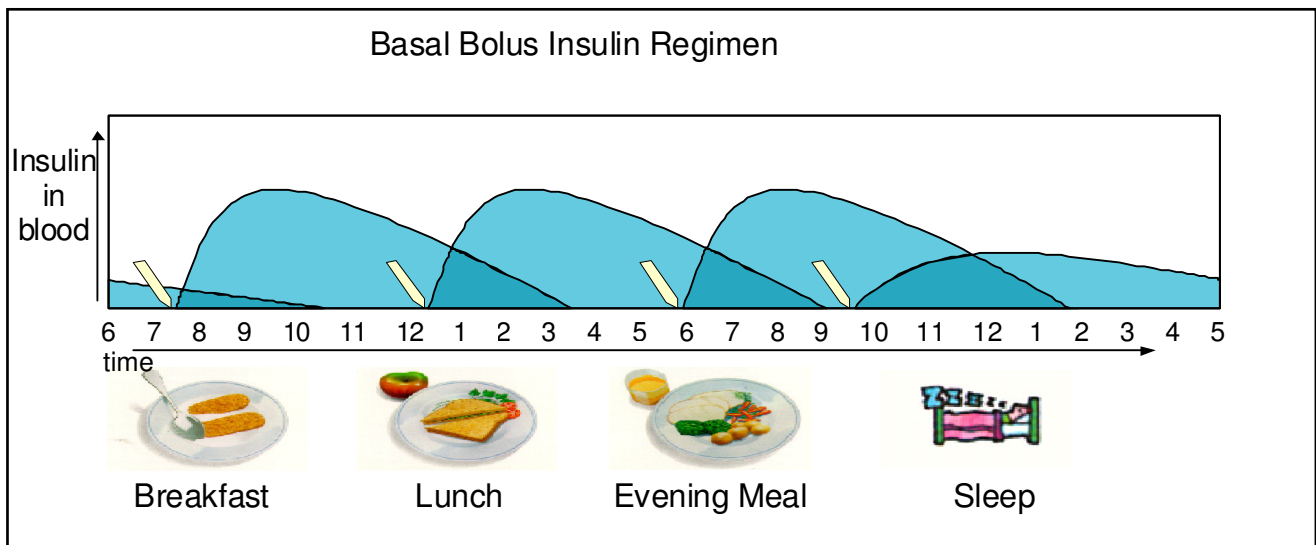


Tayside Diabetes MCN Handbook

Insulin Adjustment Guidelines

Multiple Daily Injections and Basal Bolus Regimens



Hyperglycaemia (blood glucose > 10mmol/L)

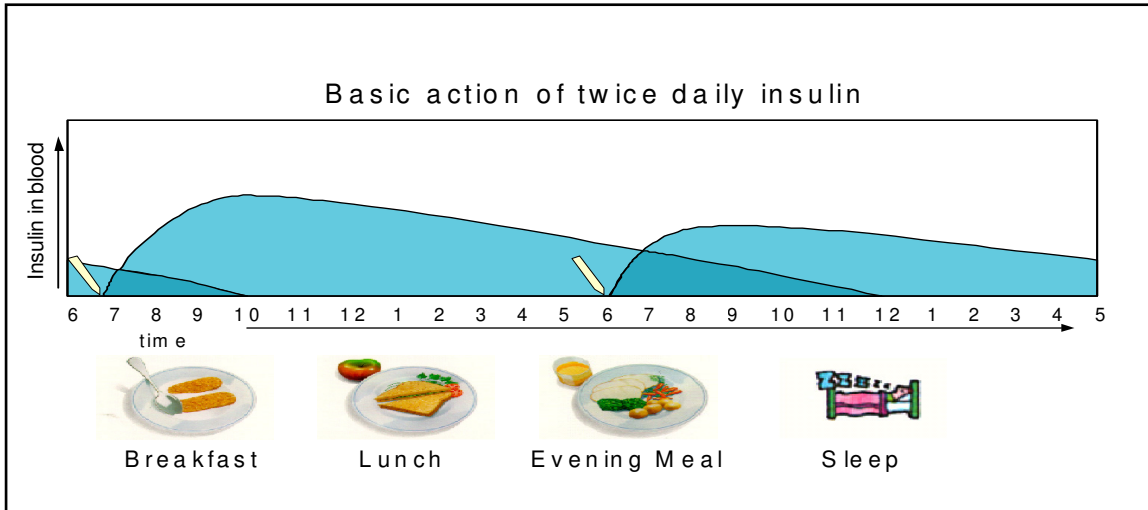
- Ideally, blood glucose levels should be 4-7mmol/L before meals
- Avoid adjusting insulin reactively to 'quick fix' high readings, this may precipitate hypoglycaemia.
- Review pattern of blood glucose levels over the previous 48 hours.
- Adjust insulin dose prior to the elevated blood glucose level as follows:
 - blood glucose > 7 mmol/L at lunchtime **increase** the breakfast insulin dose.
 - blood glucose > 7mmol/L at teatime **increase** the lunchtime insulin dose.
 - blood glucose > 7 mmol/L at suppertime **increase** the evening meal insulin dose.
 - blood glucose > 7 mmol/L at breakfast time **increase** basal insulin dose (e.g. insulatard, lantus, humulin, levemir)
- An increase of 2-4 units /10 % of dose of insulin is generally recommended.
- Check ketones in people with type 1 diabetes.
- Observe the pattern of premeal blood glucose levels thereafter and titrate insulin again if necessary.

