# Discontinuation of Levemir® (Insulin detemir) Flexpen® and Penfill® Clinical Guideline – **Version 2 (27/05/2026)**

Guidance from the Primary Care Diabetes & Obesity Society (PCDOS) and Association of British Clinical Diabetologists (ABCD)


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## Contents (click to navigate to section)

# Important Updates to Discontinuation of Levemir® (Insulin detemir) Flexpen® and Penfill® Clinical Guideline Version 2 (27/05/2026)

Following the DHSC update to Medicines Supply Notification (MSN/2025/036U) dated 15 April 2026, this guideline has been revised to reflect current availability of alternative insulin preparations and to support mitigation of wider supply disruption affecting people with diabetes prescribed other insulins.

## Key changes:

- Abasaglar® **should not** be used as an alternative U100 glargine option. Lantus® and Semglee® are the only available glargine U100 options.
- Humulin I® is unable to support any large uplift in prescribing due to the Levemir discontinuation. Humulin I® should only be reserved for individuals where alternative insulin options are not clinically suitable due to individual circumstances. Consider if specialist advice is required before switching to Humulin I® insulin as an option.

## Changes to the document:

- Abasaglar® as an option for U100 glargine removed throughout (note in option table to state **not available for switching**).
- Humulin I® removed as an option as a backup to insulin pump users in type 1 diabetes.
- Humulin I® moved from preferred choice to alternative choice throughout the document.
- Humulin I® moved to the bottom of alternative insulin options lists throughout document.
- Text added alongside Humulin I® (-**only if no suitable alternative)** throughout document.
- Update to text below alternative insulin options table to reflect these changes.
- Tresiba® U100 Flextouch® removed as an option due to product discontinuation.

# Overview of Advice (Executive Summary)

**Background**

Novo Nordisk will discontinue Levemir® (insulin detemir) in both Penfill® and Flexpen® forms, with UK supply ending by **December 2026**. This decision is based on global usage trends. A **Medicine Supply Notification (MSN/2025/036U)** has been issued. Approximately two-thirds of Levemir® prescriptions are for type 1 diabetes. There is significant regional variation in prescribing, so local data must be used for planning.

**Purpose of Guidance**

This document supports clinicians in selecting and safely initiating alternative basal insulins in preparation for Levemir® discontinuation. It should be used alongside relevant NICE guidelines (NG17, NG28, NG18).

**Key Points**

- **Do not initiate** any new individuals on Levemir® (insulin detemir).
- System planning must account for the high volume of people on Levemir®, including those with type 1, type 2, type 3c (pancreatic), and gestational diabetes.
- Clinical review by a competent clinician is essential before switching to an alternative insulin.
- No basal insulin analogue is licensed for **twice-daily** use like Levemir®, so alternatives will need consideration, close monitoring, and adjustment.
- Monitoring should rely on **capillary blood glucose (CBG)** at least four times daily, **CGM**, and ketone monitoring (where appropriate)—not HbA1c alone, due to its historical nature.
- People with allergies to alternative insulins should be referred to local allergy or diabetes services as required.
- Local teams should avoid initiating widespread switches without checking the **DHSC Medicines Supply Notification** and availability via the **SPS Medicines Supply Tool**.
- Local plans should reflect that clinicians should aim to **diversify prescribing** across available options to reduce supply risk where possible.
- Risk of glucose instability is elevated during insulin changes. A **clinical review with CBG/CGM data** is essential.
- Particular focus should be given to **high-risk groups** as outlined in patient factors section below.
- As part of the clinical review, assess whether the current insulin regimen in type 2 diabetes could be optimised by introducing / switching to different insulin types (e.g., rapid-acting, or mixed insulin) or by incorporating non-insulin therapies.
- When switching between insulins, there can be differences between absorption, potency, and action profile, therefore **consider reducing doses by 10-20% to avoid the initial risk of hypoglycaemia**.
- When prescribing new insulins, ensure any change in device type is **explained to the patient** with written product information provided (insulin "credit cards" / passports / booklets).
- For those with very erratic glucose levels, or disproportionately high insulin doses, **assess injection technique** and **check for evidence of lipohypertrophy** at injection sites.
- If lipohypertrophy is detected, considerable dose adjustment is often required when changing injection sites, seek advice and guidance as necessary if unsure.

- Education and support should be provided to help individuals self-adjust doses post-switch, where appropriate, along with a check of **understanding of sick day rules**.
- Ensure adequate safety netting, advising patients to report any concerns about glucose levels after following provided dose adjustment guidance.
- People living with diabetes should be reviewed at 2-3 weeks to support with dose titration, as necessary. For those at higher risk of dysglycaemia aim for close clinical review within 1-2 weeks of change where possible.
- If there is uncertainty seek advice and guidance or refer to community / specialist diabetes services as per locally agreed pathways.

