National Hauora Coalition

HAURAKI PHO Hauraki Primary Health Organisation Network

Pinnacle Midlands Health Network

DIABETES

A guide for general practice clinical management in type 2 diabetes

- Lakes -

(Updated November 2021)

Our aim is that a person with type 2 diabetes can go to any general practice in the Tairawhiti DHB region and receive excellent care for their diabetes

This folder is to give all general practice teams a resource for type 2 diabetes. It is filled with practical information, hints and tips that are intended to support people who are beginning to work in diabetes, through to proficient nurses developing knowledge and clinical reasoning in diabetes care.

We have focused on clinical management; however we acknowledge there is much more to working with people who live with any long-term condition than simply clinical knowledge.

This is not an original work, but a compilation from many different sources and experts from our local area. The original manual was created in 2018, and this is the first update since then.

We hope you find it useful, and we always welcome feedback.

Kathy, Suzanne, and Elizabeth.

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Front cover: For Māori, the Harakeke plant is symbolic of whānau. The outer leaves tūpuna, inner leaves mātua, and the very inner leaf is the rito or pepe. Diabetes does not impact on just one person, the whole whānau is affected, the influences rippling across generations. It takes a whole whānau, and a whole healthcare system to support the person who lives with diabetes.
The harakeke or flax plant has many uses—the mostly widely known use is weaving, but did you know that the harakeke flowers pro- duce large amounts of nectar. This was traditionally used to sweeten food and drinks.

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SCREENING FOR DIABETES

New Zealand Society for the Study of Diabetes (NZSSD) has recommended that HbA1c should be the first-line check for screening and diagnosis of type 2 diabetes.

Screening for Diabetes should be offered:

- As part of cardiovascular risk assessment (CVA)
    1. In Maori, Pasifika or Indo-Asian screen men from 30 years and women from 40 years of age
    2. For Europeans, screen men from 45 years and women from 55years of age
- Patients presenting with signs and symptoms suggestive of diabetes from 10 years of age
- Those who are at high risk of developing diabetes

Identified risk factors for diabetes:

1. Non-European ethnicity
2. Family history of Diabetes, including first degree relative <40 years of age
3. Pre-Diabetes (HbA1c 41-49mmol/L)
4. History of Gestational Diabetes or large-for-dates babies
5. On long term steroids or antipsychotics
6. Polycystic Ovarian Syndrome or other features of insulin resistance
7. Increased BMI: Adults and Children with a BMI>30kg/m2 (or >27kg/m2 in Indo-Asian children)
8. Increased Waist Circumference: >94cm (Men) and >80cm (Women) (or >90cm (Men) and >80cm (Women) if Indo-Asian)

Note for woman with previous gestational diabetes:

Hba1c is checked by general practice 3 months post-delivery and at least annually thereafter depending on result (sooner if HbA1c closer to 49).

Interpretation of Screening results https://t2dm.nzssd.org.nz/

HbA1c Result	Fasting Glucose	Non fasting glucose	Diagnosis	Comments
>50mmol/mol, with symptoms	>7.0mmol/L, with symptoms	>11mmol/L	**Diabetes**	Start treatment.
>50mmol/mol, no symptoms	>7.0mmol/L, no symptoms		**Diabetes**	2 Abnormal tests (HbA1c or fasting) are required to confirm diagnosis, either on the same day or subsequent day.
41-49mmol/mol	6.1-6.9mmol/L		**Pre-Diabetes**	Offer lifestyle advice. Perform CVD risk assessment and follow guidelines for treatment of risk. Repeat checking of HbA1c every 6-12 months
<40mmol/mol	<6.0mmol/L		**Diabetes Unlikely**	Normal range. Repeat HbA1c at next CVD assessment or when clinically indicated.

- Use of fasting plasma glucose is recommended when HbA1c results are borderline or further investigation of the result is necessary, such as when a patient has two differing HbA1c results.

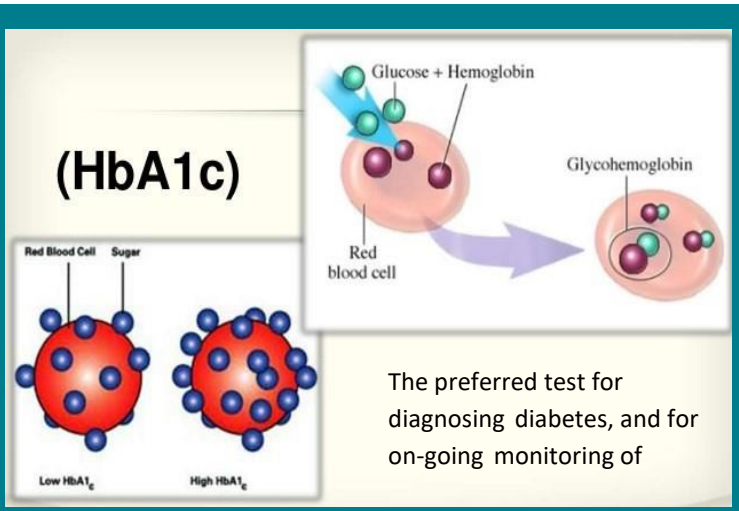
- Fasting plasma glucose remains a valid test for diagnosing people with Type 2 Diabetes, including when HbA1c is not appropriate or cannot be used or may be inaccurate in patients with haemoglobinopathies with the direction of change depending on the specific diagnosis.

Factors which can increase HbA1c:

- Alcohol intake
- Iron or vitamin B12 deficiency
- Hyperbilirubinaemia
- Renal failure
- Opiate use
- Splenectomy

Factors which can decrease HbA1c:

- Erythropoietin, iron or vitamin B12 administration
- Ingestion of antioxidants such as vitamin C or E
- Very high triglyceride levels
- Chronic aspirin use
- Splenomegaly
- Rheumatoid arthritis
- Use of antiretrovirals
- Post blood transfusion



The preferred test for diagnosing diabetes, and for on-going monitoring of

HBA1C TEST

HbA1c measures how much glucose has become stuck to haemoglobin molecules on red blood cells. By looking at the oldest red blood cells (remember red blood cells only live for around 12 weeks) it gives an average of how much glucose has been circulating in the blood for the past 3 months.

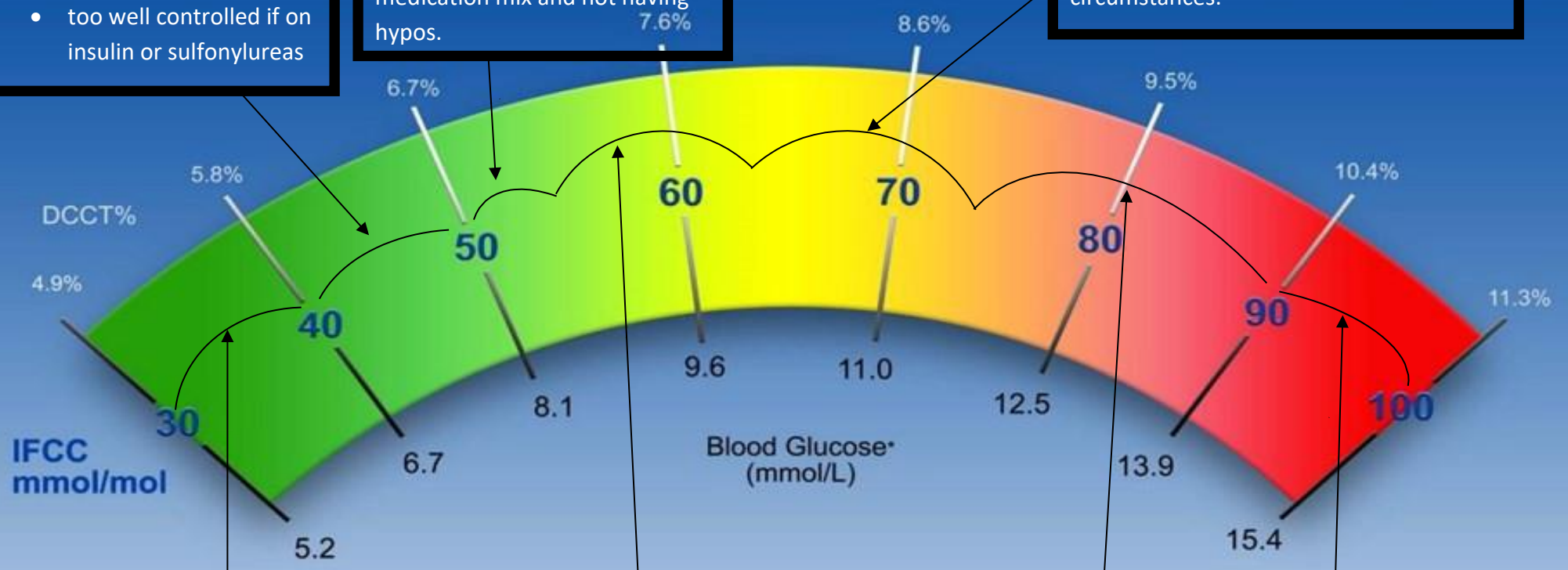
HbA_1c as indicator of Diabetes Control

41-49:

- pre-diabetes, or
- very well controlled, or
- too well controlled if on insulin or sulfonylureas

50-55: <u>Target for most people with Diabetes</u>
Lower may be ok depending on medication mix and not having hypos.

65-75: Too high f or most people: Maybe okay for some people but may need change in treatment depending on circumstances.



Less than 40mmol/L: ok for people without diabetes. Too low for people with diabetes taking insulin or gliclazide.

56-65: <u>Suggest Review</u>: May be okay for some people but may need change in treatment

75—90: Much too high for almost everyone.

ABOVE 90: TOO HIGH! <u>DISCUSS WITH YOUR DOCTORS AS SOON AS POSSIBLE.</u>

*This is an estimated average glucose (eAG)

Nathan et al. Translating the A1C Assay Into Estimated Average Glucose Values. Diabetes Care 2008; 31:1473–1478

Christchurch Diabetes Centre 2009

Clarification of diagnosing and coding

Advice for those people who have an HbA1c that has returned to within normal range.

Once a person is diagnosed with diabetes, **HbA1c** is an indication of control only - not an indicator for change in diagnosis. This is why diagnosis in the first instance needs to be clear and well documented.

- There are a few patients who fulfil the criteria for a diagnosis of diabetes, and having been coded as such, may achieve long-term normalisation of glycaemic control without medication, through lifestyle measures or bariatric surgery.
- In the UK, GPs are advised not to remove such patients from relevant screening registers (including retinal screening) as current evidence shows that all people with diabetes should be screened for diabetic retinopathy for life once there has been a definite diagnosis, excluding gestational diabetes.
- Studies show up to 40% of people who go into remission (using ADA criteria) following bariatric surgery will have relapsed within 5 years.

As yet, there is no criteria for remission of diabetes agreed on in New Zealand.

If you do consider removing the diagnosis of diabetes:

- Clear documentation in the notes by the patients GP as to why the diagnosis was changed
- How the patient is informed of the changes and a record of this occurring
- Consideration of medico-legal issues relating to removing a diagnosis of diabetes if the patient fulfilled criteria for that diagnosis at one time, particularly as it relates to past medical history for the purpose of medical insurance or life insurance.

HbA1c 41-49

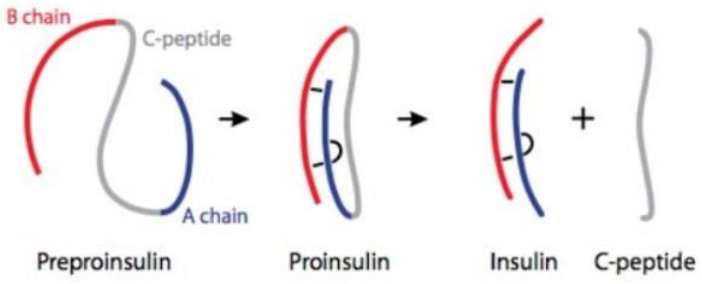
- This can indicate prediabetes.
- If your patient has been previously diagnosed with diabetes, it indicates very good control. Someone taking metformin, vildagliptin and empagliflozin or dulaglutide might have an HbA1c in this range and have no risk of hypoglycaemia and requires no down titration of their medication.
- If your patient is prescribed insulin or a sulfonylurea, an HbA1c in this range indicates they have hypoglycaemia reasonably regularly, and their medication should be down titrated.

Type 1 or Type 2 Diabetes

Anti-IA2, anti-GAD or anti-ZnT8 can help diagnosis.
C peptide must always be done with a corresponding glucose result (Note: this is expensive).
If initially managed on diet and oral medications— but are now on insulin,
they have Type 2 diabetes on insulin.

Some background information

C peptide is a part of proinsulin. When the insulin splits off, C peptide is left. It is more stable in the blood stream and therefore a more useful measure than insulin.



In a pancreas that is functioning normally the C peptide level will correspond with the amount of glucose in the blood stream. The more glucose that is present the more c peptide is present.

In type 1 diabetes C peptide can be very low despite a high glucose level i.e. <250pmol/L fasting or <600pmol/L post meal if glucose >8mmo/L.

With type 2 diabetes there are a number of options. If the glucose level is low and C peptide is high this indicates insulin resistance. If the glucose is high, and the C peptide is lower than expected, this indicates insulin deficiency. This is why it is critical to do both tests, C peptide and glucose at the same.

Note that there are other indicators for c peptide checking including insulinoma (may be indicated by a high C peptide and low blood glucose).

GAD stands for Glutamic acid decarboxylase. While this usually acts to make neurotransmitters, it can at times work as an autoantigen. It triggers the autoimmune system to produce autoantibodies to destroy its own beta cells. GAD antibodies can be found in 70 - 80% of people diagnosed with Type 1 diabetes. If at the same time there are autoantibodies to Islet cells (tyrosine phosphatase–related islet antigen 2 = (IA2), it strengthens the diagnosis. Type 1 diabetes is an autoimmune condition.

If you are concerned that the GAD and IA2 have missed the type 1 diagnosis, request a zinc transporter check as well. These are done at Waikato hospital and in some areas are added automatically if GAD/1A2 come back negative. Request ZnT8 transporters.

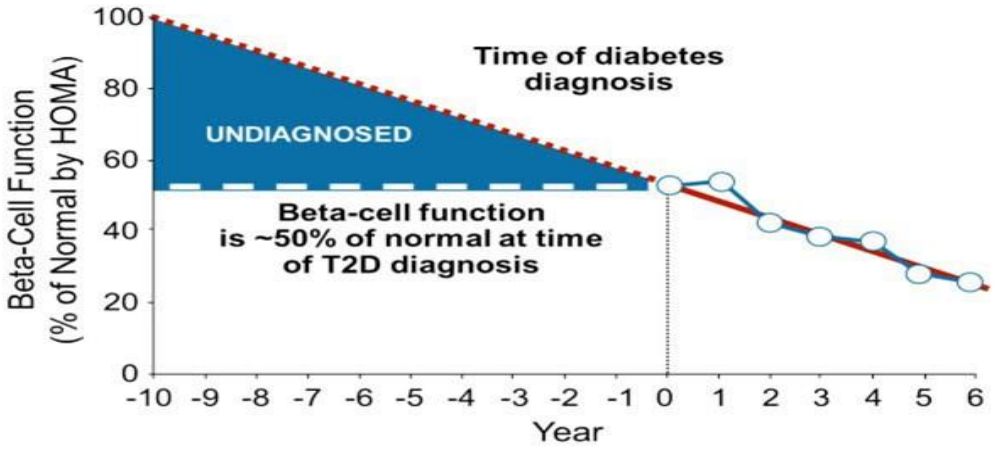
There are more than simply the 2 types of diabetes—MODY, GDM and LADA are a few of the more common ones. If you need more information on these conditions, try this article: CMAJ 2014 Approach to the patient with atypical diabetes; Jun 10; 186(9): 678–684.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4049991/

PRE-DIABETES

ALSO KNOWN AS INTERMEDIATE HYPERGLYCEMIA

- Diabetes is one of New Zealand's fastest growing long-term conditions
- Annually, 5-10% of individuals with pre-diabetes will progress to T2DM
- Prevalence has been increasing approximately 7% per year for the past 8 years
- The appropriate term to classify patients with HbA1c 41-49 is debated. In 2006, the WHO recommended use of the term "*Intermediate Hyperglycaemia"* as opposed to *"pre-diabetes"*, as not all individuals with an HbA1c between 41-49 would proceed to Type 2 Diabetes. (From MOH pre-diabetes and self-management 2016).

Beta cell function can be less than 50% of normal by the time diabetes is diagnosed



Treatment: lifestyle measures are the key treatment
Consider: The initiation of Metformin for prevention of diabetes.

ADA consensus 2017 states, 'Metformin therapy prevention of type 2 diabetes should be considered in those with pre-diabetes, especially those with BMI >35kg/m2, those aged >60years, women with prior gestational diabetes mellitus, and/or those with rising A1c despite lifestyle intervention. Long term Metformin may be associated with biochemical vitamin B12 deficiency, and periodic measurements of vitamin B12 levels should be considered in metformin-treated patients, especially in those with anaemia or peripheral neuropathy.

SOME QUESTIONS FOR YOUR PRACTICE:

- Does your practice have a routine protocol for pre-diabetes diagnosis, education, and follow up?
- There are seven possible pre-diabetes classification read codes—encouraging the whole practice to maintain one or two of these options simplifies systematic review and prompts intervention.
- Recall will depend on results of HbA1c and patient history. If HbA1c close to 49—consider recalling at 3-6 months rather than annually.
- Provide a combination of written and verbal advice.

Some background reading:

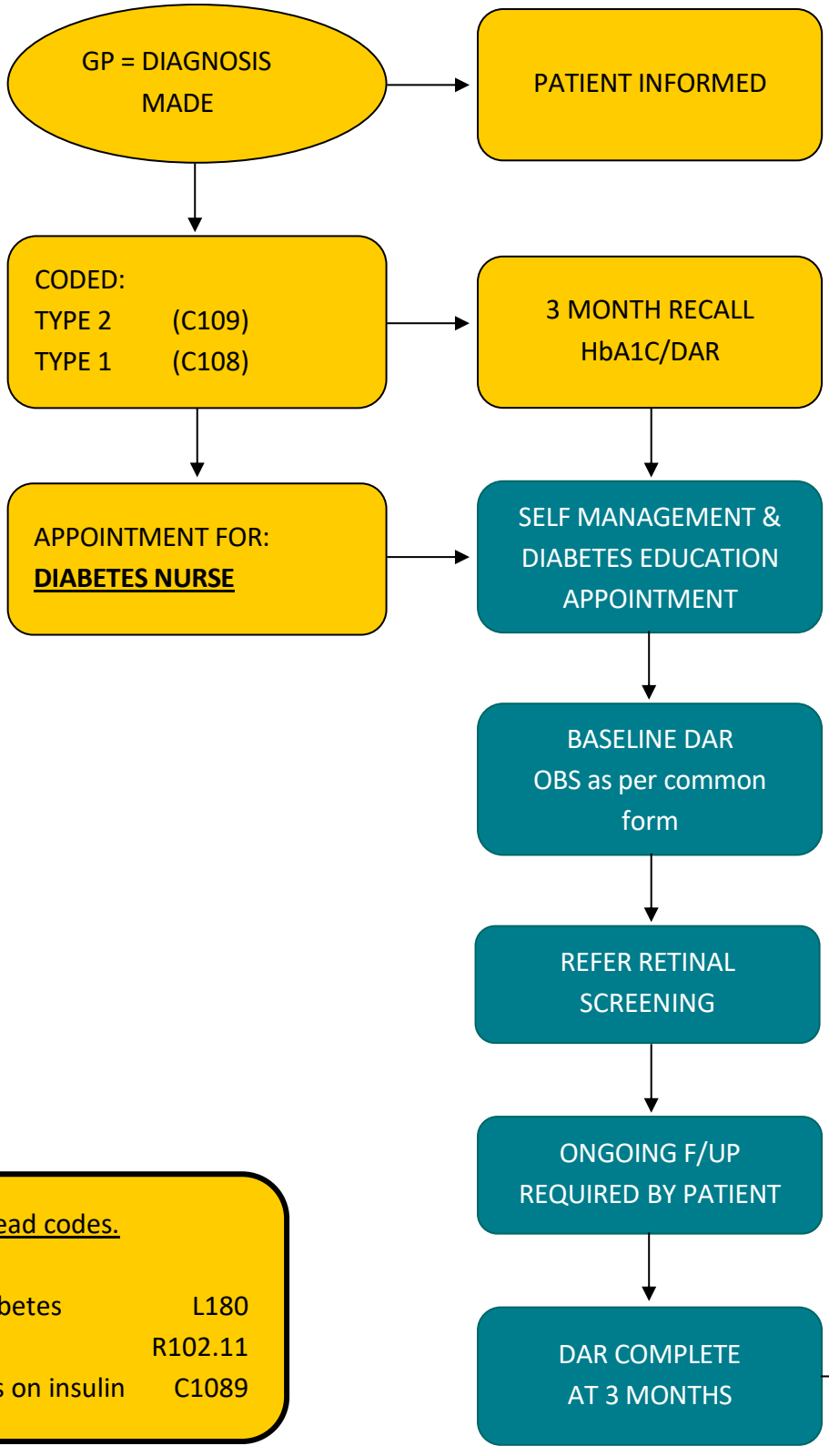
Diabetes Prevention Program (DPP) and the ongoing DPP Outcomes Study (DPPOS) are major studies that changed the way people approach type 2 diabetes prevention world-wide. The DPP showed that people who are at high risk for type 2 diabetes can prevent or delay the disease by losing a modest amount of weight through lifestyle changes (dietary changes and increased physical activity). Taking metformin, a safe and effective generic medicine to treat diabetes, was also found to prevent the disease, though to a lesser degree.

The DPPOS has continued to follow most DPP participants since 2002. To date, the DPPOS has shown that participants who took part in the DPP Lifestyle Change Program or are taking metformin continue to prevent or delay type 2 diabetes for at least 15 years. The DPPOS has also shown that the DPP Lifestyle Change Program is cost effective (costs are justified by the benefits of diabetes prevention, improved health, and fewer health care costs) and metformin is cost-saving (leads to a small savings in health care costs) after 10-years.

DiRECT and PREVIEW studies have investigated weight loss early in the diabetes journey and its positive impact on blood glucose control, and even preventing diabetes in those with prediabetes.

- Pre-diabetes is not a clinical condition in its own right but is a high-risk factor that can contribute to both diabetes and cardiovascular disease.
- Prevalence of pre-diabetes is particularly high in some population groups for example: Over 40% of people living in the Auckland metro region who are Māori, Pacific, or Indian ethnicity have been identified with pre- diabetes at 35-39 years, and over 50% at 45-49 years (Chan 2015).

INITIAL EDUCATION AND DAR



Other helpful read codes.

Gestational diabetes	L180
Pre-diabetes	R102.11
Type 2 diabetes on insulin	C1089

Patient Initial Education

How we educate people is as important as what we teach

1.

Assessment: What do they already know?

Establish what the person/whānau already know about Diabetes, build on this when answering questions they may have.

2.

Make it personal for the person with diabetes

Make information relevant to **their** diabetes, so it makes sense to them—consider their health beliefs and their previous experience/knowledge of diabetes

3.

Consider questions that the person/whānau may not voice

- What caused their Diabetes?
- What is actually wrong?
- How will Diabetes affect me now and in the future?
- How long will it last?
- How good is my treatment at controlling my Diabetes?
- What can I do to look after myself?

These are just some of the questions that a person can have but be too shy to ask.

4.

Documentation

Document what information you have covered, and any gaps that you believe will need to be discussed at a later time.

Use a keyword to make documentation easier and more consistent. E.g. diabetes education:

- Food
- Checking
- Activity

Goal setting

Small achievable goals are the key to lifestyle change

S

SPECIFIC

- Define the goal with clear, understandable language
- WHO is involved? WHAT do I want to accomplish? WHERE?

M

MEASURABLE

- Can you track the process and measure outcomes?
- How much, how many, how will I know when I'm at my goal?

A

ATTAINABLE/ACHIEVABLE

- Is the goal reasonable enough to be accomplished? How so?
- Is the goal out of reach or below standard performance?

R

RELEVANT

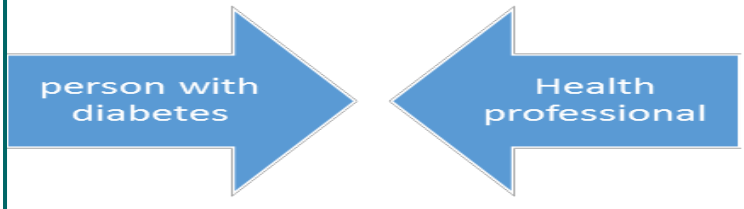
- Is the goal worthwhile and will it meet your needs?
- Is each goal consistent with other goals you have established?

T

TIMELY

- Your objective should include a time limit. E.g. I will complete this step by month/day/year

Work together to ensure best results.



People are capable partners in their health care

Diabetes Annual Review

- Type 2 diabetes is a progressive condition
- Often treatments are layered in over the years; this means that on-going control is reviewed regularly.
- An annual review is standard care for all people with diabetes.
- An annual review is the screening phase. Then triage—who needs to be seen again urgently, soon, next year? Who needs to be referred to a secondary service such as podiatry, renal or dietetics?
- Treatment is individualized

- DAR bloods can be **preset** on MedTech request form, and the pathlab e-request form
- Minimum: HbA1c, Full (non-fasting) lipid profile, Renal function, full blood count urine microalbuminuria, and consider B12 if on long term Metformin.

