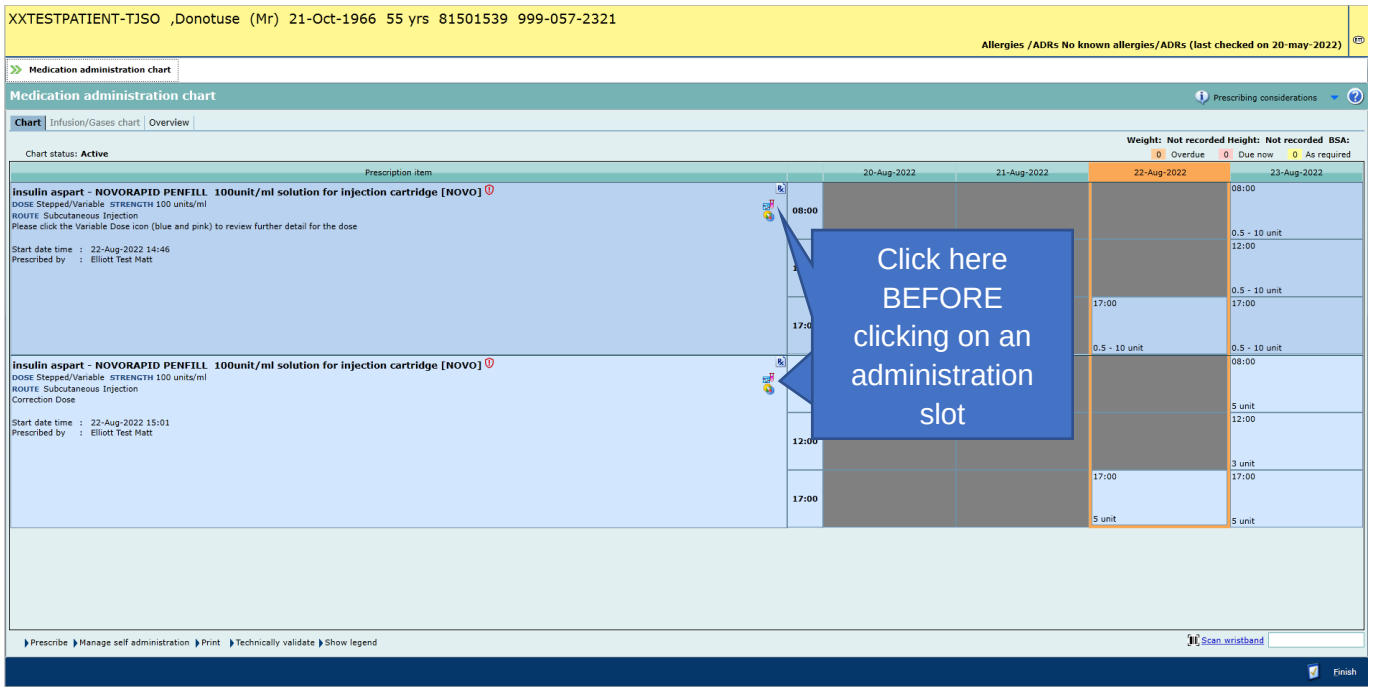

Changing dose mezzanine screen will appear. This displays the minimum dose entered.
Press OK

