

NDSS

National Diabetes Services Scheme

An Australian Government Initiative

NDSS Helpline 1800 637 700
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Diabetes management in aged care:

A practical handbook



Find this resource at ndss.com.au



The NDSS is administered by Diabetes Australia

This handbook has been written for all care staff, from carers to registered nurses. Its aim is to help care staff understand the basics of diabetes management without overwhelming them with complex information about advanced clinical care.

Diabetes Australia believes that the information contained in this training resource was accurate and reliable at the time of publication. The websites quoted in the resource were accessible at the time of publication. Diabetes Australia takes no responsibility for the accuracy or future availability of these sites.

Diabetes Australia takes no responsibility for any adverse consequences that arise as a result of using the content of the resources for clinical purposes. Trainees and other health professionals need to consider the individual circumstances and needs of people with diabetes when they are applying the skills outlined in this resource in their clinical practice information.

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Introduction

Around one quarter of all people living in residential aged care facilities (RACFs) have diabetes. These people may have lived with the condition for many years and may be living with comorbidities and diabetes-related complications. As a result, care is often complex.

Diabetes management in aged care: a practical handbook (DMAC) aims to increase knowledge and understanding of diabetes in older people for staff who support those living with diabetes in RACFs.

The DMAC has been available for a number of years, with the last revision in 2016. This latest version includes important updates, along with a range of linked resources, which will assist management and staff to support residents with diabetes.

The standard of care provided to residents in aged care settings has been highlighted in the recent Royal Commission into Aged Care Quality and Safety.

Residents in aged care are more likely to be frail with reduced life expectancy. A significant proportion of these residents may have cognitive impairment or dementia, with reduced capacity to communicate how they are feeling. The ability of staff to recognise and respond in a timely manner for those residents with diabetes has an enormous impact on residents' quality of life.

Ensuring quality of life and resident safety, coupled with regular reviews, are key factors in diabetes management in an aged care setting and has implications for all care needs. In particular, information regarding management in the residential setting around blood glucose monitoring and healthy eating have been updated to reflect this focus. Regular resident review is crucial to ensuring care delivered enables residents to have the best quality of life.

The following package of resources supporting the DMAC handbook have been developed as a direct result of working with aged care facilities and responding to their needs.

- » **Diabetes management in aged care: fast facts for care workers** was developed in 2016 and has been updated.
- » **Diabetes quality review tool: management of residents who have diabetes** is a tool designed to assist managers in aged care assess the quality of the management and care of residents with diabetes, against evidence-based practice. The tool covers admission and screening, diabetes care plan, hypoglycaemia, hyperglycaemia/sick day management, complications screening and prevention, facility and staff considerations (training/equipment).
- » **Six Minute Intensive Training (SMITs) resources** on a range of topics- hypoglycaemia, hyperglycaemia, insulin administration, know your insulin, sick day management, glucose-lowering medicines, monitoring and healthy eating. These are designed to provide key information which can be delivered to staff in six minutes and enable key information to be reinforced in a busy environment. They can be utilised in a variety of settings including at handover, team meetings or as a quick refresher.
- » **Sick day management template.** Every resident with diabetes should have a documented sick day management plan. This template can be adapted to need.
- » **McKellar guidelines for managing older people with diabetes in residential and other care settings** provides detailed information regarding diabetes management in the aged care sector.

All the resources can be found at ndss.com.au.

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Chair,

National Diabetes Services Scheme (NDSS)
Older People Living with Diabetes Program
Expert Reference Group

May 2020

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Project coordinator:

- » Judy Broad, National Program Leader, NDSS Older People with Diabetes Program.

The development of this edition was coordinated by Diabetes Tasmania.

The DMAC contains ‘Fast facts’ that have been developed for assistants in nursing and care workers and has more detailed sections for nurses or care staff wanting to learn more about a topic.

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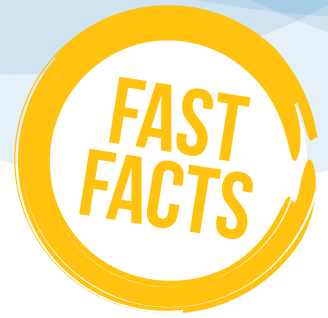
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1. What is diabetes?

