

# Supporting Youth and Young Adults with Diabetes in the Waikato

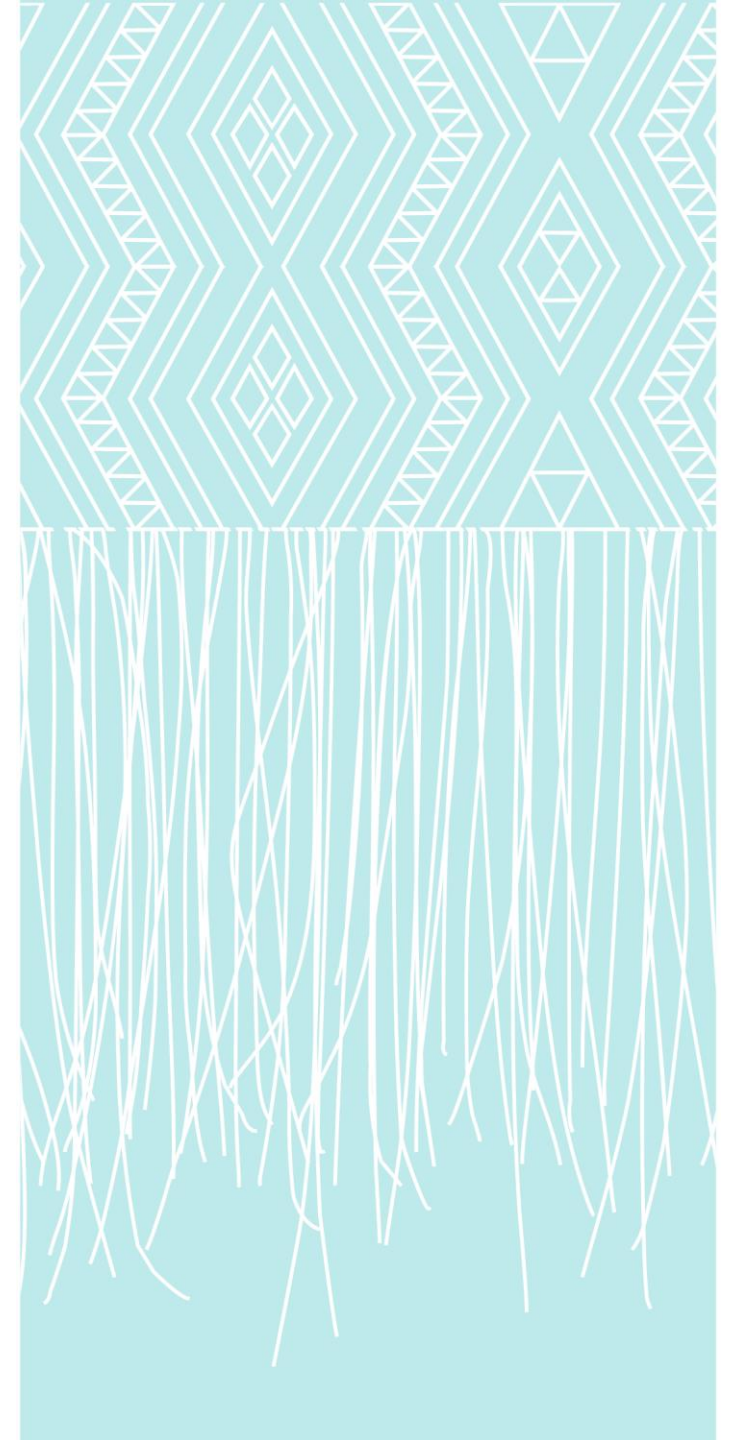
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**Clinical Nurse Specialists - Diabetes Youth & Young Adult Team  
Waikato Regional Diabetes Services**



# Overview

- Our team and how we work
- Type1 and the future
- Type 2 and new medications
- Challenges
- Diabetes distress
- Psychological correlations





# Team structure & Appointments

## Multi Disciplinary Team (MDT) structure:

- Endocrinologist
- Nurse Practitioner
- Clinical Nurse Specialists (CNS)
- Dietitian
- Psychologist

## MDT Appointments

- 4 monthly for Māori and Pacifica youth aged < 20
- 6 monthly for youth aged < 20 from other ethnicities
- 8 monthly for Māori and Pacifica youth aged >20
- 12 monthly for youth aged >20 years from other ethnicities

## Other appointments

- CNS - 3 monthly or more often for new or high-risk patients.
- Phone consults as required.
- Retinal photo-screening: Every 2 yearly
- Podiatry: On demand

# Types of Diabetes





# Type 1 Diabetes

- Autoimmune disease - destruction of insulin-producing beta cells in the islets of Langerhans
- Leads to eventual absolute absence of insulin – need for exogenous insulin
- Diagnosed at any age -  $\frac{1}{4}$  of diabetes is diagnosed in adulthood
- Symptoms at diagnosis –sudden onset illness, thirst, polyuria, weight loss, ketones
- Indicated by positive antibodies
- Incidence is increasing around the world including in New Zealand
- Around 10% of patients with Diabetes have Type 1
- Genetically susceptible people - autoimmune diseases
- Triggered by environmental agents
- Not lifestyle induced

# Diabetes and technology

**CareSens™ Dual**  
Blood Glucose Monitoring System  
Blood  $\beta$ -Ketone Monitoring System

- Easy Data Transfer by Bluetooth Connection
- GDH-FAD Based Test Strips
- Test Result Tagging Options



Bluetooth

i sens

i sens  
**CareSens™ PRO**  
Blood Glucose Test Strips

GDH-FAD

- No Coding
- 5 Second test
- 0.5  $\mu$ l Sample
- One capillary and venous blood samples

