

Medicines Regulation and Quality Fact Sheet

Safety Brief: U-500 insulin

Issue 6, October 2013

Purpose

To provide clinicians with advice on the safe management of patients admitted to hospital on high concentration insulin (500 units/mL).

Background

High concentration insulin (500 units/mL; trade name Humulin R U-500) is five times the strength of all other insulin products available in Australia (e.g. Lantus, Novorapid and Actrapid are all insulin products at a concentration of 100 units/mL). It is only available via the Special Access Scheme and is occasionally prescribed for patients who have extreme insulin resistance and require more than 200 units of insulin each day.

Issues

When the patient is self administering their own insulin at home, there are usually no problems, however, when admission to hospital occurs, the lack of staff familiarity with U-500 insulin can result in administration errors.

In Australia, actual and near miss incidents have been reported where inpatients have received incorrect doses of U-500 insulin (underdoses and overdoses) as a result of incorrect calculation of the volume that is required to be administered.

Recommendations

- Ensure clinical staff are aware of the availability of U-500 insulin and its difference to 100 unit/mL insulin.
- Ensure that the order is clearly documented:
 - Use the Special Instructions area on the *Insulin Subcutaneous Order and Blood Glucose Record* form to note that the patient uses U-500 insulin.
 - Ask prescribers to order the dose as 'X unit marks = XX units of insulin' (see example).

Special Instructions: PT IS ON U-500 INSULIN 1 UNIT MARK = 5 UNITS INSULIN 30 UNIT MARKS = 150 UNITS INSULIN		Ketones Hypo Intervention Dr Notified	
If supplemental insulin ordered for the same time as routine insulin, administer together		Administration Record Insulin type: HUMULIN R U-500 Insulin type: Insulin type:	
If for any reason insulin cannot be administered as ordered, notify Dr, enter code @ for withheld and document in clinical record		Time Given: Nurse 1 Initial Nurse 2 check Comments	
Diabetes treatment prior to admission: HUMULIN R U-500		30 30 30 UNIT MARKS	
Routine Insulin Orders must be ordered for each day		Supplemental Insulin Order	
Contact Dr if expected dose not ordered. Date: 28/5 29/5 30/5 31/5 1/6		Supplemental insulin is NOT routine. Sliding scale insulin alone is NOT. Remember: Adjust routine insulin if unsure, seek advice.	
Meal / time: Type of insulin: Prescriber Signature: Print your name:		Frequency: <input type="checkbox"/> With meals only <input type="checkbox"/> 6 hourly <input type="checkbox"/> Other (specify):	
Meal / time: Breakfast Type of insulin: HUMULIN R U-500 Prescriber Signature: J. SMITH		30 30 30 30 30 UNIT MARKS	
Meal / time: Lunch Type of insulin: HUMULIN R U-500 Prescriber Signature: J. SMITH		30 30 30 30 30 UNIT MARKS	
Meal / time: Dinner Type of insulin: HUMULIN R U-500 Prescriber Signature: J. SMITH		30 30 30 30 30 UNIT MARKS	
Meal / time: Pre-Bed Type of insulin: Prescriber Signature:		If the BGL (mmol/L) is: 8.1 - 12 or 12.1 - 16 or 16.1 - 20 or	

- Place a 'Patient Safety Alert' on the front of the notes. This may include the following wording:

*'This patient is using Humulin R U-500 Insulin (500 units/mL).
This insulin is FIVE TIMES the strength of normal U -100 insulin (100 units/mL)
Please prescribe as "UNIT MARKS" rather than units'*

Administer with a normal insulin syringe
e.g. Dose of 150 units= 150/5= 30 UNIT MARKS on an insulin syringe'

- Pharmacists can use the comments section in iPharmacy to note that the patient uses U-500 insulin.
- Doctors, nurses and pharmacists should confirm the type and strength of insulin with patients.
- Ask patient to tell the doctors, nurses and pharmacists that he/she is using U-500 insulin when admitted.
- Utilise the clinical handover process and documentation to communicate that the patient is receiving U-500 insulin.
- Get your hospital's experts involved – endocrinologists and physicians, pharmacists, diabetes nurse educators and nurse educators.

The following conversion chart shows the units and measurements required when using U-500 insulin with a conventional U-100 insulin syringe

Dose conversion table for Humulin R U-500 Insulin dose 5 units Humulin R U-500 =1 unit mark on a U-100 insulin syringe			
Humulin R U-500 dose (units)	U-100 insulin syringe (unit markings)	Humulin R U-500 dose (units)	U-100 insulin syringe (unit markings)
5	1	250	50
10	2	275	55
25	5	300	60
50	10	325	65
75	15	350	70
100	20	375	75
125	25	400	80
150	30	425	85
175	35	450	90
200	40	475	95
225	45	500	100

Use a U-100 insulin syringe
Divide prescribed dose (actual units) by 5 to determine the number of unit markings on a U-100 insulin syringe

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