Annual reviews are about the person who has diabetes. It is their opportunity once a year to check in and make sure their diabetes management and education is up to date. If we are prepared prior to them arriving, it means that we can focus on what is most important to the person.

On the next page is a suggested format for preparing yourself for an annual review. Take a photocopy, and fill in everything you can prior to the person arriving, and then you will have identified the clinical issues and are free to focus on them. It is most helpful to create a plan forward together.

Example of Diabetes Annual Review on next page:

Diabetes Annual Review Preparation Sheet

Patient Name/NHI:	**Today's Date:**
Type of diabetes:	**Duration:**

On-going plan:

Date most recent results:			**Comment: declining/stable /improving**	**Relevant medications:**
Hba1c				Metformin SGLT2/GLP1/DPP4 Sulfonylurea Insulin/type/device/amount
Cholesterol Total:		Ratio:		
LDL:	HDL:	Trig:		
Kidneys EFGR:				
Microalbuminuria:				
	Last result	**Todays result**		
BP:				
Weight:				
Height:				
WC:				
CVRA:				
Smoking:				

Exercise: Type duration frequency

Food – any changes and goals:

Assessment of feet complete and able to self-care:

Checking when, recording, changes required:

Hypos: YES/NO What used to treat hypos?

Flu vaccine due:	Driver licence type if relevant:	Retinal screening due:	Mood:	Medical Alert:

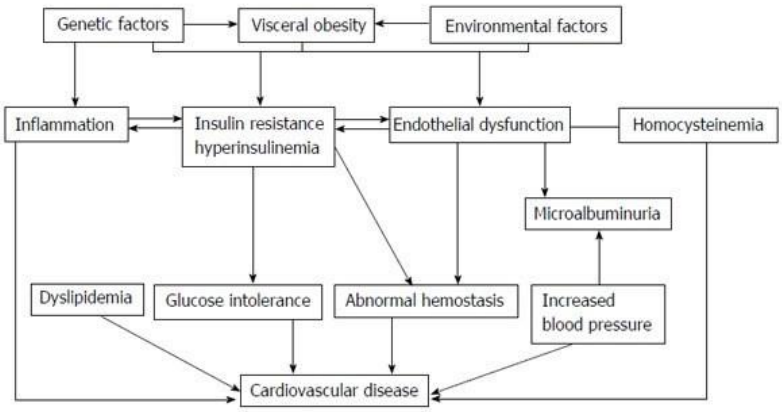
If on insulin: ☐ Storage ☐ Sharp disposal ☐ Check sites ☐ Travel ☐ Sick day

☐ Insulin dose corect ☐ Insulin technique ☐ Correct pen and insulin ☐ Changing needles

If female <40 years—pre pregnancy advice? If male—Erectile Dysfunction? DISCUSS

Cardiovascular risk

- All people with type 2 diabetes are at higher risk of cardiac disease. The reason for this is multifaceted and not completely understood.



From: World J Diabetes. 2014 Aug 15; 5(4): 444–470.

- CVD risk assessment is now based on New Zealand PREDICT study data beginning assessments 10—15 years earlier in some at risk groups.
- The aim is to facilitate informed choices, so patient considers early and lifelong healthy lifestyle choices, and when appropriate other treatments.
- Non-fasting blood lipids are now recommended for all treatment decisions and monitoring as long as the triglyceride levels are normal. Fasting bloods are only required if triglycerides are elevated

Full details can be found here: https://www.health.govt.nz/publication/cardiovascular-disease-risk-assessment-and-management-primary-care

- CVD risk assessment and management is a recommended component of the annual diabetes review in people with type 2 diabetes.
- The risk prediction equations for people with type 2 diabetes include: duration of diabetes, BMI, eGFR, ACR, HbA1c and hypoglycaemic medications; in addition to the risk factors in equations for people without diabetes.
- No specific risk equations are available for people with type 1 diabetes, although the same main disease variables (diabetes duration, renal disease, glycaemic control) apply as for type 2 diabetes. CVD risks for this group are substantially higher than for people with type 2 diabetes (50% higher in men and up to 90% higher in women).
- Encourage a healthy lifestyle (smoking cessation, healthy diet, regular physical activity, optimal weight) in everyone.
- Optimise glycaemic control to an appropriate level in consultation with the individual patient. The target range agreed will generally be more stringent in younger and fitter patients (e.g. 50–55 mmol/mol or lower) than older, co-morbid or frail patients and those prone to hypoglycaemia (e.g., 55–64 mmol/mol or higher).

Hypertension

A word from the experts!

Between 70 and 80 % of people with diabetes have hypertension.

The coexistence of diabetes and hypertension worsens clinical outcomes with respect to both microvascular and macrovascular disease. Diabetes management should therefore be comprised of a multifaceted approach that targets optimal blood pressure and lipid management in addition to glycaemic control. The pathophysiology of hypertension in diabetes involves maladaptive changes and complex interactions between the autonomic nervous system, mechanical forces, renin-angiotensin-aldosterone system as well as individual and environmental factors. Multiple high-quality randomized controlled trials have shown reduced morbidity with reduction of elevated blood pressure in people with diabetes.

What this means in practice is — please treat hypertension!

Treatment needs to be individualised but generally 130/80 is the recommendation

Causes of hypertension

Sedentary lifestyle, increased calories and insulin resistance:

- Increased adiposity = increased insulin resistance = oxidative stress and inflammation = vascular stiffness = hypertension

Increased intra vascular volume:

- Mismatch between sodium intake and sodium loss = increased sodium concentration = increased venous return = elevated arterial pressure

Premature vascular aging:

- Structural changes to the lumen of small vessels = vascular remodelling, inflammation, peripheral vascular resistance, decreased elasticity = hypertension

Autonomic nervous system deregulation:

- Increased sympathetic activity = increased heart rate, ventricular contraction, peripheral resistance and fluid retention.

Role of innate and adaptive immunity:

- Involved in angiotensin II and aldosterone induced hypertension. Renin Angiotensin Aldosterone system

- Angiotensin II is a potent vasoconstrictor and has a direct effect on the vascular smooth muscle also promotes sodium and water retention.

Dyslipidaemia

The New Zealand Heart foundation has a great explanation of Cholesterol

Cholesterol (Matu Ngako) is a type of fat that circulates in your blood. Your body needs some cholesterol to work properly, but when you have high cholesterol (hyperlipidaemia) it speeds up the process of atherosclerosis.

This is when plaque builds up in your artery walls, narrowing arteries and restricting blood flow. Eventually the plaque can get so large and hard that it cracks, and a clot forms over the plaque. If this clot blocks an artery it can cause a heart attack or stroke.

There is only one type of cholesterol, but it is carried around the body by different 'carriers' (lipoproteins) that have different tasks. There are two types of carriers: LDL (low density lipoprotein) and HDL (high density lipoprotein).

LDL-cholesterol L-L-L (LDL is Lousy and it needs to be Low)

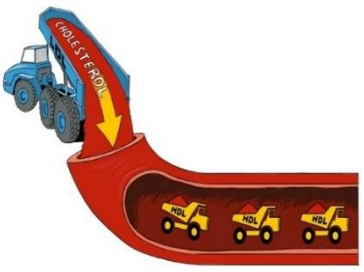
- The role of LDL in the body is to transport cholesterol to all organs for use in building cells.
- LDL is like a large 'dump truck', and dumps cholesterol in the artery walls.
- Known as 'bad' or 'lousy' cholesterol.

For high-risk individuals an LDL-C target of 1.8mmol/L or lower is recommended.

For intermediate-risk individuals the benefits and harms of lipid-lowering drugs should be presented and discussed to allow an individualised informed decision about whether to start treatment. **A target LDL-C reduction of 40% or greater is recommended if drug treatment is commenced.**

HDL-cholesterol H-H-H (HDL is Happy and it needs to be High)

- HDL cholesterol is like a 'pick up' truck that picks up and transports cholesterol from the blood stream to the liver, which gets rid of it.
- The role of HDL in the body is to carry extra cholesterol away from the arteries to the liver.
- Known as 'good' (or happy) cholesterol.



Triglycerides are the most common form of fat in your body. The role of tri-glycerides is to store and transport fat in the blood. Extra energy from food and alcohol that your body does not need is changed to triglycerides. High tri-glycerides increase your risk of heart attack and stroke.

Total cholesterol is a rough measure of all the cholesterol and triglycerides in your blood.

Total cholesterol/HDL cholesterol ratio is the ratio of your total cholesterol to your HDL cholesterol. This ratio is used to measure your risk of heart attack and stroke.

Diabetes recall process

- What system does your practice have in place?
- Is it one person or multiple people responsible for recalls?
- People with type 1 diabetes may or may not want an annual review at the GP—offer them a choice and aim to have a DAR in primary health 6 months after the specialist review.

DAR

- First recall letter and blood test form sent
- Enclose blood test form

CONTACT

- Phone calls, emails, text and portal contacts
- Document each contact attempt
- You could set up a key word for this

ONGOING

- Task GP to inform outstanding DAR
- Aim for opportunistic DAR or continue with contact attempts

monitor

- This is MOST important—what happens after the DAR?
- How soon do you need to phone or see the person to assess goals, HbA1c, BP or any other issues that were raised in DAR. Who follows this up?

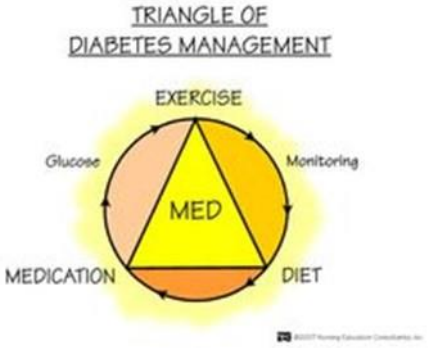
LIFESTYLE

FOOD ACTIVITY SLEEP STRESS

Numerous aspects of lifestyle and wellness affect a person's diabetes. There are real constraints in general practice as to how we can support the patient to live as well as they possibly can.

There are some key concepts that support our understanding of diabetes management. Each of you will find different ways of explaining these concepts to patients. Remember cornerstone of treatment for type 2 diabetes is:

healthy food choices,
physical activity,
medication

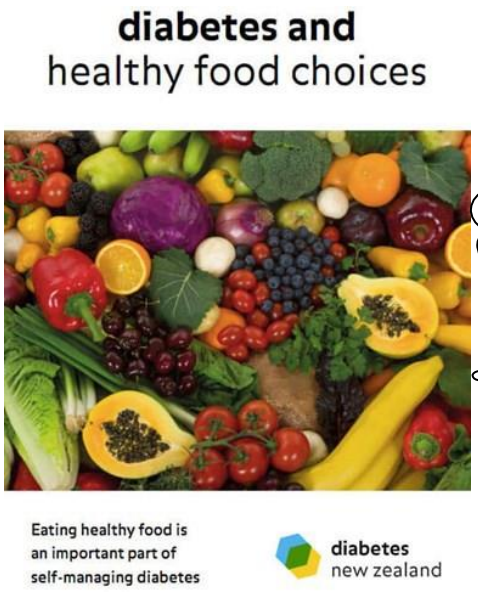


There is no conclusive evidence to suggest one dietary strategy is more effective than any other for achieving sustained weight loss and improvements in glycaemic control. The choice of dietary strategy will depend on many factors but particularly patient preference, tolerance, nutritional needs, income, comorbidities and cultural suitability.

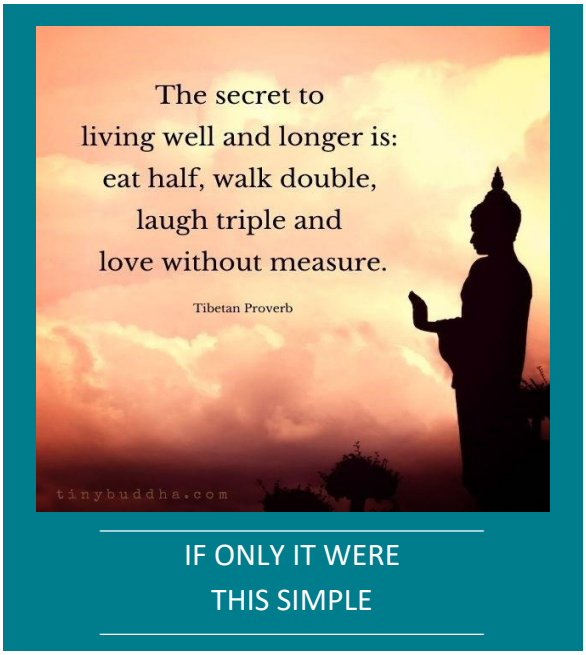
Some recommended sites for lifestyle information

https://t2dm.nzssd.org.nz/Section-88-Healthy-eating (has links to some dietitian resources for practice nurses)

https://www.diabetes.org.nz/

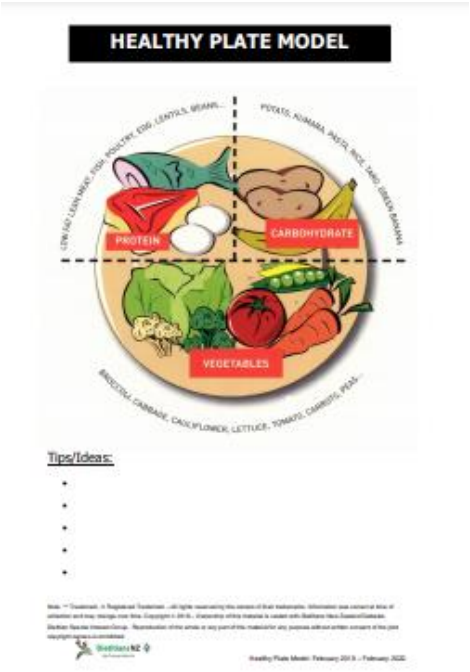


Our favourite booklet about food

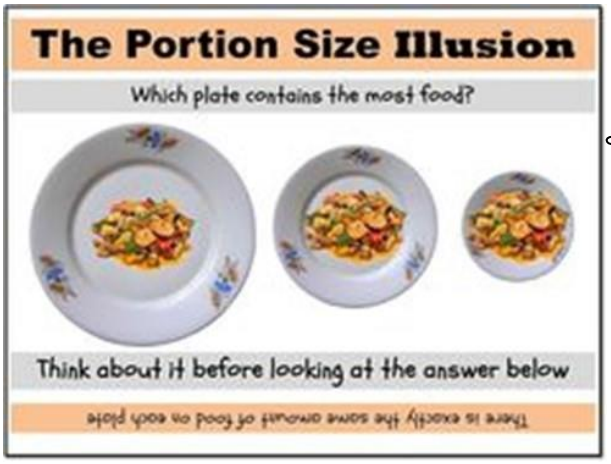


Nutrition resources

There are so many resources to choose from—be selective. Aim for no more than 5 resources you use a lot. Here are a couple more favourites.



Healthy Food Guide has a portion size poster as well– it has more detail than this one from the heart foundation



Try this at home!

Remember that people get confused if they are told different health messages. Keep to evidence-based health/food messages. Ensure as a team you are all saying the same things about food. Fad diets typically promise quick weight loss, restrict a specific food group, require expensive supplements, and are short lived.

If it sounds too good to be true—it probably is!

Dietary Intake

All people with diabetes need to know that **carbohydrates** impact on their BGL.

Make an opportunity to assess a person's food intake and prior knowledge level. Discuss some common labelling misconceptions. (No added sugar, organic, fat free)

The DNZ healthy food booklet has an excellent section on what carbohydrates (CHO) are.

Make sure that patients are aware that increased calorie consumption over their individual requirements will increase their weight.

From the Ministry of Health

Enjoy a variety of nutritious foods every day including:

- plenty of vegetables and fruit, grain foods, mostly whole grain and those naturally high in fibre
- some milk and milk products, mostly low and reduced fat
- some legumes, nuts, seeds, fish and other seafood, eggs, poultry (e.g. chicken) and/or red meat with the fat removed
- Choose and/or prepare foods and drinks with unsaturated fats instead of saturated fats, foods that are low in salt (sodium); and if using salt, choose iodised salt, foods with little or no added sugar, and foods that are mostly 'whole' and less processed.
- Make plain water your first choice over other drinks.
- If you drink alcohol, keep your intake low. Stop drinking alcohol if you could be pregnant, are pregnant or are trying to get pregnant.
- Buy or gather, prepare, cook and store food in ways that keep it safe to eat.

Discuss fat intake using the acronym FAT – frequency, amount, type. *There really is nothing that a person with diabetes cannot eat if they consider these principles. This principle applies not only to fat but also CHO*

An Example: *if a person's favourite food is pizza and they eat this 3 times a week, could they eat it once a week, or eat a smaller portion (and add a salad on the side), or change the choice they make from Hawaiian stuffed crust x large (1512 KJ) to large slice thin and crispy (626 KJ).*

Basal Bolus insulin does work best with great CHO knowledge and when teaching our patients we should focus on timing, type and amount as this is very relevant to achieving control and balance in their diet.

Some people require more in-depth information e.g. education on Glycaemic Index, being able to read nutrition labels, in general how much CHO they consume at each meal. Dietitians specialise in teaching CHO management whilst maintaining good nutrition, and patients on or starting insulin meet criteria for referral.

There is very clear information on this site https://www.carbsandcals.com/diabetes/type-2-diabetes and on the next page is information that will help people understand how much CHO is in the food they eat.

Patients can be referred to the Pinnacle MHN Extended Care Team community dietitian via e-Referral

Basic CHO Sheet

Bread	Carbohydrate	Vegetables	Carbohydrate
1 slice – check the label	10 – 20 g	1 med potato (135 g)	15 g
1 medium slice Molenburg	13 g	1 cup mashed potato	30 g
1 toast slice Molenburg	17 g	1 small piece kumara (135 g)	18 g
1 slice Vogel	18 g	1 whole cob corn	30 g
1 med slice white bread	13 g	½ cup creamed corn	23 g
1 toast slice white bread	17 g	½ of 420g can baked beans	23 g
1 slice your usual bread	_____ g	1 cup cooked dried beans	30 g
1 bread roll long/hamburger	30 g	1 parsnip (22 cm long 160 g)	20 g
1 bread roll med bakery	20 g	Yams (135g)	17 g
1 crumpet	20 g	1 cup thick vegetable soup	20 g
1 large pita bread	40 g	Taro (135 g)	33 g
1 wrap – check the label	15-40 g	Plantain/Green banana (135 g)	33 g
1 English muffin	30 g		
Cereals		**Fruit**	
1 Weetbix	10 g	1 banana	30 g
1 cup cooked porridge	30 g	2 raw apricots/plums	10 g
½ cup raw rolled oats	25 g	150 gm berries	10 g
1 cup muesli - check the label	90 g	½ cup stewed fruit (in juice)	10 g
1 cup just right/ light n tasty	54 g	1 cup grapes/cherries	25 g
Weetbix Bites (45 g)	32 g	1 apple	15 g
1 cup All Bran flakes	28 g	1 orange	10 g
1 cup Kornies/rice bubbles	25 g	2 medium feijoa	5 g
1 cup Nutrigrain	25 g	1 slice fresh pineapple	13 g
Pasta/Rice		**Dried fruit**	
1 cup cooked pasta	40 g	4 dried apricot halves	10 g
1 cup cooked rice	50 g	1 cup dried fruit	100 g
1 pkt instant noodles	50 g	1 tablespoon raisins/sultanas	10 g
½ of 420g can spaghetti	23 g	4 dates	20 g
Dairy products		**Crackers biscuits baking**	
1 glass milk (200 ml)	10 g	1 med cracker (check the label)	5 g
1 pottle diet yoghurt	10 g	1 large cracker	10 g
1 pottle regular yoghurt	25 g	1 plain biscuit (arrowroot, round wine)	5 g
1 ice-cream slice	10 g	1 large biscuit (digestive)	10 g
1 glass soy milk (200ml)	10g	1 rice wafer	10 g
Extras		1 sweet muffin (small 80 g)	40 g
1 pie	45 g	1 scone (small 80 g)	30 g
1 cup macaroni cheese	35 g	1 pikelet (small 25 g)	10 g
1 hamburger – regular	30 g	1 cup flour	90 g
¼ pizza (2 slices)	60 g	1 pkt crisps (small 40 g)	18 g
2 Sushi rolls	20 g	1 pkt crisps (large 150 g)	68 g
1 serve hot chips - med	60 g	1 muesli bar (read the label)	15 – 40 g

Food/glucose activity record sheet

Please record as much information as you can the 4 days before your appointment. You do not need to change your normal pattern of eating, but please write down what you do eat. It also helps to record your blood glucose levels before the meals and 2 hours after the meals. If you normally snack between meals, eat AFTER you have done the 2-hour glucose check.

Remember - there is no such thing as a bad level, as all the information can be used to help you manage your diabetes better.

	Day one	Day two
Before meal blood glucose level		
Breakfast		
2 hours after meal blood glucose level		
Morning tea		
Before meal blood glucose level		
Lunch		
2 hours after meal blood glucose level		
Afternoon tea		
Before meal blood glucose level		
Dinner		
2 hours after meal blood glucose level		
Supper before bed		

	Day three	Day four
Before meal blood glucose level		
Breakfast		
2 hours after meal blood glucose level		
Morning tea		
Before meal blood glucose level		
Lunch		
2 hours after meal blood glucose level		
Afternoon tea		
Before meal blood glucose level		
Dinner		
2 hours after meal blood glucose level		
Supper before bed		

Bring these records to your appointment

Remember to bring your glasses if you wear them!

Physical activity

Physical activity is a key component in diabetes management
It increases insulin sensitivity and increases consumption of glucose by the cells.

The latest NZ MoH guidelines are for ADULTS:

Do at least 2 ½ hours of moderate or 1 ¼ hours of vigorous physical activity spread throughout the week.

Moderate intensity activity causes a slight, but noticeable, increase in breath and heart rate. You can still carry on a conversation.

Vigorous intensity makes you out of breath – you can't do these activities and chat at the same time.

For extra health benefits, aim for 5 hours of moderate or 2 ½ hours of vigorous physical activity spread throughout the week.

Do some muscle-strengthening activities on at least 2 days each week. More information can be found here: https://www.health.govt.nz/our-work/preventative-health-wellness/physical-activity

Exercise may impact on the BGL for up to 24 hours. People need to be aware of the potential of a hypo following moderate or vigorous exercise.

Ideally adults with Type 2 diabetes should do both aerobic and resistance exercise training for optimal glycaemic and health outcomes (ADA,2016).

Pre exercise health check by GP is advisable for people with diabetes if previously sedentary or co-morbidities present.

There are many opportunities for people to increase their activity.

It can be as simple as parking further away from work, walking upstairs not taking the elevator, sit and be fit activities.

Dancing, walking, swimming, waka ama, in2hula, marathons, TriMāori, hiking… the list is endless. Be aware of what opportunities are in your local area.

It must be affordable, achievable, and often. Doing a small amount of activity regularly is better than a huge effort once in a while.

Consider setting a goal, invite a friend, gradually increase the intensity.

Some people are motivated by technology—pedometers are cheap, fitness watches and apps such as my fitness pal or charity miles.

Encourage people to start any new exercise slowly and aim to increase.

Sleep

Reduced sleep is now widespread, usually as an accommodation to a busy lifestyle and the use of technology intruding into sleep time.

The Sleep Heart Health Studied those with a self-reported short sleep duration (<5 hours) had an increased risk of type 2 diabetes compared to those with a sleep duration of 7—8 hours.

You can find a hand out on sleep hygiene on the health navigator page: https://www.healthnavigator.org.nz/healthy-living/s/sleep-tips/


Sleep

Health Navigator

Tips to improve your sleep


Sleep tips tracker

Health Navigator

To help you get a better night's sleep

Activity	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
No caffeine within 6 hours of going to bed							
No alcohol within 2 hours of going to bed							
No smoking within 2 hours of going to bed							
No heavy meals within 2 hours of going to bed							
Didn't go to bed hungry							
No physical exercise within 3 hours of going to bed							
Set a bedtime routine and went to bed on time							
Set a bedtime routine and woke up on time							
Didn't have a sleep/nap during the day							
Got out of bed when awake for more than 20 minutes							
Relaxed before bedtime							
Wrote down things on my mind and took pen and paper to bed							
No computer, mobile phones or other electronic device 30 minutes before going to bed							
Did some exercise during the day							
Rate 1 ..... 10 how good was your sleep							

Having difficulty sleeping? There are lots of things you can do to help get a better night's sleep. Use this form to record the changes you are making – remember the more changes you make, the more likely you are to get a good night's sleep. For more copies, visit www.hn.org.nz/takecharge

If blood glucose levels are high overnight, nocturia can be an issue and further interrupt sleep patterns. Restless leg syndrome is sometimes experienced by people with diabetes as is cramping and neuropathic pain. All of these issues will improve with improved blood glucose control.