50 Test Strips

i sens  
**KetoSens™**  
Blood  $\beta$ -Ketone Test Strips

- No Coding
- 10 Test Strips
- 8 Second test
- 0.5  $\mu$ l Sample
- Accurate results
- Automatically stores blood into test strip

Use with KetoSens and CareSens Dual



FreeStyle Libre

My Glucose

6.2 mmol/L

10:23pm

Ends in 13 days



6.1 mmol/L

6.1 mmol/L


6.1 mmol/L

1009

FreeStyle G4

**CareSens™ N**  
Blood Glucose Monitoring System

- No Coding
- Easy & Accurate Testing
- 0.5  $\mu$ l Very Small Sample (actual size shown)
- 5 sec Rapid Test Result



i sens

i sens  
**CareSens™ N**  
Blood Glucose Test Strips

- No Coding
- 50 Test Strips
- 5 Second test
- 0.5  $\mu$ l Sample
- Accurate results
- Automatically stores blood into test strip



one+












G7

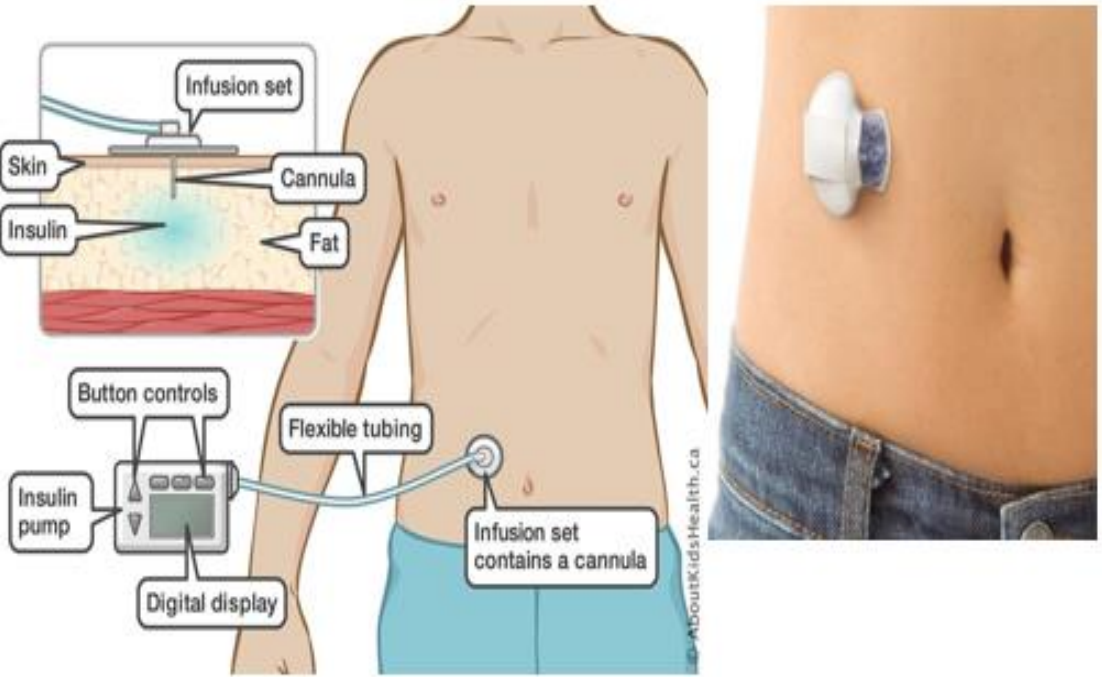




# Insulin delivery – Multi Daily Injection

<p>Lantus® SoloStar® pen prefilled with Insulin Glargine. <b>Disposable</b></p>		<p>Luxura™ pen for Lilly insulin cartridges. <b>Reusable</b></p>	
<p>Gilver AllStar® Pro pen for Lantus® (Insulin Glargine) cartridges. <b>Reusable</b></p>		<p>Savvio™ pen for Lilly insulin cartridges. <b>Reusable</b></p>	
<p>Apidra® SoloStar® pen prefilled with Insulin Glulisine. <b>Disposable</b> <small>With a mealtime icon</small></p>		<p>Novopen® pen for Novo Nordisk® insulin cartridges. <b>Reusable</b></p>	
<p>Cobalt/Blue AllStar® Pro pen for Apidra® (Insulin Glulisine) cartridges. <b>Reusable</b></p>		<p>NovoMix® 30 FlexPen® prefilled with 30% Insulin Aspart / 70% Insulin Aspart Protamine. <b>Disposable</b></p>	
		<p>NovoRapid® FlexPen® prefilled with Insulin Aspart. <b>Disposable</b></p>	

# Role of technology in diabetes





# Pharmac funding proposal (currently considering feedback)

- To fund a range of continuous glucose monitors (CGM) for everyone with Type 1 Diabetes, which will expect to benefit up to 18,000 people
- To fund insulin pumps that could be paired with a funded CGMs to create an automated insulin delivery system
- To simplify access criteria for insulin pumps
- To increase the limit of funded insulin pump consumables

# Pros and cons of insulin pump therapy

## Pros:

- Possibly better outcomes than multiple daily injections – not really proven
- Better quality of life particularly if using hybrid closed loop
- More flexibility with eating and exercising
- In some ways more discreet
- No need to have multiple daily injections
- Insulin doses can be adjusted depending on glucose trends
- Reduce diabetes distress

## Cons:

- Pump failure risk
- Cannula blockage
- Device malfunction
- Insertion site issues – infection, improper insertion
- Can't take the pump everywhere
- The pump is only as good as the person using it
- Accurate carb counting required
- Data overload, especially with continuous glucose monitoring as well