## Alternative Insulin Options (further outlined below):

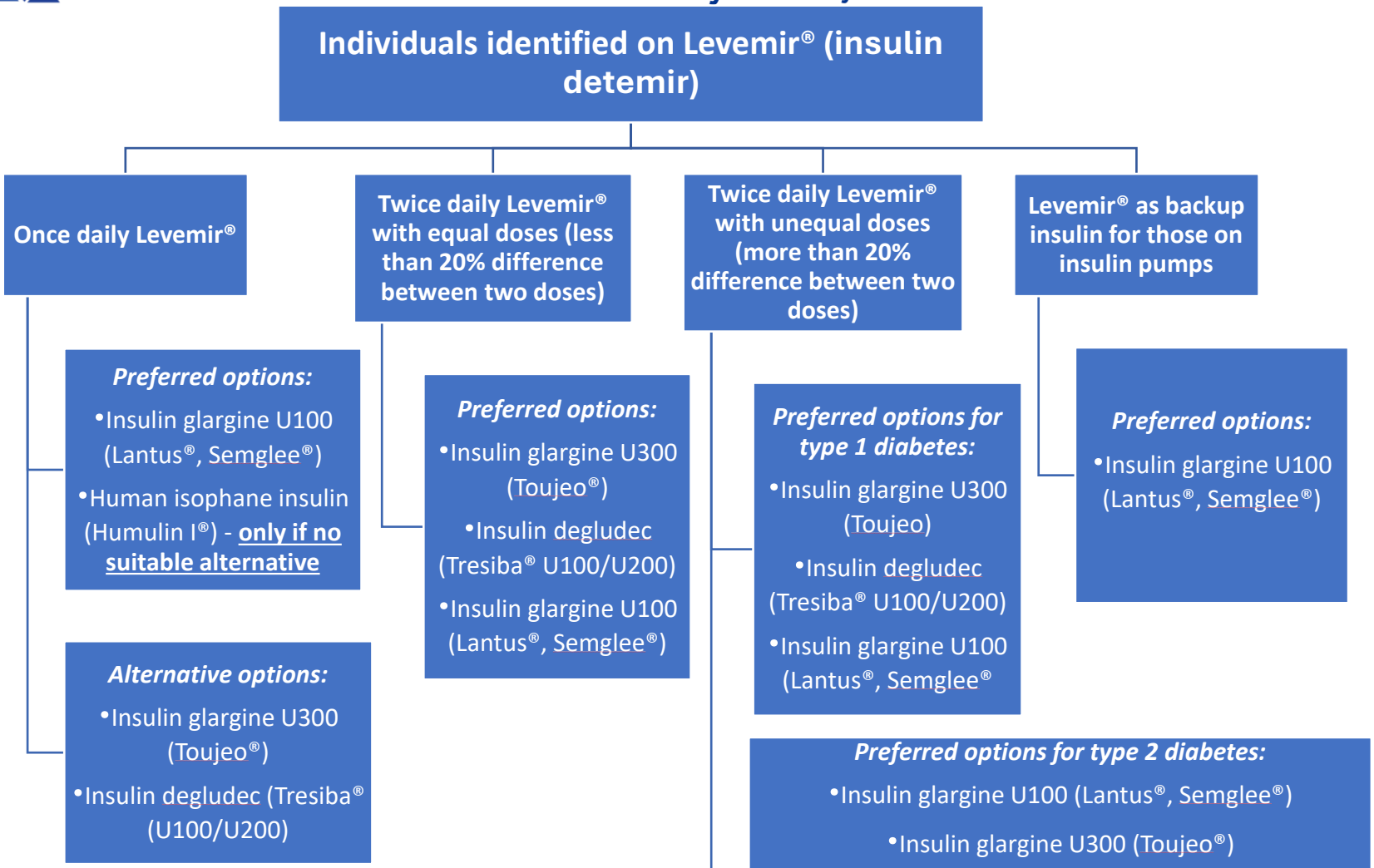
(see example worked patient scenarios for overview of suggested treatment options)

| Insulin type | Brand name and devices | Compatible re-usable cartridge pen device |
|---|---|---|
| Insulin glargine U100 (Long acting) | ~~Abasaglar® (Kwikpen® / cartridges)~~ **(Not available for switching)** | ~~HumaPen Savvio®~~ **(Not available for switching)** |
| | Lantus® (Solostar® / cartridges) | AllStar® PRO (1 unit increments)<br>JuniorSTAR® (½ unit increments) |
| | Semglee® (pre-filled pens) | N/A |
| Insulin glargine U300 (Ultralong acting) | Toujeo® (Solostar® / Doublestar®) | N/A |
| Insulin degludec (Ultralong acting) | Tresiba® U100 (cartridges)<br><br>Tresiba® U200 (FlexTouch®) | NovoPen 6® (1 unit increments)<br><br>NovoPen Echo Plus® (½ unit increments) |
| Human isophane insulin (intermediate acting) *NPH insulin* | Humulin I® (Kwikpen® / cartridges) **(very limited availability for any switching)** | HumaPen Savvio® **(very limited availability for any switching)** |

****Please note:** For up to date supply guidance, ensure you are referring to the initial medicines supply notification and subsequent updates via SPS Medicines Supply Tool. At the time of writing version 2 of this document (27/5/2026) Tresiba® U100 Flextouch® has been discontinued. Abasaglar® insulin is unable to be used for switching due to insufficient stock availability. Humulin I® is unable to take any significant increase in usage for switching from Levemir and therefore should be reserved for the small number of patients where this may be the only clinically suitable alternative.**

Association of British Clinical Diabetologists

PCDO Society | Primary Care Diabetes & Obesity Society




## Algorithm of alternative insulin options (*Must be used alongside clinical caveats in worked examples)

NB. Please see example patient scenario section below for full details and clinical caveats.