1. What is diabetes?



When someone has diabetes, their body cannot maintain healthy levels of glucose in the blood. Glucose is a form of sugar which is the main source of energy for our bodies.

For your body to work properly, it needs to convert glucose from food to energy. This conversion occurs in the cells of the body. A hormone called insulin is essential for this to happen.

Insulin helps glucose move from the blood into the cells.

In people living with diabetes, the pancreas does not produce enough – or any – insulin, or the insulin that is produced does not work properly, which means the glucose stays in the blood and makes their blood glucose levels high.

There are three main types of diabetes:

- » type 1 diabetes
- » type 2 diabetes
- » gestational (pregnancy) diabetes.

When someone has diabetes, their body cannot maintain healthy levels of glucose in the blood.

1. What is diabetes?



There are many myths about diabetes which are not true and can leave people feeling confused. Here are the facts behind some common myths.

‘People with diabetes cannot eat sugar’ – not true

Given diabetes is a condition where blood glucose levels are too high, many people think they need to avoid sugars and foods containing sugar. However, if they are eaten as part of a healthy meal plan – and combined with regular exercise – sugar can be eaten by people with diabetes in small amounts. This is the recommendation for all Australians, not just those with diabetes.

‘Diabetes is not serious’ – not true

There is no such thing as ‘mild’ diabetes. All types of diabetes are serious and can lead to complications if not well managed. Diabetes can affect quality of life and can reduce life expectancy.

‘All types of diabetes are the same’ – not true

The main types of diabetes are type 1, type 2 and gestational diabetes. There are also other forms of diabetes, but they are less common.

Each type of diabetes has different causes and is managed in different ways. However, once someone has diabetes, they will need to manage it every day. All types of diabetes are complex and serious.

‘Diabetes can be prevented in all cases’ – not true

Not all types of diabetes can be prevented. Type 1 is an autoimmune condition; there is no cure and no consistent preventative strategy. Nobody knows definitively what causes type 1 diabetes.

There is no single cause of type 2 diabetes, but there are well-established risk factors. The risk of developing diabetes is affected by some things which cannot change, such as family history, age and ethnic background. However, it is estimated up to 58% of type 2 diabetes can be prevented or delayed by modifying lifestyle factors such as exercise and diet.

‘You have to be overweight or obese to develop diabetes’ – not true

Being overweight or obese in adolescence and in adulthood through to middle age is one risk factor for type 2 diabetes, but it is not a direct cause. Some people who are overweight will not develop type 2 diabetes while some people who are a healthy weight will develop type 2 diabetes.

Type 1 diabetes is not caused by being overweight.

1. What is diabetes?



‘You only get type 1 diabetes when you’re young’ – not true

Type 1 diabetes can occur at any age. It often occurs in children and young adults, but older people can also develop type 1 diabetes.

‘You only get type 2 diabetes when you’re old’ – not true

Type 2 diabetes usually develops in adults over the age of 45 years, but it is becoming more common in younger age groups, including children, adolescents and young adults.

‘People with diabetes should eat a diabetic diet’ – not true

There is no such thing as a ‘diabetic diet’. People with diabetes do not need a special diet, or things like artificially sweetened, low-joule, diet or sugar-free jams, chocolates or treats. They should aim to eat a healthy diet, the same as everybody else.

‘Only people with type 1 diabetes need insulin’ – not true

It is true people with type 1 diabetes need to take insulin every day of their lives. But some people with type 2 diabetes also need to take insulin every day.

How type 2 diabetes is managed may change the longer someone has had it. People may need to use more or different types of medicines. Half of people with type 2 diabetes will need insulin six to ten years after being diagnosed.

Type 2 diabetes does not become type 1 diabetes when a person starts taking insulin.

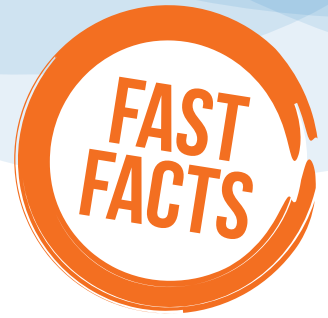
‘People who have diabetes complications have not looked after themselves properly’ – not true

Diabetes can affect the normal function of the heart, brain, kidneys, eyes and feet, and it can also cause digestive problems or problems with sexual function. Having regular checks can help avoid the damage diabetes can cause. While high blood glucose levels can contribute to complications in some people, there are other factors which also contribute to the development of complications, some of which are still unknown. People should not be blamed if they do have complications, as this may have been out of their control.



