

Management of Enteral Feeding for Patients with Diabetes in Hospital

Key Points

- Refer people with diabetes or hyperglycaemia to the Diabetes Inpatient Team and dietitian early, ideally before enteral feeding starts, and agree the feed regimen and glucose lowering treatment from the outset.
- Always continue basal insulin in people with Type 1 diabetes or known insulin deficiency. Never stop basal insulin, even if feeds are interrupted or stopped, to prevent ketosis and DKA.
- Prescribe insulin with clear timing linked to the feed (e.g. at the start of the feed, midway through the feed); avoid vague instructions such as “when feeding”, as this increases the risk of hypoglycaemia. Change timings of insulins on Epic to ensure this is given in consideration of the feed.
- Monitor capillary blood glucose prefeed and 4–6hourly while feeding, and monitor hourly if the feed is stopped; aim for a target glucose range of 6–12 mmol/L.
- Use VRIII short-term when required to stabilise glucose, assess insulin needs and calculate feed-related insulin doses (reducing the 24-hour total requirement by 20%).
- Respond to persistent hyperglycaemia by checking ketones when indicated, titrating insulin in 10–20% steps and escalating early to the Diabetes Inpatient Team if control remains suboptimal.

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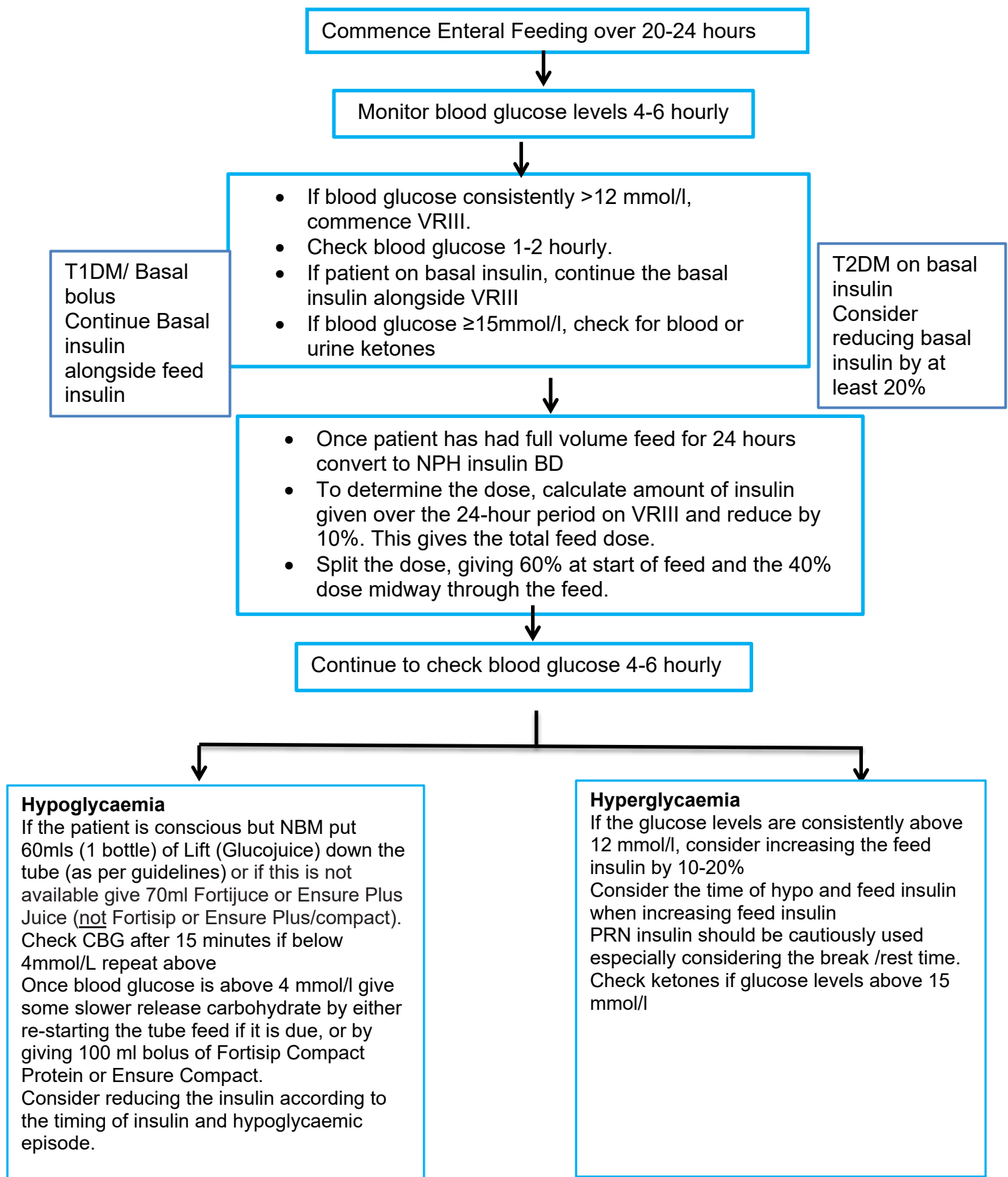
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Abbreviations