## Background

In September 2024 Novo Nordisk informed the Department of Health and Social Care (DHSC) and healthcare professionals working in diabetes in the UK, of their intention to discontinue several insulins and insulin devices due to them being considered older or declining in usage globally. Levemir® insulin in both its Penfill® and Flexpen® presentations is listed for discontinuation with an anticipated supply end date of December 2026. There is significant regional variation in the prescribing volume of Levemir® across the UK. Approximately two-thirds of Levemir® prescriptions are for individuals with type 1 diabetes, while the remaining third are for those with type 2 diabetes or other forms of the condition. It is imperative that local prescribing data is used to map and plan the workload required. This needs to be done within the available timeframe, assessing the impact on primary care, community, and specialist services.

A Medicine Supply Notification (MSN/2025/036U) has been issued regarding Levemir® insulin discontinuation.

## Scope

This guidance aims to support clinicians in the safe selection and establishment of alternative options to use in place of Levemir® insulin. This guidance should be used in conjunction with the NICE NG17 *Type 1 Diabetes in adults: diagnosis and management*, the NICE NG28 *Type 2 diabetes in adults: management* and NICE NG18 *Diabetes (Type 1 and Type 2) in children and young people: diagnosis and management*.

The authors were pulled together to ensure cross representation across the UK and across healthcare professionals working in diabetes, ensuring representation from ABCD and PCDO as the main hosts of this guidance.

The guidance contained within this document is not intended to replace individual clinical decision making by healthcare professionals who are competent in the management of insulin in those living with diabetes. Please ensure close attention to any timelines or uplift availability noted within the medicines supply notification issues by DHSC when considering alternative treatment options to avoid shortages / product unavailability. In Type 2 diabetes there may be circumstances where treatment options other than insulin may be clinically appropriate as alternatives, but these are not covered in this guideline.

Due to the wide range of patient-specific factors influencing clinical decisions, predicting prescribing patterns and insulin demand across this diverse population, is highly challenging. Insulin manufacturers typically require around four months' lead time to adjust the volume of insulin supplied to UK wholesalers. Manufacturers with higher baseline prescribing levels generally have greater flexibility to increase their stock. All recommendations in this guidance are contingent on ongoing supply chain availability, as detailed in the DHSC Medicines Supply Notification for Levemir® insulin. Any changes to insulin availability will be communicated by the DHSC and published through the SPS Medicines Supply Tool. Suggested treatment options are based on current supply availability and aim to minimise the risk of supply disruption. It is acknowledged that some people living with diabetes may require more individualised treatment or have specific clinical reasons for using alternative insulins; however, these decisions should always be checked against the latest supply information. At a local level, where multiple alternative options exist for certain types of insulin—such as insulin glargine U100 (Lantus®, Semglee®)—utilising a range of prescribing choices across available brands (where the MSN does not impose restrictions) can help minimise disruption to the supply chain.

The authors of this guidance acknowledge the existing recommendations outlined in NICE NG17 *Type 1 Diabetes in Adults: Diagnosis and Management* and the DAFNE (Dose Adjustment for Normal Eating) structured education programme regarding the use of Levemir®. Work is currently underway to update this guidance in response to the discontinuation of Levemir®.

## Target audience

- Prescribers in all care settings
- NHS Diabetologists / Endocrinologists
- Specialist diabetes services and associated health care professionals
- Primary care and community care diabetes teams
- General practice healthcare teams
- People with diabetes using Levemir® insulin, their families, and/or carers
- Organisations commissioning NHS services
- Providers of NHS services and private diabetes services

## Advice from the Department of Health & Social Care (DHSC)

The following advice has been issued from DHSC as a medicines supply notification:

(MSN/2025/036U) – Levemir (insulin detemir) discontinuations

Latest advice on medication supply issues along with timelines is published on the SPS Medicines supply Tool *(registration required but is free).*

## Advice for prescribers

This guidance aims to support clinicians in selecting and prescribing alternative insulin therapy in preparation for the discontinuation of Levemir® insulin. This guidance should be used in conjunction with the NICE NG17 *Type 1 Diabetes in adults: diagnosis and management*, NICE NG28 *Type 2 diabetes in adults: management* and NICE NG18 *Diabetes (type 1 and type 2) in children and young people: diagnosis and management*.

When prescribing an alternative insulin, clinicians are advised to prescribe medications in accordance with the licenced indications, ensuring an appropriate clinical review occurs which allows for individualisation of treatment and shared decision making.

This guidance does not override the responsibility of the clinician to make decisions appropriate to the circumstances of the individual, in consultation with them and/or their families, carers or guardian. Responsibility remains with the prescribing clinician / clinical team.

Levemir® (Insulin detemir) is a long-acting insulin analogue used as a basal insulin administered subcutaneously by injection. Levemir® is available in either Flexpen®, a disposable pen device, or Penfill®, 3ml cartridges designed to be used with Novo Nordisk insulin delivery systems such as NovoPen®. – (See Levemir® section)

## Clinical review

Due to the large number of people living with diabetes (type 1,2, 3c (pancreatic) and gestational) on Levemir® a planned and pro-active approach is essential to avoid overwhelming services and depleting supplies of alternative insulins. With a planned approach this can be incorporated in regular reviews where possible. Clinical assessment with a competent clinician will help move people safely to alternative treatment.