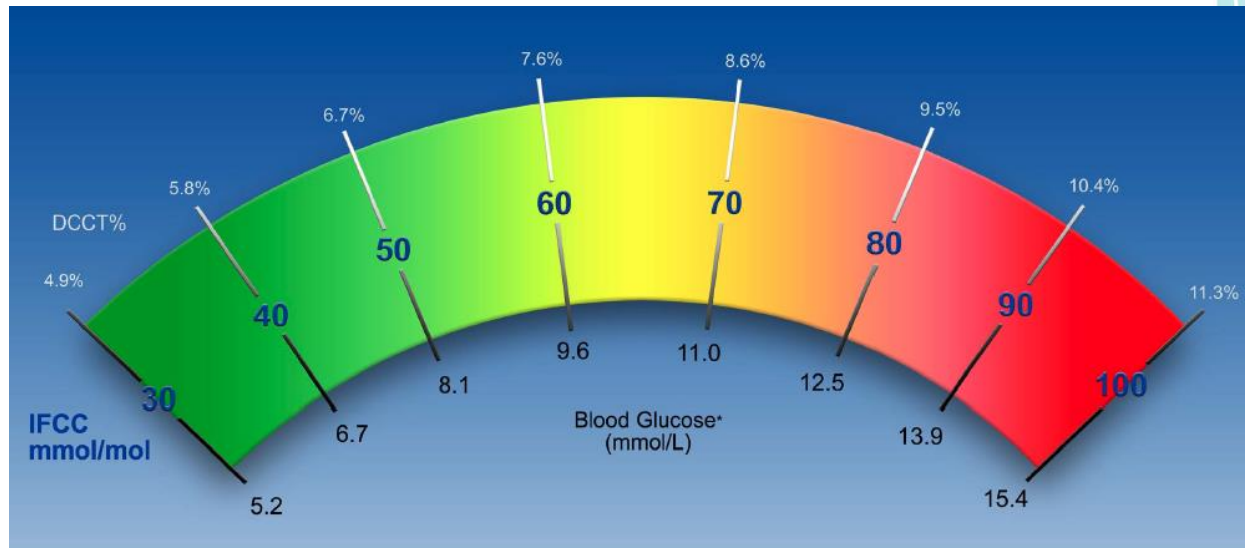




# Case Study

## Miss B diagnosed with Type 1 Diabetes in 2008 – age 6

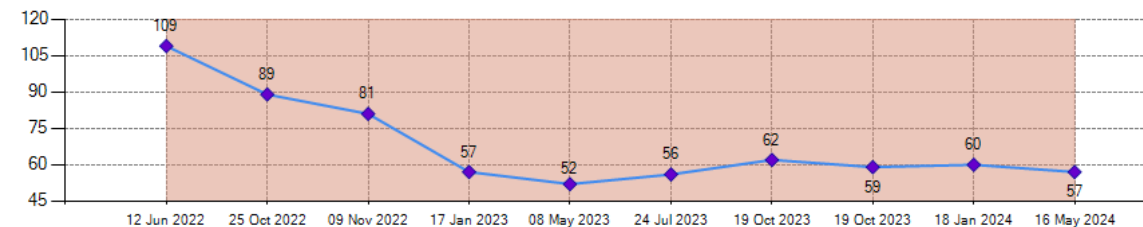
- no other co-morbidities
- no family history diabetes
- commenced multiple daily injections
- Moved to insulin pump therapy 2014 with intermittent CGM – paediatric team
- Transferred to YaYa team 2017 age 15 – HbA1c 87 mmol/mol



# Case Study

- November 2020 – left school becoming more independent, went back to MDI (HbA1c 104 mmol/mol)
- Feb 2021 – June 2022 – Six admissions to hospital (HbA1c 110 – 130 mmol/mol) using Libre
- August 2022 – wanted to get Class 2 licence (HbA1c - >130 mmol/mol)
- October 2022 – Met funding criteria to go back on pump (HbA1c – 89 mmol/mol)
- November 2022 – Got class 2 drivers licence
- December 2022 – On control IQ – Hybrid closed loop
- January 2023 - HbA1c – 57 mmol/mol
- May 2023 - HbA1c – 53 mmol/mol
- No hospital admissions since June 2022

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# Type 2 Diabetes

- Progressive disease resulting from insulin resistance and impaired insulin secretion by Beta cells of pancreas.
- Increasingly found in children, adolescents and young adults
- In NZ, T2DM increase fuelled by obesity
- >33% children and adolescents are classed as 'obese'
- Incidence of T2DM among youth and adults more prevalent among Māori, Pasifika and South East Asian communities
- Youth from ethnic minority groups, poor socio-economic backgrounds, those with family history of diabetes and pubertal girls are at higher risk of T2DM

# Type 2 Diabetes- scope of the problem

- Prevalence in youth (15—24 years) increased from 0.3% in 2016 to 1.1% in 2019
- Youth with T2DM are at risk of diabetes complication earlier in life than youth with Type 1 Diabetes (T1DM)
- Macrovascular e.g. MI, strokes, Peripheral Vascular Diseases
- Microvascular e.g. retinopathy, nephropathy, peripheral neuropathy
- Psychological burden also an important consideration
- Adds to complexity of management in youth
- Compounds poor health outcomes