CBGs	Capillary blood glucose
CSII	Continuous subcutaneous insulin infusion
DSN	Diabetes Specialist Nurse
IV	Intravenous
NBM	Nil by mouth
QDS	Four times a day
VRIII	Variable rate intravenous insulin infusion

Management of Diabetes with Enteral Feeding - Summary



1. Enteral feeding and diabetes

Enteral nutrition is delivered via a nasogastric, gastrostomy, or jejunal tube. Feeds administered through enteral feeding tubes are typically delivered continuously over several hours, typically delivered as a single long feed with a break, for e.g. 20-hour feed with a 4-hour break. Patients usually commence feeding at a reduced rate for the first 24 hours, with gradual advancement to the target volume over the following 24–48 hours, depending on individual nutritional requirements and tolerance.

Most patients with diabetes will experience a rise in their blood glucose levels when they commence enteral feeding. Diabetes medications are likely to need to be increased or changed. For those patients on insulin therapy, the insulin dose requirements will generally increase. The demand for insulin should be relatively consistent, as the hourly carbohydrate intake is consistent. This pathway applies to people with known diabetes or hyperglycaemia when enteral feeding is planned or has commenced.

2. Impact of feeds on different type of diabetes

Type 1 Diabetes Mellitus (T1DM)

T1DM poses a specific risk of hyperglycaemia and ketosis during enteral feeding. Close glucose and ketone monitoring is therefore essential, particularly during the initiation phase of feeding. As patients with T1DM lack endogenous insulin production, a basal insulin is required to prevent ketosis, even when nutritional intake is reduced or variable.

Type 2 Diabetes Mellitus (T2DM)

T2DM may initially be managed with oral glucose lowering therapies alone. However, during acute illness and stress, increased insulin resistance, the risk of lactic acidosis, or the development of acute kidney injury may mean that patients previously managed by oral glucose lowering therapies alone may need temporary or permanent conversion to insulin therapy.

Type 3c/Secondary diabetes

Diabetes secondary to pancreatic damage or pancreatitis may be associated with variable endogenous insulin production. Some individuals are markedly insulin deficient and require management like that of T1DM, while others retain a significant insulin reserve. The degree of insulin deficiency may be unclear at the time enteral feeding is initiated. In addition, pancreatic exocrine insufficiency may impair digestion and absorption of enteral feeds, leading to altered nutrient delivery and unpredictable glycaemic control.

3. Impact of different types of feeds on glycaemic control

There are several types of feeding regimens used in the hospital, each with its own potential benefits and challenges. The most common regimens are outlined below:

Feeding regimen	Advantages	Risks / Disadvantages
Single-feed regimen (commonly 20-hour feed with 4-hour break)	• Provides a gastrointestinal rest period • Often used as a first line feeding approach • May work better in patients with endogenous insulin production	• Frequent interruptions for hygiene, procedures, or medications • Increased risk of hypo- or hyperglycaemia due to feed disruption and in the break period • Difficulty establishing a consistent feeding–insulin regimen
Continuous 24-hour feed regimen	• Provides a stable and continuous glycaemic load • Commonly used in intensive care and high-dependency settings	• Feed interruptions on general wards increase hypoglycaemia risk • Reduced flexibility for mobilization and routine nursing care
Multiple short-feed (bolus feed) regimen	• More closely mimics normal meal patterns • Better alignment with the pharmacodynamics of subcutaneous insulin	• Increased intensive nursing workload • High risk of hypo- and hyperglycaemia if insulin timing does not match feed delivery