There are no direct alternatives to Levemir® (insulin detemir), which is the only analogue basal insulin to be licenced for twice daily use. Alternative insulins will need to be chosen after clinical review, with appropriate follow-up arranged for further insulin dose adjustment as required. When switching between insulins, there can be differences between absorption, potency, and action profile, therefore consider reducing doses by 10-20% to avoid the initial risk of hypoglycaemia. Where possible and clinically appropriate, people with diabetes should be given appropriate education and encouraged to self-adjust their insulin doses according to their blood glucose concentrations after switching to alternative insulins whilst awaiting a further review.

Capillary blood glucose (CBG) checks, continuous glucose monitoring (CGM) and where appropriate, ketone monitoring should be used to guide clinical decision making. As a minimum, 4 CBG checks a day (before meals and before bed), should guide decisions. It is advised not to use HbA1c as this will give only a historical context and not reveal day-to-day or in-day variability.
NICE NG17 Type 1 diabetes in adults currently recommends Levemir® be offered twice-daily for adults as first line therapy in the absence of a strong patient preference for once daily basal insulin, particular concerns for nocturnal hypoglycaemia or third-party insulin administration. In the UK, structured education platforms such as DAFNE have previously named twice daily Levemir® as a preferred basal insulin in type 1 diabetes.

For people living with diabetes with listed allergies to alternative insulins, please liaise with local allergy or specialist diabetes services via existing referral pathways, clearly stating the timeframe required for any investigations and possible conversion to alternative insulin.

## Summary of Levemir® patient groups and actions suggested

| Diabetes Type and Levemir® usage | Suggested action |
|---|---|
| Any type of diabetes and pregnancy | Levemir® should not be initiated for new people living with diabetes from July 2025 |
| Paediatric and adolescent diabetes of any type (Type 1, Type 2, Type 3c) under 25 years old. | Children or adolescents living with diabetes should be reviewed by local paediatric or young adult diabetes services to consider alternative treatment options in line with local commissioned pathways. |
| Adults on insulin pumps with Type 1 Diabetes, Type 3c Diabetes or Cystic Fibrosis related Diabetes (CFRD) with Levemir® insulin as a backup injection. | People living with diabetes should be advised to discuss alternative insulin options with their specialist diabetes team at their next routine review, or to contact the relevant service if they are on a Patient-Initiated Follow-Up (PIFU) pathway. Insulin pump services should proactively work to identify individuals under their service prescribed Levemir® as a backup insulin and plan an approach to ensure |

| | |
|---|---|
| | people living with diabetes are gradually converted over to an alternative backup basal insulin. |
| Adults on Levemir® insulin with Type 1 Diabetes, Type 3c Diabetes or Cystic Fibrosis Related Diabetes. | People living with diabetes should be advised to discuss alternative insulin options with their specialist diabetes team at their next routine review, or to contact the relevant service if they are on a Patient-Initiated Follow-Up (PIFU) pathway. For individuals with type 1 diabetes who are not currently under specialist care, referral to a specialist diabetes service should be made if their management cannot be safely supported in primary care due to staffing or clinical competency constraints. If the person is not under specialist diabetes care and is not achieving their individualised HbA1c target, has recurrent hypoglycaemia or HbA1c < 48mmol/mol consider referring to specialist diabetes services as further optimisation may be needed. For people living with diabetes who do not wish to be referred to the specialist diabetes team, support for switching should be sought through advice and guidance routes.<br>Secondary care specialist services may not have access to commercial patient databases and may therefore require support with patient identification, which should be incorporated into any local plans. |
| Adults with Type 2 Diabetes on Levemir® insulin | After individual review, taking into consideration clinical and patient factors, consider alternative insulin options as outlined in the guidance below, seeking advice and guidance in line with local pathways if required. |
| Adults with any form of diabetes with an eGFR <30ml/min on Levemir® insulin. | People living with diabetes should be reviewed by local specialist diabetes services in line with local pathways. |

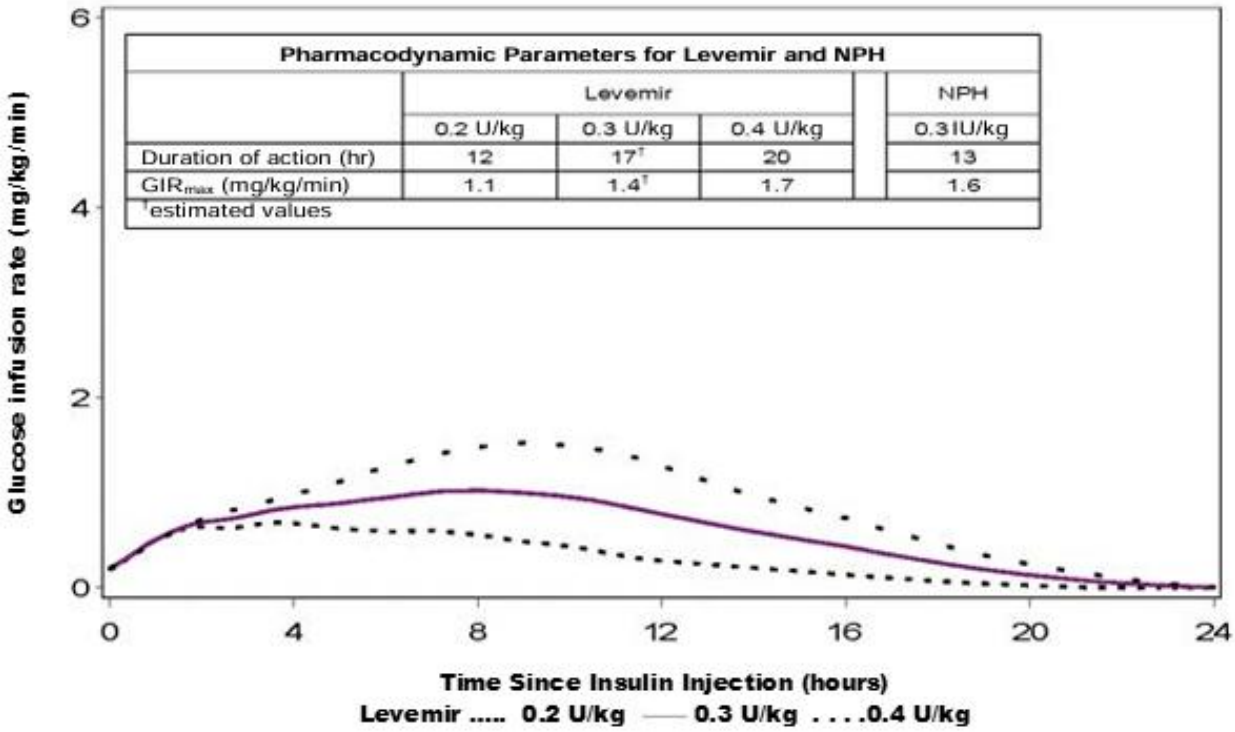
# Levemir® (Insulin detemir) – Key Information