# Intervention for young people with Type 2 diabetes

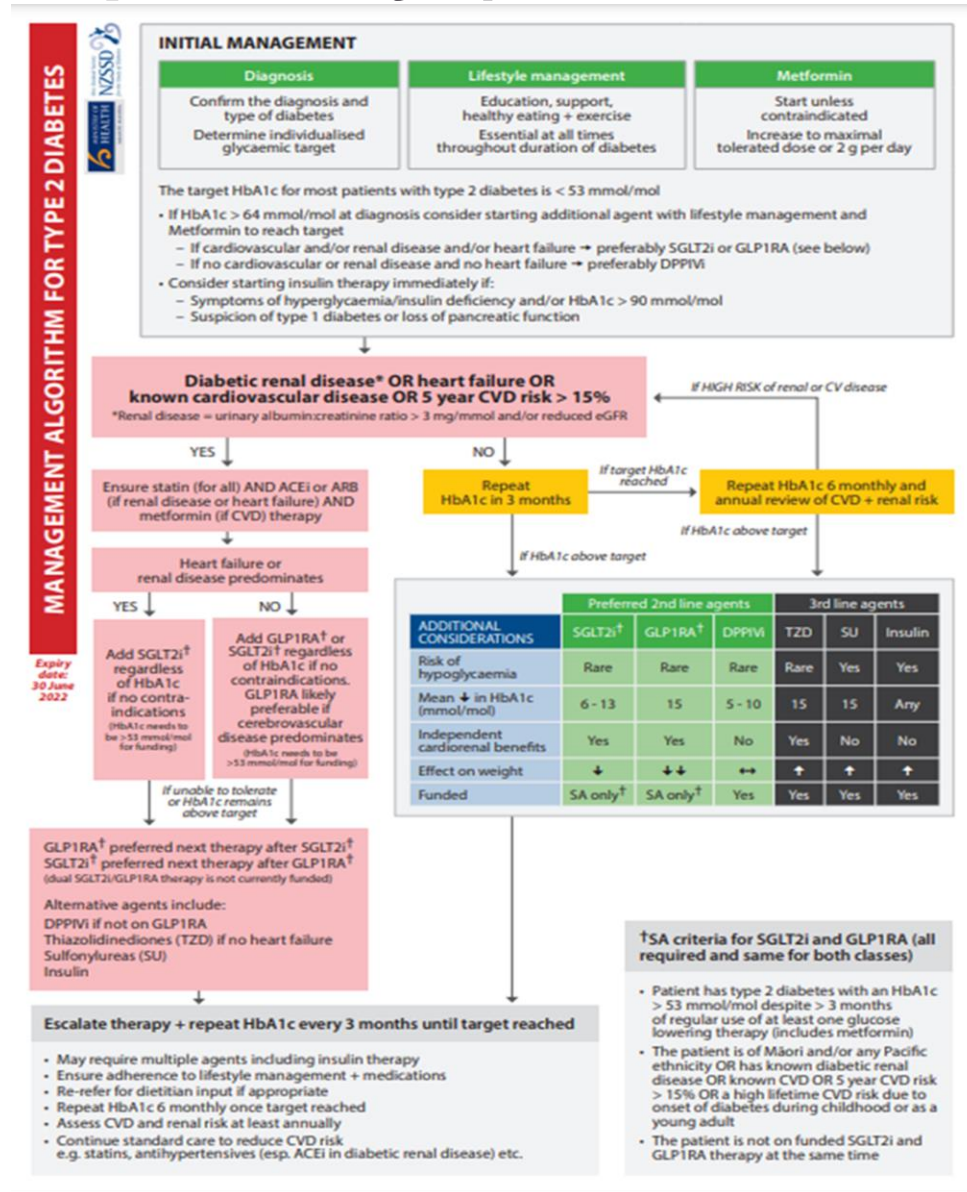
- Go hard and go early!
- Interventions <18years:
- Lifestyle
- Metformin
- Insulin

## Interventions for those >18 years

- GLP-1 agonists (Dulaglutide, Liraglutide)
- SGLT2-inhibitors (Empagliflozin, Dapagliflozin)
- DDP4-inhibitors (Vildagliptin)
- Sulphonylureas (Gliclazide, Glipizide)



# Management pathway (NZSSD website)





# Case Study

Miss A, diagnosed with Type 2 diabetes at age 19 (April 2022).

## Background health history:

- Morbid obesity weight: 160kg, height: 164cm, BMI: 59.5 (Healthy weight for her height is between 50-70kg)
- Autism spectrum disorder with anxiety and depression
- Endometrial thickening (seen by gynecology)
- Family history of type 2 diabetes
- Coeliac disease diagnosed in 2023, started gluten-free diet

## Social history:

- Lives with dad
- Does not study or work
- Non-smoker, drinks alcohol very rarely, no use of recreational drugs
- Does not drive

## Medication:

- Started on Metformin 500mg BD in the hospital, increased to 1000mg BD after a week.
- Stopped Metformin citing side-effects.
- Started Dulaglutide once weekly injections in June 2022, restarted Metformin but missed most doses
- Increased Dulaglutide to twice weekly dose in October 2022 – weight reduced to 153kg

# Case Study – barriers and enablers

## Barriers:

- Extreme anxiety
- Does not like phone reminders, or dad reminding her to take medication
- Does not like to take medication in front of others
- Constant nausea and abdominal pain
- No motivation to do things, not many friends