For bolus feeding regimen, rapid-acting insulin is usually required with each feed. This demands careful coordination by nursing staff to ensure both insulin and feed are given at the correct time, minimising the risk of both hypoglycaemia and hyperglycaemia. Due to this increased complexity and safety risk, bolus feeding is generally not the preferred regimen for inpatients with diabetes where suitable alternative feeding regimens are clinically appropriate.

4: Factors influencing glucose and treatment regimen:

It is important to ensure that the insulin profile aligns with the intended insulin regimen. Certain factors such as people with T1DM, known insulin deficiency (e.g. total pancreatectomy), high Hba1c, high glucose variability prior to feeding and high NEWS score may increase the risk of glucose variability during the feed.

5. Glucose targets

- Patients with diabetes who are receiving enteral feed should have their capillary blood glucose checked pre-feed, then 4-6 hourly while the feed is running.
- Use of continuous glucose monitoring (CGM) like Dexcom or Libre should not be used in isolation, as the results may not be reliable when patients are unwell.
- If glucose remains within the target range of 6-12 mmol/L, continue the current feed and insulin regimen, maintain regular glucose monitoring, and adjust feed or insulin only if trends change.
- If the feed stops unexpectedly, blood glucose should be monitored hourly until stable due to the increased risk of hypoglycaemia.

6: Testing for ketones

- Ketones should be tested if the blood glucose level is $\geq 15\text{mmol/l}$, or the person is unwell, vomiting or showing signs of infection.
- Ketone assessment is particularly important in type 1 diabetes and known insulin deficiency.
- Ketones can be tested using a blood ketone testing kit.

7: Choice of agent

Non-Insulin Treatment

- Metformin (liquid form) are licensed to be administered via enteral feeding tube and may be considered, where appropriate, for mild hyperglycaemia (up to blood glucose of 12 mmol/L) in T2DM. The tube must be flushed twice with 10ml of water after each dose.
- Crushing sulphonylureas is generally not advised as it may lead to unpredictable absorption and administration challenges. Ward pharmacists may be consulted if options outside of this are limited.
- Modified release preparations must never be crushed.
- There is currently no data to support the use of glucagon-like peptide-1 mimetics (GLP1), DPP-4 inhibitors (also known as "gliptins") or SGLT2 inhibitors in the management of hyperglycaemia during enteral feeding. Data supporting their administration through enteral tubes is also lacking.
- Usual oral antihyperglycemic agents should only be given if the patient is eating orally.

Insulin Treatment:

Insulin will need to be commenced if capillary glucose (CBG) level is consistently $>12\text{mmol/l}$.

Variable Rate Intravenous Insulin Infusion (VRIII)

- Initially start VRIII and follow the 'Hospital guidelines for the use of a variable rate intravenous insulin infusion' Frimley Short-term VRIII (usually 24 hours) may be used to achieve glucose control and to establish insulin requirements.

- 5% dextrose is not required alongside VRIII in patients who are receiving enteral feed as the feed will provide glucose. If fluids are required alongside the feed, normal saline should be the fluid of choice.
- During the rest period from the feed, or if the feed is stopped unexpectedly, IV 5% dextrose should be considered as an alternative carbohydrate source to minimise risk of hypoglycaemia.
- It is recommended that the VRIII continues for 24 hours after commencement of feed. If blood glucose levels are elevated on the VRIII, upgrade the scale. Do not reduce the rate of the feed. Blood glucose should be stable on VRIII before subcutaneous insulin is commenced.

Assessing insulin requirements for the feed – Total Feed Dose

Initiate VRIII to determine the patient's 24-hour insulin requirements. Based on this, calculate the insulin needed for the feed. Administer NPH (intermediate) or biphasic (Humulin I or M3) insulin at the start and midway through the feed, allocating approximately 60% of the total dose at the beginning and 40% midway.