Please see SmPC for full clinical information – www.medicines.org.uk

## Overview of Levemir® insulin

Levemir® (insulin detemir) is a soluble long-acting human insulin analogue used as a basal insulin for the treatment of diabetes mellitus in adults, adolescents, and children aged 1 year and above. Onset of action is between 1 - 2 hours, with peak action between 4 – 14 hours after administration. Its total duration of action is between 12 - 24 hours dependent on dose and is therefore licenced for once or twice daily administration, where if administered twice daily, steady state will occur after 2 – 3 dose administrations. The duration of action will vary according to the dose, injection site, blood flow, temperature, and level of physical activity.

## Dose Dependent Time Action Profile of Levemir® (available via Levemir® SmPC)




## Clinical Particulars

Levemir® is licenced for once or twice daily administration alone as a basal insulin or in combination with bolus insulin. It is also licenced for use with oral antidiabetic agents and GLP-1 receptor agonists and GIP/GLP-1 receptor agonists. At the lower doses commonly used in type 1 diabetes for twice-daily administration, Levemir exhibits a relatively flat, peakless profile. However, at higher doses—typically around 0.4 units/kg and above, as often required in type 2 diabetes—Levemir demonstrates a longer duration of action and develops a peak effect approximately 8 to 12 hours after injection.

The formulation of insulin can affect the variation in dose response, both person to person and in the same individual over multiple doses, this is termed coefficient of variation (CV), where the higher the percentage the higher the risk of variable dose effect. In clinical trials, Levemir® has shown a low coefficient of variation

(CV) of approximately 25%, indicating consistent pharmacodynamic effects both between individuals and within the same individual across multiple doses. In contrast, human isophane insulin has a significantly higher CV—about 46% for glucose infusion rate (reflecting peak action) and 68% for area under the curve (reflecting overall insulin activity).

**These differences highlight the greater variability of human isophane insulin and emphasise the need for even greater care in dose adjustment and monitoring when switching people living with diabetes from Levemir® to formulations like Humulin I® to avoid risk of glucose instability such as hypoglycaemia.**

## Patient Factors to be taken into consideration

Glucose instability is a potential risk during any switch to an alternative insulin. To assess and minimize this risk, it is essential to conduct an appropriate clinical review supported by sufficient glucose data from structured CBG monitoring (e.g. before meals and bedtime) or CGM. There are patient groups who are higher risk for instability, some of which are outlined below:

- Impaired hypoglycaemia awareness
- History of severe hypoglycaemia or recurrent diabetic ketoacidosis (DKA)
- Evidence of lipohypertrophy at injection sites
- Frailty and/or older age
- Children and Adolescents
- Renal or severe hepatic impairment
- High glucose variability on CGM
- Cognitive or functional impairment
- Learning difficulties or low health literacy
- Those with visual impairment and manual dexterity problems
- High alcohol intake or binge drinking
- High level of physical activity

Generally, people living with diabetes should be reviewed at 2-3 weeks to support with dose titration as necessary. For those at higher risk of dysglycaemia due to reasons outlined above, aim for close clinical review within 1-2 weeks of change where possible, providing written dose adjustment plans to support self-dose adjustment.

# Overview of alternative insulin preparations

## Insulin glargine U100

Insulin glargine U100 is a long-acting basal insulin analogue. Onset of action is 2-4hours, reaching a maximum effect within 8-12 hours, although generally considered "peakless" in the majority of individuals. Its duration of action is between 20-24 hours depending on dose, injection site and individual metabolism reaching steady state in 2-4 days after first dose. Brands available include Lantus® and the biosimilar Semglee®. All brands are licenced for once daily dosing, however in some people living with diabetes, especially at lower doses, the insulin action may not last 24 hours. As type 1 diabetes requires full 24hour basal insulin coverage, clinical practice often is to split the total daily dose, prescribing twice daily glargine U100 off licence. An alternative to switching to off-licence use of U100 glargine would be to consider switching to an ultralong acting basal insulin such as insulin glargine U300 (Toujeo®) or insulin degludec (Tresiba®).

