



How much insulin needs to be prescribed per month?

It is difficult to determine how much insulin will be required for an individual at insulin initiation. Typically, insulin will be commenced at a modest starting dose of around 10 units/day and the dose uptitrated over several weeks until the target blood glucose levels are achieved. With support, many individuals are able to self-titrate according to their home blood glucose monitoring results. Insulin requirements will usually increase in the weeks following initiation.

For those individuals who adjust the amount of insulin they administer according to what they eat or their varying activity levels, it can be more difficult to predict how much insulin will be needed each month.

Table 1 (overleaf) is a guide for prescribers to help calculate how much insulin to prescribe each month **for people whose glycaemic control has stabilised**. Note, however, that it should not override the individual prescriber's own clinical judgement, and regular review of medication and dose is essential.

Most insulin cartridges and pre-filled pens hold 300 units of insulin in 3 mL (i.e. an insulin concentration of 100 units/mL), and five cartridges or pre-filled pens are supplied in one box. However, a higher concentration of insulin glargine, called Toujeo®, is now available containing 300 units/mL. This insulin is only available in a SoloSTAR® pen, which is prefilled with 450 units of insulin in 1.5 mL, with three pens supplied per box.

Priming the insulin pen (performing an “air shot”)

Insulin pens should be primed (observing at least a drop of insulin at the needle's tip) according to the manufacturer's instructions* before each injection to ensure there is unobstructed flow and to clear needle dead space (Forum for Injection Technique, 2016).

How to perform an “air shot”

- Turn the dose selector to 2 units
- Hold the pen with the needle pointing up and tap the pen gently a few times, which will move any air bubbles to the top
- Fully depress the delivery push button. A drop of insulin should appear at the tip of the needle. If a droplet is not seen, repeat the priming process
- Small air bubbles are normal and will not affect the dose

*Most manufacturers recommend performing a 2-unit “air shot”; however, for Toujeo, the manufacturer recommends turning the dose selector until the dose pointer is at the mark between 2 and 4 (i.e. 3 units).

Pen needles



DON'T FORGET: Pen needles are not supplied with the cartridges or pens and need to be prescribed separately.

- A 4-mm pen needle inserted perpendicularly (at 90 degrees) is long enough to penetrate the skin and enter the subcutaneous tissue with little risk of intramuscular (or intradermal) injection. This is the safest option for adults and children regardless of age, gender and BMI (Forum for Injection Technique, 2016)
- Assessment of injection technique and examination of injection sites should be part of a regular face-to-face review
- For the latest guidance on injection technique, refer to the 4th edition of *The UK Injection and Infusion Technique Recommendations* (Forum for Injection Technique, 2016)



About this series

The aim of the “How to” series is to provide readers with a guide to clinical procedures and aspects of diabetes care that are covered in the clinic setting.

What and why

People requiring insulin therapy should be discouraged from over-ordering and stockpiling insulin in their fridge.

The shelf-life of most unopened insulin vials, cartridges and pre-filled pens is 3 years but there may be a delay from date of manufacture to the date the insulin is dispensed. Therefore, users **MUST ALWAYS** check the expiry date on each preparation before use.



Once opened, or after first use, any insulin remaining in a vial, cartridge or prefilled pen should be discarded after 28 days.

Reference

Forum for Injection Technique (2016) *The UK Injection and Infusion Technique Recommendations* (4th edition). Available at: www.fit4diabetes.com



INSULIN IS A HIGH-RISK MEDICATION!

Many insulins have very similar sounding names but completely different time–action profiles

ALWAYS PRESCRIBE INSULIN BY BRAND NAME



Splitting packs

Some pharmacies are willing to split packs of cartridges and pre-filled pens, although some people prefer their insulin to be in its original box. Where packs are split, the expiry date on every cartridge or pen should be clear and a patient information leaflet supplied.

Remember to take account of the additional insulin required to allow for priming (see overleaf)

This will vary depending on the frequency of injections:

- Once daily (OD): add **56 units** for 28 days
- Twice daily (BD): add **112 units** for 28 days
- Three times daily (TDS): add **168 units** for 28 days

Table 1. Chart for calculating amount of insulin required per month according to daily dose.

Total daily dose (units)	If splitting packs: Number of pens needed for 28-day supply			Rounded up	If prescribing complete packs: Number of boxes (containing five pens) needed for 28-day supply
	OD	BD	TDS		
10	1.1	1.3	1.5	2	1
20	2.1	2.2	2.4	3	1
30	3.0	3.2	3.4	4	1
40	3.9	4.1	4.3	5	1
50	4.9	5.0	5.2	6	2
60	5.8	6.0	6.2	7	2
70	6.7	6.9	7.1	8	2
80	7.7	7.8	8.0	8	2
90	8.6	8.8	9.0	9	2
100	9.5	9.7	9.9	10	2
110	10.5	10.6	10.8	11	3
120	11.4	11.6	11.8	12	3
130	12.3	12.5	12.7	13	3
140	13.3	13.4	13.6	14	3
150	14.2	14.4	14.6	15	3

Quick glance

Total daily dose (units)	Number of boxes needed for 28-day supply
1–50	1 box
50–100	2 boxes
100–150	3 boxes
150–200	4 boxes



Have you undertaken insulin training in the last 2 years?

IF NOT, access the free E-learning module
Six Steps to Insulin Safety

Available at:

<https://is.gd/insulinsafety>

FREE E-learning Module:
Six Steps to Insulin Safety

Written by healthcare professionals for healthcare professionals

The module has been created by:
Jane James, consultant diabetes nurse
Jane Diggle, practice nurse
Julie Widdowson, diabetes specialist nurse
Martin Huxley-Brown, GPs, and endorsed by PCDS, TREND UK and NHS England.

Who is it for?
This module is for all primary and secondary care health professionals working in both generalist and specialist environments, including those managing insulin on hospital wards.

How do the modules work?

- Users access the module in the online training CPD centre hosted at www.cpd.diabetesnet.com
- The module will take approximately 30 minutes to complete
- On successful completion of a short assessment, users will receive a downloadable certificate that can form an essential part of the CPD log

To complete the FREE module, please visit www.cpd.diabetesnet.com or, for more info, email info@diabetesnet.com or call +44 (0)20 3738 8244