Subcutaneous Insulin Regimen:

- The **total daily dose (TDD)** is the total dose of insulin a patient requires over 24 hours. This includes basal and bolus insulin requirements to meet their basic needs.
- **Total Feed Dose (TFD)** is the amount of insulin needed to cover the enteral feed only. It does not include basal, bolus or any insulin required before feed was commenced, but it contributes to the total daily dose (TDD). People with T1DM do not produce endogenous insulin; therefore, subcutaneous basal insulin must always be continued alongside the feed insulin.

Calculating Total Feed Dose (TFD):

To calculate the **TFD**, add up the total amount of insulin given via the VRIII while the feed was running, then reduce this total by 20%. The final number is the insulin dose needed for the feed. For example:

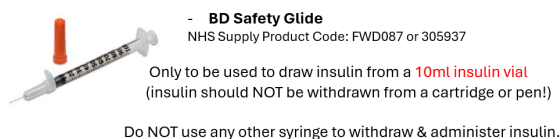
Patient X required 40 units of insulin via VRIII during the feed.

Reduce this by 20%:

20% of 40 units = 8 units

40 – 8 = 32 units

- The Total Feed Dose (TFD) is therefore 32 units.
- Use NPH or biphasic insulin (Humulin I or Humulin M3): Split the dose to 60% (19 units) at the start of the feed and 40% (13 units) halfway through the feed



(Refer to Insulin Supply Guidelines for information on where Insulin is stocked and obtain insulin promptly
Frimley Guidelines)

For patients with T1DM:

- Continue subcutaneous basal insulin in patients with T1DM. A dose reduction of around 20% may be considered in those at risk of hypoglycaemia.

- Basal insulin must never be stopped in people with T1DM or known insulin deficiency, as this risks diabetic ketoacidosis (DKA), particularly if the feed is stopped unexpectedly or earlier than planned. Where possible, refer to the Diabetes Inpatient Team (DIT) prior to starting feeds to optimise glucose control if levels are suboptimal.
- Prescribe subcutaneous insulin based on the insulin requirements observed during VR111 to cover the glucose rise from feeds.
- If the enteral feed is stopped or discontinued early and the patient remains nil by mouth, a VR111 should be commenced to maintain glycaemic control and prevent ketosis, particularly in those with insulin deficiency.

For patients who are on basal insulin:

Sometimes people with T2DM or Type 3c diabetes may be on basal insulin.

- Basal insulin may be continued alongside the insulin for feed; however, the dose should be reduced by at least 20%.
- Further reduction may be needed further depending on the glucose levels. Refer to the diabetes inpatient team at the earliest.

For patients who are on mixed insulin:

- These patients may need their insulin adjusted to align with the feed regime.
- Basal insulin may need to be introduced.
- Referral should be made to the diabetes specialist team for advice.

8: Documentation of Enteral Feeds and Insulin

Prescription and administration of enteral feeds

Feeding Tube Nasogastric 12 Fr. Left nare							
Feeding Tube Properties	Placed: 7/4/2026 20:00	Earliest Known Present: 9/4/2026	Show All Properties				
Site assessment							Clean, Dry, Intact
Method of securement							Bridle
Measurement at nare (cm)							53
Tube status							Uncolimped
NG/NJ tube retention device (bride) in place							N/A
Drainage appearance							Cloudy
pH aspirate							5
X-ray read							
Tube feeding method							Intermittent
Name of tube feed							Hutson Proteol...
Tube feeding bag changed							Yes
Flush Tube Intake (mL)						200	200 mL
Meds intake (mL)							100 mL
Tube feed administered (mL)	80	80	80	80	80		80 mL
Tube output (mL)							0 mL
Gastric residual volume drawn (mL)							0 mL
Gastric residual volume replaced (mL)							0 mL
Gastric residual volume discarded (mL)							0 mL

Enteral feeds must be accurately documented in the intake/output (I/O) flowsheet. Clear documentation of feed start times, stop times, interruptions, and volumes delivered is essential to allow the Diabetes Specialist Nurse (DSN) and medical team to safely review and adjust insulin doses

- Incomplete or unclear feed documentation can lead to inappropriate insulin dosing and increase the risk of hypoglycaemia or hyperglycaemia and patient harm.