## Insulin glargine U300 (concentrated insulin)

Insulin glargine U300 (Toujeo®) is a concentrated ultralong acting basal insulin analogue providing 300units per 1ml of insulin, rather than the typical 100units per 1ml of insulin (U100). Concentrating glargine insulin results in a slower onset and extended duration of action, allowing for more consistent insulin coverage over 24 hours once steady state is achieved. Onset of action is around 4-6 hours with a duration of action of up to 36 hours, reaching steady state within 3-4 days. Titration may take longer due to duration of action and therefore dose adjustments should be made cautiously every 3 days. Toujeo® is the only available brand of glargine U300 insulin and is available in two device types, Solostar® (range 1-80 units) or Doublestar® (range 2-160 units). The Doublestar device is intended for use for those on higher doses of insulin (typically greater than 80 units daily) and can only be dosed in even numbers given the minimum increment of 2 units. No additional dose adjustments are necessary when switching between U100 and U300 insulin preparations. Although the concentration and injected volume differ, the unit markings on pen devices are accurate and do not require conversion.

## Insulin degludec U100 / U200

Insulin degludec (Tresiba®) is an ultralong basal insulin analogue which when injected forms multi-hexamers in subcutaneous tissue, creating a slow and steady release of active insulin monomers into the circulation. Its onset of action is around 60 minutes, with a "peakless" profile and a duration of action around 42 hours. It reaches steady state within 3 days, but because of its long half-life will require cautious dose adjustments every 3 days when titrating insulin to ensure the full effect of any dose change has been observed before further titration. It is available in U100 and U200 concentrations with the U200 concentration pen device being designed for individuals requiring doses above 80 units daily (range 2-160units) and can only be dosed in even numbers due to the minimum dose increment of 2 units. No additional dose adjustments are necessary when switching between U100 and U200 insulin preparations. Although the concentration and injected volume differ, the unit markings on pen devices are accurate and do not require conversion.

## Human isophane insulin

Human isophane insulin (Humulin I®) is an intermediate acting insulin also known as NPH insulin (Neutral Protamine Hagedorn). Onset of action is within 1½ hours, reaches a maximum effect within 4–8 hours and the entire duration of action is approximately 16 hours but ranges between 14-24 hours. It is usually

administered twice daily but can be used once daily in individual circumstances. Human isophane insulin has a greater degree of variability in onset, peak, and duration between individuals and in the same individual across multiple daily dosing therefore dose conversions from other insulins can often be more difficult to stabilise and can require more dose adjustments to optimise.

## Summary of Insulin Time Action Profiles

| Insulin Type | Brand names | Onset of action | Peak Effect | Duration |
|---|---|---|---|---|
| Insulin detemir (long acting) | Levemir® (FlexPen® and Penfill® cartridge) | 1-2 hours | 4-14 hours (generally considered peakless at lower doses) | Duration is dose dependent (Range 12-24 hours) |
| Insulin glargine U100 (Long acting) | Lantus® (solostar® / cartridges) Semglee® (pre-filled pens) | 2-4 hours | Generally considered peakless (8-12 hours in some individuals) | 20-24 hours |
| Insulin glargine U300 (Ultralong acting) | Toujeo® (Solostar® / Doublestar®) | 4-6 hours | No pronounced Peak | 30-36 hours |
| Insulin degludec (Ultralong acting) | Tresiba® U100 (cartridges) Tresiba® U200 (FlexTouch®) | 30-90 minutes | No pronounced Peak | 42 hours |
| Human isophane insulin (intermediate acting) *NPH insulin* | Humulin I® (Kwikpen® / cartridges) | 2-4 hours | 4-8 hours | Approximately 16 hours Range (14-24 h) |

## Example patient scenarios

The examples below aim to support clinicians in the safe selection and establishment of alternative options to use in place of Levemir® insulin. This guidance should be used in conjunction with the NICE NG17 *Type 1 Diabetes in adults: diagnosis and management*, the NICE NG28 *Type 2 diabetes in adults: management* and NICE NG18 *Diabetes (Type 1 and Type 2) in children and young people: diagnosis and management*.

The guidance contained within this document is not intended to replace individual clinical decision making by healthcare professionals who are competent in the management of insulin in those living with diabetes. Please ensure close attention to any timelines or uplift availability noted within the medicines supply notification issues by DHSC when considering alternative treatment options to avoid shortages / product unavailability. In Type 2 diabetes there may be circumstances where treatment options other than insulin may be clinically appropriate as alternatives, but these are not covered in this guideline.