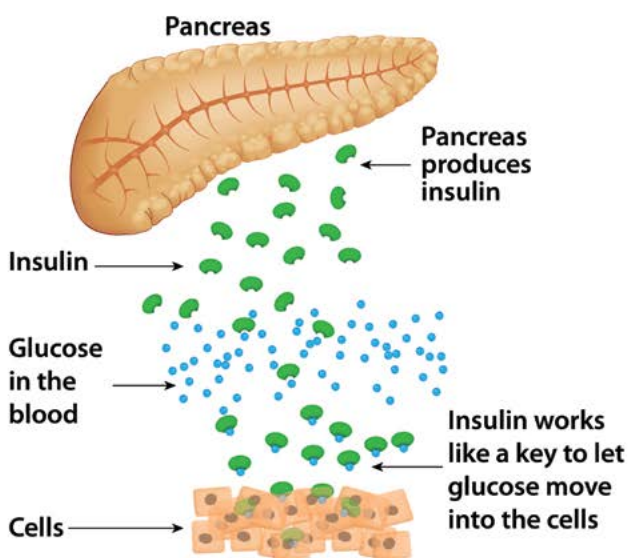
2. Type 1 diabetes

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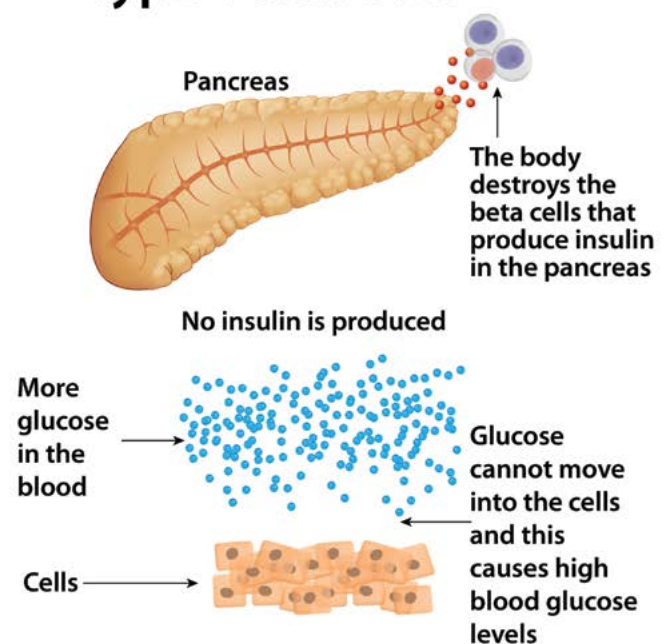