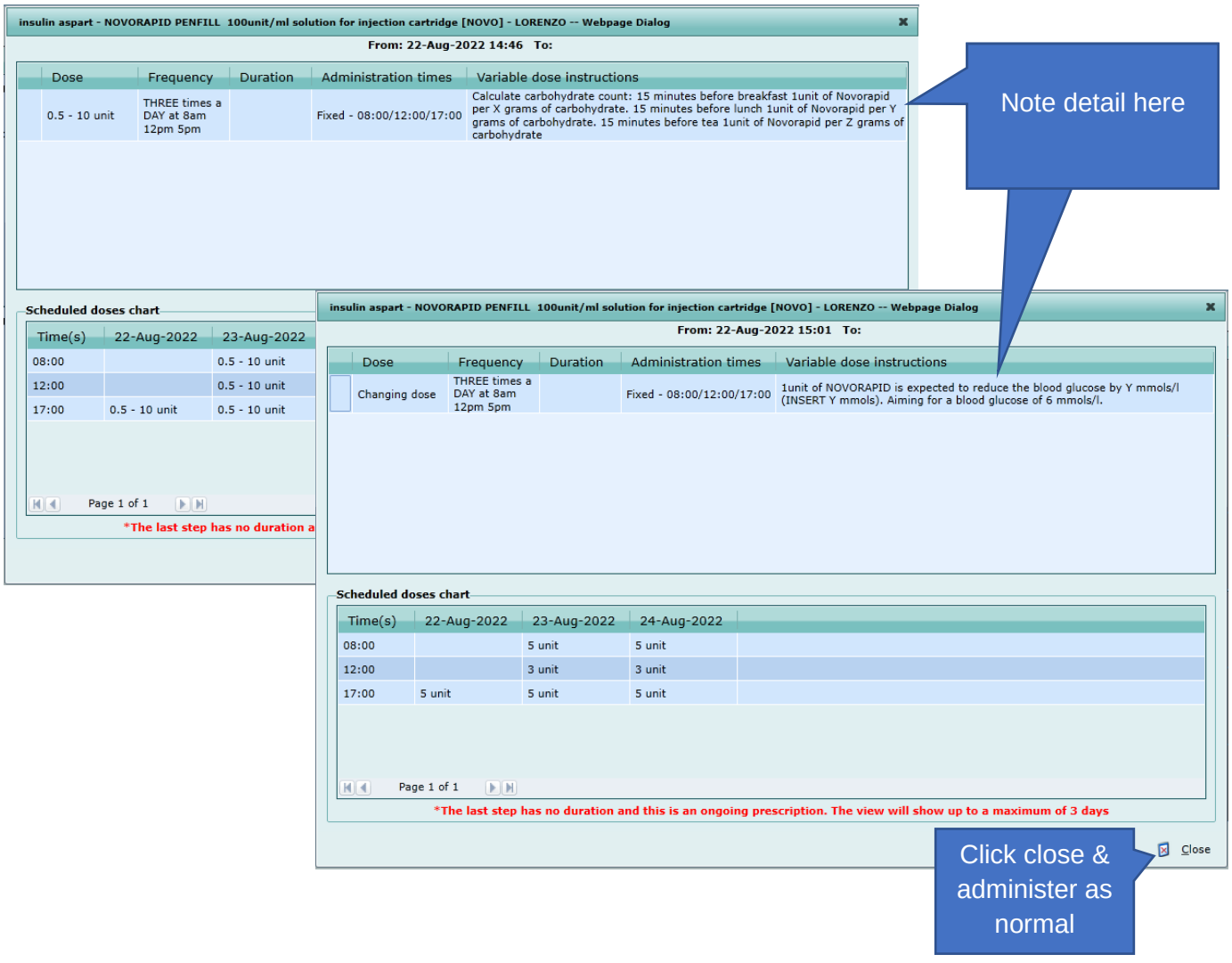

XXTESTPATIENT-TJSO ,Donotuse (Mr) 21-Oct-1966 55 yrs 81501539 999-057-2321
Allergies /ADRs No known allergies/ADRs (last checked on 20-may-2022)
Create/Amend inpatient prescription
Print
Create/Amend inpatient prescription
Prescribing considerations
LORENZO--Webpage Dialog
insulin aspart - NOVORAPID PENFILL 100unit/ml solution for injection cartridge [NOVO]
Basic details
Technically validate
Conflicts
Record administration
Dose range check
Start date time
09-Aug-2022 08:05
Stop date time
Dose
Frequency
Duration
Variable dose instructions
Administration times
Scheduled
Drug round
No records to show
Add
Update
Frequency
Duration
Administration times
Variable dose instructions
0.5 - 10 unit
THREE times a DAY at 8am 12pm 5pm
Fixed - 08:00/12:00/17:00
Calculate by carbohydrate count: 15 minutes before breakfast 1unit of Novorapid per X grams of carbohydrate. 15 minutes before lunch 1unit of Novorapid per Y grams of carbohydrate. 15 minutes before tea 1unit of Novorapid per Z grams of carbohydrate
Additional options
The first scheduled administration will be at 09-Aug-2022 12:00 which is 3 hour(s), 54 minute(s) from now. Do you wish to prescribe an additional STAT dose?
Yes
Full prescription view
Links
Observations/Results
Remove item
Ok
Cancel
Add to favourites
Medication administration
Re-prescribe
Finish now
Next
Cancel
2) Check the frequency is TDS – 8am, 12pm, 5pm
3) Check the ratio has been saved in the 'variable dose instructions'
1) Ensure dose range is here
Press OK


XXTESTPATIENT-TJSO ,Donotuse (Mr) 21-Oct-1966 55 yrs 81501539 999-057-2321
Allergies /ADRs No known allergies/ADRs (last checked on 20-may-2022)
Create/Amend inpatient prescription
Print
Create/Amend inpatient prescription
Prescribing considerations
Recorded medication
Search
Quick links
Search
Search drug catalogue
Search order sets
Begins with
Any word
Create multiple component item
Inpatient Encounter - Start date: 12-May-2022 - GENERAL MEDICINE - DUMMY Care Provider - Open
Include cancelled items