(see algorithm for overview of suggested treatment options)

| | |
|---|---|
| **Once daily Levemir®** | ***Preferred options:***<br>• Insulin glargine U100 (Lantus®, Semglee®)<br><br>***Alternative options:***<br>• Insulin glargine U300 (Toujeo®)<br>• Insulin degludec (Tresiba® (U100) / U200)<br>• Human isophane insulin (Humulin I®)- **only if no suitable alternative**<br><br>**For individuals with type 1 diabetes or type 3c diabetes, ensure 24-hour basal insulin coverage.** For those on once daily Levemir®, consider the initial purpose of this treatment choice, for example, was this once daily Levemir® given in the morning chosen to avoid overnight hypoglycaemia in which case an intermediate acting insulin such as Humulin I® may be the only appropriate alternative. When considering alternative insulin options taking glucose levels into account and consider reducing the dose by 10-20% depending on fasting glucose levels and any incidence of hypoglycaemic episodes. If considering switching to Humulin I® consider if once or twice daily dosing is more appropriate based on glucose levels.<br><br>***Worked example - Insulin glargine U100 (Lantus®, Semglee®)***<br><br>*Levemir® 30 units once daily at night switching to Lantus® once daily could be converted to:*<br>• *10% reduction = Lantus® 27 units once daily at night*<br>• *20% reduction = Lantus® 24 units once daily at night* |

| | |
|---|---|
| | ***Worked examples (Humulin I®):***<br>*Levemir® 20 units once daily in the morning being used to avoid overnight hypoglycaemia switching to Humulin I® could be converted to:*<br>***Once daily =***<br>• *10% reduction = Humulin I® 18 units in the morning*<br>• *20% reduction = Humulin I® 16 units in the morning*<br><br>***Twice daily due to raised fasting glucose upon review =***<br>• *Reduce by 10% = Humulin I® 18 units total daily dose (TDD)*<br><br>*(This could be split as ⅔ morning and ⅓ evening* = 12 units Humulin I® in the morning and 6 units in the evening)*<br><br>****Required split will be based on evidence from glucose monitoring***<br><br>**Caveats:**<br>1. **For individuals with type 1 diabetes or type 3c diabetes, ensure 24-hour basal insulin coverage. Do not switch to once-daily Humulin I® unless specifically advised by a specialist diabetes renal clinic or equivalent service.**<br>2. Clinical trials show that when switching to Toujeo®, achieving comparable glucose control often requires a 10–18% higher dose. Therefore, a cautious dose reduction approach is recommended initially, with the expectation that the final Toujeo® dose will likely exceed the equivalent unit dose of Levemir®.<br>3. For those using Toujeo® / Tresiba® follow the worked example above for insulin glargine U100 once daily<br>4. If there is uncertainty seek advice and guidance or refer to community / specialist services as per locally agreed pathways. |
| **Twice daily Levemir® with equal doses (less than 20% difference between two doses)** | ***Preferred options:***<br>• Insulin glargine U300 (Toujeo®)<br>• Insulin degludec (Tresiba® U100/U200)<br>• Insulin glargine U100 (Lantus®, Semglee®)<br><br>For those prescribed twice daily Levemir® it is important to continue to ensure insulin cover across 24 hours especially in Type 1 / Type 3c diabetes. This is best achieved through ultralong acting insulin such as Toujeo®/Tresiba® or twice daily insulin glargine U100. It is important to note that twice daily insulin glargine is considered off-licence use for Lantus® and Semglee® both of which are only licenced for once daily use. The dose of the chosen alternative insulin should |

be calculated by taking the total daily dose (TDD) of Levemir® and reducing the dose by 10-20%, prescribing this as a once-a-day injection. If the total daily dose exceeds 80units then Toujeo® Doublestar® device should be prescribed with the number of units prescribed as an even number because of the 2-unit increments on this device.

***Worked examples:***

1. *Levemir® 20 units twice daily in the morning and night switching to Toujeo® / Tresiba® once daily could be converted to:*

   *20 units twice daily = 40 units total daily dose (TDD)*

   - *10% reduction = 36 units Toujeo® / Tresiba® once daily in the morning **OR** night*
   - *20% reduction = 32 units Toujeo® / Tresiba® once daily in the morning **OR** night*

2. *Levemir® 18 units in the morning and 15 units at night could be converted to:*

   *18 units morning and 15 units night = 33units TDD*

   - *10% reduction = 30 units Tresiba® once daily **OR** 15 units twice daily U100 insulin glargine (off licence).*
   - *20% reduction = 27units Tresiba® once daily **OR** 14 units twice daily U100 insulin glargine (off licence).*

**Caveats:**

1. For individuals with Type 1 diabetes or Type 3c diabetes, ensure 24-hour basal insulin coverage with ultralong acting basal insulin (Toujeo® or Tresiba®) or ***off licence*** twice daily insulin glargine U100 (Lantus®, Semglee®)
2. For individuals with type 2 diabetes on lower doses (< 50 units TDD) once daily insulin glargine U100 may be considered, where the dose would be calculated as per worked example 1 and 2 above for once daily Toujeo®/ Tresiba®.
3. For individuals with type1, type 2 or type 3c diabetes on higher doses (>50 units TDD), check injection technique and for evidence of lipohypertrophy at injection sites and consider utilising a concentrated insulin such as Toujeo®; with a Doublestar® device prescribed if doses exceed 80 units as outlined in Toujeo® section above or splitting insulin glargine U100 twice daily *(off licence)* as outlined in NICE CKS and other international guidance. This is due to the