Consider assessment for sleep apnoea

Obstructive sleep apnoea (OSA) alters glucose metabolism, promotes insulin resistance, β cell dysfunction, and is associated with development of type 2 diabetes. This appears to be independent of obesity. Chronic exposure to intermittent hypoxia and other pathophysiological effects of OSA affect glucose metabolism directly and treatment of OSA using a CPAP machine can improve glucose homeostasis. Lifestyle interventions has a significant impact on Apnoea hypopnoea index (AHI) in people with type 2 diabetes.

If people are struggling with sleeping well: https://www.sleepwellclinic.co.nz/

Stress

KEY POINTS for the person with diabetes

- Stress is a part of our daily lives
- Stress becomes unhealthy when it begins to make us less able to manage our physical or psychological health, or other factors in our lives such as our work and relationships
- Stress can be caused by physical factors (like an injury or illness) or psychological or social factors (unresolved work issues, bereavements, moving house, unresolved relationship problems)
- For many people with diabetes, stress can cause blood glucose levels to rise. Learning strategies to deal with stress may lessen this effect
- Having diabetes is in itself a major source of stress. People with diabetes have higher rates of anxiety and depression. Learning how to manage stress and treating these skills as a priority, can help a person cope with stress more effectively
- There are practical things that can be done to reduce stress, such as learning relaxation techniques, learning different ways to respond to stress, identifying situations that cause stress and choosing to avoid them, and making changes to your life that increase your enjoyment level
- Developing a positive coping style may help you deal more effectively with stress

Stay vigilant for diabetes burnout and distress.

Screening for psychological problems and diabetes burn out has not been happening systematically. In order to address this, the PHQ2 Depression questionnaire and DDS2 are now a routine aspect of the diabetes annual review. These give more focus to the persons feeling of coping with the rigorous demands of living with diabetes. If the person you are seeing scores highly when answering these questions, your role is to support them to achieve healthy habits that benefit their physical body as well as their mental health – good food, good exercise, good sleep habits, meditation and referral to the GP highlighting your concerns.

Weight Management

A weight management service is provided by the dietetic service at Lakes DHB and can be accessed via e-Referral. There are fortnightly clinics in Taupo and Turangi.

Referrals for dietary advice can also be made to the dietitian within the Pinnacle MHN extended care team, this is also via e-Referral.

All of the lifestyle topics addressed here are great for the whole population.

Be the champion for healthy lifestyle messages.

MICROVASCULAR COMPLICATIONS

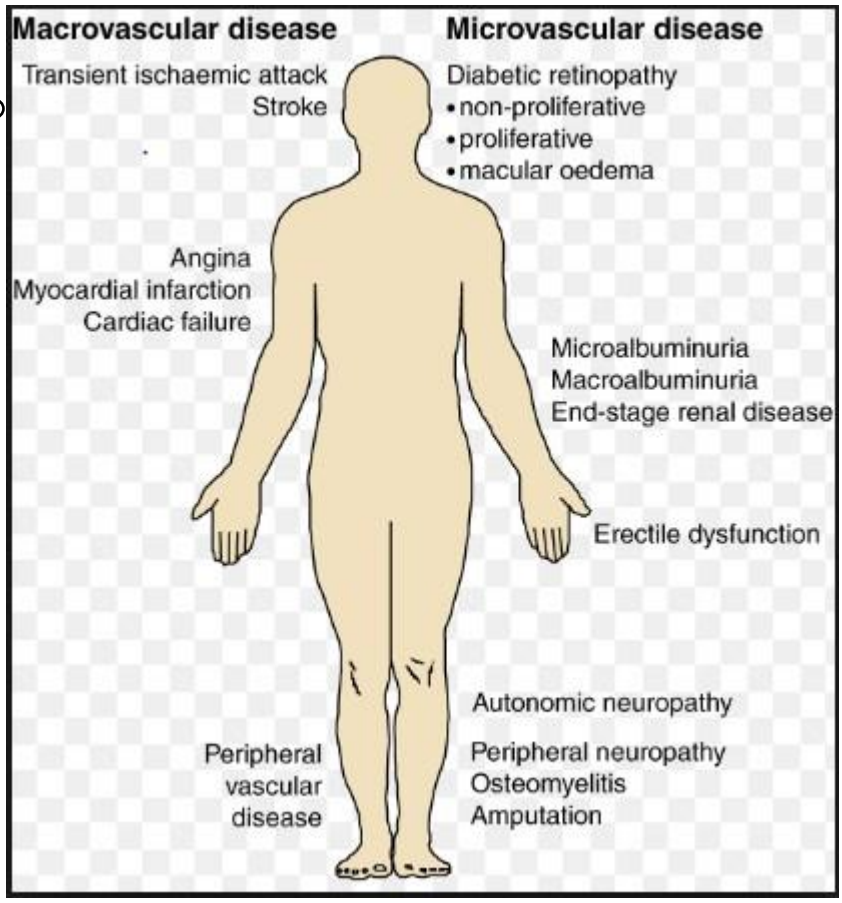
It is essential to identify diabetes related complications by early and regular screening and this includes gum disease, foot examination for neuropathy and ulceration, kidney damage and eye disease. Patient education is necessary in all of these areas to avoid impaired quality and length of life and burden of costs to secondary health care services. (MOH, 2015. Living well with Diabetes).

While the UKPDS is an older study in today's terms, it still a landmark for reducing complications. The key messages are:

- retinopathy, nephropathy, and possibly neuropathy are benefited by lowering blood glucose levels in type 2 diabetes with intensive therapy. The overall microvascular complication rate was decreased by 25%.
- Tight control of blood pressure reduced the risk of any non-fatal or fatal diabetic complications and of death related to diabetes

This is why there is a target for good glycaemic control, which is HbA1c 53 for most people.

Think about how to communicate this to your patient



Renal disease

<u>All people with type 2 diabetes should have eGFR and Albumin/Creatinine ratio assessed annually and more often if abnormal (3 - 6monthly)</u>

- If the patient has albuminuria, then this result should be repeated one or two times over the next 3 months to confirm the result. Exclude causes such as UTI, severe hyperglycaemia, heart failure, vigorous physical activity, contamination with blood, or other kidney disease i.e., concomitant haematuria is present. Confirm with another blood test.
- The combination of a low eGFR and albuminuria/proteinuria means that the patient is at greater risk of developing end-stage renal failure, compared with patients who have a low eGFR, but no albuminuria or proteinuria.

				Persistent Albuminuria Categories Description and Range		
				A1	A2	A3
				Normal to mildly increased	Moderately increased	Severely increased
				<30 mg/g <3 mg/mmoL	30–300 mg/g 3–30 mg/mmoL	>300 mg/g >30 mg/mmoL
GFR Categories (mL/min/1.73 m²) Description and Range	G1	Normal or high	≥90			
	G2	Mildly decreased	60–89			
	G3a	Mildly to moderately decreased	45–59			
	G3b	Moderately to severely decreased	30–44			
	G4	Severely decreased	15–29			
	G5	Kidney failure	<15			

Kidney Disease: Improving Global Outcomes (KDIGO) 2017 Clinical Practice Guideline classification chart for albuminuria.

For people with diabetic kidney disease in the Lakes region, there is a specialised kidney clinic in Rotorua run by the Waikato DHB renal service. Refer via e-Referral.

PRACTICE POINTS

- People with confirmed microalbuminuria should be treated with an ACE inhibitor or an ARB whether or not hypertension is present.
- Good glycaemic control in patients with CKD and diabetes is essential to prevent or delay the progression of diabetic nephropathy, and to reduce cardiovascular risk.
- Jardiance (SGLT2i) is funded for patients with renal complications and eGFR >30 mL/min.
- An HbA1c 53 mmol/mol is generally a target for patients with CKD and diabetes. However, if there is an increased risk of hypoglycaemia, older patients living alone, comorbidities or limited life expectancy, a target HbA1c > 53 mmol may be more appropriate. This should be decided with patients using a shared decision-making approach.
- In patients with advanced stage 4 and stage 5 CKD the risk of hypoglycaemia is also clinically relevant, and less intensive glycaemic control but with close monitoring is often required. The maximum dose of metformin in patients with an eGFR < 60 is metformin 1 gram daily. Metformin should be avoided altogether in patients with an eGFR < 15 except under the close supervision of a nephrologist.

Using ACE inhibitors

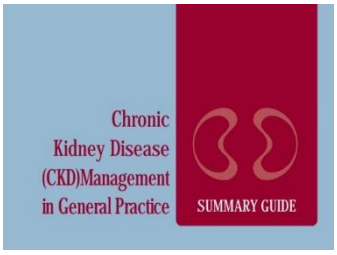
- When an ACE inhibitor is commenced, the GFR and serum potassium should be measured 7—10 days later to ensure there is no further decline in GFR
- If reduction in GFR < 25% and GFR stabilises within 2 months of starting therapy, continue the ACE inhibitor.
- A reduction > 25% after starting ACE inhibitor may indicate renal artery stenosis. Reduce or stop the ACE inhibitor and consider nephrology assessment.
- If potassium > 6 mmol/L, reduce or stop the ACE inhibitor.
- If intolerant of ACE inhibitor, use an angiotensin-II receptor antagonist.

Some extra notes about treatment of renal disease:

- Any evidence of renal disease based or decreasing eGFR should be treated with urgency.
- Loop diuretics may be used instead of or in combination with thiazide diuretics in patients with significant renal impairment (eGFR <45 ml/min/1.73m2).
- People with type 2 diabetes are more prone to nephrogenic anaemia (from no other cause) and eligible for erythropoietin for eGFR<45. Hb <100

Opinions vary as to when metformin should be reduced in the presence of renal impairment, but all agree that metformin is contraindicated when eGFR<15.

A helpful resource:
'Chronic kidney disease (CKD) management in general practice':
https://www.kidneys.co.nz/resources/file/kidneyhealth_complete_pgs-2.pdf



End stage renal disease (ESRD)

Historically this has been the domain of the renal unit, but at times general practice will be asked to manage blood glucose levels. This needs to be done on an individual basis. Some general points are:

HbA1c target is moderate. Expert opinion recommends HbA1c between 53-75mmol/mol. Targeting lower HbA1c levels may exacerbate mortality risk in dialysis patients with underlying illness and malnutrition.

Up to 1/3 of people with ESRF experience 'Burn- out diabetes'. There are a number of factors that contribute to a spontaneous resolution of hyperglycaemia—the HbA1c returns to normal without the use of treatment.

Many glucose lowering drugs and their active metabolites are metabolised and excreted through the kidneys and will therefore require dose adjustment in the dialysis patient.

Limitations of HbA1c in dialysis patients: ESRD related factors can cause falsely high HbA1c values (due to high urea levels and metabolic acidosis) as well as falsely low values (due to anaemia, repeated blood transfusions, haemoglobinopathies, use of erythropoietin-stimulating agents and malnutrition). Despite this, renal guidelines from both the UK and US advise use of HbA1c to monitor glycaemic control in dialysis patients.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3960718/pdf/nihms558834.pdf

Autonomic neuropathy

This can affect the sympathetic and parasympathetic functions in people with diabetes involving cardiovascular (silent MI), gastrointestinal (gastroparesis, constipation), genitourinary (neurogenic bladder/erectile dysfunction), metabolic (hypoglycaemia unawareness), sudomotor (excessive sweating) and ocular changes (small pupil that constricts poorly to light).

PRACTICE POINT

It is important when screening patients at annual diabetes review you can recognise the symptoms of autonomic neuropathy and refer the patient on for further medical assessment

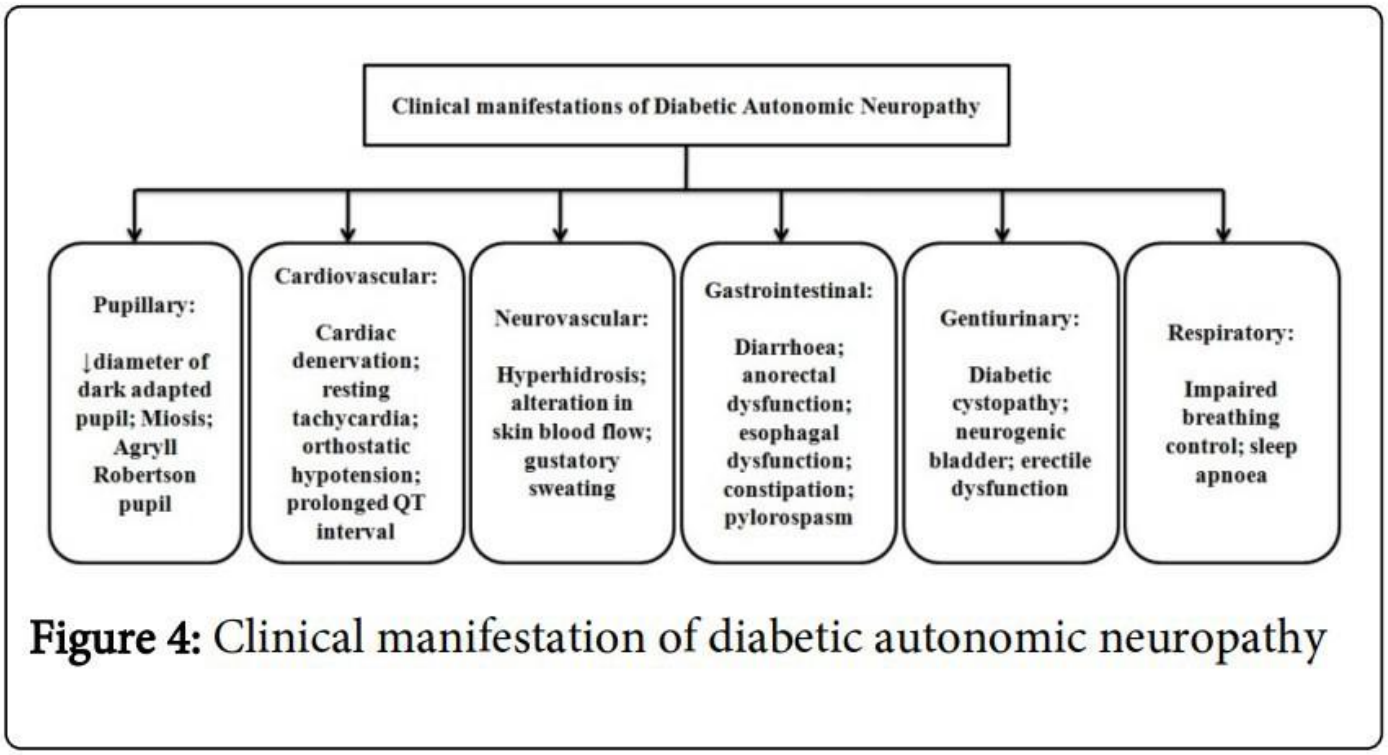


Figure 4: Clinical manifestation of diabetic autonomic neuropathy

Peripheral neuropathy

- Diabetic peripheral neuropathy is one of the most common long-term complications of diabetes.
- It develops in up to half of all people with diabetes and is one of the main risk factors contributing to foot ulceration and eventual amputation.
- Basic foot education at an annual review can prevent some issues developing.
- It is the main cause of non-traumatic lower limb amputation, which is a result of a combination of decreased sensation and reduced arterial supply.
- Assessing for peripheral neuropathy is a routine part of ongoing care for patients with diabetes.
- Treatment of diabetic neuropathy includes optimal control of hyperglycaemia, appropriate foot care (often involving input from a podiatrist), and symptomatic management of any neuropathic pain.

A very comprehensive article on Peripheral Neuropathy can be found here: https://bpac.org.nz/BPJ/2014/June/diabetic-peripheral-neuropathy.aspx

For a thorough foot check:

- Take off the persons shoes and socks.
- A general inspection of the feet and the patient's footwear
- Musculoskeletal assessment for deformity (including Charcot arthropathy)
- Neurological assessment
- Vascular assessment of the feet, and assessment of the heart rate and blood pressure

General inspection of the feet notes.

Examine both feet and check the condition of the skin, particularly looking for erythematous areas, dryness, flakiness, thickness, cracking, callus formation, infection and ulceration. Dermatological changes, such as dry or scaly skin, may be secondary to a degree of autonomic dysfunction which can begin distally.

There may also be abnormalities of sweating or circulatory instability in the feet, e.g. a hot or cold foot. Heavy callus formation over the pressure points of the foot and signs of localised rubbing or friction, blisters or erythema can also be an indication of inappropriate footwear. Foot ulcers are not caused by neuropathy alone but can occur without injury once hard callus is present over pressure points. If a patient has a loss of sensation in the foot, there will be prolonged and increased forces on the callused areas which then increases the risk of tissue breakdown and ulceration.

Checking for sensation in feet

Monofilament

Monofilament testing uses a 10 g monofilament to assess a patient's ability to feel light pressure at a number of separate sites on the foot. The New Zealand Society for the Study of Diabetes guidelines suggest the examination of 12 sites in total – six on each foot (Figure 1), although some clinicians believe that fewer sites are required, e.g. four sites on each foot. If the patient cannot detect the light pressure at more than one of the designated checking sites, then loss of protective sensation is deemed to be present.

To perform the check the patient is placed supine with bare feet (or their feet raised on a stool in front of the clinician). The use of the filament should be demonstrated to the patient on their upper arm. Ask them to close their eyes and say "yes" when they can feel the filament. The filament should then be placed against the foot, avoiding areas of callus if possible, and pressed until the patient indicates they can feel it, or until the filament bows (Figure 1). The filament should be pressed against the foot slowly over three seconds, not tapped. Site selection should be random and not predictable by the patient.

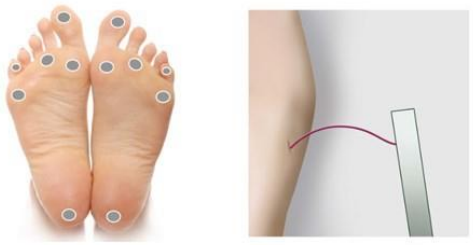


Figure 1: Recommended sites for cutaneous sensory pressure perception testing using a monofilament. Monofilament bent to form a C shape.

N.B. It is recommended that a monofilament is not used on more than ten patients in 24 hours, as they may buckle. The monofilament should also be replaced on a regular basis to ensure it still has a 10 g pressure. In addition, the monofilament should be cleaned with alcohol after each use.

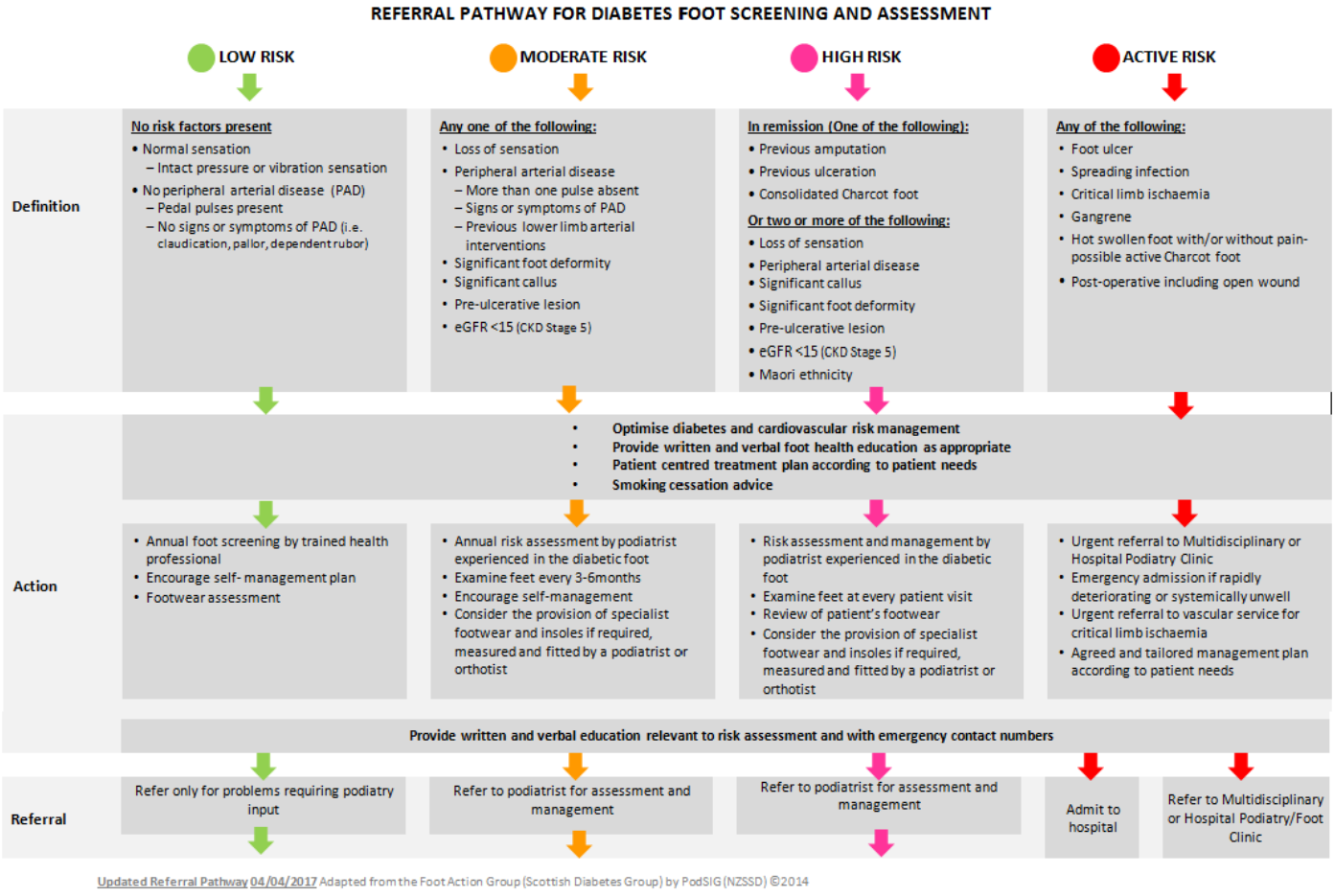
Available to purchase from:
https://www.mediray.co.nz/diabetes/shop/peripheral-neuropathy/neuropen-monofilaments-10g-box-5-gds-nt0104/
or source from an online retailer such as www.aliexpress.com

Ipswich Touch Test

If a monofilament is not available, it is still important to examine and touch the feet. The Ipswich Touch Test involves lightly TOUCHING or RESTING (not brushing, tapping or poking) the tip of the index finger for 1-2 seconds at the same points indicated above. The online DAR form has the Ipswich Touch Test as an option, but defaults to the monofilament test as this is the gold standard assessment. This video shows you how to do the touch test https://www.youtube.com/watch?v=KbMljfRubvQ

Vibratip

The idea with vibration checking is that sensation is the first sensation to be impacted by neuropathy, rather than pressure—so the changes in the foot could be picked up earlier than with a monofilament. Vibratip should only be used in conjunction with a monofilament, not as an alternative.



Podiatry Services (via e-Referral)

Funding is available for 3 podiatry consults/year for patients with moderate to high risk, as per the algorithm. There is also a limited amount of funding for orthotics.
Referral is via BPAC e-Referral to Foot Mechanics.

Active foot clinic at Waikato Regional Diabetes Service for patients who meet the following criteria

Diabetes – secondary services (DHB) podiatry referral

This service is for diabetic patients with active foot complications and high risk feet.

active ulceration

spreading infection

critical ischaemia

gangrene, or;

unexplained hot, red, swollen foot with or without pain

Include in referral (if available):

last diabetic foot check (screening)

last three months BPs (screening)

last three HbA1c readings

BP / height / weight (automatically included if in screening)

other relevant clinical history, e.g. consultation

For more information please view the Referral pathway for diabetes foot screening and assessment .

Patient education is essential

Encourage your patient to check their feet daily so they will immediately know if there is a change

- After a shower or bath, when putting on shoes and socks, or when getting into bed
- If they can't check their own feet, get a family member to check for them, or they could use a mirror on the floor to check the underside of the foot
- Check between the toes, nails and skin
- Compare the feet – colour, temperature, sensation
- Choose shoes that fit have a wide and broad toe, a heal counter, don't rub and are preferably laced or have Velcro.
- Socks are advisable to prevent rubbing (wool or cotton)

You will find some more useful patient resources at the diabetes New Zealand website:

https://www.diabetes.org.nz/

Retinopathy

- Classified into non-proliferative, proliferative, and macular oedema
- Is the leading course of blindness in the developed world countries
- Diabetic retinopathy is a microvascular complication of both type 1 and 2 diabetes
- About 20% of patients with type 2 diabetes have retinopathy at diagnosis.
- The prevalence is strongly related to the duration of diabetes, prolonged hyperglycaemia and the presence of nephropathy, hypertension and dyslipidaemia
- National and international studies show that between 30-40% of people with diabetes have retinopathy
- Severe retinopathy may be present with normal vision
- Educate patients to seek prompt medical assessment if there is any visual deterioration
- Refractive errors occur as lens changes shape with elevated blood glucose

This means that when the glucose levels are high, you may experience blurred vision. This is reversible. Retinopathy is not reversible.

