
The University of Auckland, The University of Waikato & NZSSD
PRESENTS
PACIFIC DIABETES MANAGEMENT COURSE
Your session will start shortly
with support & facilitation from
Aotearoa Diabetes Collective
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Welcome to the 2025
Pacific Diabetes Management Course

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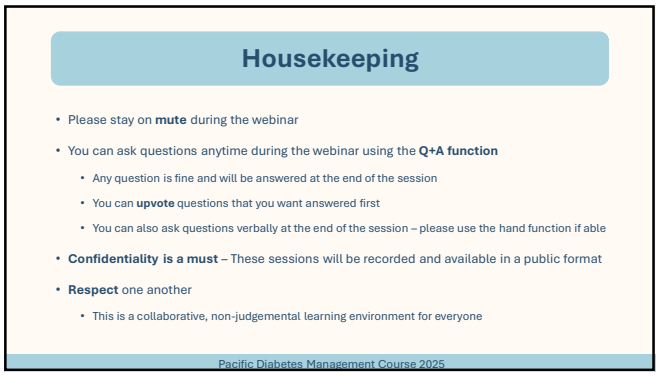
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Please stay on mute during the webinar
You can ask questions anytime during the webinar using the Q+A function
Any question is fine and will be answered at the end of the session
You can upvote questions that you want answered first
You can also ask questions verbally at the end of the session – please use the hand function if able
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Respect one another
This is a collaborative, non-judgemental learning environment for everyone
Pacific Diabetes Management Course 2025

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The University of Auckland, The University of Waikato & NZSSD
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PACIFIC DIABETES MANAGEMENT COURSE
with support & facilitation from
Aotearoa Diabetes Collective
Webinar 5.
Diabetes & sick day management, pregnancy + driving

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Diabetes + driving

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Diabetes + driving

- Patients on **insulin and/or sulfonylureas** need to be informed of the law + recommendations around driving
  - Patients may be prosecuted if they have not followed these recommendations
- **Key points to emphasise to patients are – they must:**
  - Ensure their glucose levels are > 4.2 mmol/L before they drive
    - (above 5 is safe to drive or to stay alive)
  - Have their glucometer and/or CGM + treatment for hypoglycaemia in the vehicle
  - To stop the vehicle + check their glucose levels immediately if any symptoms of hypoglycaemia
  - Not drive for 1 hour after an episode of mild hypoglycaemia
  - Not drive for 24 hours after an episode of severe hypoglycaemia (48 hours if on sulfonylureas)
  - Not drive for 1 month if an episode of severe hypoglycaemia whilst driving
  - Useful to check glucose levels ≥ 2-3 hourly on long trips + not drive if unwell with very high glucose levels

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Diabetes + driving

- Key part of clinical assessment for driver's licence is to **determine risk of hypoglycaemia**:
  - Adequacy of monitoring + any evidence of hypoglycaemia
  - Hypoglycaemic unawareness + previous severe hypoglycaemia
  - Irregularity of shift patterns/meal breaks etc.
- **Also important to consider other related factors** in fitness to drive:
  - Peripheral neuropathy + vascular disease
  - IHD + cerebrovascular disease
  - OSA + daytime somnolence
  - Cognitive impairment
  - Vision
    - Cataracts + previous panretinal photocoagulation may disproportionately affect night vision

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When to refer to specialist care

- **Whenever legally required**
- **Whenever you have doubts on the patient's fitness to drive**
- **Red flags include:**
  - Applications for special or heavy vehicle classes and endorsements on licence 2,3,4,5 licences
  - Severe hypoglycaemia and/or frequent episodes of mild hypoglycaemia
  - Long duration of disease and/or elderly → especially if hypoglycaemic unawareness
  - HbA1c < 48 mmol/mol + > 90 mmol/mol on insulin
  - Significant burden of microvascular and/or macrovascular complications

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Sick day management

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Why is sick day management important?

- People with diabetes are more likely to get unwell
- **Intercurrent illness often results in significant hyperglycaemia even in prediabetes**
- **Hyperglycaemia leads to increased morbidity + mortality** via multiple mechanisms:
  - Decreased immune response + healing & increased thrombosis + fluid shifts
  - May result in life threatening DKA or HHS
- Patients on **insulin and/or sulfonylureas at risk of hypoglycaemia** if reduced oral intake

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Why do people get high glucose levels when unwell?