Type 1 diabetes

Person without diabetes



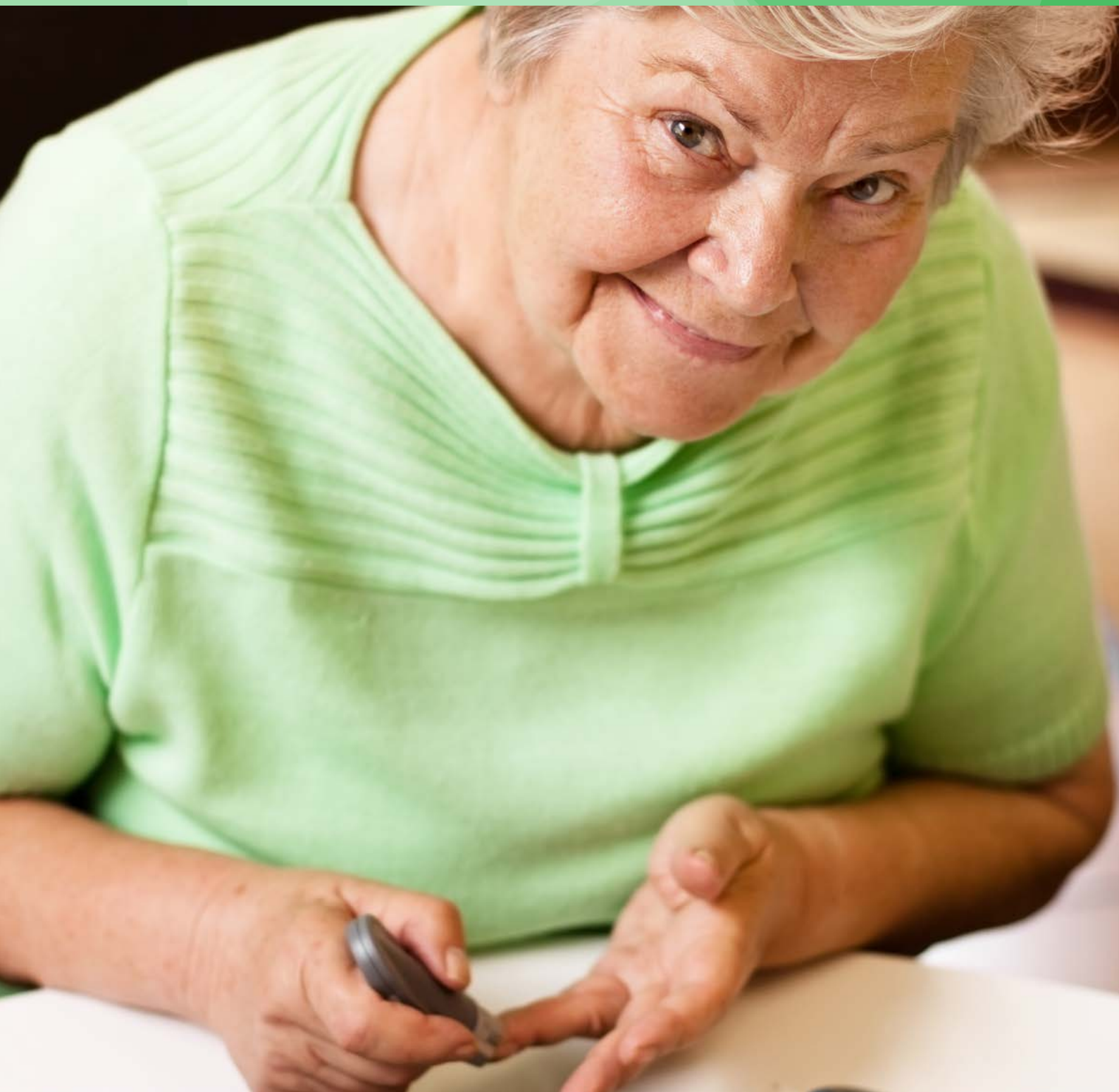
Person with type 1 diabetes



In type 1 diabetes, the pancreas stops making insulin.

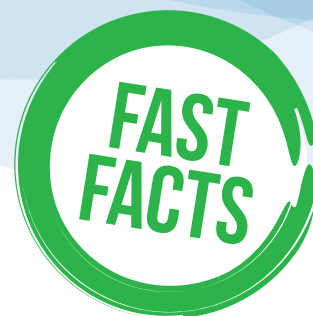
Type 1 diabetes:

- » is an autoimmune condition where the body destroys the cells which produce insulin in the pancreas – the beta cells
- » is a less common form of diabetes – only 10–15% of people with diabetes have this type of diabetes
- » often occurs in people under 30 years of age, but it can occur at any age, including in older people
- » requires the person to take lifelong insulin using an insulin pen device or by using an insulin pump.