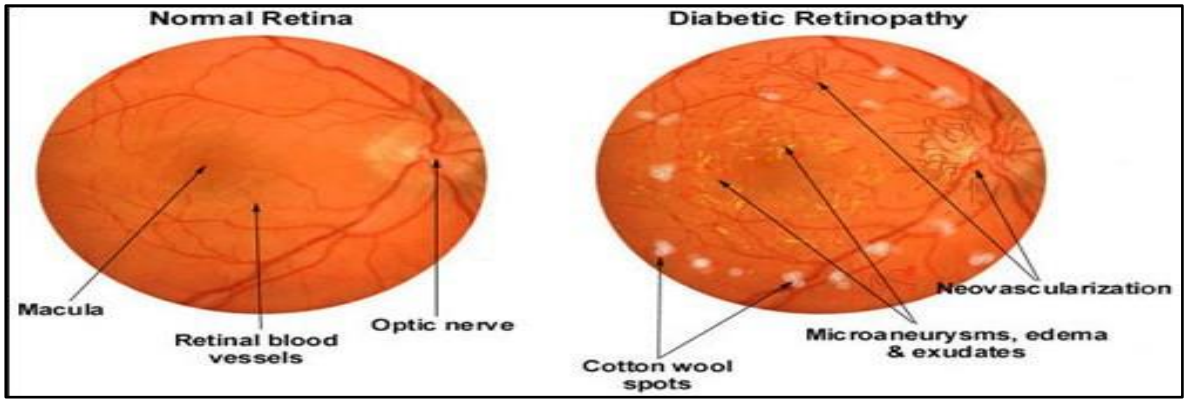
Arrange regular retinal photography:

- For type 2 diabetes, start from diagnosis.
- For type 1 diabetes, start 5 years after diagnosis, not if aged < 12 years.
- If no retinopathy, screen every 2 years— 3 years.
- If retinopathy present, screen at least annually for changes
- If you are not sure when they last had an eye photograph—check clinical workstation for an upcoming appointment. If there is none, call RAPHS 07 349 3563

ACTIVE MANAGEMENT

This can be concerning to people; they need good explanations of what is happening and why.

- Very rapid improvement of glycaemic control can result in short-term worsening of retinopathy. Inform the ophthalmology department if a patient with established retinopathy is being taken from poor control to tight control quickly, in case laser treatment becomes indicated.
- In the longer term, the risk of retinopathy progression is decreased by tight glycaemic control.
- Active management of all diabetes risk factors (e.g. glycaemic control, blood pressure, lipids, renal function) helps prevent the onset and reduce the progression of retinopathy.



Retinal Photo Screening

Use e-Referral for retinal screening:

Entry criteria:

all individuals with a confirmed clinical diagnosis of diabetes

Referral must include:
Most recent labs
HbA1c Creatinine/eGFR /ACR
Type of diabetes
Duration of diagnosis or year of diagnosis
History of foot ulcers
Include BP / height / weight if available (automatically included if in screening).

Note: Gestational diabetes lasts the length of pregnancy – these women will not develop diabetic retinopathy within 9 months and do not meet the service entry criteria.

Normal visual acuity does not preclude sight-threatening retinopathy.

Cataracts are more common in diabetes, seen at a younger age, and progress more rapidly.

Erectile dysfunction

Erectile dysfunction is defined as the inability to get and maintain an erection

- impacts 35 – 75 % of men who have diabetes.
- Men with diabetes are likely to develop the problem 10 – 15 years earlier than men without diabetes. Over the age of 70, there is a 95% likelihood of facing difficulties with erectile function.
- Women also experience sexual dysfunction at higher rates when they have diabetes. Up to 78% of women with diabetes will experience sexual dysfunction in the form of decreased lubrication, desire and arousal, dyspareunia, orgasmic dysfunction and sexual satisfaction. This rate increases if the woman has diabetes and depression and/or anxiety.

The following website has excellent up to date information about what ED is, the pathophysiology and the treatment options.

https://www.urologywaikato.co.nz/erectile-dysfunction

Often the person will not ask about ED issues, so it is up to health professionals to become comfortable at starting the conversation.

There are a number of treatments for ED:

- Glucose and BP management are the essential first steps of reversing erectile dysfunction
- Counselling – the basis of ED may be psychological, behavioural, or physical
- Exercise – this does more than simply boost circulation, it can reduce weight, reduce depression and anxiety, it may increase testosterone, and it simply boosts how we feel about ourselves
- Oral medications – there are many of these on the market. Some have a shorter half-life than others, they still require stimulation and arousal to achieve a positive result, and they have reduced in price considerably since coming off market. They are available without script from pharmacy, encourage the person to try them more than once before they say it doesn't work – performance anxiety can reduce their effect the first time, and warn people about online herbal options particularly from overseas; the label claims are not always accurate
- Penile injections are often a useful option
- Vacuum devices
- Penile implant or prosthesis

MONITORING

- Refer to CHECKING rather than TESTING. Testing suggests a pass or fail. There are no "wrong" answers to the monitoring as it is investigative, not accusatory.
- People prescribed Metformin, Galvus, Jardiance or Trulicity are not at risk of hypoglycaemia unless also taking insulin or a sulfonylurea and do not "need" to monitor their blood glucose from a safety aspect.
- However, self-monitoring of blood glucose (SMBG) is the only way the person with diabetes (PWD) and their health care professional know what is happening with their diabetes. The more checking being done the more information they (we) have.
- People can learn more about their own diabetes by looking at how their blood glucose respond to what they eat /do/feel/medication use.
- Short periods of intense checking 3-4 days are achievable by most and gives you the information that is required to make decisions on medication options.

Most people will be somewhere on the following continuum:

Pre breakfast, pre bed 1 day a week

Pre and 2-hour post meals (6)
Plus pre bed (7) plus 2 am (8 checks)

- Encourage checking even when levels are not great. Identifying the problem times of day means you can work towards fixing the problem
- Consider getting people to write their results in a logbook/download results/use an app (mysugr) at home as they are looking for a **pattern**
- Discuss BGL patterns - what can you see and what does this mean? - CHO consumption, exercise and medication
- Use a food/exercise diary with blood glucose check results alongside for a 4-day snapshot (see pages 23/24 and photocopy this for your patient to use)

Paired checking & Overnight hypoglycemia

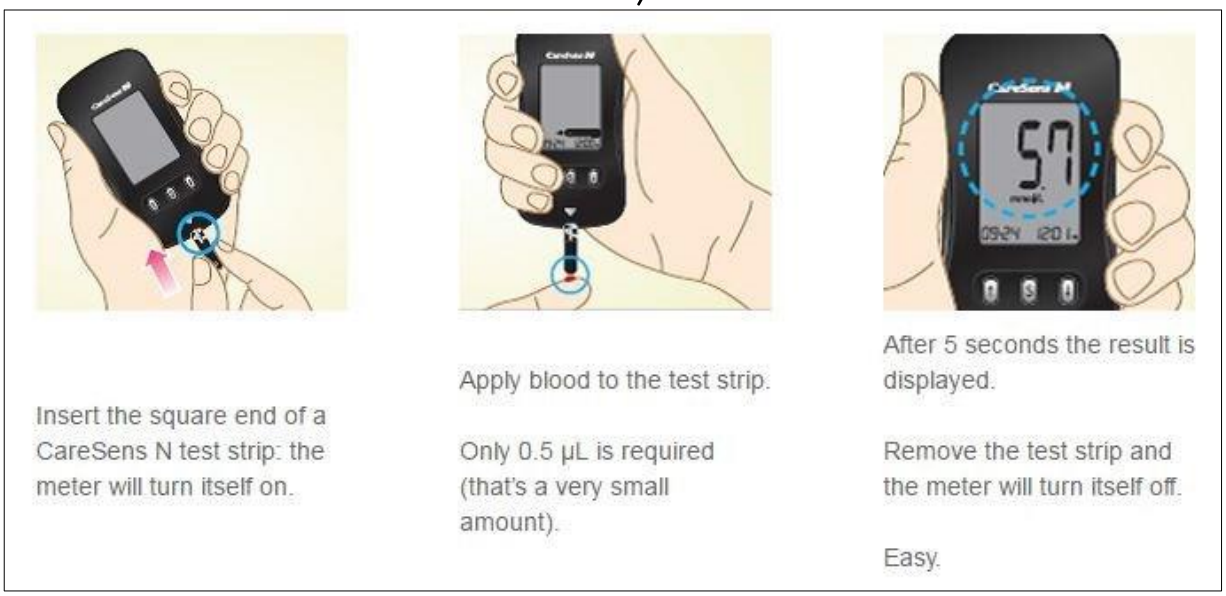
- If starting a new insulin or concerned about **<u>overnight hypos</u>** (people often sleep through these) ask the person to check at 2am.
  Clues to overnight lows - HbA1c is low, but daytime glucose levels are high, >0.5 units/kg basal prescribed, waking with nightmares or sweaty, elevated results in the morning (there can be a rebound like effect), or simply that something just does not make sense.

- **Paired checking** is when people check before and then 2 hours after a meal.
  The thinking is that if there is a postprandial rise of more than 3mmols, reassess CHO load of the meal. Is it excessive or reasonable? Or introduce/increase medications that support insulin secretion (sulfonylurea, rapid acting insulin). Consider dietitian referral.

Whichever meter the person uses, the correct technique is important.

Wash hands prior to checking

Keep meter in upright position



Battery—CR2032 Lithium battery for the CareSens range of meters are free from your local pharmacy.

A guide to the availability of CareSens meters and test strips for newly diagnosed patients.

Patients newly diagnosed with diabetes

TYPE OF MEDICATION

Sulphonylurea and/or insulin	Medications other than sulphonylurea and Insulin

BLOOD GLUCOSE METER

Subsidised by PHARMAC	Not subsidised by PHARMAC

HOW TO GET A METER FOR YOUR PATIENTS

Patients can obtain subsidised CareSens meters by presenting a prescription to their pharmacy Models available: • CareSens N, N POP or N Premier • CareSens Dual (only for patients with type 1 diabetes)	• Give a free meter coupon to your patient to get either a CareSens N or an N POP meter free of charge. Contact your CareSens representative for coupons. OR • Patients can purchase a CareSens meter of their choice from a pharmacy or Pharmaco Diabetes website.

FUNDED TEST STRIPS

Blood glucose test strips are NOT restricted to one pack per prescription. 2 packs of 10 KetoSens (blood ketone test strips) are funded for people with Type 1 diabetes	Blood glucose test strips are restricted to one pack per prescription

METERS AND TEST STRIPS FOR CLINIC USE

Use the PSO form

	Compatible test strips	Tests
Current Meters		
CareSens N meter CareSens N POP meter	CareSens N	Blood glucose
New Meters with Bluetooth Functionality		
CareSens N Premier	CareSens N	Blood glucose
CareSens Dual	CareSens PRO and KetoSens	Blood glucose and blood ketone

Pharmaco Diabetes Training Portal

The Pharmaco Diabetes Training Portal is a convenient online training platform for healthcare professionals. Simply go to the portal, register your interest and start learning at a time and place that works for you. Full of information and videos, the portal will help you become expert in using the CareSens blood glucose monitoring systems.

www.PharmacoDiabetes-training.co.nz

Lancets are not free but please ensure that people are changing them because when they are blunt, they often cause more pain and can lead to resistance to self-monitoring of blood glucose. One lancet is good for 12 finger pricks.

Choose a suitable meter for your patients

Features	CareSens N	CareSens N POP	CareSens N Premier	CareSens Dual
				
Test	Blood Glucose	Blood Glucose	Blood Glucose	Blood Glucose and Blood Ketones
Compatible test strips	CareSens N 	CareSens N 	CareSens N 	CareSens PRO (For blood glucose testing) KetoSens (For blood ketone testing) 
Bluetooth data transfer to SmartLog app	NO	NO	YES	YES
Manual data entry to SmartLog app	YES	YES	YES	YES
Data download to Windows and Mac computer	YES	YES	YES	YES
Illuminated numbers	NO	YES	YES	YES
Meal Flags	Pre and post meal	Pre and post meal	Fasting, pre and post meal	Fasting, pre and post meal
Memory	1000	1000	1000	1000
Averages	1, 7, 14, 30 and 90 days	1, 7, 14, 30 and 90 days	1, 7, 14, 30 and 90 days	1, 7, 14, 30 and 90 days
Strip ejector	NO	NO	YES	YES
Ideal for	People with diabetes looking for a simple easy to use meter to test blood glucose levels	People with diabetes looking for a compact and discrete meters to test blood glucose levels	People with diabetes needing advanced meter with Bluetooth functionality and bigger screen	People with diabetes for testing blood glucose and blood ketone typically people with type 1 diabetes

Pharmaco Diabetes i-sens www.PharmacoDiabetes.co.nz

Always read the label. Follow the manufacturer's instructions, and the advice provided by your healthcare professional.
Pharmaco (NZ) Ltd, Auckland. TAPS DA18271M.

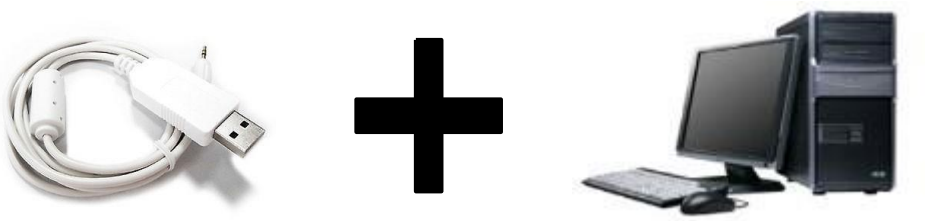
For more information on eligibility criteria please refer to the pharmaceutical schedule.
For more information on CareSens meters and test strips contact Pharmaco Diabetes on support@pharmacodiabetes.co.nz or 0800 GLUCOSE (0800 45 82 67)

CareSens N 0800 742 762

Ensure you have enough replacement meters—use MPSO and the vouchers available from your caresens rep. Mob. 021575128 or 0800 glucose.

Smartlog – downloading meters

This is really useful for helping to adjust medication to BGL profiles



The software is free and the cord you can get free from the rep.

Patients can also buy their own + download the free software on the website

Sue Laywood
Diabetes Territory Manager Pharmaco (N.Z.) Ltd
PO Box 4079, Auckland 1140
P 09-377 3336 or 0800 GLUCOSE (458 267)
M 021 575 128

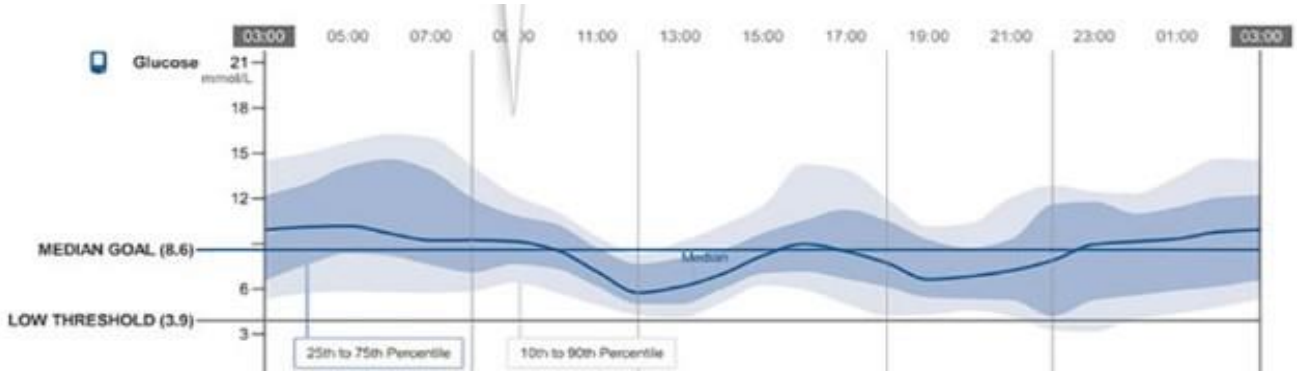
https://www.pharmacodiabetes.co.nz/smartlog-data-management/smartlog-software/

There are some very helpful videos on the website to guide you or your patient set up functions on the meter https://pharmacodiabetes.co.nz/helpful-videos/

CareSens N Voice

- With its talking function, the N Voice makes checking easier for those who are visually impaired.
- In addition to the talking function, the N Voice has a larger screen and numbers.
- The N Voice comes with a test strip ejector for the easy removal of a used strip.

The **FreeStyle Libre** Flash Glucose Monitoring System is a glucose monitoring device used to detect trends and tracking patterns without the use of finger pricking. The reader is currently about $100.00 and the sensors (which last 2 weeks) a similar price. People can use them continuously or use them when they want more in-depth picture of their BGL.



More information can be found at Mediray New Zealand

https://www.mediray.co.nz/diabetes/shop/freestyle-libre-flash-glucose-monitoring-system/freestyle-libre-flash-glucose-monitoring-system/

Ketone Testing

A bit of Pathophysiology

When there is not enough insulin, the fat cells keep releasing fat into the circulation, and the liver keeps making more and more ketones and ketoacids. The rising ketoacid levels make the blood pH too low (acidotic), which requires immediate medical attention.

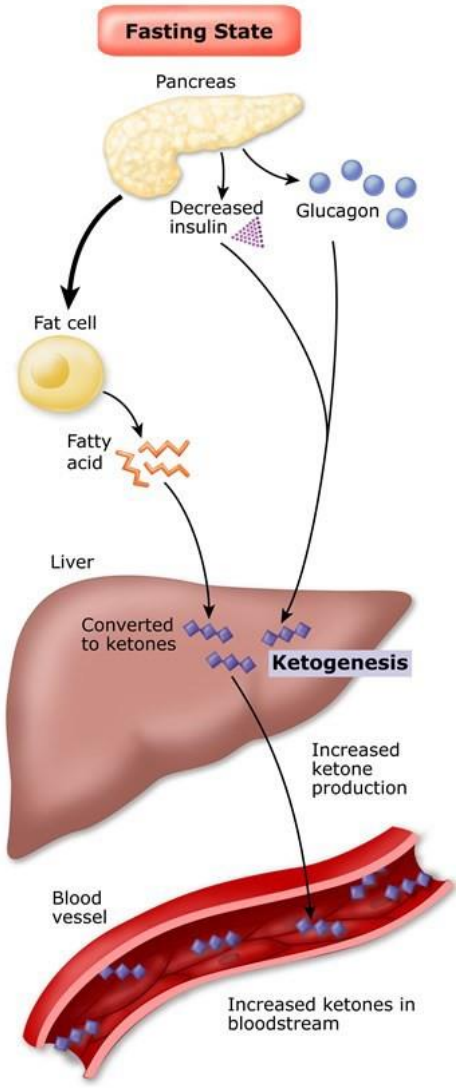
A person with Type 1 diabetes has the highest risk of developing ketoacidosis.

However, ketoacidosis also can occur in someone with Type 2 diabetes if there is a major increase in insulin resistance (such as infection or treatment with steroids) or reduction in insulin release from the pancreas.

People are most likely to develop ketones when unwell.

If a person with Type 2 Diabetes presents to general practice and is physically unwell, it is useful to do a ketone test. You can get Ketone tests on MPSO and they work with the CareSens duo meter, particularly if they are on SGLT2i (Jardiance).

Ketone Production by Liver During Fasting Conditions (Ketosis)



If unwell, someone taking Jardiance can have a glucose in the normal range but still have ketosis. The Jardiance prevents them passing ketones via the urine, so you must do a blood ketone test using the DUAL meter.

Ketone blood testing is the preferred method for assessing the presence of ketones during times of sickness, as they are more accurate and timelier than urine tests. When using a DUAL meter results will fall into one of the following three ranges:

- **Below 0.6 mmol/L: Normal range**
- **0.6 to 1.5 mmol/L: This may develop into a problem if not treated**
- **Above 1.5 mmol/L: Readings above 1.5 indicate a greater risk for developing Ketoacidosis (DKA). Discuss with GP and consider acute sick day management. Consider referral to hospital**

Regularly check the expiry date of ketone strips as they have a short life

NON-INSULIN MEDICATIONS

Common Oral Hypoglycaemic Agents

Full information can be found on the New Zealand Formulary (nzf.org.nz). Prescribers need to be aware that the following pages are for a *quick reference* only.

Metformin hydrochloride

Metformin is the first line of treatment and sensitises the patient to their own insulin. Initially 500mg 1-2 times daily, **increased gradually as tolerated** to 1.5-2g daily in divided doses; there is very little clinical benefit over 2g/day.

If you find people have had a GI upset from Metformin, encourage them to try again with a 250 mg dose once a day. Increase this very slowly. It doesn't matter how small the dose is and how slowly you increase it, there will still be some benefit!

Take it up as far as they can until they get GI upset again and then pull it back slightly and you have found their tolerated dose!

Patient Advice:

- Take with or just after food or at a meal
- Contact your doctor immediately if symptoms such as increasing drowsiness, loss of appetite, nausea, vomiting, abdominal pain, cramps, fatigue, diarrhoea, unexplained weight loss, muscle pain, and non-specific abdominal upset.

Additional information is available through **Diabetes New Zealand** and SafeRx patient information guide.

ALWAYS THINK ABOUT RENAL FUNCTION WHEN SOMEONE IS ON METFORMIN

Renal Impairment:

- eGFR 30-60 1000mg maximum daily dose
- eGFR 15-30 500mg maximum daily dose
- eGFR < 15 avoid.

Remember:

Withdraw or interrupt treatment in those at risk of tissue hypoxia or sudden deterioration in renal function, such as those with dehydration, severe infection, serious trauma, shock sepsis, acute heart failure, respiratory failure or hepatic impairment, or those who have recently had a myocardial infarction - increased risk of Lactic acidosis

STOP taking temporarily if transient tummy bug, prior to surgery or contrast dye procedure.

SGLT2inhibitors – Empagliflozin Jardiance

90% of glucose is reabsorbed from the urine back into the blood stream by **S**odium **Gl**ucose co-**t**ransporter **2** in the proxmial renal tubual, along with sodium and water.

If this process is blocked or inhibited, then glucose and fluid loss in the urine is increased.
SGLT2inhibitors do just that, lowering blood glucose and blood volume.

Your patient will meet special authority criteria if they have type 2 diabetes with an HbA1c > 53 mmol/mol despite at least 3 months of regular use of metformin and/or an alternative glucose lowering therapy, is not on a funded GLP1RA (i.e. dulaglutide) AND any of the following:

- has diabetic renal disease (ACR > 3 mg/mmol and/or eGFR < 60 mL/min) OR
- has known cardiovascular disease (any ischaemic heart disease, cerebrovascular event, peripheral vascular disease, congestive heart failure or familial hypercholesterolaemia) OR
- has a 5-year cardiovascular disease risk > 15% OR
- has a high lifetime cardiovascular risk due to onset of diabetes in childhood or as a young adult OR
- is of Māori or Pacific ethnicity

Preferred 2nd line agent after metformin if renal disease and/or heart failure predominates

Doses:

Either once a day as Jardiance in a 10mg or 25mg tablet.
Or twice a day mixed with Metformin as Jardiamet

5mg / 500mg Or 5mg / 1000mg			12.5mg / 500mg Or 12.5mg / 1000mg

If your patient is unwell with D&V they are at risk of DKA. They should come to the practice for a ketone check. You must have a CareSens Dual meter and KetoSens test strips available.

Benefits of SGLT2i

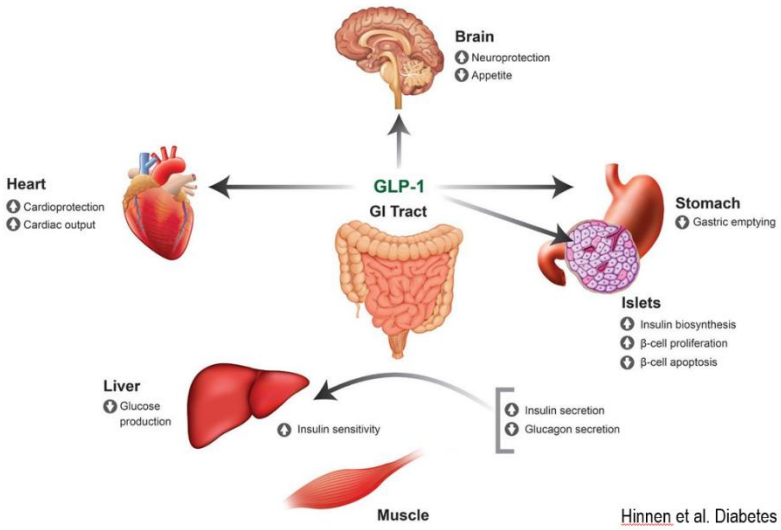
- Reduction in HbA1c of 5 – 11 mmol/mol
- Hypoglycaemia is rare, but consider reducing insulin doses if HbA1c < 65
- Modest weight loss
- Mean reduction in systolic and diastolic BP of 1 – 6 mmHg
- Reduced progression of diabetic renal disease
- Reduced CVD events
- Reduced death from heart failure

Side effects of SGLT2i

- Lower blood pressure – consider review of BP meds
- Urinary tract infections & genital thrush, which is usually mild and short lived but patients need advice on genitourinary hygiene and to seek help if concerned.

GLP1RA – Dulaglutide Trulicity

Glucagon Like Peptide 1 Receptor Agonist is the main incretin produced in the small bowel. The mechanism of action of its receptor agonist is to act on the pancreatic islet cells to increase glucose dependent insulin secretion, decrease glucagon secretion and reduce hepatic glucose production. It also acts on other organs to slow gastric emptying, reduce appetite, increase cardiac output and increase loss of sodium.