- Stress response of illness
- Reduced physical activity
- Altered diet
- Withholding of glucose lowering agents
- New medications e.g. steroids

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Sick day management plans

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Sick day management plan

- All with diabetes should have a **written sick day management plan** that includes:
  - Basic advice to stay well
  - When to check glucose levels
  - What glucose lowering therapies need to be changed
  - When to seek medical attention
- **Ideally provide at diagnosis & ensure up to date if changes made + at annual review**

Available on Healthify & ADC website

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Basic advice for sick day management

- Notify somebody that they are unwell
- Avoid strenuous activity
- Avoid NSAIDs
- Stay well hydrated → aim for 1 glass of water per hour
- Continue to eat as per normal → regular light meals if unable to tolerate normal diet

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When do people need to check their glucose levels?

- **Whenever they have symptoms of hyperglycaemia or hypoglycaemia**
- **At least 3 - 4 times across the day when unwell**
- **More frequent monitoring may be required particularly around hypoglycaemia**
- Ketone levels (ideally blood) should be checked during illness if:
  - Type 1 or pancreatogenic diabetes
  - Previous history of DKA
  - On empagliflozin – do not qualify for funded CareSens Dual meter + urinary ketones inappropriate

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What do I do with their glucose lowering therapies?

- **Empagliflozin needs to be stopped in all acute illnesses**
  - Do not restart until well & eating + drinking normally
  - Need to attend practice or hospital if nausea, vomiting or abdo pain to check ketones
- In gastrointestinal illness withhold any agents that may make symptoms worse:
  - Metformin, vildagliptin + acarbose may need to be withheld
  - Delay next injection of GLP1Ra till well
- **Typically need to greatly reduce or stop sulfonylureas + bolus insulin if reduced intake**

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What do I do with their glucose lowering therapies?

- **Important to continue basal insulin in illness**
- Safest to do temporary 20-30% reduction in basal + premixed insulin if reduced intake
  - May need at least a 40-50% reduction if very large doses + reduced oral intake
- **Frequent monitoring of glucose levels essential to ensure safety**
  - Adjust doses of insulin and/or sulfonylureas as required
  - Ideal time to use CGM if able

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Other points to consider

- Glucose lowering therapies may need to be reduced if acute kidney injury
- Consider withholding other therapies such as diuretics, antihypertensives etc. as appropriate
- Use antimicrobial treatment early if appropriate
- Optimise preventative care such as vaccination
  - Medic Alert and/or MediAlarm if on insulin and/or sulfonylureas

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When should/does care need to be escalated?

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When should people seek medical attention?

- **To phone an ambulance when significantly unwell**
- Whenever they would contact the practice irrespective of their glucose levels
  - **Patients should be encouraged to contact if any gastrointestinal illness**
- Any episode of severe hypoglycaemia or frequent episodes of mild hypoglycaemia
- Glucose levels persistently > 16 - 20 mmol/L – individualise threshold

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When do I refer to secondary care/hospital?

- **When referral is warranted independent of glucose or ketone levels**
- Capillary ketone levels > 1.5 mmol/L
- Glucose levels persistently > 25 mmol/L and/or symptoms of hyperglycaemia
- Any concerns over the development of HHS or DKA
- Severe hypoglycaemia or high risk for severe hypoglycaemia

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Steroid-induced hyperglycaemia

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Steroid-induced hyperglycaemia

- Steroids may cause significant hyperglycaemia by ↓ insulin secretion > ↑ insulin resistance
  - Very common with doses of prednisone > 10 mg/day or dexamethasone > 1 mg per day
  - Often results in significant symptoms even in those with prediabetes or normoglycaemia
- **Need an approximately 30% increase in both basal + prandial insulin**
  - **Correction insulin useful to treat ongoing hyperglycaemia**
  - May be more effective to switch basal insulin to mane if prolonged course
- May need to start weight-based basal insulin in insulin-naïve patients
  - **Once daily isophane insulin (Protaphane) in the morning likely matches prednisone profile best**
    - **Once daily glargine insulin (Lantus) in the morning likely matches dexamethasone profile best if available**
  - **Sulfonylureas may be useful alternative in mild steroid-induced hyperglycaemia**

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Example of steroid-induced hyperglycaemia

- Mr F is a 68 year old man with T2D with an HbA1c of 58 mmol/mol on metformin/empagliflozin, vildagliptin + gliclazide
- Frequent exacerbations of COPD treated with prednisone 40 mg daily for 1 week
- Associated with significant hyperglycaemia + appropriately stops Jardiamet when unwell
- **Start 0.2 units/kg Protaphane mane + add correction with rapid-acting insulin**
- **E.g. If 80 kg start 16 units Protaphane mane + use glucose levels to titrate**

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How do I use correction insulin?