Include ALL completed / discontinued items
Inpatient prescription
Prescription item
Start date
Other...
insulin aspart - NOVORAPID PENFILL 100unit/ml solution for injection cartridge [NOVO] - Strength 100 units/ml - DOSE stepped/variable - subcutaneous injection - three times a day at 8am 12pm 5pm, 0.5 - 10 unit at 08:00, 0.5 - 10 unit at 12:00, 0.5 - 10 unit at 17:00
22-Aug-2022
Other links
Links
Observations/Results
Reconcile
Add to favourites
Medication administration
Re-prescribe
Finish now
Next
Cancel
Check the prescription. You can double check correct carbohydrate ratios have been set by clicking here


XXTESTPATIENT-TJSO ,Donotuse (Mr) 21-Oct-1966 55 yrs 81501539 999-057-2321
Allergies /ADRs No known allergies/ADRs (last checked on 20-may-2022)
Create/Amend inpatient prescription
Print
Create/Amend inpatient prescription
Prescribing considerations
Recorded medication
Search
Quick links
Search
Include cancelled items
Include ALL completed / discontinued items
Create multiple component item
insulin aspart - NOVORAPID PENFILL 100unit/ml solution for injection cartridge [NOVO]
From: 22-Aug-2022 14:46 To:
Dose
Frequency
Duration
Administration times
Variable dose instructions
0.5 - 10 unit
THREE times a DAY at 8am 12pm 5pm
Fixed - 08:00/12:00/17:00
Calculate carbohydrate count: 15 minutes before breakfast 1unit of Novorapid per X grams of carbohydrate. 15 minutes before lunch 1unit of Novorapid per Y grams of carbohydrate. 15 minutes before tea 1unit of Novorapid per Z grams of carbohydrate
Scheduled doses chart
Time(s)
22-Aug-2022
23-Aug-2022
24-Aug-2022
08:00
0.5 - 10 unit
0.5 - 10 unit
12:00
0.5 - 10 unit
0.5 - 10 unit
17:00
0.5 - 10 unit
0.5 - 10 unit
0.5 - 10 unit
Page 1 of 1
*The last step has no duration and this is an ongoing prescription. The view w
3 days
Close
Close
Click Finish Now
Other links
Links
Observations/Results
Reconcile
Add to favourites
Remove
Medication administration
Re-prescribe
Finish now
Next
Cancel

Appendix 4: How Do I know Which Item is Which





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