Hinnen et al. Diabetes Spectrum 2017; 30(3):202

Preferred 2nd line agent after metformin if cerebrovascular disease predominates, especially if overweight or obese

Clinical benefits

- Mean ↓ in HbA1c of 6-15mmol/mol
- ↓ Weight
- Mean ↓ in systolic BP 2-3mmHg
- Mean ↓ LDL 0.08mmol/L
- ↓cardiovascular events (MI, CVA, CVD death)
- Likely ↓ progression to diabetic renal disease

Adverse effects

- Gastrointestinal (nausea, vomiting, diarrhoea) usually mild and reduces with time
- Injection site reactions
- Antibody formation to GLP1RA
- Pancreatitis – caution recommended if previous pancreatitis

Same special authority as SGLT2i, BUT both medications cannot be funded. Best practice does indicate that both can be prescribed, so if the patient chooses to self-fund one of the 2nd line therapies, the empagliflozin is considerably cheaper than the dulaglutide.

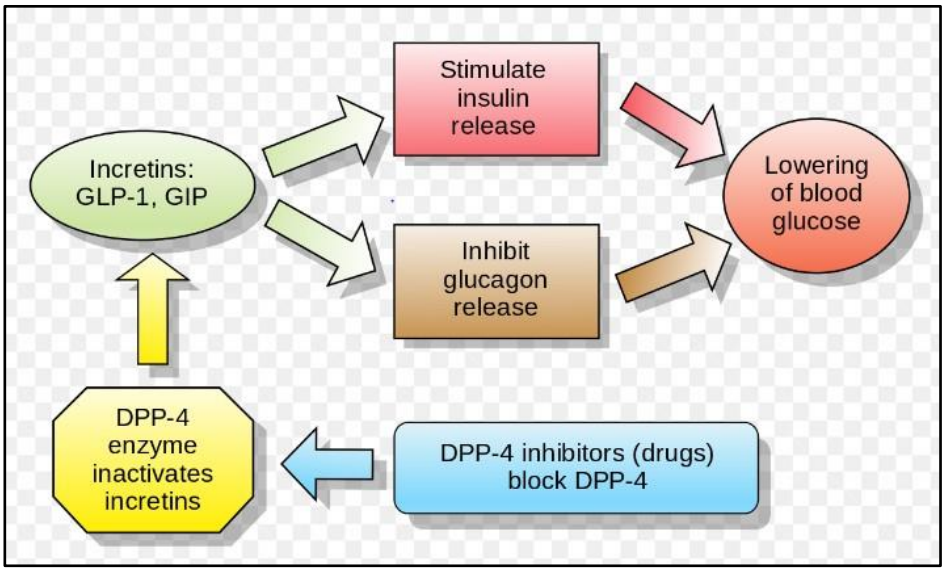
Dose: 1.5mg weekly injection

Up to 30% of people suffer nausea when starting dulaglutide. Reassure your patient that the GI symptoms are expected, usually mild, will reduce with time and are less if they:

- Have adequate hydration
- Eat smaller meals
- Avoid fatty or spicy food
- Reduce smoking and alcohol intake
- Don't eat within 2 hours of bed

DPP4inhibitors – Vildagliptin Galvus

Dipeptidylpeptidase is an enzyme that deactivates GLP-1 (glucagon-like-peptide-1) and GIP (glucose-dependent insulinotropic polypeptide). After eating a meal these hormones inhibit glucagon release and increase insulin production, they also delay gastric emptying, all of which lower blood glucose levels. DPP4 inhibitors block the enzyme DPP4 and enables the GLP-1 and GIP incretins to work properly so improving blood glucose control



Galvus is now funded in NZ and is a 2nd line agent after metformin and available in 50mg tablets

Galvumet which combines Galvus and Metformin is available in 50/850mg tablets and 50/1000mg tablets. This decreases medication burden as patients take less tablets for the same effect.

- Cannot be used in conjunction with GLP1 Agonist (Trulicity) but can be used alongside SGLT2i (Jardiance)
- Vildagliptin can be used at a dosage of 50mg once or twice daily. It should be reduced to 50mg if eGFR is less than 50mL/minute/1.73m2. It does not cause hypos by itself but used in combination with sulfonylureas or insulin hypoglycaemia can occur.
- Vildagliptin has been shown to delay the progression to requiring insulin.
- Gliptins are a class of medications that are weight neutral. They can cause a reduction of HbA1c between 7-12mmol after 12 weeks of treatment.
- There seems to be few side effects but the most common of these are nasal stuffiness, headache and dizziness which can occur in 6-9% of patients.
- **Contraindicated**: do not use if liver enzymes (ALT or AST) are two and half times the upper limit of normal pre-treatment. The use of DPP4 inhibitors have been associated with an increased risk of pancreatitis although there is still uncertainty and debate around the strength of this association but probably best to avoid in this group of patients.
- A very comprehensive Bpac article can be found here: https://bpac.org.nz/2018/vildagliptin.aspx

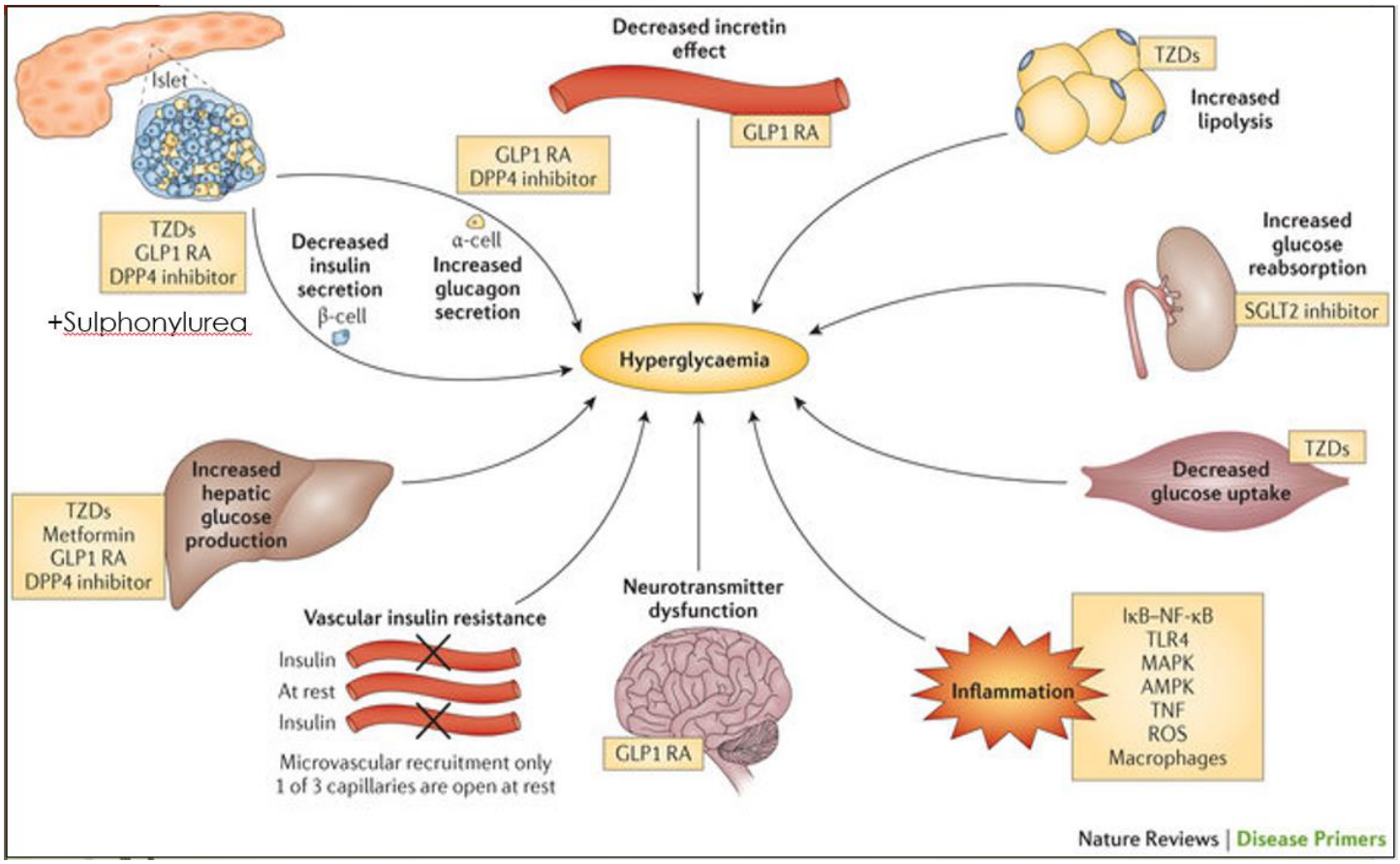
Other funded 3rd line oral agents

A snippet of less used/available oral medication options.

Find all the up to date information at: https://t2dm.nzssd.org.nz/Subject-21-Non-insulin-medications

Class	Name	Background Information
Sulfonylureas	Glicazide Glipizide	• Stimulates the pancreas to produce more insulin • Effectiveness diminishes over time as βcell function declines • Take with breakfast or first meal of the day. If BD dose, take second dose with evening meal • Can cause **hypoglycaemia**. Patients need education about hypo management and a funded glucose meter • Can lead to weight gain • Do not use in conjunction with rapid acting or mixed insulin • **Contraindicated**: pregnancy, renal and hepatic impairment.
Thiazoli-dinediones (TZD)	Pioglitizone	• Makes cells more sensitive to insulin • Shown to decrease cardiovascular outcomes • Beneficial with some mild NAFLD, high TG, or low HDL • Caution in patients with renal dysfunction/liver failure • AVOID in patients with heart failure • 2.3-4.9kg weight gain • Side effects: Peripheral oedema, expansion of plasma volume, increased risk of anaemia, heart failure • **Contraindicated**: History of heart failure, bladder cancer, osteoporosis • Only continue beyond 6 months if there has been a reduction of 5mmol/mol or more in HbA1c
a-Glucosidase Inhibitors	Acarbose	• Taken orally and reduces the amount of glucose absorbed in the small intestine by blocking the a-glucosidase enzymes. • Can be used as first line or added to any of oral anti-diabetic meds • Hypoglycaemia can occur if used with insulin/sulfonylurea - patients should consume glucose not sucrose if hypos occur • Flatulence, soft stools and diarrhoea are common side effects • Abdominal distension, pain and hepatitis have been reported • **Contraindicated**: in pregnancy, people with hepatic or renal impairment, have inflammatory bowel disease, history of intestinal obstruction/hernia, previous abdominal surgery or GI disorders with malabsorption

A visual overview of non-insulin medications mechanisms of action



Each of these different medications has a different mode of action.

Not all medications are available or fully funded in New Zealand. People emigrating into New Zealand may be using medications which they do not meet the funding criteria for here, and they may have to pay. They may be on a similar medication, and if they do meet the criteria, they might like to change to the funded version e.g. Dapagliflozin is not funded in New Zealand, but Empagliflozin is.

If a person is already on insulin, you can still initiate oral medications to achieve the agreed HbA1c target. Your patient may have started insulin prior to these newly funded medications being available.

Comparison of all funded glucose lowering medications

The Bpac Diabetes Toolbox has published this table of the factors to consider when prescribing hypoglycaemia medications.

Medicine	Effects on weight	Risk of hypoglycaemia	Use in patients with renal or hepatic impairment	Other factors and monitoring requirements
Metformin	Weight loss of approximately 2 – 3 kg over 12 months[12]	Low	▪ Avoid if CrCl < 15 mL/min* ▪ Reduce doses if CrCl 15 – 59 mL/min* ▪ Avoid if severe hepatic disease (Child-Pugh grade C) and use with caution if mild hepatic impairment; impaired hepatic function can reduce lactate clearance and increase the risk of lactic acidosis	▪ The preferred oral medicine in patients who are pregnant or breastfeeding ▪ May cause vitamin B12 deficiency; check levels if patients have symptoms of anaemia or peripheral neuropathy – supplementation may be required[13] ▪ Up to 20% of patients experience gastrointestinal adverse effects; slow titration and taking metformin with food may help to avoid this[13] ▪ Consider temporary cessation of metformin in situations that may lead to lactic acidosis, e.g. dehydration due to illness
Empagliflozin	Weight loss of approximately 2 kg over six months[14]	Low	▪ Contraindicated for people with eGFR < 30 mL/min/1.73m^2 as it is ineffective ▪ No dose adjustment required for people with mild renal impairment	▪ Renal function should be assessed at least annually in patients taking empagliflozin (with or without metformin) and prior to initiating any medicines that may reduce renal function ▪ May cause diabetic ketoacidosis; treatment should be temporarily stopped during acute illness and prior to elective procedures. Use with caution in patients on a low carbohydrate or ketogenic diet. ▪ Avoid in patients with a history of severe genitourinary infections
Dulaglutide	Weight loss of approximately 2 – 3 kg over 12 months[15]	Low	▪ No dose adjustment required	▪ No additional monitoring requirements ▪ Common, but usually transient, adverse effects include gastrointestinal disturbance and injection site reactions ▪ Avoid in patients with a history of medullary thyroid cancer; and use with caution in patients with a family history
Vildagliptin	No change	Low	▪ Reduce dose if eGFR < 50 mL/min/1.73m^2 † ▪ Avoid in patients with hepatic dysfunction, e.g. ALT levels > 2.5 times the upper limit of normal	▪ Avoid use in patients with severe heart failure (New York Heart Association functional class IV) ▪ Assess liver function prior to initiation, every three months for the first year and then periodically
Sulfonylureas (glipizide, gliclazide)	Weight gain of approximately 2 kg over 12 months[16]	High	▪ Other medicines are preferable in patients with increased risk of hypoglycaemia, including patients with renal impairment or severe hepatic impairment [16,27] ▪ Contraindicated in patients with ketoacidosis or acute porphyria	▪ Effects on HbA_{1c} may not persist as long as other oral options, requiring a change in medicine earlier[17]
Pioglitazone	Weight gain of approximately 2 kg over 12 months[16]	Low	▪ Avoid in patients with hepatic impairment, e.g. ALT levels >2.5 times the upper limit of normal ▪ Use is not advised in patients with renal failure	Increased risk of: ▪ Oedema and heart failure ▪ Fractures ▪ Bladder cancer; avoid use in patients with risk factors for or a history of bladder cancer
Insulin	Weight gain of 3 – 9 kg over 12 months[18]	High	▪ Dose reduction not usually required in patients with hepatic or renal impairment	▪ Injection site reactions are a common adverse reaction

* While in many cases eGFR will be sufficient to estimate renal function in patients taking metformin, the NZF recommends using the Cockcroft-Gault equation for a more accurate calculation of creatinine clearance, which may be particularly useful in people with more severe renal impairment.[9] A calculator is available here: **www.mdcalc.com/creatinine-clearance-cockcroft-gault-equation**

† The combination vildagliptin + metformin formulation is not recommended in patients with eGFR < 60 mL/min/1.73m^2; prescribing metformin and vildagliptin in separate tablets may be preferable to allow for an appropriate reduced dose of metformin.

INITIATING INSULIN

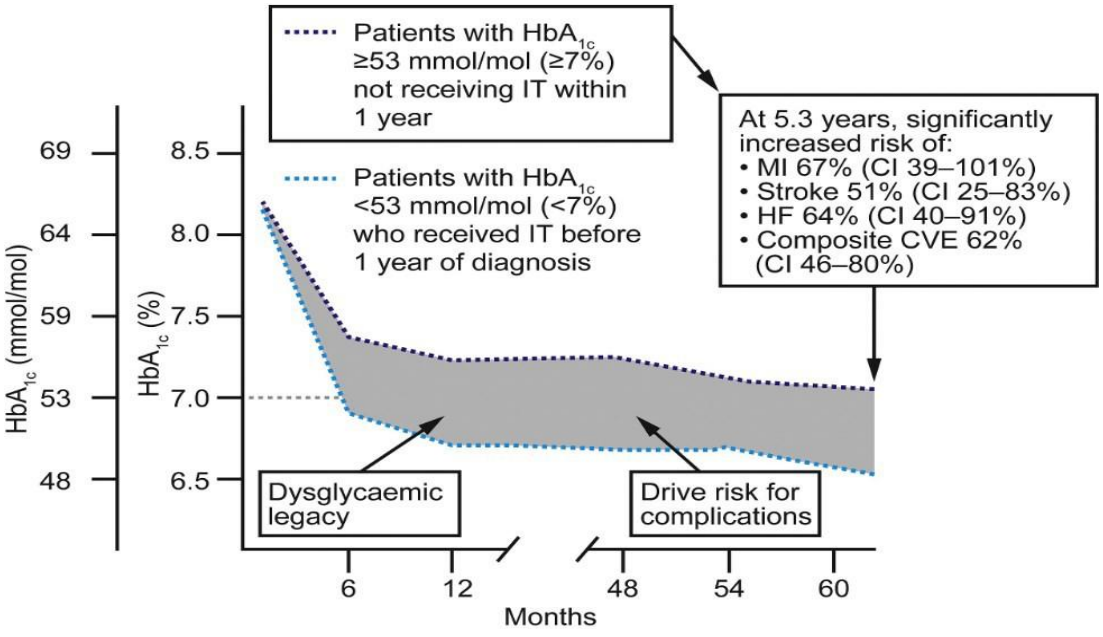
Introduction

When starting a person on insulin have a clear plan of what you are aiming to achieve; the agreed HbA1c target, know that they are already on maximum oral medication, and that the person has had some time to talk about their concerns. Have a check list, clear documentation, and a follow up strategy to ensure the correct dose is obtained. The process takes time and the whole practice needs to support the additional time and effort this takes.

The following chapter starts with two check lists. One is the process involved, the next is an education check list for the patient. Then each of the points on the education check list is explained in detail. This may be completed in one session, but in reality, only a small portion of what is taught is retained. You will need to create multiple opportunities to reinforce the information in the short term, but also over the years. The DAR is always a great opportunity to ask questions related to insulin administration such as hypo management or sharps disposal.

The earlier the insulin is started, the more of the remaining beta cell function is preserved.

This is a sobering graph showing the consequences of delaying insulin treatment (IT) by 1 year taken from Primary care diabetes review regarding clinical inertia.



If you need any support or further education regarding insulin initiation contact the local diabetes CNS:

Alexandra (Alex) Landl Mob: 0274 521 050 or 07 376 1000 ext. 5926

Taupo.DiabetesCNS@lakesdhb.govt.nz

Have a plan:

Before—During –After

Before starting insulin – consider these factors:

- What other things could be causing hyperglycaemia? Consider food, fluids, exercise, stress, medication, lack of sleep, unwell, illness.
- Dietitian review to prepare for mixed or bolus insulin
- Check understanding of why control is necessary.
- Do they take their oral meds?
- Are the orals at maximum dose for that patient?
- What are their blood glucose levels like? – logbook profile. No checking? No insulin!
- Address their concerns about starting insulin.
- Script: - Insulin (plus 2 units for priming)
  - Needles BD microfine 4 mm / 5 mm
  - Test strips if required.

Your practice needs to have a clear pathway for getting the initial dose of insulin to correct level.

Either physician led titration, or patient led titration can work.

During insulin initiation - consider these factors:

- You will need a 45 – 60 minute appointment.
- Use check list.
- Consider having check list for patient as well.
- Company handouts.
- Principles of adult education (don't 'tell' patient what to do!)
- Lots opportunity for hands on with the device.
- Consider having first dose while in clinic.
- Key information vs information overload. Dose/pen/hypos.
- Clearly arrange next contact moment.
- Document – if you haven't recorded then it didn't happen.
- Claim Insulin initiation through primary options.

After the initial education session – consider these factors.

- Phone call, email, face to face.
- Blood glucose levels.
- One 'topic' e.g. hypos – "so tell me what it would feel like, what have you got prepared to treat…."
- Document.
- Insulin adjusted with GP.
- Next contact arranged.
- Exit appointment – ensure all information covered and documented.
- Next blood test arranged and encouraged to make contact if anything changes.

Checklist

Using a check list helps you and the patient know what to expect and provides a framework for the education process. The following is one example.

Starting Insulin

Patient name: _____ **Date:** _____

Checking

When to check, how to check, how to record.

Increase if unwell, check if hypo, looking for patterns.

Insulin regimen

Which insulin, what dose, and when to administer.

How to use injection device and importance of priming.

How to administer the insulin.

System in place for titration.

Sharps disposal.

Storage of insulin.

Hypoglycaemia advice

How to recognise, manage and treat hypos.

Formulate individualised plan of action – what and where will their hypo kit be.

Discuss hypo prevention.

Oral medications

Any changes?

Lifestyle advice

Maintaining healthy weight by healthy eating and exercise and reinforce advice from the dietitian.

Risks with alcohol consumption and insulin.

Driving

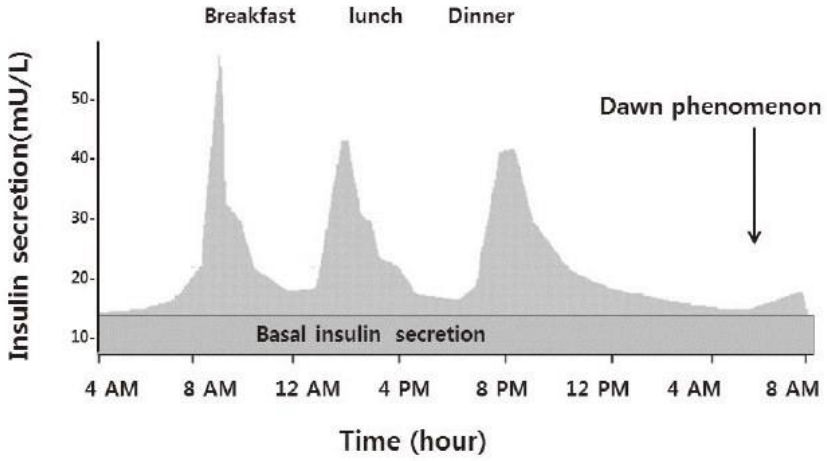
Ensure understanding of their responsibility to maintain a reasonable level of glycaemic control when driving. Particularly how to minimise their risk of hypos.

If vocational driver on insulin – Ensure control is adequate for safe driving. If required, or you are uncertain, refer for specialist advice.

Next contact time: _____

Practice Tip: DOCUMENTATION:
Set up a key word that mimics your education check list. It is then simple to document what you have covered today and what needs to be covered next time.

Background information



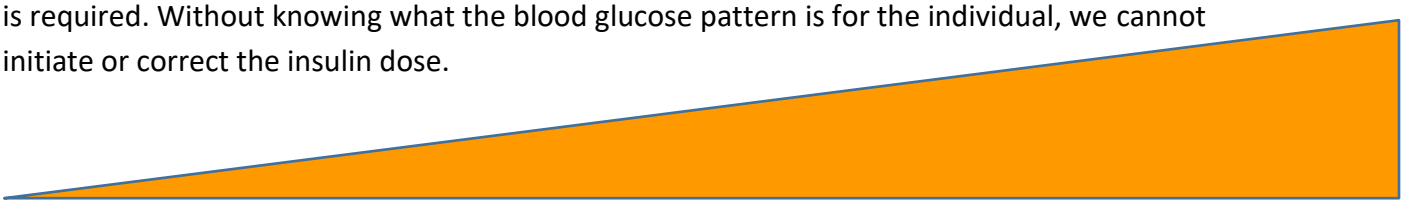
This is the insulin profile when we do not have diabetes and we eat 3 meals a day. When people have diabetes, and their blood glucose control deteriorates the aim of treatment is to mimic this natural profile, without causing hypos.

Initially the natural function of the pancreas is supported by adding in a basal insulin. The aim being to reduce the overall BGL, assuming that the beta cells can still make enough post prandial (after food) insulin on their own. Over time, the ability to make post prandial insulin diminishes and we need to also add a rapid acting insulin that matches the food intake (called a bolus dose). This can be as a separate dose of rapid acting insulin, or a premixed insulin.

Blood glucose checking when starting/changing insulin

Refer chapter 5 on *monitoring* for more information.

While insulin is being initiated and titrated to the correct dose, a commitment to some glucose checking is required. Without knowing what the blood glucose pattern is for the individual, we cannot initiate or correct the insulin dose.



Bare minimum checking → most intensive checking

Pre breakfast, pre bed → pre and 2 hour post meals (6) + pre bed (7) plus 2 am (8 checks)

2 am checking

If starting a new insulin or concerned about overnight hypos (often people sleep through these) ask the person to check at 2 am. Clues to overnight lows – HbA1c is lowish, but daytime checking high. Waking with nightmares or sweaty, elevated results in the morning (there can be a rebound like effect), basal dose >0.5 units/kg, or simply that something just does not make sense.

Paired checking

Refers to checks before a meal and 2 hours after a meal. The thinking is that if the rise between the two checks is more than 3mmols, a rapid insulin is required with the meal.

