

Insulin Concentration

Higher concentrations of insulin are available to:

- deliver larger doses of insulin with less volume (in milliliters).
- decrease the number of injections needed at one time when patients require high doses of insulin (e.g. doses > 100 units).

Concentrated insulins contain more units in each milliliter.

	U-100	U-200	U-300	U-500
0.1 ml	10 units	20 units	30 units	50 units

This means you use less volume for the same number of units.

	U-100	U-200	U-300	U-500
50 units	0.5 ml	0.25 ml	0.167 ml	0.1 ml

Remember: Insulin is dosed in units. If a different concentration is used, the units will remain the same but the volume will change.

Converting to different concentrations of insulin

When switching to a more or less concentrated insulin, you can often continue the same number of units of insulin. There are some exceptions noted in the table below:

Current Insulin	New insulin	Conversion
U-100 (Any)	U-200 (Any)	Same total daily dose
U-200 (Any)	U-100 (Any)	Same total daily dose
U-100 (Any except NPH BID)	Glargine U-300	Same total daily dose May need to increase dose of Glargine U-300 by 10-15% after switching from Glargine U-100 to maintain control
U-100 NPH BID	Glargine U-300	Reduce total daily dose by 20%
Glargine U-300	Glargine U-100	Reduce total daily dose by 20%

Any insulin U-500 Regular

Calculate total daily dose (in units) from all insulin products combined (replaces both bolus and basal insulin)

Use this total daily dose if A1c > 8%

Decrease total daily dose by 10-20% if A1c ≤ 8%

U-500 is dosed BID or TID 30 min before meals.

Consider initial dosing ratios of 60:40 for BID (AM & PM) and 40:30:30 for TID (AM, Noon, PM)

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Concentrated Insulin Products

All concentrated insulins are available in pen form. The pens are calibrated in units to deliver the correct volume of insulin for a specific dose.

Maximum dose per injection:

U-100 Insulin vial (any product)	100 units
U-100 Lispro (Humalog U-100 KwikPen)	60 units
U-100 Aspart (Novolog FlexPen)	60 units
U-100 Aspart (Fiasp FlexPen)	80 units
U-100 Glulisine (Apidra SoloSTAR Pen)	80 units
U-100 Detemir (Levemir FlexPen)	80 units
U-100 Glargine (Lantus SoloStar Pen)	80 units
U-100 Degludec (Tresiba Pen)	80 units
U-200 Degludec (Tresiba Pen)	160 units
U-200 Lispro (Humalog U-200 KwikPen)	60 units
U-300 Glargine (Trujeso SoloSTAR Pen)	80 units
U-300 Glargine (Toujeo Max SoloSTAR Pen)	160 units
U-500 Regular (Humulin R U-500) vial	250 units
U-500 Regular (Humulin R U-500 KwikPen)	300 units

U-500 Regular is available in both a pen and a vial.

If using the vial, patients should use the U-500 syringe only (specially calibrated to deliver the correct dose).

! Safety Caveats:

- Inform and educate patients about their insulin and insulin regimen, especially if there are changes to the type of insulin used.
- It is important to note that the higher concentration insulins may have very similar generic and/or trade names to insulins that have a U-100 concentration.
- Never withdraw insulin from pens for use in syringes. This may result in an incorrect dose.
- Must use U-500 syringe only with U-500 vial.