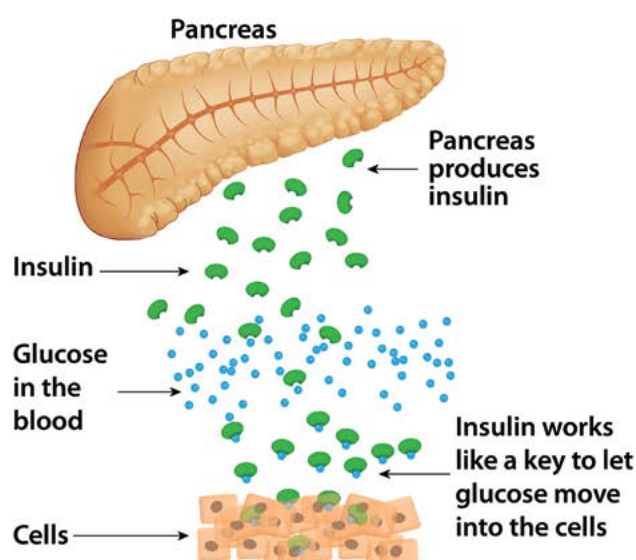
3. Type 2 diabetes

3. Type 2 diabetes

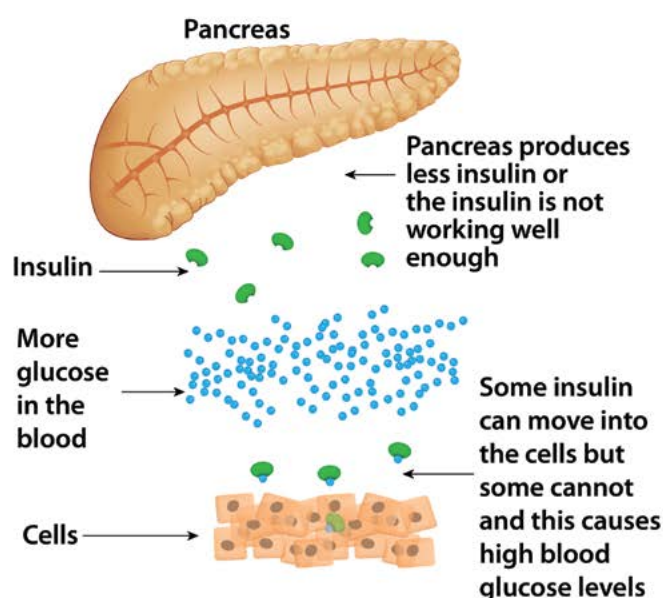


Type 2 diabetes

Person without diabetes



Person with type 2 diabetes



In type 2 diabetes, the pancreas makes some insulin but it is not working as well as it used to.

Type 2 diabetes:

- » is a complex condition where the pancreas is not producing adequate insulin, or the insulin is not working well enough
- » is the most common form of diabetes – it affects 85–90% of all people with diabetes
- » usually occurs in adults but may occur in younger people
- » up to 25% of people over the age of 65 have type 2 diabetes
- » most people who are diagnosed will eventually need glucose-lowering medicines to manage their diabetes, and a quarter need insulin.

3. Type 2 diabetes



Type 2 diabetes usually occurs in adults, but it may occur in the early teens or even children. There is a strong hereditary link in type 2 diabetes, which means people with a family history of type 2 diabetes are more at risk of developing it.

Unlike type 1 diabetes, lifestyle factors also have an influence on type 2 diabetes occurring. Risk factors include poor quality diet, inactivity and obesity. Another major risk factor is ageing - as the body ages, organs and cells do not function as well as they used to, so processes like producing insulin also do not work as well.

In type 2 diabetes, many cells (especially muscle cells) are resistant to insulin. This means there is not enough glucose being transported from the bloodstream and into muscle and liver cells to keep blood glucose levels (BGLs) within the normal range.

Insulin resistance results in the body not using insulin as effectively as it should. Consequently, the pancreas needs to produce more insulin than usual to maintain normal blood glucose levels. If the body does not use insulin effectively, or does not produce enough insulin, blood glucose levels will rise.

Type 2 diabetes also has an effect on blood lipid (fat) levels. Diabetes tends to lower 'good' cholesterol levels and raise triglyceride and 'bad' cholesterol levels. This increases the risk of heart disease and stroke.

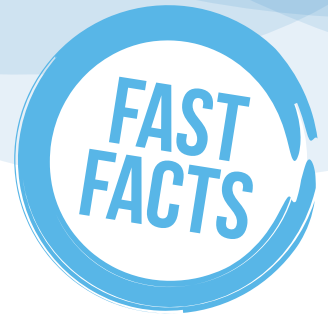
As type 2 diabetes progresses, the pancreas produces less insulin, and blood glucose levels become more difficult to manage. Most people with type 2 diabetes will need glucose-lowering medicines to manage their diabetes at some point, and a quarter of all people with type 2 diabetes use insulin.

If someone with type 2 diabetes needs insulin, this does not mean they have type 1 diabetes. It means they have progressed to needing insulin to manage their type 2 diabetes (they are insulin-requiring, not insulin-dependent).