Hypoglycaemia (blood glucose <4mmol/L) should not be tolerated on a regular basis

- In the event of an episode of **unexplained hypoglycaemia** reduce insulin.
- Adjust insulin prior to the hypoglycaemic episode as follows:
 - blood glucose < 4mmol/L prior to lunchtime **reduce** the breakfast insulin dose
 - blood glucose < 4mmol/L prior to teatime **reduce** the lunchtime insulin dose
 - blood glucose < 4mmol/L prior to suppertime **reduce** the evening meal insulin dose
 - blood glucose < 4mmol/L prior to breakfast time **reduce** basal insulin dose (e.g. insulatard, lantus, humulin, levemir).
- A reduction of 2-4 units/ 10 % of dose of insulin is generally recommended.
- Observe the pattern of the blood glucose levels thereafter and titrate insulin again if necessary.
- **DO NOT OMIT INSULIN**, ask for advice from diabetes team if necessary.

- If blood glucose level is low (below 4mmol/L) and insulin injection is due, provide patient with some quick acting carbohydrate e.g. 50mLs of Lucozade to increase blood glucose level, then administer insulin and meal as usual.
- Address the cause of hypoglycaemia to prevent it from happening again.

Twice Daily Insulin Regimen



Hyperglycaemia (blood glucose >10mmol/L)

- Ideally, blood glucose levels should be 4-7mmol/L before meals
- Avoid adjusting insulin reactively to 'quick fix' high readings, this may precipitate hypoglycaemia.
- Review the pattern of blood glucose levels over the previous 48 hours.
- Adjust insulin if the pattern of blood glucose level is elevated.
- Adjust the insulin dose prior to the elevated blood glucose level:
 - blood glucose > 7mmol/L before lunch and tea **increase** the breakfast insulin dose.
 - blood glucose > 7mmol/L before bed and before breakfast **increase** the teatime insulin dose
- An increase of 2-4 units/ 10 % of dose of insulin is generally recommended.
- Check ketones in people with type 1 diabetes.
- Observe the pattern of the premeal blood glucose levels thereafter and titrate insulin again if necessary.
- Occasionally a different 'mixture' of insulin may be required.

Hypoglycaemia (blood glucose <4mmol/L) should not be tolerated on a regular basis

- In the event of an episode of **unexplained hypoglycaemia** reduce insulin.
- Adjust the insulin dose prior to the hypoglycaemic episode:
 - blood glucose < 4mmol/L before lunch and/or before tea **reduce** breakfast insulin
 - blood glucose < 4mmol/L before bed and/or before breakfast **reduce** the teatime insulin dose
- A reduction of 2-4units/ 10 % of dose of insulin is generally recommended.
- If blood glucose level is low (below 4mmol/L) and insulin injection is due, provide patient with some quick acting carbohydrate e.g. 50mLs of Lucozade to increase blood glucose level, then administer insulin and meal as usual.

- Address the cause of hypoglycaemia to prevent it from happening again.
- Occasionally a different 'mixture' of insulin may be required.

Trouble Shooting Guidelines - Glycaemic Control

- If normal insulin regimen unknown **DO NOT OMIT INSULIN** consider suitable substitute until routine insulin details are established e.g. daily/BD isophane in elderly, biphasic insulin twice daily in others - dose 0.5units/kg/24hours.
- Quality controlled blood glucose meters should be used in acute ward areas by healthcare staff.
- Ideally, the pre meal blood glucose should be maintained 4-7mmol/L.
- Assess target blood glucose range and frequency of blood monitoring for each individual.
- Hba1c indicates the glycaemic control during previous 3 months –target 6.5% to reduce risk of health problems associated with diabetes. Personal targets should be agreed, aggressive targets may be unsuitable in elderly.