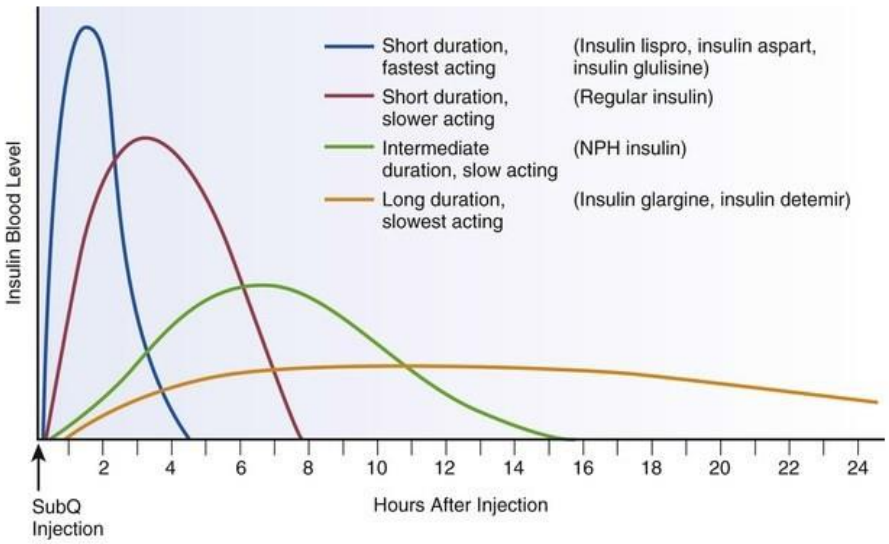
Insulins to choose from

Three companies provide insulin – Sanofi, Novo Nordisk and Lilly. Get to know the reps and keep up to date with their handouts. There are a limited number of insulin options – Long acting, intermediate acting, rapid acting and several premixed options. There is also short acting – but rarely used in primary care. Most clinics are very familiar with 3 – 4 insulins and get to know how they work and when one is more appropriate than the other. Be aware there are more options than this and be open to trying different types. One insulin option will not work for every person. The trick is to look at the blood glucose profile and fit the insulin that best matches, while also considering the person's lifestyle and the goals of management. Consider that a person may need one insulin in the morning and a different insulin regimen in the evening; or weekday at work is one regimen and weekends they take something different. See Appendix 3 (page 88) for a guide to help choose appropriate insulins for your patient.

Insulin regimens

Simplest — most complex

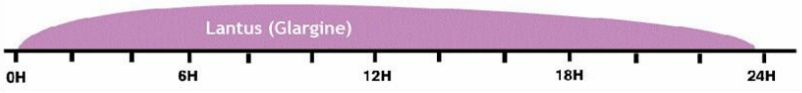
Long acting daily	Intermediate daily and BD	Premixed	Basal bolus
Once day, doesn't intrude into lifestyle (often taken at night) Dose is same time every day and does not need to be taken with food.	Works well for people with high BGL at one end of day but not the other. Simple. Easy to progress from once a day to twice.	Gives some post-prandial control. Once twice or three times a day.	Most flexible, can achieve great results pre and post prandial Consider one, two or three bolus doses depending on need
Gives no post prandial control (relies on some residual insulin supply) Impact on BGL may not cover 24 hours	Gives no postprandial control.	Best for people whose lifestyle is routine. Less flexibility, but also less work. Taken just before or with meals.	Works best if checking pre (and post) meals, CHO counting and awareness of activity impact.



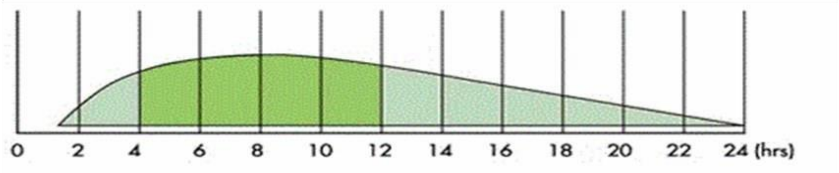
Take time to discuss with the person the difference in insulin regimens. You may be surprised what they choose.

Basal Insulins (New Zealand)

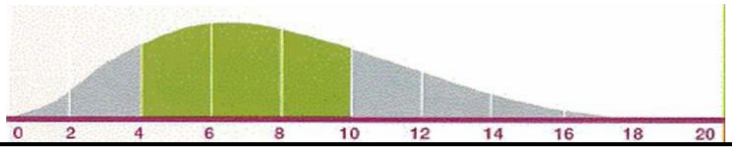
Lantus

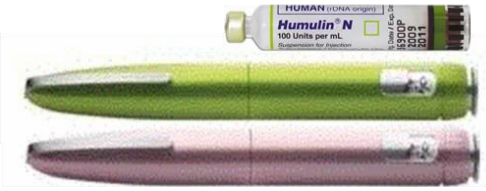


Protaphane



Humulin NPH





Rapid Insulins (New Zealand)

Peak at 1-3 hours, lasts up to 5 hours

Insulin type	Brand name	Manufacturer	Nature	Appearance
Insulin lispro	**Humalog®**	Lilly	Analogue	Clear
Insulin aspart	**NovoRapid®**	Novo Nordisk	Analogue	Clear
Insulin glulisine	**Apidra®**	Sanofi	Analogue	Clear

Humalog®

NovoRapid®

Apidra®

Premixed Insulins with analogue (rapid)

- Includes rapid-acting insulin.

Insulin type	Brand name	Manufacturer	Nature	Appearance
Lispro 25%/lispro protamine 75%	Humalog® Mix25™	Lilly	Analogue	Cloudy
Lispro 50%/lispro protamine 50%	Humalog® Mix50™	Lilly	Analogue	Cloudy
30% rapid-acting / 70% protaminated insulin aspart (rys)	NovoMix® 30	Novo Nordisk	Analogue	Cloudy

Humalog® Mix25™

Humalog® Mix50™

NovoMix® 30

The following insulins are not used as much but are still available in New Zealand. They contain short acting, or human insulin as opposed to analogue insulin (rapid acting) Note—human insulin is manufactured in a laboratory using recombinant DNA technology— not from humans per se!

Short acting insulin with human component

Actrapid®

Peak at 2–5 hours, lasts 6–8 hours

Insulin type	Brand name	Manufacturer	Nature	Appearance
Neutral	**Actrapid®**	Novo Nordisk	Human	Clear
Neutral	**Humulin® R**	Lilly	Human	Clear

Premixed insulins with human insulin (short acting)

- Includes rapid-acting insulin.

Insulin type	Brand name	Manufacturer	Nature	Appearance
Neutral 30%/isophane 70%	Humulin® 30/70	Lilly	Human	Cloudy
Neutral 30%/isophane 70%	Mixtard® 30	Novo Nordisk	Human	Cloudy
Neutral 30%/isophane 70%	PenMix® 30	Novo Nordisk	Human	Cloudy
Neutral 40%/isophane 60%	PenMix® 40	Novo Nordisk	Human	Cloudy
Neutral 50%/isophane 50%	PenMix® 50	Novo Nordisk	Human	Cloudy

Humulin® 30/70

Mixtard® 30

PenMix® 30

PenMix® 40

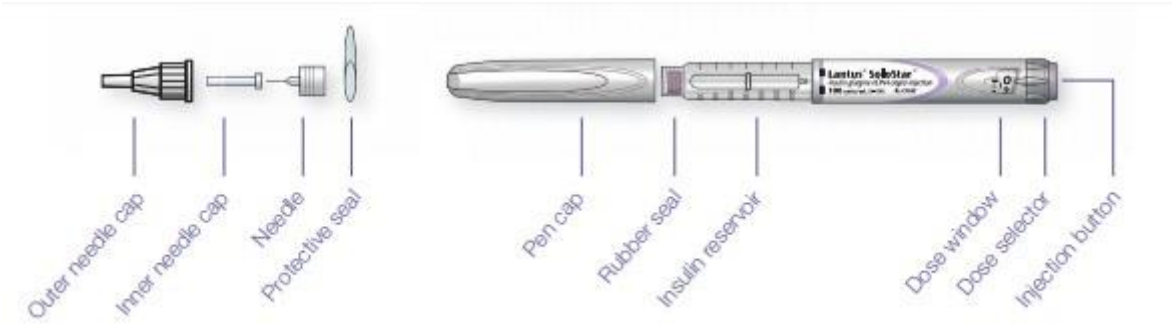
PenMix® 50

Devices

Consider different devices – disposable (best if there is less dexterity, convenient), or non-disposable (environment?), what does the patient prefer. Familiarise yourself with the pens prior to starting a patient on insulin. A well-resourced kit such as the one below means you will have all the gear needed in one place in your clinic.

Practice tip:

A well-resourced demonstration kit such as this ensures that you have all the demonstration pens, needles, cartridges and the dummy tummy in one place.

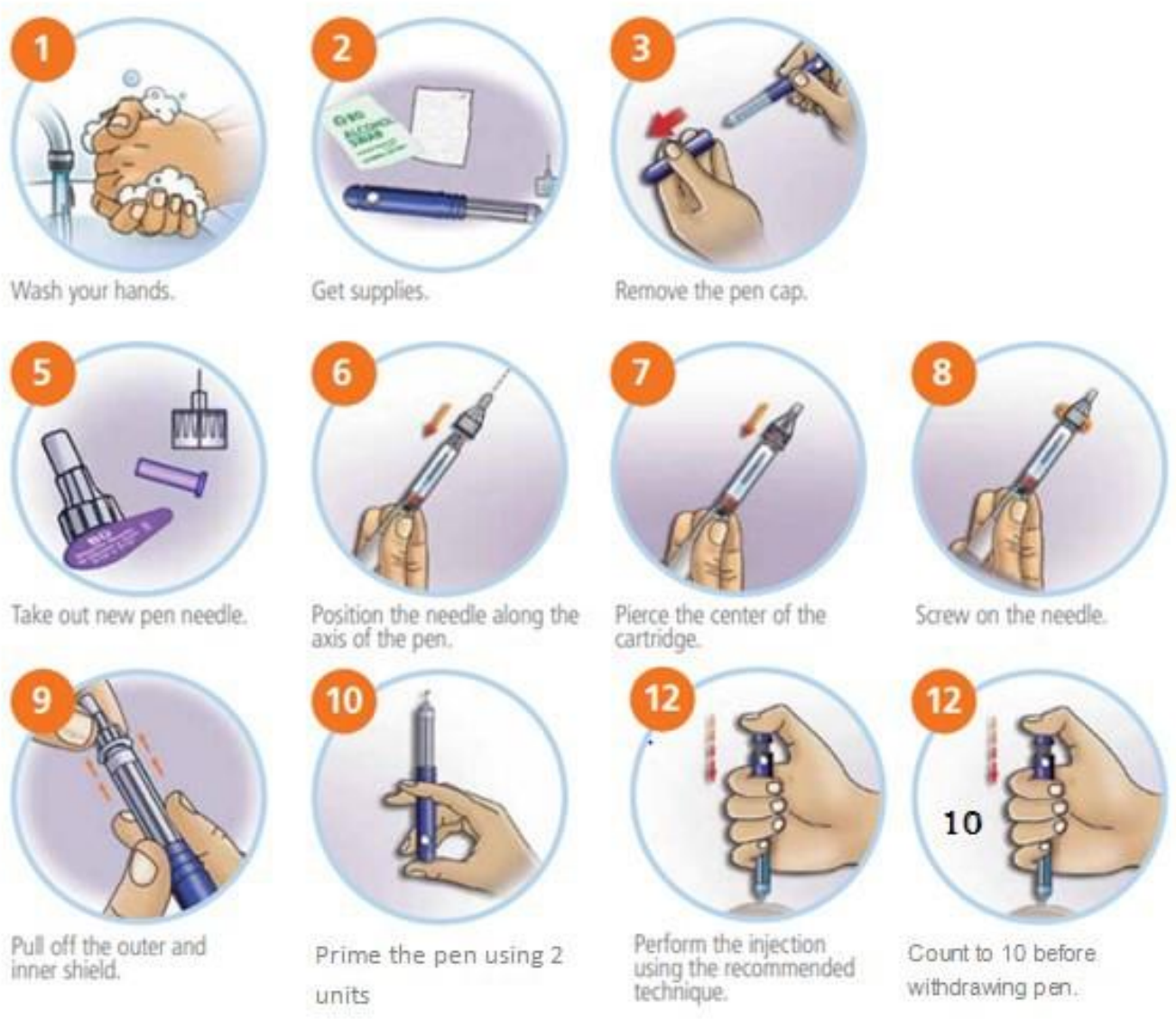


Follow manufacturer's instructions. https://www.lantus.com/-/media/ems/conditions/diabetes/brands/lantus/consumer/lantus-solostar-pen-guide.pdf

Make sure you know which insulin goes with which pen.

Technique

When teaching a patient to use insulin, it is a good idea to get the "injection part" done early in the session, otherwise they are so anxious about the injection that they hear very little of the education you provide. Once they see it's not as bad as anticipated, they relax and are in a better space to hear and learn.



"Priming the pen" means dialling up 2 units and squirting into the air to make sure there are no air bubbles in the pen or needle. The patient then dials up the dose and injects into their thigh or abdomen. The prescription needs to allow for priming or they will run out of supply before the end of the month.

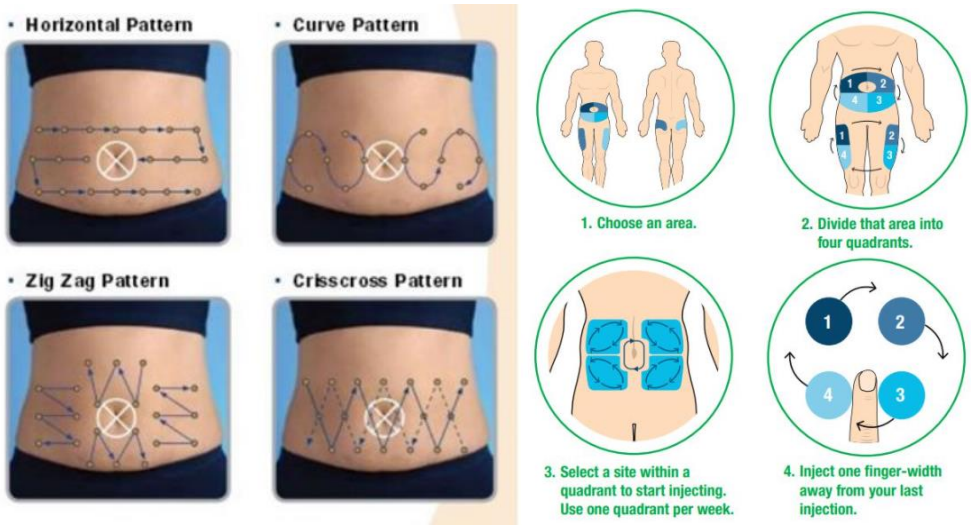
Any insulin that is premixed such as Humalog Mix50, or cloudy in nature such as or Protaphane, needs to be gently resuspended prior to injection. Use a rolling or similar action not a shake, which will introduce bubbles.

Starting Basal Insulin

Insulin can be used in conjunction with oral medications, although those that are insulin secretagogues (e.g. suphonylurea) may need to be down titrated or switched to bolus insulin if hypoglycaemia occurs.

- Start isophane (Protaphane or Humalin NPH) or glargine (Lantus) insulin at
  - 0.1 units/kg daily if HbA1c < 64 mmol/mol or BMI < 18 or elderly or renal/liver failure
  - 0.2 units/kg daily if HbA1c > 64 mmol/mol and BMI >18
- Start with a nocte dose to counteract hepatic gluconeogenesis and target fasting blood glucose.
- Monitor fasting blood glucose levels, and educate on how to manage hypoglycaemia (page 72)
- If 3 consecutive fasting blood glucose levels are > 7mmol/L then increase the dose by 10% or 2 units every 3 days (see page 67 for more on titration)
- Stop up-titration of basal insulin if;
  - Hypoglycaemia occurs (< 4mmol/L), OR
  - Fasting blood glucose is < 7mmol/L, OR
  - Dose reaches 0.5 units per kilogram per day
- Basal insulin can be injected into the thigh or abdomen
- Prescribe 4 or 5mm needles for optimal absorption, which should be changed daily
- Rotating the site of injection is important to avoid build-up of scar tissue (lipohypertrophy) which results in poor absorption over time

Examples of rotating the injection sites:



Treatment intensification should be considered for patients who have not reached their HbA1c target after 3 months of using basal insulin, despite achieving fasting levels of <7mmol/L and/or they are taking a dose of 0.5units per kilogram per day.

They may need bolus or mixed insulin…

Starting Mixed (biphasic) Insulin

Mixed insulins are the best option for some one who requires insulin to improve glycaemic control after meals, and:

- Does not need flexibility for work patterns or exercise
- Eats similar meals at similar times each day
- Is not likely to need rapid intensification of insulin therapy
- Has reduced dexterity, cognitive ability or requires suppervison/support with medications
- Prefers not to regularly monitor blood glucose levels
- Prefers fewer injections daily

<u>When converting from basal only insulin to mixed insulin if the person generally eats one big meal per day;</u>

- Convert the total daily dose of basal to premixed insulin and inject before the largest meal
- Monitor BGLs before and 2 hours after meals (paired checking, page 41)
- Increase dose by 10% if
  - 3 paired checks indicate a rise of > 3mmol/L after meals AND
  - 3 fasting levels are > 10mmol/L

<u>When converting from basal only to mixed insulin if the person usually eats more than one meal a day;</u>

- Convert the total daily dose of basal to premixed insulin and inject half before breakfast and half before the evening meal
- Consider a different ratio (e.g. 1/3 with breakfast, 2/3 with dinner) if one meal is larger than the other
- Monitor BGLs before and 2 hours after breakfast and dinner (paired checking, page 42)
  - Increase breakfast dose by 10% if 3 paired checks indicate post prandial rise of > 3mmol/L AND 3 pre-dinner BGLs are > 10mmol/L
  - Increase dinner dose by 10% if 3 paired checks with dinner indicate a post prandial rise of > 3mmol/L AND 3 pre-breakfast BGLs are > 10mmol/L

Rotate the injection sites every time to avoid lipohypertrophy (lumpy bumpy under the skin)

Patients starting mixed insulin meet the referral criteria for a community dietitian to learn about eating a consistent amount of carbohydrate at meals. This will improve post prandial BGLs, lower HbA1c and help prevent weight gain.

Starting Bolus (Rapid) Insulin

Bolus insulin with meals is the best option for someone who requires insulin to improve glycaemic control after meals, and;

- Requires flexibility for work patterns or exercise
- Prefers a varied diet in terms of quanitity and timing
- Will likely require rapid intensification of insulin therapy
- Has good ability to inject
- Is comofortable with monitoring blood glucose levels more frequently
- Is comfortable with more frequent injections – 4 or 5 in total per day (basal + bolus)

"Basal Plus" is the addition of bolus insulin to the largest meal, while continuing the basal regimen.

- Start bolus insulin at 4 units or 10% of the basal dose
- Monitor BGLs before and 2 hours after the meal (Paired checking, page 41)
- Increase dose by 2 units every 3 days if 3 paired checks indicate a post prandial rise of > 3mmol/L
- Consider the early addition of bolus insulin at other meals if the paired checking indicates a post prandial rise of > 3mmol/L at the other meals
- Add correction doses to treat preprandial hyperglycaemia (see page 66)

Doses of basal insulin may need to be decreased to prevent hypoglycaemia, especially if HbA1c < 64mmol/mol

If the bolus dose is "right", a person will only need a correction dose occasionally. Correction doses are given when a persons blood glucose levels are unexpededly high before a meal. If someone is taking a correction dose at every meal or even every day then the bolus dose needs review and up titration from the prescriber (see page 67). The "right dose" is achieved when the blood glucose check 2 hours after the meal is consistently only 1 or 2 mmol/L higher than the pre meal level.

Patients starting bolus insulin meet the referral criteria for a community dietitian to learn about managing carbohydrate intake either through carbohydrate portions or carbohydrate counting. The dietitian will assess the most appropriate approach depending on the patient's health and maths literacy. This will improve post prandial levels, reduce the need for correction doses, lower HbA1c and help prevent weight gain.

Correction Doses

Rapid acting insulin can be used to "correct" high blood glucose levels when added to the bolus, or mealtime dose, of insulin. The only insulins that can be used for this are Novo Rapid, Humalog or Apidra. It is **NOT** suitable for basal or mixed insulins.

We ask our patients to check their blood glucose 2 hours after a meal as a safety measure, or to establish a pattern so we can determine if the bolus dose requires titration (page 67). It is **NOT** for the purpose of correcting a higher than expected reading. If someone requires correction most days or always at a certain meal, they likely require titration at the *previous* meal.

Rapid insulin is active for up to 5 hours after the injection. If a correction dose is given 2 or 3 hours *after* the meal, the bolus dose has not had a chance to work fully, and the additional dose is "stacked on top" of the initial dose. This can cause hypoglycaemia and is why it is important that bolus insulin is not given more than 3 times a day - at breakfast, lunch and dinner.

<u>The correction calculation is based on the total daily dose of insulin</u>

Total daily dose of basal + bolus insulin	Correction dose calculation
≤ 25 units/day	1 unit for every 4 mmol > 8 mmol/L
26 – 40 units/day	1 unit for every 3 mmol > 8 mmol/L
41 – 75 units/day	1 unit for every 2 mmol > 8 mmol/L
≥ 76 units/day	1 unit for every 1 mmol > 8 mmol/L

- **An example of how to use correction insulin**
  - If a patient is on 40 units of basal insulin nocte and 10 units of bolus insulin with meals their TDD is 70 units per day, so their starting correction is 1 unit for every 2 mmol > 8 mmol/L
  - A table can then be provided for the combined doses of bolus + correction insulin at each meal e.g.:

Blood glucose level	Correction dose of insulin	Total insulin dose with meal
< 10 mmol/L	0	10 units
10 – 11.9 mmol/L	1	11 units
12 – 13.9 mmol/L	2	12 units
14 – 15.9 mmol/L	3	13 units
16 – 17.9 mmol/L	4	14 units
18 – 19.9 mmol/L	5	15 units
≥ 20 mmol/L	6	16 units

Rapid acting insulin is used to correct **PREMEAL** hyperglycaemia. It should not be injected between meals. A patient using bolus insulin should only ever give 3 bolus injections per day.

Titration

- Ensure you have up-to-date contact details – cell phone, landline, email, NOK.
- Make a time and date you will contact them for BGLs and to check how they are managing.
- Every phone call is an opportunity to reiterate the education you have given them. Pick one topic each time and go over it. Ask them for what they remember so you can ensure they did understand all the detail.

Typically, a person will be started on a small amount of insulin then the dose is titrated up to what they actually require. Talk with the person about what they may expect. This process may take some time and ongoing commitment to blood glucose monitoring.

Other than the doctor, only a nurse or pharmacist prescriber can change a prescription

- If the GP writes a maximum dose in the prescription, the nurse can support the patient to increase a dose up to that point.
- Patient can self-titrate – at GP direction (using titration rates provided by company). Ensure that patient knows an upper limit to titration – otherwise they may just keep going!
- A weight gain of 2 – 3 kgs is reasonably normal (not everyone gains weight – especially if insulin is started earlier).
- Contact every 3 – 7 days until BGL within target. Don't take too long to reach ideal dose (risk is patient disengages). If the patient is quite insulin resistant, they may need large doses of insulin, however there is very little clinical benefit in greater than 0.5units per kilo body weight of basal insulin.
- Consider a percentage increase rather than a unit increase if the person appears to be needing quite a number of increases.

Always be aware that insulin doses may need to decrease if the person is experiencing lower than target blood glucose levels. Talk to the prescriber about this.

- Basal insulin needs to be given at the same time each day.
- Premixed and rapid insulin must be taken immediately prior to a meal.

Some general notes for the prescribers

There is no specific maximum amount of insulin, titrate upwards until blood glucose levels are at target. If a person is insulin resistant, they may require larger amounts of insulin. If the patient is gaining weight or regularly hypoglycaemic; they are on too much insulin.

Type 2 diabetes is not an acute condition – aim to commence and titrate insulin safely, but efficiently. Be clear about the agreed HbA1c target with the patient. Tight control is not the aim for everyone.

Troubleshooting – I Help

Try this mnemonic if there is unexplained hyperglycaemia:

I HELP

I for Insulin	Is the correct insulin being used?
	Is the correct insulin in the correct pen?
	Is the insulin taken at the right time and sites rotated?
	Is the patient priming the needle and changing it regularly?
	Are doses of insulin being missed?
	Is mixed/cloudy insulin being mixed prior to use?
	Is the insulin being stored correctly?
	Is the insulin potent/expired/gone off due to extreme temperature chang
	Is the insulin being absorbed? (check the site when patient is standing fo
	Is the correct needle length being used?
H for Health status	Is there an underlying illness?
	Has a new medication been prescribed e.g. prednisone that changes gluc
	Is there a change in renal function?
	Has there been change in eyesight making dialling correct dose difficult?
	Is the patient dehydrated?
	Has the patients weight increased lately?
	Check for ketones.
E for Equipment	Check glucose meter and insulin pen are working.
	Check strips/insulin expiry dates.
	Check storage of strips (not out of container).
	Is the technique to check BG and administer insulin correct? (observe tec
	If on insulin pump—contact pump team.
	Check patient is washing hands prior to checking.
L for Lifestyle	Has there been a change in diet e.g. a new food/drink been consumed?
	Has there been a change in exercise habits?
	Check alcohol and drug consumption.
P for Psychological issue	Are there stressors that impact on the patient's ability to manage diabete
	Are the prescribed doses of insulin and oral medications being taken?
	Is there a fear of hypoglycaemia that leads to a reduced dose of insulin a
	Does the patient have needle phobia?
	Are there underlying mental health issues?