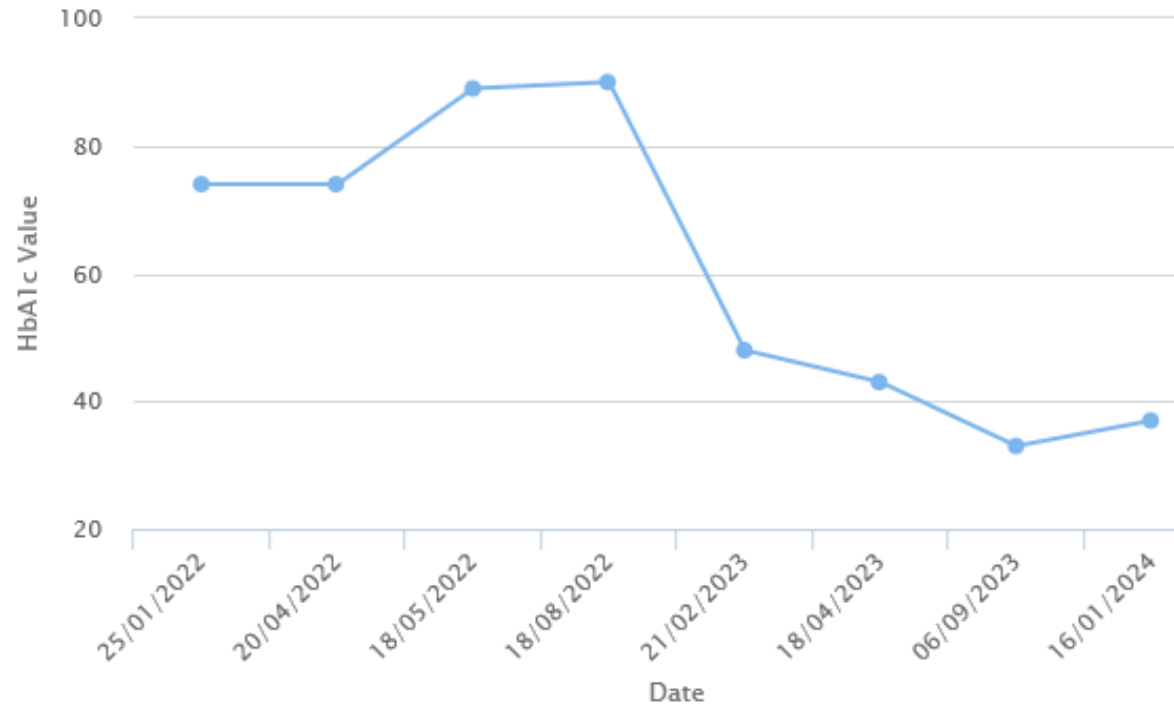
## Enablers:

- Supportive dad
- Miss A has the ability to read and write, and reasonable health literacy
- Started taking proactive measures after seeing changes in HbA1c and weight
- 3 monthly clinic appointments – attended every appointment!
- Reaches out if needing any support (prescriptions, advice)

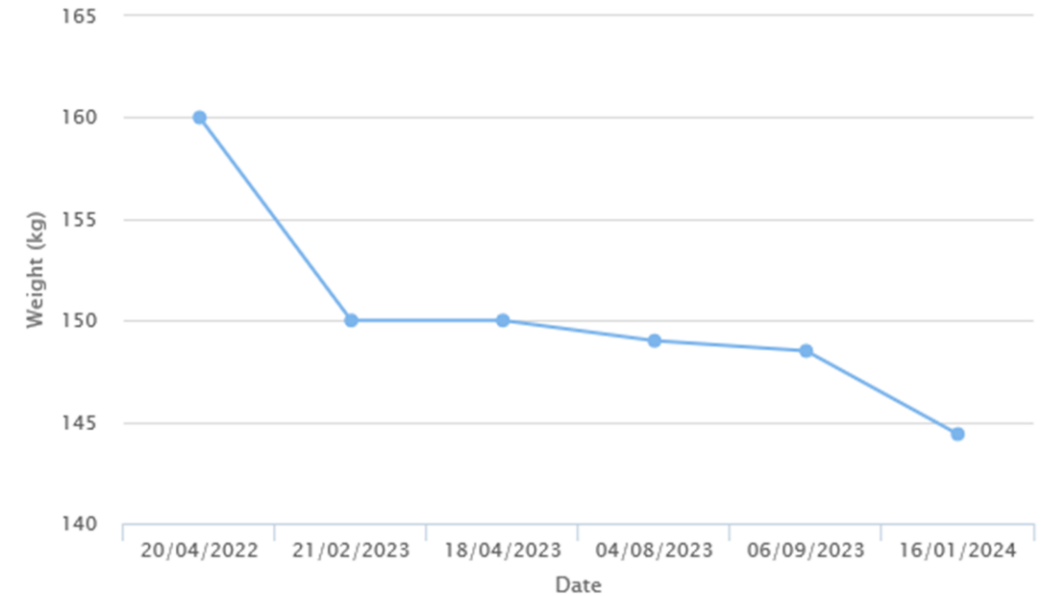


# Case Study

## HbA1c History



## Weight History



# Case Study – As of May 2024

- Reports excellent adherence with twice weekly Dulaglutide
- Started taking Metformin regularly- tolerating much better
- Planning to start a new job
- Got restricted license
- Plans to move out of home once she gets a job.