- Allows 'correction' of hyperglycaemia pre-meals or at times of reduced oral intake e.g. when unwell
- **Only use Actrapid insulin for correction insulin + do not typically repeat within 6 hours**
  - Needs to be administered separately if on basal or premixed insulin alone
- **Use 1 unit for every x mmol > 6 mmol/L based on the total daily dose (TDD) of insulin**
  - TDD **≤ 25** units → correction 1 unit for every **4** mmol > 6 mmol/L
  - TDD **26 – 40** units → correction 1 unit for every **3** mmol > 6 mmol/L
  - TDD **41 – 75** units → correction 1 unit for every **2** mmol > 6 mmol/L
  - TDD **≥ 76** units → correction 1 unit for every **1** mmol > 6 mmol/L
- **Often safer to limit initial correction to 6 – 10 units + correct to 8 mmol/L if risk of hypoglycaemia**

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How do I use correction insulin?

- E.g. if on basal insulin 40 units + bolus insulin 10 units with meals → total daily dose is 70 units
  - Correction factor is **1 unit for every 2 mmol > 6 mmol/L** provide clear instructions on what dose to administer at each meal

BGL (mmol/L)	Correction dose (units)
4.0 – 7.9	0
8 – 9.9	1
10 – 11.9	2
12 – 13.9	3
14 – 15.9	4
16 – 17.9	5
≥ 18.0	6

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BGL (mmol/L)	Correction dose (units)	Total dose with meal (units)
4.0 – 7.9	0	10
8 – 9.9	1	11
10 – 11.9	2	12
12 – 13.9	3	13
14 – 15.9	4	14
16 – 17.9	5	15
≥ 18.0	6	16

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Management of glucose lowering therapies around procedures

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Glucose-lowering therapies around elective procedures

- No change to glucose lowering therapies typically required for minor procedures
- But need to stop or reduce glucose lowering therapies if reduced oral intake:
  - Stop sulfonylureas + bolus insulin if nil by mouth/minimal intake → can use correction insulin
  - Reduce basal/premixed insulin by > 25% if NBM/minimal intake → can use correction insulin
    - May need ~50% reduction if on large doses e.g. > 0.5 units/kg
  - Stop empagliflozin 3 days (i.e. 2 days before + day of) before bowel prep or low carb diet
  - Stop empagliflozin 3 days (i.e. 2 days before + day of) before any procedure involving:
    - Fasting/reduced oral intake for > 12 hours
    - Any major procedure

Do not restart Empaglilfozin until eating + drinking normally

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Glucose-lowering therapies around elective procedures

- Consider withholding last dose of GLP1RA before surgery if high risk of aspiration
  - GLP1RA + vildagliptin do not influence quality of bowel prep or ability to perform colonoscopy
  - Some centres are now recommending 24 hours of clear fluids prior to procedure for those on GLP1Ra
- Risk of metformin-induced contrast injury now shown to be virtually non-existent
  - Current guidance still recommends withholding metformin for > 48 hours if eGFR < 30 mL/min
  - Ensure adequate hydration if high risk
- Avoiding high + low glucose levels around procedures is important to reduce complications

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Management post discharge from hospital

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Management of diabetes post discharge

- Management of diabetes is difficult in inpatients + often requires marked change in regimen
  - Often withheld medications are forgotten to be restarted
- Glucose lowering therapies on discharge may not be best regimen in outpatient setting
  - **Complex insulin regimens may need to be simplified + doses adjusted**
  - **Knowledge of diabetes care may be greater in community than hospital teams**
- Can usually return to pre-admission regimen if at/close to targets + no major changes
- **Otherwise optimise new regimen as per normal → may need de-escalation of therapy**