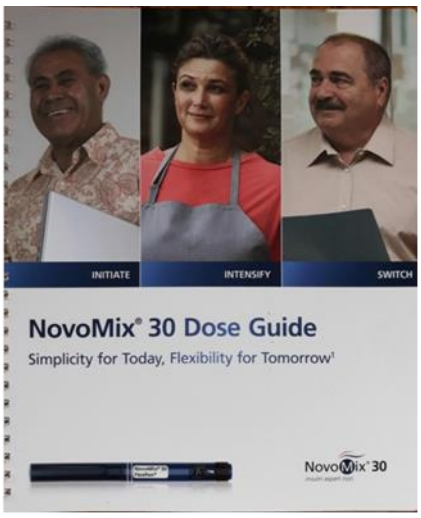
Intensification

There are times when a person needs a different insulin regimen.

- They started on a very simple regimen of one daily dose of insulin, but they no longer achieve adequate control on this.
- They require fewer doses of insulin (i.e. as people age, a basal bolus regimen that requires CHO counting and dose adjustment may be too complex for them to manage, or they simply don't wish to any longer).
- They are planning pregnancy and require excellent control of their diabetes in the preconception time.

Ensure that your clinic has up to date resources from each of the companies. Contact the representative if you have any questions.

New Zealand freephone number: 0800 283 684



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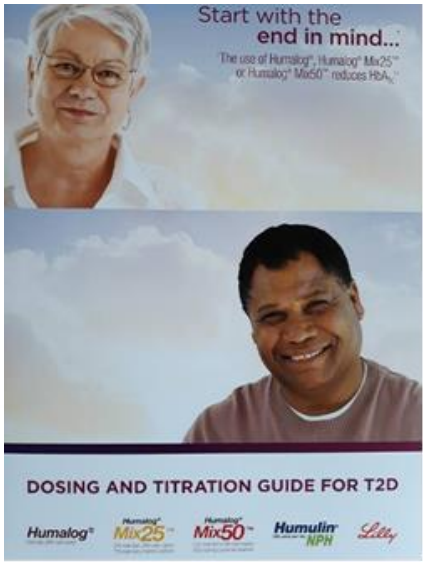

Brian Swain
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Eli Lilly and Company (NZ) Limited

Sharps containers

available in pharmacies for patients

Sharps containers are **ONLY** for sharps!

- Disposable pens can be thrown away—**only the needle** goes into the sharps container.
- Insulin cartridges can be thrown away—**only the needle** goes into the sharps containers.
- Plastic caps, band-aids, tissues ...do not belong in sharps containers
- Lancets can be disposed of in sharps container
- The aim is one small sharps container should last about a year!

Pharmacy

- For those prescribed insulin or other injectable medications [1]
- There may be a part charge up to $5.00
- Available at any pharmacy who will also arrange disposal as required
- Patients need to provide a current prescription or have collected prescription at the pharmacy previously.

[1] *note: not for needle exchange programme sharps*

Hypoglycaemia

- What does a hypo feel like? People need to be clear between the symptoms of hypoglycaemia and simply feeling tired/rundown. If someone feels the "symptoms" of a hypo, it is always better to check blood glucose levels before treating.
- Give written information.
- No driving for ONE hour after a hypo has been successfully treated.
- No driving for 24 hours after a severe hypo that has been treated by someone else because the person could not treat their own hypo.

Practice point:
Ask the person—"What have you got with you today if you needed to treat a hypo?"
or "What have you got in the car?"

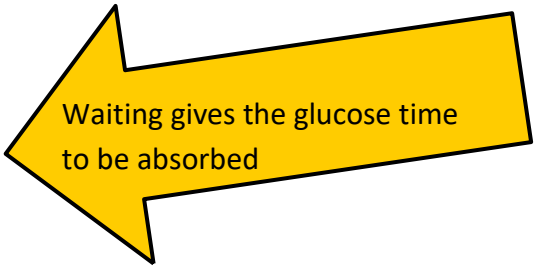
- Appropriate treatment of hypoglycaemia will likely prevent severe rebound hyperglycaemia
- Treatment of hypoglycaemia (blood glucose levels < 4 mmol/L)
  - Weight-based management of hypoglycaemia is more effective
    - Eat 0.3 grams/kg of body weight **OR** 30 grams of rapid acting carbohydrate
    - **How to get 30 grams of rapid acting carbohydrate**

      i. 10 Dextro or vita glucose tablets or 6 BD glucose tablets
      ii. 30 grams of glucose powder
      iii. 6 teaspoons of sugar dissolved in water
      iv. 350 mL of fruit juice or non-diet/zero soft drink
      v. 18 jellybeans
      vi. 2 tablespoons of honey
      vii. 3 tablespoons of jam
      viii. 2 Hypofit gels

    - Wait 15 minutes and re-check blood glucose level

      i. If glucose level < 4 mmol/L repeat steps above until glucose > 4 mmol/L

    - Once glucose is > 4 mmol/L have a carbohydrate snack e.g. a slice of toast, 2 biscuits or crackers with cheese and recheck glucose levels in 30 minutes to ensure safe
    - If the patient becomes unresponsive and is unable to take carbohydrate replacement an ambulance should be phoned for. Glucagon 1 mg may be administered intravenously or intramuscularly, but has reduced efficacy in type 2 diabetes and should not delay treatment with IV or buccal glucose.



Hypo unawareness—this happens when someone has had so many hypos that their body no longer thinks it is unusual and forgets to warn them when their blood glucose levels drop below 4 mmol/L. This means they can have a blood glucose level of 2 or less in some cases, and yet feel absolutely normal. This puts them at extreme risk of going unconscious without warning. They can partially reverse this condition by keeping their blood glucose levels a little higher with NO hypos for a number of weeks or months. This helps 'reset' their body warning system so that they start experiencing symptoms of hypoglycaemia when their blood glucose levels fall below 4mmols/L. A more scientific explanation can be found in the page about hypo unawareness.

Insulin storage

- Insulin is stored in the fridge.
- Once opened - store at room temperature (so the injection does not hurt as much) Dispose of opened insulin 28 days after opening.
- Check the expiry date before using.
- Look at the insulin—does it look like it normally does? Any particles, discolouration, crystal formation?
- Frozen insulin cannot ever be used—throw away.
- Do not keep insulin in the glovebox of the car—the temperature can rise too high and cook the insulin.
- Cooling wallets are designed for people travelling to hot climates and are activated by water — no refrigeration needed. Each soak in water keeps the bag cool for 2 days.

The Frio wallet is available in different sizes and available here:
https://www.mediray.co.nz/diabetes/product-category/insulin-cooling-wallets/

Alcohol

Alcohol is very energy dense and it is easy to gain weight if drinking regularly.

- Alcohol inhibits hepatic gluconeogenesis and induces hypoglycaemia whenever gluconeogenesis is required to maintain normal glucose levels. People with diabetes on a sulfonylurea or insulin should be warned about the blood glucose-lowering action of alcohol.

The recommendations for people with diabetes remain the same as for all New Zealanders.

Some tips from the American diabetes association:

If you have diabetes, do not drink on an empty stomach or when your blood glucose is low, since your risk of low blood glucose increases after drinking.

- Don't skip a meal if you are going to drink. (If you use carbohydrate counting to plan meals, it is important to understand how the drinks you choose affect your blood glucose and often your insulin dose will need to be decreased if having more than one drink).
- Wear an I.D. that notes you have diabetes. If you are in a setting where people are drinking alcohol, hypoglycaemia may be mistaken for being drunk.
- For mixed drinks, choose calorie-free drink mixers like diet soda, club soda, diet tonic water or water.
- As with anyone with or without diabetes, do not drive or plan to drive for several hours after you drink.

Alcohol can cause hypoglycaemia shortly after drinking and for up to 24 hours after drinking. If you are going to drink alcohol, check your blood glucose:

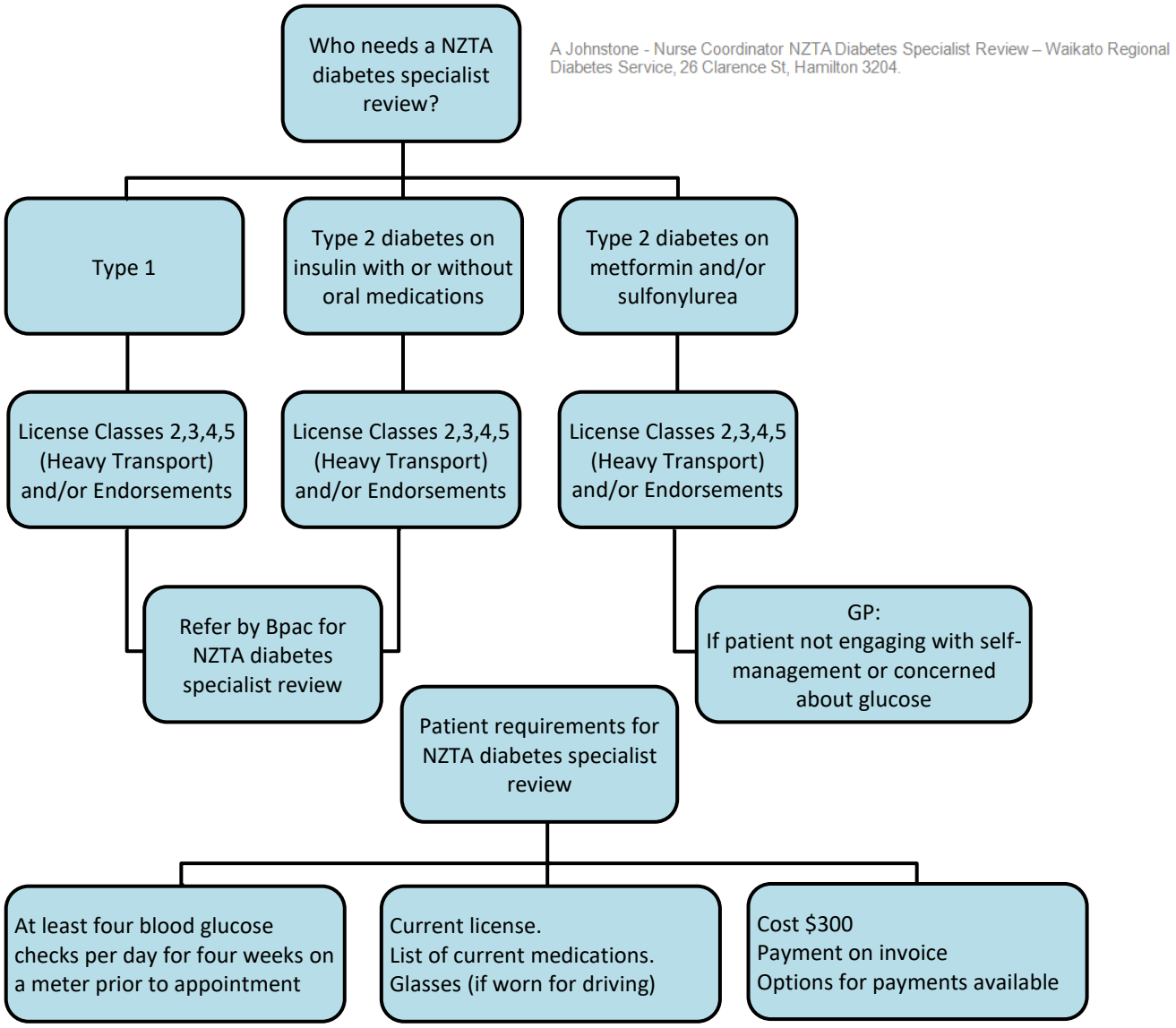
- Before you drink.
- Before bed and throughout the night—needs to be over 8mmols before you go to sleep.

If your blood glucose is low, eat something to raise it and be sure to check again before you go to sleep, and again over night to be sure it's not dropping too low.

Wondering if adding a glass of wine or beer might help lower your blood glucose if it is high? The effects of alcohol can be unpredictable, and it is not recommended as a treatment for high blood glucose. The risks likely outweigh any benefit that may be seen in blood glucose alone.

Driving

- The biggest risk is that a person has a hypo while driving causing an accident.
- Think—over 5 to drive.
- Tips: Check prior to driving and regularly while on a long drive—every 2 hours is recommended.
- Keep your blood glucose meter with you while driving for evidence of regular checking.
- Have a hypo kit in the car: non-perishable sweet items (glucose tablets) and a longer acting carbohydrate such as a muesli bar, crackers or similar.
- The NZTA advise that you should not drive for:
    - One hour after a mild hypo
    - 24 hours for a sever hypo (requiring some else's help)
    - 1 month if severe hypo while driving. An urgent review is required.
    - Your insurance may not be valid if you have an accident and have no evidence of monitoring on your meter



SICK DAY MANAGEMENT

This refers to periods of minor inter-current illness that requires changes to the persons usual diabetes self-management. It is important that patients are educated on how to deal with sick days and have an individualised plan and this should be revised at each annual review.

"Do you know your sick day rules?"

Key Concepts of sick day management

- Have a sick day management plan
- Never stop your usual insulin, doses may need adjusting
- Hourly fluids to reduce the risk of dehydration (1 glass/cup)
- Increase the frequency of blood glucose monitoring and blood ketones as necessary (1-hourly if ketones present, if not then 2-hourly if BG >15mmmol)
- Diabetes medication dose adjustment as necessary (type 2) and insulin adjustment (type 1 & 2)
- Metformin and Jardiance should be stopped for the duration of the illness
- Supplementary insulin as necessary (use individualised plan)
- Health professional number and name for assistance when sick—especially after hours.

HHS: high glucose levels can cause hyperosmolar hyperglycaemic state (HHS).

This condition is characterised by hyperglycaemia, hyperosmolarity and an absence of significant ketosis. The blood glucose is usually >30mmol with a raised osmolarity >320mOsmol, dehydration with no significant ketones/or acidosis.

There is insulin deficiency and this condition can lead to coma if untreated.

Always test for ketones if a person with type 1 or type 2 diabetes presents to general practice and is unwell.

When a person with diabetes is acutely unwell, the role of primary care is to ensure that person is

already well educated about sick day management → well supported with their diabetes management → while treating the underlying cause of the illness

Type 1 Diabetes

- patients can develop diabetic ketoacidosis (DKA) when unwell with an increase in levels of counter regulatory hormones which leads to hyperglycaemia and ketone bodies due to not enough insulin present
- They will often require a temporary increase in insulin which can include basal rates and supplementary rapid acting insulin 1-2 hourly if ketones are present and while they remain unwell.
- Dehydration must be avoided with frequent fluid replacement hourly (aim for at least a cup or glass hourly).
- Patient to contact their Diabetes nurse specialist or present to ED if hyperglycaemia/ ketones/vomiting/abdominal pain/fruity breath or shortness of breath are present

Almost all sick day management can happen in primary health care setting.

Preparing the patient prior to them getting sick is important.

On the following 2 pages is a sick day leaflet for patients with type 2 diabetes that you can copy and give to your patients or at https://www.pinnaclepractices.co.nz/resources/diabetes-sick-day-advice/

Sick day management for people with type two diabetes.

When you are sick you may notice that your blood glucose levels change. This can be because your appetite changes, but also because infections, trauma, stress and other illnesses can cause your blood glucose levels to go up or down.

It can be difficult to manage your diabetes on your own when you feel crook, so it is important to let a whānau member, friend or neighbour know when you are unwell.

Drink:

If you are vomiting and not eating or drinking enough, you can quickly become dehydrated. Sip at least one glass of sugar free drink every hour. (Water, sugar free soft drink, tomato juice, tea, weak coffee)

Food:

If you are unable to eat your usual meals, something small and full of energy each hour can help. Some examples are orange juice, milk, soup and toast, fruit yoghurt, 4 – 6 water crackers, 1 small banana

Checking:

Check your blood glucose levels often – every 2 or 4 hours if you are really sick. More often if needed. This is so you can react if your blood glucose is too high or too low. You might need to call your nurse for help, and she will ask how your blood glucose levels have been.

Healthline is a free 24-hour telephone health advice service. Phone 0800 611 116 for any health information.

Medicine:

If you are feeling a little unwell, its really important that you still take the medicines the doctor has prescribed for you.

BUT: If you have any <u>diarrhoea or tummy upset</u>

*Stop the **Metformin, ardiance or Jardiamet** tablets if you take these.*

Start taking Metformin, Jardiance or Jardiamet again once you are well

If you are really sick and if your glucose levels are higher than normal – contact your nurse for help. You may neeed to change the medicine you take.

If your glucose levels are lower than normal – you may need less of your insulin or tablets that you take.

Hypo – if your blood glocose is too low or under 4 mmols.

If your blood glucose levels are under 4 mmols – your need to treat this 'hypo' with a good dose of sugary drink or food – ½ a glass of regular fizzy or orange juice, 8 jelly beans, glucose tablets or similar. Test your blood glucose levels again in 15 minutes, if you are still under 4 mmols, treat again with sugar, but if you have blood glucose above 4 – have something to eat

Phone your doctor or nurse if you

Cannot keep your blood glucose above 4 mmol
Are too sick and have no support person
Are passing lots of urine or have abdominal pain
Have nausea, vomiting or diarrhoea for more than 12 hours
Feel drowsy, weak or confused
Have chest pain
Have difficulty breathing

Healthline is a free 24 hour telephone health advice service.

Phone 0800 611 116 for any health information

MEDICATION USE REVEIW

A Medicines Use Review aims to improve understanding and adherence to medicines by identifying and addressing factors linked to non-adherence behaviours.

Patients (and their family/whānau) with complex difficulties in understanding, and adhering to medications, receive personalised education and support to improve self-management. This is achieved through tailored education for greater understanding of what their prescribed medications are through an agreed action plan to address adherence issues.

Patients can be referred to the clinical pharmacist within the Pinnacle MHN extended care team as per the following criteria.

Criteria of Extended Care Team Clinical Pharmacists Input

Patient Referral Guidelines

Priority	Who	Action
Low (Level 1)	• Patient is able to self-manage their medicines, and • Patient has a reasonable level of adherence to all prescribed medicines	**General Practice Teams** General Practice team works with patient to continue to self-manage.
Medium (Level 2)	• Patient is having some adherence issues or some confusion about their medicines	**Community Pharmacy** Refer patient to their usual Community Pharmacy for enrolment in pharmacy adherence service (Medicines Use Review). The Community Pharmacists will work with the patient to resolve adherence issues.
High (Level 3)	**Patient has at least 2 of the following:** • >4 medicines and/or 12+ doses/day • Not adherent with medication • Complex medication regime needing a review • Is experiencing a sub-optimal response to medication • Recent hospital admission • Confused by medication regime • Multiple ED admissions • Patient has multiple prescribers • Is taking a medicine with a narrow therapeutic index e.g. warfarin, amiodarone, digoxin, lithium, clozapine • Taking medication with a high risk of adverse effects	**Extended Care Team Clinical Pharmacists Support** To be provided in home, General Practice or Pinnacle offices. 1:1 individual consultation *or* Part of an Extended Care Team Package of Care **Clinical Pharmacists activities include:** • Clinical medication reviews • Medicines reconciliation with a full clinical review • Liaison with the primary care team • Provision of medication management plans for high care needs clients • Provision of medicine related information to the patient, careers, family and whanau

If your patient falls within the **HIGH** Criteria, refer to the Extended Care Team Clinical Pharmacists via BPAC e-Referral.

Or contact the mobile pharmacist from Midland Community Pharmacy group directly

Megan Grant megan@midcpg.co.nz (07) 858 5921 or mobile 027 222 1631

ORAL HEALTH

People with diabetes (type 1 or 2) have a high prevalence of oral problems such as dental caries, xerostomia (reduced or absent saliva flow causing dry mouth), periodontal disease, taste problems and oral infections. Periodontal disease which is an inflammatory condition destroys the connective tissue surrounding the teeth which can lead to tooth loss. These conditions are caused by poorly controlled blood glucose levels which cause susceptibility to bacterial infections in the mouth.

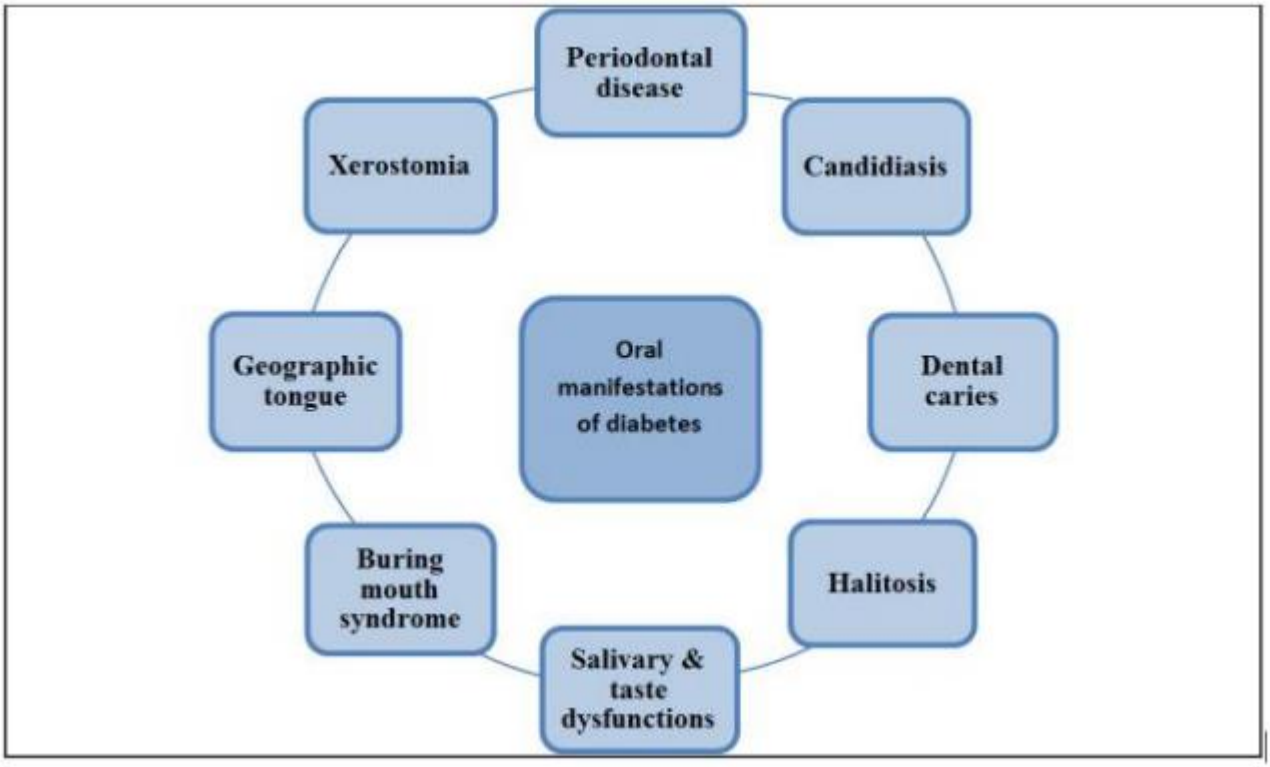


Figure 5: Oral manifestations among diabetic patients [23] [41] Open Access Macedonian Journal of Medical Sciences. 2018.

Patient education includes being aware of the risk for periodontal disease and the importance of maintaining oral health as part of their diabetes management. This includes regular dental checks and care, with collaboration between patient and all health care professionals. Advice should include tooth brushing twice daily, with dental floss once a day to control plaque. The use of mouthwashes to prevent caries and plaque build-up may be useful for prevention of periodontal disease.

PLANNED/ELECTIVE SURGERY

Diabetes Management for Gastroenterology Procedures

On most occasions these are outpatient procedures. All situations should be discussed with GP and practice nurse. However, the Endoscopy Unit have specific endoscopy protocols for the management of patients with diabetes who are undergoing endoscopic procedures.

These include upper endoscopy, endoscopic ultrasound, endoscopic retrograde cholangiopancreatography, bronchoscopy and anterograde double balloon.

There is also the preparation for lower endoscopic procedures which include colonoscopy and retrograde double balloon procedure, Klean-Prep or Pico-Salax preparation and capsule endoscopy. These can either be morning or afternoon procedures but for people with diabetes we would expect that these procedures are scheduled for the mornings.

Patients will need an **insulin reduction** for all these procedures, particularly if they need to be nil by mouth for an extended time or require bowel prep prior to surgery. This will involve the days prior to the procedure and the day of procedure, and the patient's current blood glucose profile must also be considered. This is particularly relevant if they have tight control or you feel that their current dosage might be a bit too high. It will also depend on whether they are using basal/bolus or premixed insulins.

It may be necessary to stop or reduce other medications such as Metformin or sulfonylurea prior to the procedure. **For procedures involving bowel prep, Empagliflozin (Jardiance) should be stopped 3 days prior and the day of (4 days in total) to reduce the risk of diabetes ketoacidosis (DKA).**

Other Elective Surgery

If your patient is referred for an elective procedure, it is imperative to support good glycaemic control.