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| | diminished dose-response effect of s/c insulin observed when injecting higher volumes subcutaneously (>0.5ml or 50 units of U100 insulin).<br>4. No additional dose adjustments are necessary beyond those already documented when switching between U100 and U200/U300 insulin preparations. Although the concentration and injected volume differ, the unit markings on pen devices are accurate and do not require conversion.<br>5. Clinical trials show that when switching to Toujeo®, achieving comparable glucose control often requires a 10–18% higher dose. Therefore, a cautious dose reduction approach is recommended initially, with the expectation that the final Toujeo® dose will likely exceed the equivalent unit dose of Levemir®.<br>6. If there is uncertainty seek advice and guidance or refer to community / specialist services as per locally agreed pathways. |
| **Twice daily Levemir® with unequal doses (more than 20% difference between two doses)** | ***Preferred options for type 1 diabetes:***<br>• Insulin glargine U300 (Toujeo)<br>• Insulin degludec (Tresiba® U100)<br>• Insulin glargine U100 (Lantus®, Semglee®)<br><br>***Preferred options for type 2 diabetes:***<br><br>• Insulin glargine U100 (Lantus®, Semglee®)<br>• Insulin glargine U300 (Toujeo®)<br>• Insulin degludec (Tresiba® U100)<br>• Human isophane insulin (Humulin I®)- **only if no suitable alternative**<br><br>For individuals with Type 1 or Type 3c diabetes who are prescribed twice-daily Levemir®, it is important to maintain consistent 24-hour basal insulin coverage. However, if there is a difference of more than 20% between the morning and evening doses, further evaluation is needed to understand the rationale for this dosing pattern. This is best achieved using an ultra-long-acting insulin such as Toujeo® / Tresiba®, or by administering insulin glargine U100 twice daily. It is important to note that twice-daily use of insulin glargine U100 is considered off-licence for Lantus® and Semglee®, as these products are only licensed for once-daily administration. For individuals with Type 2 diabetes, human isophane insulin may be the preferred choice in certain circumstances. However, due to its variable dose–response profile (as outlined in the clinical particulars), it is important to initiate treatment cautiously, with careful titration to achieve an appropriate insulin dose. |

To calculate an appropriate dose of alternative once daily insulin (either insulin glargine U100 or ultralong basal insulin such as Toujeo® / Tresiba®), take the lowest of the two Levemir® doses and multiple this by 2, and consider this the maximum safe daily dose initially. Reduce this maximum safe daily dose by 10 - 20% as the initial new dose of basal insulin.
In type 2 diabetes to convert to a twice daily Humulin I® dose, reduce each individual dose by 10-20% compared with the Levemir® dose, matching the original prescribing times if still considered appropriate.

***Worked examples (once daily basal analogue):***

1. *Levemir® 20 units in the morning and 14 units at night switching to insulin glargine U100* (Lantus®, Semglee®) or *(Toujeo®/Tresiba® once daily can be calculated as:*

   *Maximum safe daily dose* = lowest dose Levemir® x2*
   *(14 units x 2 = 28 units)*

- *10% reduction = 25 units once daily in the morning **OR** night*
- *20% reduction = 22 units once daily in the morning **OR** night*

*****A significant reduction in total daily dose using this method may indicate future underdosing during part of the day. In such cases, adjustments to mealtime insulin (if prescribed) or to adjunct oral and injectable therapies in Type 2 diabetes should be considered.

***Worked examples (twice daily Humulin I®:***

1. Levemir® 36 units in the morning and 20 units in the evening switching to Humulin I® can be calculated as:

- 10% reduction = Humulin I® - 32 units morning and 18 units evening
- 20% reduction = Humulin I® - 29 units morning and 16 units evening

**Caveats:**

1. For individuals with type 1 diabetes or type 3c diabetes, ensure 24-hour basal insulin coverage with ultralong acting basal insulin (Toujeo® or Tresiba®) or ***off licence*** twice daily insulin glargine U100 (Lantus®, Semglee®)

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| | 2. For individuals with type 1, type 2 or type 3c diabetes on higher doses (>50 units TDD), check injection technique and for evidence of lipohypertrophy at injection sites and consider utilising a concentrated insulin such as Toujeo®; with a Doublestar® device prescribed if doses exceed 80 units as outlined in Toujeo section above or splitting insulin glargine U100 twice daily *(off licence)* as outlined in NICE CKS and other international guidance. This is due to the diminished dose-response effect of s/c insulin observed when injecting higher volumes subcutaneously (>0.5ml or 50 units of U100 insulin).<br>3. No additional dose adjustments are necessary beyond those already documented when switching between U100 and U200/U300 insulin preparations. Although the concentration and injected volume differ, the unit markings on pen devices are accurate and do not require conversion.<br>4. Clinical trials show that when switching to Toujeo®, achieving comparable glucose control often requires a 10–18% higher dose. Therefore, a cautious dose reduction approach is recommended initially, with the expectation that the final Toujeo® dose will likely exceed the equivalent unit dose of Levemir®.<br>5. If there is uncertainty seek advice and guidance or refer to community / specialist services as per locally agreed pathways. |
| **Levemir® as backup insulin for those on insulin pumps** | ***Preferred options:***<br>• Insulin glargine U100 (Lantus®, Semglee®)<br><br>The purpose of a backup insulin for those on an insulin pump is to ensure basal insulin is available in case of pump failure. The backup basal insulin is generally only needed for up to 72 hours in the majority of cases whilst a replacement pump device is obtained. An insulin which can reach steady state quickly and does not have a long half-life is preferred in this scenario over ultra-long-acting insulin, as ultralong acting insulin can complicate re-initiation of pump therapy. Specialist teams should review backup plans and ensure these are clearly communicated to primary care teams to enable repeat prescribing lists to be updated. |

Please see the Comparison Charts page from DSN Forum UK: Insulin Types & Delivery Devices Comparison Chart for further information.