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De-escalation of therapy

- De-escalation of therapy commonly required in advanced illness e.g. cancer, dementia etc.
- Individualise + relax glycaemic, BP+ lipid targets → stop or reduce medications as appropriate
  - Likely need to stop sulfonylureas + meal insulin & reduce basal insulin with declining oral intake
  - Also sometimes need to start insulin in end of life cares as other glucose lowering therapies may be inappropriate
- Target glucose levels 6 – 18 mmol/L on as few agents as possible useful to maintain quality of life
- **NB: Development of end-stage diabetic complications not necessarily indicator for de-escalation**

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Diabetes in pregnancy

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Diabetes in pregnancy

- Tight glucose levels periconception + throughout pregnancy is important for best outcomes
  - Risk of miscarriage/stillbirth + fetal malformations exponentially increases with HbA1c > 48 mmol/mol (6.5%)
  - Glucose levels in potential fathers also important
- Ideally all pregnancies in women with diabetes are planned – preconception care involves:
  - Continuing contraception until glucose levels optimised
  - Starting folic acid 5 mg daily + iodine 150 mcg daily
  - Stopping teratogenic medication if safe
    - NB: ACEi/ARBs not teratogenic until at least late 1st trimester + statins low risk of teratogenicity
- May choose to switch glucose lowering therapies to metformin ± insulin pre-conception
  - New guidance suggests that GLP1Ra best stopped 3 months for men + 1 month for women before conception

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Diabetes in pregnancy

- If known diabetes → refer to Diabetes in Pregnancy team as soon as pregnancy confirmed
  - NB: Some services will also see high-risk women with T1D or T2D pre-conception
- Referral to Diabetes in Pregnancy teams asap should also occur if:
  - HbA1c ≥ 42 mmol/mol (6%) on booking bloods
  - Fasting glucose ≥ 5.1 mmol/L and/or 1 hour glucose ≥ 10.6 mmol/L on 75 g GTT at 24 weeks
  - If any random glucose is ≥ 11 mmol/L
- Glucose levels are the best glycaemic targets in pregnancy – aim for:
  - Fasting glucose < 5 mmol/L
  - 1 hour post-meal glucose < 7.4 mmol/L **OR** 2 hour post-meal < 6.7
  - Balance against risks of hypoglycaemia + CGM useful if available

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Diabetes in pregnancy

- Other important points to consider during pregnancy with diabetes:
  - Eye disease can rapidly progress during pregnancy → refer for photoscreening if preexisting diabetes
  - Aspirin ± vitamin D may be started < 16 weeks to prevent pre-eclampsia if high risk
- Follow up for all wāhine with GDM is important as 50% will develop T2D within 5 years
  - Ensure HbA1c at 3 months post delivery is normal or treat if persisting prediabetes/T2D
    - If normal → annual HbA1c to screen for any progression to prediabetes/T2D

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What are the take home messages?

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Take home messages

- **All patients with diabetes should have a written sick day management plan**
- **Glucose lowering therapies often need to be adjusted in acute illness**
  - Empagliflozin has to be stopped in all acute illnesses + others with GI illness
  - Doses of insulin + sulfonylureas may need to be reduced to prevent hypoglycaemia
  - Continue basal insulin but reduce if decreased oral intake
- **Insulin is often best treatment of hyperglycaemia of illness** → particularly if steroid-induced
  - May need to start insulin in insulin-naïve patients + **correction insulin very useful**
- Periconception + post delivery care is very important in people with diabetes
  - Primary care + midwives have important role in screening for undiagnosed diabetes + gestational diabetes

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Upcoming webinars

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Case for discussion – Miss S

- 31 year old woman with type 2 diabetes with HbA1c 75 mmol/mol (9%) on:
  - Metformin 1 g twice daily
  - Empagliflozin 10 mg daily
  - Gliclazide 160 mg twice daily
  - Protaphane 60 units nocte
  - Candesartan 32 mg daily
  - Bendrofluazide 5 mg daily
  - Atorvastatin 20 mg nocte
- She has an acute GI illness + is unable to tolerate much oral intake → what do you advise her to do with her medications?
- She has a subsequent flare of her asthma + starts prednisone 40 mg daily → what do you with her medications now?
- She is keen to get pregnant → what do you advise + what would you do with her medications?

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Discussion

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