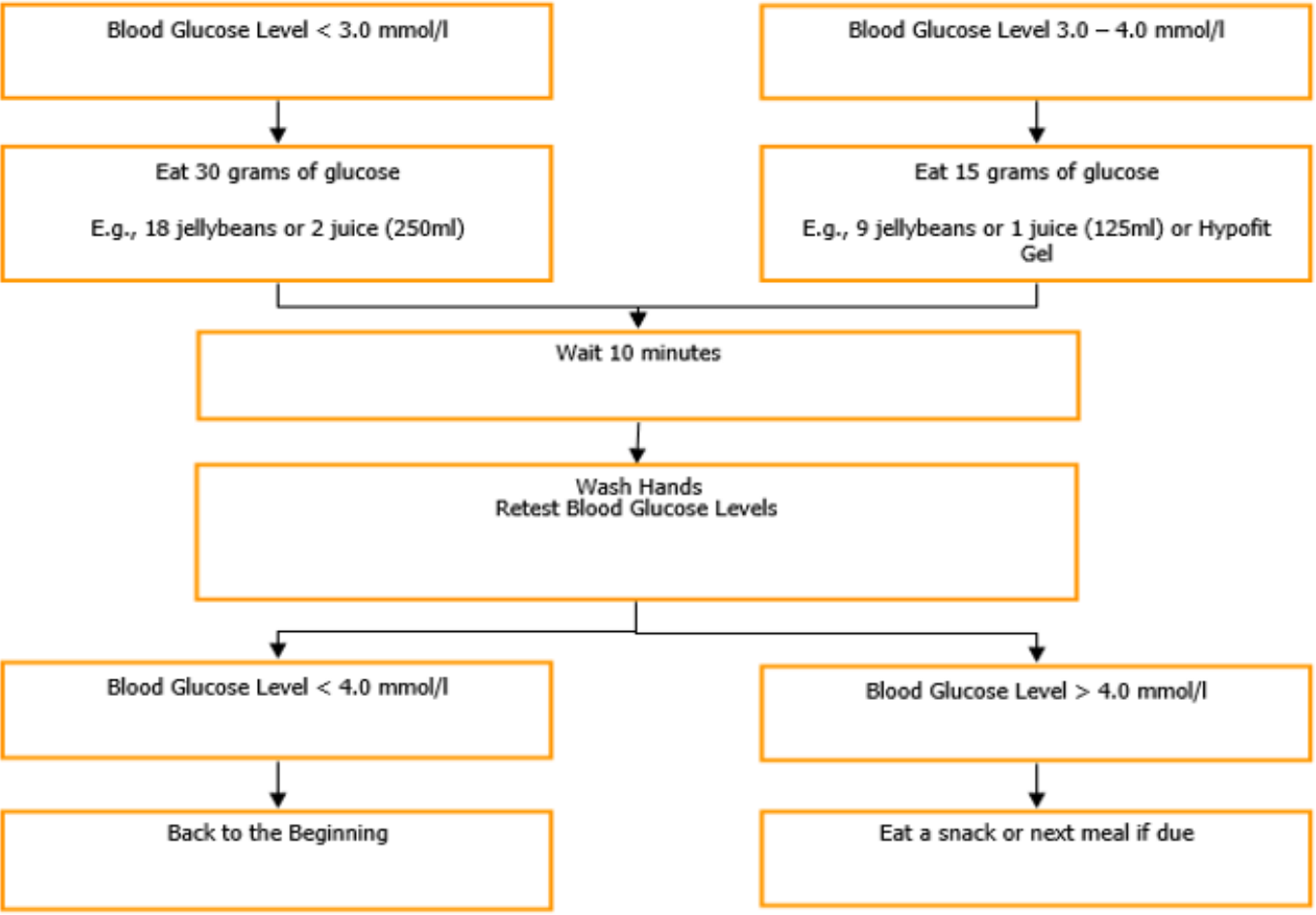


# Challenges of Diabetes Management

- Regular glucose checks
- Administering insulin and carbohydrate counting – at school, work, in public
- Pumps - Changing infusion sites 3/7, charging pump, changing CGM
- Other conditions– coeliac, thyroid disease, ADHD, ASD, intellectual disabilities
- Prescriptions
- Annual blood tests
- Regular diabetes appointments – time out of school or work
- Restocking hypo kits at home, school, car
- Preparation for exams
- Exercise
- Travel
- Driving – 5 to drive, NZTA rules, insurance
- Bank loans



# Challenges of Diabetes Management - Hypoglycaemia (low blood glucose)





# Challenges of Diabetes Management - Hyperglycaemia (high blood glucose)

## Hyperglycaemia:

- Glucose levels is above the normal range (4-8 mmol/L)
- Usually become symptomatic when persistently above 15 mmol/L – irritable, thirst, dry mouth, headache, blurred vision, frequent urination

## Causes of hyperglycaemia:

- Missed insulin doses
- Not giving enough insulin
- Insulin has lost potency
- Lipohypertrophy at injection sites
- Change in activity levels
- Unwell causing stress on their body

## High glucose levels can cause ketones and possible diabetic ketoacidosis

- If glucose levels high need to check for ketones
- If ketones are positive will need to go home from school or work to treat these with hourly insulin or food
- If left untreated may become a medical emergency and need admission to hospital
- Diabetes helpline there 24/7 to assist all our people within the Waikato region with diabetes management

# Challenges from family and friends

## Dont's

- Offer unsolicited advice about eating or other aspects of diabetes
- Be the food police
- Tell horror stories or use scare tactics
- Tell everyone about my diabetes the minute you meet them
- Look horrified when doing diabetes management e.g. giving an injection
- Offer thoughtless reassurance – e.g. it could be worse
- Comment on my glucose level or assume its my fault if they are high

