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Appendix 9

Examples of Insulin Initiation and Titration Regimens in People With Type 2 Diabetes

Examples of Insulin Initiation and Titration Regimens in People With Type 2 Diabetes

All people starting insulin should be counseled about the recognition, prevention and treatment of hypoglycemia. Consider a change in type or timing of insulin administration if glycemic targets are not being reached.

Example A: Basal insulin (degludec U-100 or U-200, detemir, glargine U-100 or U-300, NPH) added to non-insulin antihyperglycemic agents

- Insulin should be titrated to achieve target fasting BG levels of 4.0 to 7.0 mmol/L or individualized targets (e.g. 4.0 to 5.5 mmol/L if A1C target ≤7.0% not achieved; higher fasting BG targets may be considered in some people with diabetes where the goal of avoiding hypoglycemia is important, see Targets for Glycemic Control, p. S42).
- Individuals can be taught self-titration, or titration may be done in conjunction with a health-care provider.
- Suggested starting dose is 10 units once daily at bedtime.
- Suggested titration is 1 unit per day until target is reached. (Degludec should be titrated by 2 units every 3 to 4 days or 4 units once a week).
- A lower starting dose, slower titration and higher targets may be considered for elderly or normal-weight subjects.
- In order to safely titrate insulin, people with diabetes must perform self-monitoring of blood glucose at least once a day fasting.
- Insulin dose should not be increased if the individual experiences 2 episodes of hypoglycemia (BG <4.0 mmol/L) in 1 week or any episode of nocturnal hypoglycemia.
- Noninsulin antihyperglycemic agents (especially insulin secretagogues) may need to be reduced if daytime hypoglycemia occurs.

Example B: Basal Plus Strategy - Adding bolus (prandial or mealtime) insulin (aspart, faster-acting insulin aspart, glulisine, lispro) once daily to optimized basal insulin therapy

- When intensification of insulin therapy is necessary, start one injection of mealtime insulin to either main meal or breakfast.
- Starting dose is 2 to 4 units and the person with diabetes can be taught self titration or dose increase can be done by health-care provider.
- To safely increase dose, blood glucose levels should be measured at least prior to insulin dose then titrated by 1 unit daily to either of the following targets.
  - 2-hour post-meal glucose of ≤8.0 mmol/L
  - pre-meal glucose of the next meal of 4.0 to 7.0 mmol/L.
- Important to keep carbohydrate intake constant and may consider reduction or discontinuation of insulin secretagogues

Example C: Basal-Bolus Insulin - Multiple Daily Injections Therapy

- Calculate total daily dose of 0.3 to 0.5 units/kg then distribute as follows:
  a. 40% of total insulin dose as basal insulin (degludec U-100 or U-200, detemir, glargine U-100 or U-300, NPH)
  b. 20% of total insulin as bolus (prandial) insulin 3 times per day using rapid-acting insulin analogue (aspart, faster-acting insulin aspart, glulisine, lispro).

Example D: Premixed Insulin (Humulin 30/70, Novolin 30/70, Humalog Mix 25, Humalog Mix 50, NovoMix 30, added to noninsulin antihyperglycemic agents

- Suggested starting dose is 5 to 10 units once or twice daily (prebreakfast and/or presupper).
- Suggested titration is 1 to 2 units added to prebreakfast dose and/or presupper dose daily until target BG values are reached based on prebreakfast and presupper BG readings.
- Prebreakfast premixed insulin achieves presupper target BG value (4.0 to 7.0 mmol/L).
- Presupper premixed insulin achieves target fasting BG value (4.0 to 7.0 mmol/L).
- 30/70 premixed insulin should be given 30 to 45 minutes before meals.
- Humalog Mix 25 or NovoMix 30 premixed insulin should be given immediately before eating.
- Stop increasing insulin doses when both target BG levels are reached.
- If both BG targets are not reached, continue to increase the relevant dose until both targets achieved.
- The individual needs to self-monitor BG at least twice daily to safely titrate insulin.
- Insulin dose should not be increased if the individual experiences 2 or more episodes of hypoglycemia (BG <4.0 mmol/L) in 1 week or any episode of nocturnal hypoglycemia.
- Noninsulin antihyperglycemic agents (especially insulin secretagogues) may need to be reduced or stopped at the start of this regimen or when daytime hypoglycemia occurs

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Sample Instructions for Patients With Type 2 Diabetes Who Are Starting and Adjusting Insulin

You will be taking insulin _____ at _____ .

It is important that you continue to take your other diabetes medications as prescribed unless you have been told to change the dose or stop them.

How to adjust your insulin dose

- Your target fasting blood glucose level is _____ mmol/L.
- You will inject _____ units of _____ at _____ .
- You will continue to increase your insulin dose by _____ unit(s) every _____ day(s) until your fasting blood glucose level is _____ mmol/L.
- Do not increase your insulin when your fasting blood glucose is _____ mmol/L.
- You should call for further instructions when your blood glucose reaches _____ mmol/L for 3 or more days: phone number _____ .
- A side effect of insulin is low blood glucose (hypoglycemia); low blood glucose can occur with too much insulin, increased activity or not enough food.

Monitoring your blood glucose

- It is important to test your blood glucose while your insulin treatment is being modified.
- You should test your blood glucose and record the value every day before breakfast and _____ .
- Test before each meal, unless you are instructed differently.
- It is important to record your blood glucose values and any changes in activity or food in your diary and bring this to your next appointment; this information helps your diabetes health-care team understand your diabetes control.
- Unless otherwise instructed, you are trying to reach a target blood glucose of 4.0 to 7.0 mmol/L before meals, and 5.0 to 8.0 mmol/L after meals.
- If you think your blood glucose is low, check it and record that information in your diary.

Instructions for taking your other glucose-lowering diabetes medications:

Current medications	Dose	Time of day	Special instructions