Prescription and administration of insulin with enteral feeding

- Ensure the feeding tube is in place and ready to use, and that the feed is prepared and ready to be administered before giving any feed-related insulin.
- Feed related insulin must be prescribed with clear timing linked to the feed:
 - 20–24 hour feeds: “At the start of the feed” and “midway through the feed”

- Overnight/shorter feeds (10–12 h): “At the start of the feed”
- Bolus feeds: Enter Admin instructions as “At the start of the feed”
- Prescriptions must not state “when feeding” without clear timing, as this risks insulin being given when feeds are interrupted or stopped.
- Prescription timings must be changed to align with feed timings.
- Nursing staff must document the exact time insulin is administered; this is essential for reviewing glycaemic trends and adjusting doses after hypo or hyperglycaemia.

- If the patient is already prescribed a bolus insulin (for feed or prior to admission), the same insulin brand should be used for PRN correction doses.
- Always continue basal insulin in patients with T1DM or known insulin deficiency.
- Ensure appropriate enzymes are prescribed in patients with pancreatic exocrine insufficiency, as altered carbohydrate absorption can significantly affect glucose control.

9: Actions to take if feed stopped unexpectedly

If an enteral feed is stopped for any reason, remember that insulin already given may still be active and can continue to lower blood glucose. This places the patient at risk of hypoglycaemia. Close monitoring and prompt action are essential.

- Check capillary blood glucose hourly and increase to every 15 minutes if there are symptoms or signs of hypoglycaemia.
- Consider IV glucose to replace missed carbohydrate intake and prevent hypoglycaemia.
- If the feed is stopped unexpectedly and a feed related subcutaneous insulin dose is due, do not administer that dose.
- When the feed is restarted, give the appropriate feed related insulin dose, noting that this may differ from the dose that was missed.
- Continue basal insulin in patients with T1DM.
- If the feed is withheld for a prolonged period, PRN rapid acting insulin or a VRIII may be required to maintain glycaemic control
- Contact the Diabetes Inpatient Team (DIT) or the on call medical team if the DIT is unavailable.

10: Further Insulin adjustments for hyperglycaemia

Once feed-related insulin has been started, reassess glucose trends after each insulin adjustment. Further dose adjustment may be required if hyperglycaemia persists. Capillary blood glucose >12 mmol/L should trigger review and action. If ketonemia >0.6 mmol/L, follow local ketone testing and DKA protocols Frimley Guidelines. If ketones are not present, manage hyperglycaemia as outlined below.

- **PRN insulin** may be used alongside the feed related insulin regimen to correct hyperglycaemia.
 - PRN insulin must be a rapid acting insulin and should be prescribed cautiously considering the timings of the feed and the active insulin on board
 - Use PRN insulin with caution during or shortly before feed breaks.
- **Adjusting feed insulin doses:**
 - If blood glucose remains >12 mmol/L on two or more consecutive readings, increase the feed insulin dose by 10–20% at a time
 - Review response and repeat adjustments until target glucose levels are achieved.
- **Escalate if control remains poor:**
 - Some patients may require larger dose increases.
 - Involve the Diabetes Inpatient Team (DIT) if hyperglycaemia persists despite repeated titration.

11. Actions in events of Hypoglycaemia

Blood glucose should be monitored regularly, particularly during feed rest periods. If hypoglycaemia occurs, treat immediately as per the ward hypoglycaemia guideline and inform the medical team and DSN- [Insert guideline link here](#). In patients who are NBM

- Give 15–20 g rapid acting carbohydrate via the feeding tube (e.g. 60 ml Lift®/GlucoJuice® or 70 ml Fortijuce®).
- Recheck blood glucose after 15 minutes and repeat treatment if this remains <4 mmol/L.
- Once blood glucose is >4 mmol/L, give longer acting carbohydrate (e.g. restart feed if due or a 100 ml bolus of Fortisip Compact Protein. Flush the feeding tube with 50 ml water before and after treatment.
- If hypoglycaemia persists, escalate as per Hypoglycaemia guideline (IV glucose ± glucagon).
- Review insulin timing and doses following any hypoglycaemic episode and increase monitoring frequency.