## Do

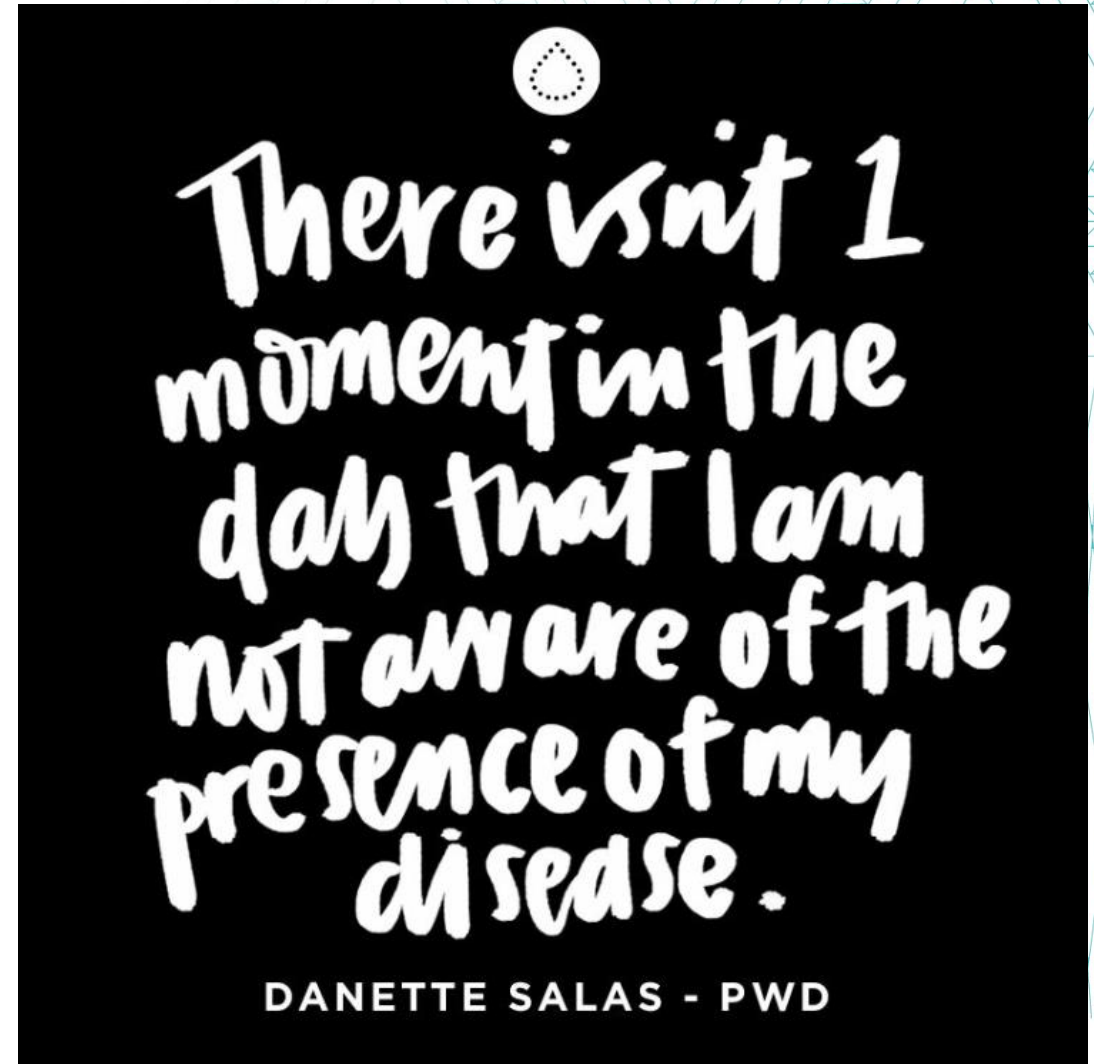
- Realise that diabetes is hard work and life long
- Join in making healthy lifestyle changes
- Ask how you can help – support, encouragement, understanding
- As parents stay involved – be there
- Acknowledge when I am doing something right



# 24 -7 Condition

Decisions that people with diabetes make – make sense to them

– it is our job to understand that decision making process



# Diabetes Distress

Diabetes affects all aspects of a person's life – we often talk about the three aspects of diabetes – insulin, exercise, diet

What about work, school, peers, emotional wellbeing

PEOPLE WITH DIABETES REPORT MANY ASPECTS OF DAILY LIFE ARE **NEGATIVELY IMPACTED** BY THEIR CONDITION:



REDUCING THE BURDEN OF DIABETES CAN GREATLY IMPROVE **DAY-TO-DAY QUALITY OF LIFE** FOR PEOPLE WITH DIABETES. WE CAN ALL ACT TO INCREASE SUPPORT BEYOND MEDICATION ALONE



# Summary of complications rates between young people with Type1 and Type2 Diabetes

## Microvascular complications:

- Renal failure: 4 x higher risk in T2DM
- Nephropathy: 3 x higher in T2DM
- Peripheral Neuropathy: 3— 4 x higher among youth with T2DM
- Retinopathy: Similar rates across both diagnostic groups

## Macrovascular complications:

- Hypertension: 2 x higher in T2DM
- Arterial Stiffness: 4 x higher in T2DM
- Ischaemic Heart Disease: 3— 4 x higher in T2DM
- Cardiovascular deaths: 2 x higher risk among T2DM

**Higher rates of depression, disordered eating, and poorer quality of life among youth with T2DM**

# Psychological correlations

## 16 – 24 year olds with type 1 diabetes

- 12.5% experienced low emotional wellbeing
- 7.5% who experienced likely depression
- 24.1% experienced diabetes distress
- 30.7% experienced disordered eating behaviours
  - 38% female teenagers
  - 25% male teenager
- Inequities were identified between Māori and non-Māori
- Often correlated with HbA1c





# Online Mental Health Resources



[Wellbeingsupport.health.nz](http://Wellbeingsupport.health.nz)



[Smallsteps.org.nz](http://Smallsteps.org.nz)



Whitu 7 Ways  
in 7 Days



Āio Māori



Positively  
Pregnant



[1737.org.nz](http://1737.org.nz)



[Justathought.co.nz](http://Justathought.co.nz)



Melon



All Right?

# Working together in partnership

## Working in partnership:

- Schools
- Primary Health care
- Maori Health care providers

## Contraception:

- GP referral/ prescription for contraception if a young person with diabetes is sexually active.
- It is crucial to have optimal glycaemic control and pre-conception planning for women with diabetes.

## Smoking cessation:

- Smoking cessation is highly recommended for people with diabetes at any age.
- Follow guidelines for smoking cessation therapy - Quitline

## Alcohol:

- Advice on safe drinking limits
- Alcohol Drug Helpline 0800 787 797
- People with diabetes need close monitoring of blood glucose levels if drinking alcohol.