- Stop Metformin and Empagliflozin (Jardiance) 2 days prior to planned surgery
- Patients with HbA1c ≥64 mmol/l will be put "on hold" until their diabetes is better managed. Higher HbA1c indicates
    - Twice as likely to get surgical site infection
    - ↑ risk post-operative myocardial infarction
    - post-operative renal failure (AKI)
- This means at least another 4 months wait for their operation

Plan ahead and maximise glycaemic control as soon as the patient is referred for surgery

TRAVEL GUIDELINES

There are a number of recommendations to be given to people with diabetes so that they can travel safely. These include planning travel with the following safeguards in mind:

- Have a medical consultation prior to travel to assess diabetes control and check immunization status
- Ask GP to provide a covering letter for travel stating that the person has diabetes requiring use of insulin, syringes/pen devices, monitoring equipment such as insulin pumps/continuous glucose monitoring devices
- Check with airline if continuous monitoring devices can be operated during flight
- Advise to use travel insurance
- Advise to find out from airline about security guidelines in countries being visited
- Carry supplies on board with the person in their hand luggage
- Do not put insulin supplies in checked in luggage as it will be exposed to extreme temperatures which may degrade the insulin/lose efficacy
- It is a good idea to also carry a printed list of prescriptions in case of medication loss or theft of bag

If a person is on insulin and changing time zones, they will need to consider how they will change their insulin to meet their needs while away. Any advice given will depend on if the patient is on basal only or basal plus rapid acting insulins. Work out when the most likely time is that the person will be having a meal, and how they can change into the new time zone. Remember there is quite a difference in the insulin needs between a person with type 1 diabetes (contact the diabetes clinic for advice) with absolute insulin deficiency and a person with Type 2 diabetes and some residual beta cell function.

PRE-PREGNANCY PLANNING

It is important that a woman starts the pregnancy with well controlled diabetes so that the baby's growth and development is optimised.

Discuss planning pregnancy at every annual review during child-bearing years

Target HbA1c	If on no treatment — the closer to normal glucose levels the better	< 40mmols
	If taking sulfonylurea or insulin with no hypos	53mmols
	Defer pregnancy. Ensure reliable contraception until BGL stable	> 85mmols

See GP for discussion around medications

Contraindicated in pregnancy:

- Statin
- ACE
- SGLT2i, GLP1RA, DPP4
- Sulfonylurea—consider starting insulin prior to pregnancy.

Recommended prior to pregnancy:

- Folic acid **5mg** (not the standard 0.8mg)
- Retinal screening within last 6 months
- Stop smoking and alcohol
- Weight management

The aim for pregnancy is a healthy baby and a well mother. By focusing on pre pregnancy care, the whānau start the pregnancy with the best outcomes in mind. During pregnancy and 3 months prior to, aim to achieve normoglycemia so that the baby is conceived and develops in conditions as close to a pregnancy uncomplicated by diabetes as possible.

At times, this means a lot more effort from the woman with food choices, activity and checking blood glucose. Recommended reading: https://www.nice.org.uk/guidance/ng3/chapter/1-recommendations#preconception-planning-and-care-2

Once pregnant the woman can be referred the diabetes in pregnancy team (diabetes CNS and dietitian) at either Rotorua or Taupo hospital. Referral is via the DHB mailbag or can be initiated by the LMC.

PAEDIATRICS AND YOUTH

If a child with type 1 diabetes presents with a concurrent illness, the role of general practice is to assess and treat the illness with the support of the paediatric team as required.

Paediatricians **Dr Jaco Nel and Dr Danny De Lore**

There is no specific youth diabetes service in Lakes DHB. These patients are seen by adult endocrinology once they leave the paediatric service.

Taken from the Starship website for parents: what to do when your child is sick:
https://www.starship.org.nz/sick-days

> *Children and young people with diabetes generally don't get sick any more often than other children if their diabetes is well managed. However, illness can have a significant impact on diabetes. The stress hormones produced during illness can cause changes to blood glucose levels. Levels can go high or low depending on the type of illness. Infections that cause fever and pain often cause high blood glucose levels. Gastroenteritis (vomiting and diarrhoea) can cause low blood glucose levels. Vomiting can also be a sign of not enough insulin.*

If your child is sick:

- Always give insulin, but call the diabetes doctor/nurse for advice on changes to the usual amount
- Take your child to your GP for assessment and treatment of the underlying illness
- Check blood glucose levels 2 hourly
- Check blood ketones 2 hourly
- Encourage your child to drink plenty of fluids

If your child is unable to eat:

- If blood glucose levels are under 10, give fluids with sugar such as diluted juice or jelly (not sugar free)
- If blood glucose levels are 10 or higher, give water or sugar-free fluids
- If your child has been vomiting or has diarrhoea, Pedialyte™ may be recommended by the diabetes doctor or your GP (this can be purchased from the pharmacy)
- Relieve the symptoms of pain and fever with Paracetamol or Ibuprofen

Even teenagers who usually manage their diabetes independently need to be looked after when they are sick ❤️

APPENDICES

Appendix 1: Key contacts

0800283684 – free phone for all New Zealand for Lantus and Apidra products

SANOFI

Anastasia A. Lissington *MSc Pharmacology*
Diabetes Care Specialist
Novo Nordisk Pharmaceuticals Ltd.
58 Richard Pearce Drive
Airport Oaks
Auckland
0274445722

novo nordisk

MR MEDIRAY+

FIONA CLOETE
TERRITORY MANAGER - MEDICAL
021 349 991 | +64 9 414 0318
www.mediray.co.nz

Sue Laywood
Pharmaco
021 575128

Pharmaco
Always from the heart.

Brian Swain 021378475

Swain_brian@lilly.com

0800500909

Eli Lilly and company (NZ) Limited

PO Box 109197 New Market

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Anita Timms Key Account Manager
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PO Box 99102
Auckland 1149
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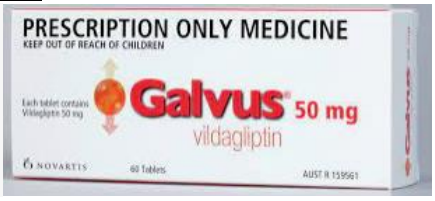
NOVARTIS



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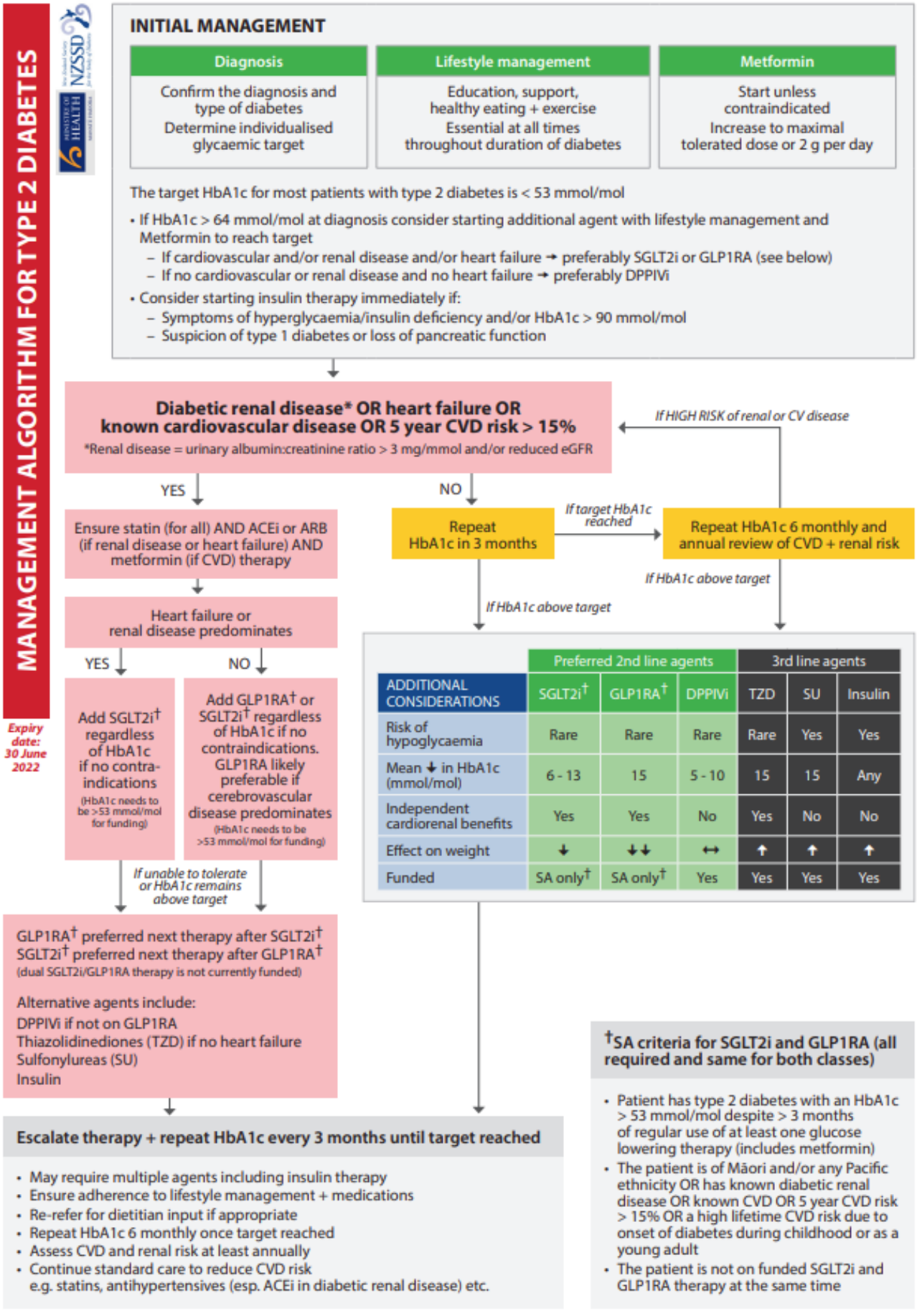
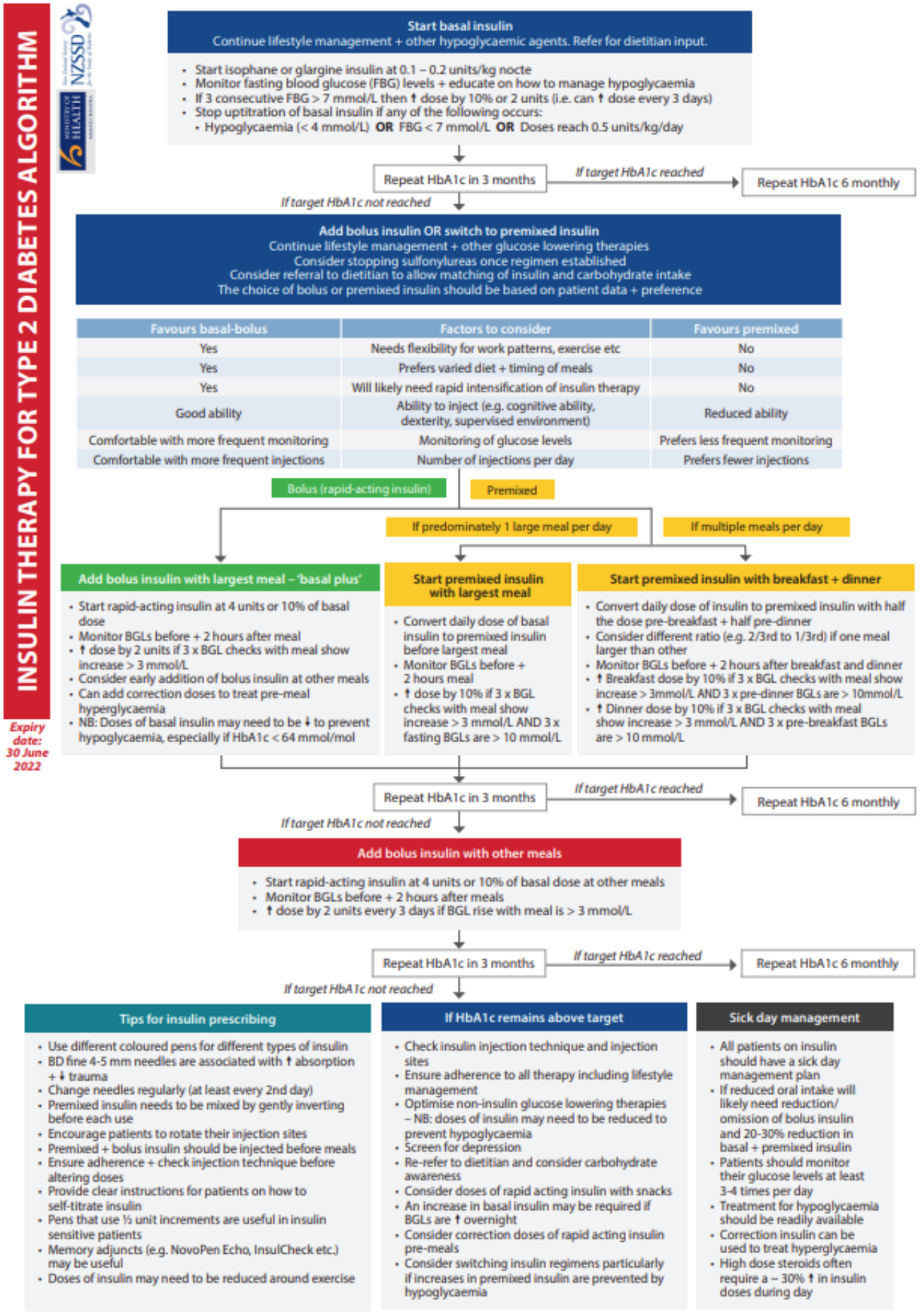
Boehringer Ingelheim

CURRENT AS AT NOVEMBER 2021

Appendix 2: NZSSD T2DM guideline algorithm



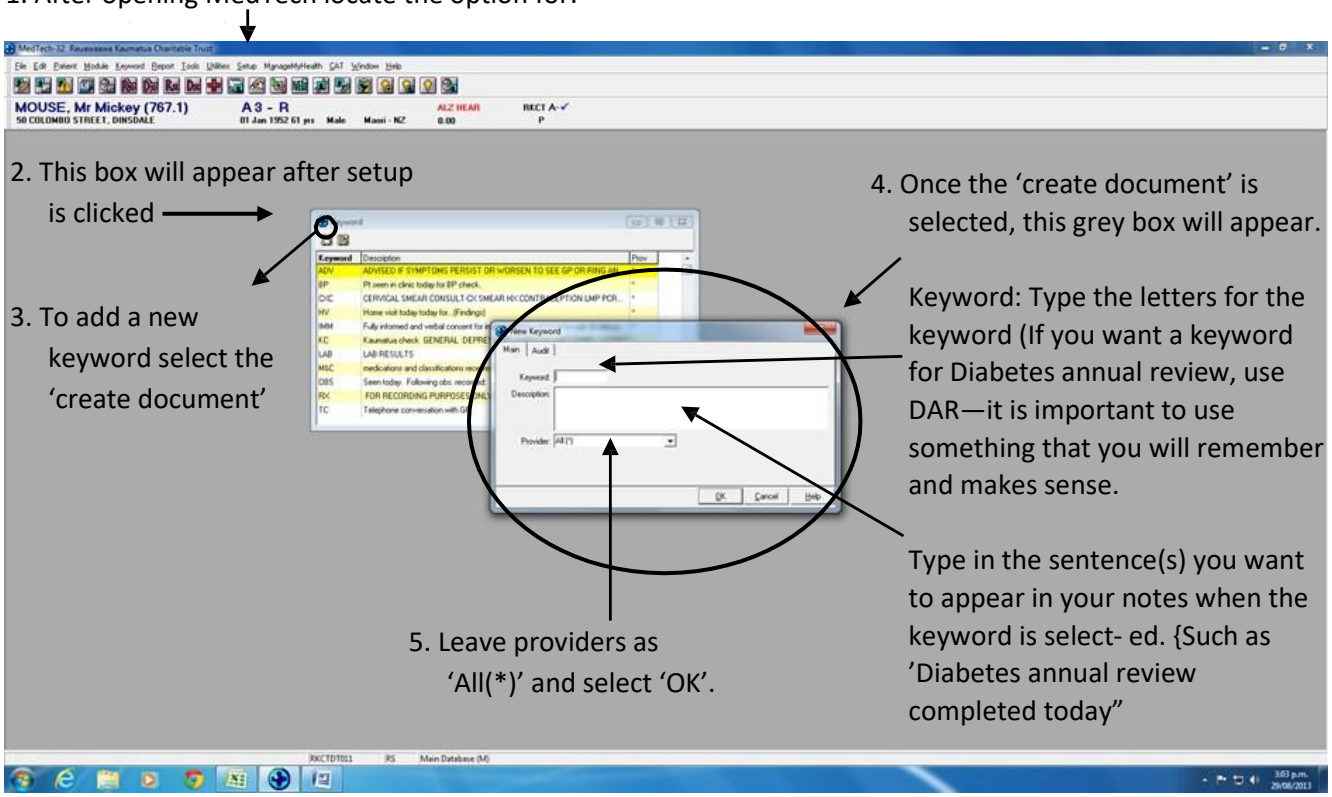
Appendix 3: NZSSD insulin algorithm



Appendix 4: Key words

Using **KEYWORDS** can make writing notes easier and helps keep documentation consistent between users. This is an example on MedTech—your PMS system will have similar capabilities. Talk with your administrator to set up keywords for your practice:

1. After opening MedTech locate the option for:



Now to practice:

Using MedTech, open the Mickey Mouse practice screen.
In the clinical notes type. DAR (full stop DAR) and press 'Enter', and it will automatically self-populate what you set up.

The headings listed here guide what you are going to record. You start typing after each heading and then press **ENTER**. This will move to the next heading down the consult and you can start typing beside it, repeating until all headings have an entry beside them:

E.g. Diabetes annual review completed today

PLAN: HbA1c remains high, requires more oral medication—task to GP.

CLINICAL FINDINGS: BP LIPIDS WEIGHT *all stable*

NUTRITION: Food plan completed 2016—discussed today and remains very similar. Portion size the biggest issues along with eating out at weekends.

EXERCISE: sedentary at office but has been walking across carpark and up 4 sets stairs.

Try to use keywords for longer blocks of typing.

Aim: to have keywords you can recall easily and that will help save you time.

Appendix 5: Recalls

Every practice will have a different process/system - the key, is to have a system and a key person assigned to:

- monitor/do the recalls
- Be familiar with the recall list and BPI information

Below is a mock-up recall letter - you will need to adapt this for individual needs (annual, 3-month monitoring appointment, Type 1 diabetes, Type 2 diabetes).

The majority of clinics are contacting patients with verbal and paper invitations and we know that those who do not respond to the initial letter or the five phone calls are most probably the people who would benefit the most.

Recall Letter.

Dear Mickey,

Free Annual Diabetic Review

Your annual check-up for your diabetes is now due.
Please do a blood test and make a **double appointment** when it suits your schedule.

Please find enclosed a form for blood tests and also a urine test. These should be done at least 3 days before your appointment.

If you have a meter, please bring this and your logbook to your appointment. We look forward to seeing you soon and assisting you with your diabetes management.

PLEASE ALSO BRING ALONG ALL MEDICATIONS, INSULIN PENS and STRIP SUPPLY for a check.
You will be having a foot check, so wear footwear that is easy to remove and replace.

There is no cost to you for this appointment, however, if you require a prescription there will be a prescription charge of $20.

Yours sincerely,

[Insert Name]

DAR Recall Process

A designated person initiates DAR recalls at the beginning of each Quality quarter (July, October, January and April). If there is a query, this person can clarify recalls. The essence is that no person misses their opportunity to be seen and discuss their diabetes management goals and aspirations.

1. Print off the BPI list of High Needs “Not Achieved” Patients with HbA1c >64mmol/mol Refer to this list when sending DAR invites.

2. Create the Recall Contact List for all patients requiring DAR during the next Quarter, using the toolbar icon or via the “Module” tab.

3. For each patient on the Recall Contact List:

    - Check Classifications: If Type 1 Diabetes, check if patient is under secondary review, and if so, send a task to the designated Diabetes Nurse to decide if a Virtual DAR is best.
    - Check screening: Has DAR already been completed? If so, check if Recall is correct
    - Check Outbox: Has DAR invite/lab form already been sent?
    - Check Inbox: Have lab checks already been completed?
    - Check Daily Record, Classifications and Tasks for any relevant information/exceptions to DAR.

Exceptions to DAR Recall:

For any of the following, send a Task to the designated Nurse to advise DAR is due. The Nurse can liaise as appropriate with either the Doctor or other service provider.

- Patients who are in Rest Home care (See below)
- Patients who are palliative
- Patients who are being intensively managed by a designated Diabetes Nurse
- Patients who are under the care of Specialists services

First Contact (Letter)

- Print DIABAR letter (DAR invite)
- Print DAR lab request. Check Tasks for any other lab tests which are also due (Liaise with Doctor as needed)
- Forward letter and lab form together to Doctor for signing, before being mailed
- If the patient is identified as "High Needs" on the BPI list: Send a task to the designated nurse to follow up in 2 weeks.
- Do not reschedule recall at this stage, to keep the Patient Prompt Recall active
- Adjust "R#" in the Recall Contact List to "1", to indicate 1st contact made

Second contact (phone)

After 2 weeks if "High Needs" patients, and 6-8 weeks if standard DAR

- Check Screening: Has DAR been completed, and Recalls updated?
- Check Appointments: Has DAR been booked?
- Check Daily Record, Classifications and Tasks for any new relevant information/exceptions before phoning patient
- Check Inbox: Have lab tests been completed?

⇒ If not, phone patients to check letter and lab-form were received, and to remind them to complete lab tests and book DAR appointment

⇒ If lab tests have been completed, phone patient to book DAR appointment. Consider offering a Doctor's appointment if prescription or other review is due. The DAR appointment should be scheduled before the Doctor's appointment.

- Do not reschedule recall
- Adjust "R#" in the Recall Contact List to "2", to indicate 2nd contact made.

As with all patient phone contact, check contact details are correct, check and advise if other recalls are due (e.g. cervical smear) and update smoking status as appropriate.

Third Contact (letter)

After 2 weeks if "High Needs" patients, and 6-8 weeks if standard DAR

- Check as per Second Contact above
- If no appointment made send DIABR2 letter with a copy of lab test request if not yet completed
- Adjust "R#" in the Recall Contact List to "3", to indicate 3rd contact made

If DAR incomplete after a further interval, send a Task to GP/designated Diabetes Nurse for review.

Rest Home DARs

Rest Home Contact Information:

Rest Home DAR Process

- If all people with diabetes within the rest home come to your clinic,
- The Diabetes Nurse(s) or HCA responsible for the Rest Home DARs will coordinate these DARs, following the standard DAR Recall Process checks
- A single covering letter is sent to the Nurse in Charge/Manager at the Rest Home, with all the DAR lab request forms for the residents due to their DAR.
- Forward letter and lab forms together to Doctor for signing, before being sent to the Rest Home
- Monitor patients on task list. Make notes of the dates lab request form were sent, when results are received, and leave on task list until DAR documentation complete
- When results are back, arrange visit with the Rest Home Nurse in Charge/Manager
- On the day of the Rest Home visit:
- Check Rest Home has a list of patients being seen, and request patient file be available - *to include copy of medication chart, current weight and height.*
- Take required equipment for DAR, including sphygmomanometer, foot check monofilament, tape measure, steri-gel, as well as DAR forms, and laptop if available
- Invoice via reception on the day seen.
- Complete PMS notes and submit Common Form. Task can then be completed
- Check and adjust Recalls as appropriate
- Send task to Doctor advising DAR has been done

Diabetes Annual Review Decline Process

- If a Patient declines to have a DAR, document this in their notes using a keyword you have set up adjusting as appropriate:

  "Face to face/phone discussion re diabetes annual review invitation. Pt declines to have DAR her as: seen elsewhere …/ declines to participate. DIAP code entered as incomplete, with declined, added to note line"

- In "Screening" under "Outcome" select "Incomplete Screening (IN). Type "declined" in the 'Note' field. This enables available data to still be added.

- Reschedule Recall for 1 year and send a task to the designated nurse to advise of the decline

- Designated Diabetes Nurse to complete Screening template as much as possible, as for "Virtual DAR"

Diabetes Monitoring Recall Guideline

Diabetes Monitoring Recalls are completed by the designated Diabetes Nurse between patient DARs - as a means of providing ongoing Diabetes support to the patient and based on goals set at DAR.

To create the recall contact List:

Process:

- When the DAR is completed, a recall for "Diabetes Monitoring" (DCIP) is automatically generated for 3-6 months' time

- Monitoring notes can be added into DCIP (e.g. repeat HbA1c and BP in 3 months). As a minimum, all patients with diabetes should have their HbA1c checked 6-monthly.

- The designated Diabetes Nurse is responsible for implementing the Diabetes Monitoring Process for their own patients. This may include reminding patients to complete lab tests, reviewing current Diabetes control and management, medications reviews and liaising with the Doctor as required

Before contacting patients, the designated Diabetes Nurse should check the patient records for any new information, including the Daily Record and Inbox.

- Make an entry in the notes using the Diabetes Monitoring classification, noting current Diabetes management and control, any recent investigations, and advice given including intensification of treatment

- Liaise with/send task to GP if further input required or send task to self to provide further follow- up.

- Reset Diabetes Monitoring Recall as appropriate.

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