12. Use of Technology during enteral feeds

- Capillary blood glucose (CBG) monitoring remains mandatory throughout enteral feeding, even if a CGM sensor is in place, and should be used to guide insulin and feed adjustments.
- Evidence is limited in acute illness: CGM has not been sufficiently studied in hospitalised patients receiving enteral feeding, and ward staff may be unfamiliar with its interpretation and limitations.

- CGM should be used as an adjunct only, to support—not replace—fingerstick glucose checks.
- Closed loop (hybrid) insulin pump systems are not routinely advised, as there is very little experience and evidence supporting their use during enteral feeding in hospital.

13: Self-Management of diabetes and insulin

- During acute illness and short-term enteral feeding, self-management of diabetes may not be appropriate due to the complexity of glucose control. Patients should still be given a clear explanation of any changes made to their diabetes treatment.
- If enteral feeding is expected to continue beyond the acute phase, the patient should be actively involved in agreeing the feeding and insulin regimen, with early, supported engagement in self-management self-management according to their ability.
- For patients likely to be discharged on enteral feeding, self-management should be planned early, and education should not be left until just before discharge unless clinically unavoidable.
- If a patient is willing and assessed as capable of managing some aspects of their usual insulin regimen, this should be recognised and documented. Where appropriate, the patient may be supported to self-manage at Level 1 (assisted self-management), in which the patient administers their usual insulin with support and oversight from nursing staff, in line with local policy and safety procedures. Self-management decisions should align with the local guidelines Frimley Guidelines ensuring patient safety while promoting autonomy where feasible.

14: Stopping Enteral feeds

During the transition phase where oral intake improves, but before enteral feeding is fully discontinued, glycaemic variability is common due to changing carbohydrate intake. Close monitoring of blood glucose is essential until glucose levels are stable

- In patients who did not require diabetes treatments prior to enteral feeding, and where no new diagnosis of diabetes has been made, all feed related diabetes treatments can be stopped once enteral feeding ceases.
- For patients previously treated with oral hypoglycaemic agents, these should be reviewed, adjusted as needed, and restarted gradually as oral intake improves.
- Any feed related insulin or diabetes treatments should be reduced or stopped as enteral feeding is reduced or discontinued.
- The ward team should review whether the preadmission insulin regimen remains appropriate and seek advice from the Diabetes Inpatient Team (DIT) if there is any uncertainty.
- Ensure the insulin is removed from the patient's bedside and NOT SENT HOME WITH THE Patient if this was for short term use only

Full version control record

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Guidelines Lead(s):	Aish Chalise (Diabetes Specialist Nurse) Ruth Sturgess (Diabetes Specialist Dietitian)
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This guideline has been registered with the Trust. However, clinical guidelines are guidelines only. The interpretation and application of clinical guidelines will remain the responsibility of the individual clinician. If in doubt, contact a senior colleague or expert. Caution is advised when using guidelines after the review date.

This guideline is for use in Frimley Health NHS Foundation Trust hospitals only. Any use outside this location will not be supported by the Trust and will be at the risk of the individual using it.

Version Control Sheet

Version	Date	Guideline Lead(s)	Status	Comment
1	Dec 2020	Aish Chalise, Dr Emma Bingham	Final	First trust-wide version.
2	May 2023	Aish Chalise, Dr Jenny Tringham	Final	Updated guidelines to include documentation on Epic and amendments made for management of hypoglycaemia
3	June 2026	Aish Chalise	Final	Update Ratified at: Cross site Diabetes and Endocrine Clinical governance meeting 18/06/2026 DTC: 10/08/2026

Related Documents

Document Type	Document Name
Guideline	Frimley Guidelines - Insulin Supply
Guideline	Use of a Variable Rate Intravenous Insulin Infusion (VRIII)
Guideline	Hypoglycaemia in Adults with/without diabetes