## Periodontal health, Vision, Foot care

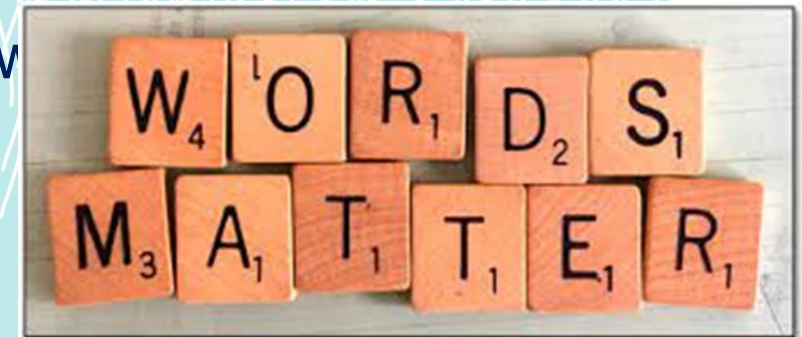
- People with suboptimal glucose control are at risk of developing recurrent infections.
- Any infection makes it difficult to control blood glucose levels
- Poor glucose control puts people at risk of developing microvascular and macrovascular complications even for young people.





# Words matter

- Language that we use influences how people act, respond, and thus interact with others.
- Labelling – ‘diabetic’
- Diabetes is full of judgemental words and this influences how a person feels about themselves and about diabetes.
- Good and bad results - does that make me a good or bad person?
- Tests – term implies that there is a “pass” or “fail”
- Normal – does that make me abnormal?
- Denial – Or having difficulties at the moment?
- Please note: People with diabetes can use whatever you wish.





# Follow the 4 C's

## Connect

- Learn about them as a person

## Collaborate

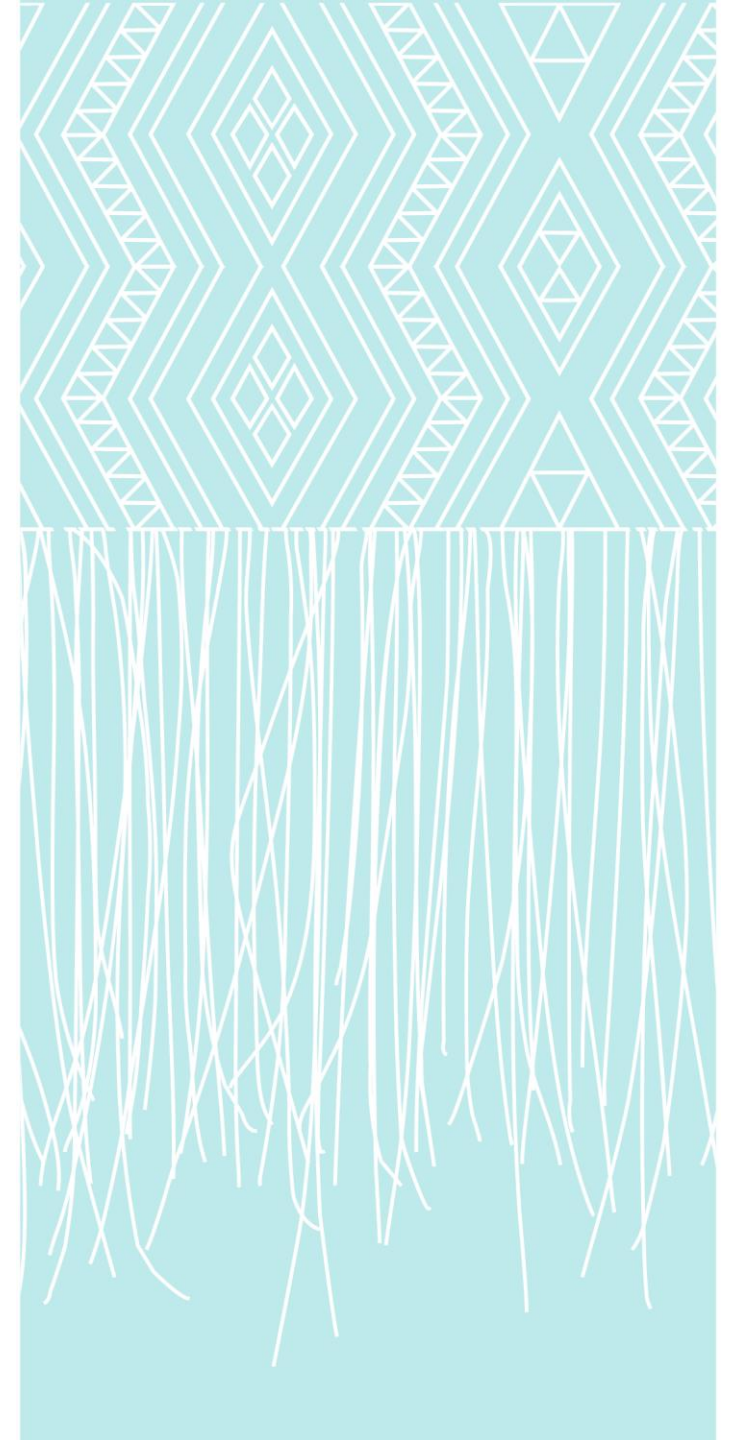
- Seek feedback and ideas about management plan
- Facilitates engagement and success

## Commit

- “Hanging in”
- “We are here if you need us”

## Continue

- Prevent having to tell story to new people at each appointment



# Big potholes can be filled

- Inequity – access to medications, technology and appropriate health services
- Appropriate information and education
- Young peoples health needs are different from those of children or adults.
- Chronic illness puts pressure on young peoples key relationships with peers, partners and family.
- Young people with chronic illness value professionals who have a caring, empathetic responsive approach.
- A culturally competent co-design approach is recommended to develop a health system that is responsive to the diverse needs and cultures of young people.



The image features a dark teal background with intricate white geometric patterns. The top half is filled with a repeating pattern of concentric diamonds and zig-zags. The bottom half is dominated by a dense, vertical pattern of thin white lines that resemble grass or reeds. The text 'Ngā mihi nui' is centered in the dark teal area.

**Ngā mihi nui**