SITUATION	SITUATION
<p>HYPERGLYCAEMIA and/or KETOSIS <i>Blood glucose level >10mmol/L.</i>Risk of osmotic symptoms of diabetes and dehydration. Risk of DKA in type 1 diabetes</p>	<p>HYPOGLYCAEMIA <i>Blood glucose level <4mmol/L</i> A potentially dangerous side effect of insulin therapy and sulphonylureas e.g. gliclazide, glipizide, glibenclamide. Prompt treatment is required. Hypoglycaemia should not be tolerated on a regular basis.</p>
BACKGROUND	BACKGROUND
<p>Consider causes of high blood glucose levels: e.g.</p> <ul style="list-style-type: none"> • Infection • Stress • Steroid therapy • Insulin and/or diabetes medication omission /inadequacy • Concordance with treatment/food intake • Problems with insulin injection technique • Problems with injection site affecting insulin absorption 	<p>Consider causes of low blood glucose levels: e.g.</p> <ul style="list-style-type: none"> • Inadequate food intake, fasting, missed meals • Too much insulin/diabetes medication • Insulin administration or drug administration at inappropriate time • Problems with insulin injection technique • Problems with injection site affecting insulin absorption • Increased activity • Renal or hepatic impairment • Pancreatic pathology
ASSESSMENT	ASSESSMENT
<ul style="list-style-type: none"> • Assess recent pattern of blood glucose levels i.e. last 48 hours • Identify potential causes of elevated blood glucose levels • Check insulin/diabetes medication is being prescribed and administered at correct dose, and time, in relation to food intake. • Check for signs of lipohypertrophy (lumpy areas at injection sites) which may affect insulin absorption. • Check credibility of blood glucose monitoring e.g. handwashing 	<ul style="list-style-type: none"> • Assess recent pattern of blood glucose levels i.e. last 48 hours • Identify potential causes of low blood glucose levels • Assess recent nutritional status • Check insulin/ diabetes medication is being prescribed and administered at correct dose, and time, in relation to food intake • Check for signs of lipohypertrophy (lumpy areas at injection sites) which may affect insulin absorption.

<ul style="list-style-type: none"> • Check ketones in type 1 diabetes. • Check ketones in all patients at diagnosis of diabetes • KETONES signify potential risk of DKA in people with type 1 diabetes 	<ul style="list-style-type: none"> • Check credibility of blood glucose monitoring e.g. handwashing
<p>RECOMMENDATION</p>	<p>RECOMMENDATION</p>
<ul style="list-style-type: none"> • Address identified causes if possible • Check ketones in patients with type 1 diabetes 2-4 hourly until ketone free, daily thereafter. • Insulin and fluid increase may be indicated in ketosis, report to medical staff. • Refer to DKA protocol in type 1 diabetes with ketosis • Consider increase in insulin/ diabetes medication if recent pattern of pre meal blood glucose levels greater than 7mmol/L • Inform patient if medication dose is changed • Monitor pre meal blood glucose levels to assess glycaemic control • Review glycaemic control over next 48 hours • Adjust insulin/medication again if necessary • Consult with diabetes team for advice as required 	<ul style="list-style-type: none"> • Treat hypoglycaemia • If patient able to swallow -administer 50mL Lucozade • If patient confused or drowsy and able to swallow – administer glucogel • If patient unconscious/unable to swallow - IV 50%dextrose. • Provide complex CHO snack e.g. wholemeal bread/toast • Observe and chaperone patient until recovery complete • Recheck blood glucose in 15 minutes and repeat treatment if necessary. • Establish the cause of hypoglycaemia and take action to prevent re occurrence. • NEVER OMIT insulin –treat hypo and administer insulin as usual • Consider reduction of insulin/medication • Inform patient if medication dose is changed • Monitor pre meal blood glucose levels over next 48 hours • Review glycaemic control, adjust insulin/medication again if necessary • Consult with diabetes team for advice as required

See other sections of Handbook for information on Treatment with insulin and Treatment with oral hypoglycaemic agents.

Contact Details for Diabetes Team

Specialist Registrar for Diabetes bleep 5416,
Diabetes Specialist Nurse bleep 4872 tel. Ext. 36009