Most people with type 2 diabetes will need glucose-lowering medicines to manage their diabetes at some point, and a quarter of all people with type 2 diabetes are on insulin.



4. Signs, symptoms and diagnosis

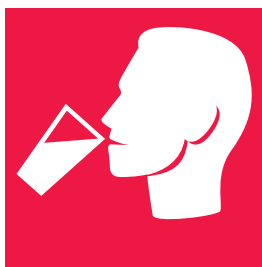


4. Signs, symptoms and diagnosis

Both type 1 and type 2 diabetes can occur at any age.

The signs and symptoms of diabetes in older people can be non-specific, so they may not be as obvious as in younger people. Older people with cognitive decline are also less able to report signs and symptoms. As a result, diabetes can be mistaken for other causes – including ‘getting old’ – which can delay the diagnosis.

Signs and symptoms in residents which indicate diabetes are shown below.



feeling very thirsty



blurry vision



extreme tiredness



slow wound-healing



cognitive changes or confusion



unexplained weight loss



frequent urination or incontinence



changes in mood and irritability

Actions

If you notice any of the signs or symptoms above, let your supervisor know.

4. Signs, symptoms and diagnosis



Residents who present with these symptoms should be screened for diabetes by measuring plasma glucose, as recommended for the general population.

Signs or symptoms of diabetes typically include:

- » urinating more than usual
- » feeling very thirsty
- » increased or reduced appetite
- » extreme tiredness/feeling lethargic
- » weight loss
- » glucose in the urine
- » dry mouth, lips or skin, or sunken eyes
- » flushed face
- » feeling irritable
- » blurred vision
- » itchiness
- » vaginal thrush in women and (occasionally) pubic thrush in men
- » loss of sexual desire in women
- » impotence in men.

Symptoms are often non-specific and can be attributed to 'old age'. This means diabetes is often only diagnosed when an older person presents for a routine health check or is hospitalised for an underlying illness (which can often be a complication of diabetes). In some cases, their diabetes is not revealed until they have an acute diabetes-related complication, such as a stroke or heart attack.

It is important to understand the way diabetes presents and the different clinical features of diabetes. As residents can experience unusual or atypical symptoms, it is essential to undertake regular risk assessments and screening for type 2 diabetes in high-risk individuals.

Symptoms of diabetes can often be mistaken for 'old age'.

Residents who are asymptomatic (not showing any symptoms) may be screened for diabetes using the Australian Type 2 Diabetes Assessment Tool, AUSDRISK, which can be found at diabetesaustralia.com.au/are-you-at-risk-type-2

Residents who show symptoms or signs of diabetes, or who are identified as at-risk through a risk assessment, must be referred promptly to their doctor for medical assessment and appropriate management.

Recommended screening frequency rates are as follows:

- » every three years in older people with a low risk of diabetes; consider more frequently for residents in aged care
- » every year for those at high risk (that is, people with impaired glucose tolerance or impaired fasting glucose, or with new signs or symptoms of hyperglycaemia)
- » on admission to residential aged care consider the following:
 - o older people who require admission to residential aged care are at higher risk of undetected diabetes due to their frailty
 - o residents may not be sensitive to hyperglycaemia or be unable to report symptoms to staff.

4. Signs, symptoms and diagnosis



Diabetes can be screened for and diagnosed using one of four tests:

- » haemoglobin A1c (Hb A1c) $\geq 6.5\%$ (48mmol/mol)
- » fasting plasma glucose ≥ 7.0 mmol/L
- » random plasma glucose ≥ 11.1 mmol/L in the presence of diabetes symptoms
- » oral glucose tolerance test (OGTT) - fasting plasma glucose ≥ 7.0 mmol/L or 2hr level ≥ 11.1 .

A fasting blood glucose test, random blood glucose test, HbA1c or an OGTT or a combination of these, as determined by the doctor, may be required to diagnose diabetes.

If a fasting blood glucose test or an OGTT is required, the person will need to fast. This means:

- » no food or drink for at least eight hours
- » the person can have water.

An oral glucose tolerance test involves the person drinking a special fluid that contains a high amount of glucose and having a blood test prior to and two hours after having this drink.

Any fasting test requires the resident to be nil by mouth (except water) for at least eight hours. The OGTT takes at least 2 hours to perform (after eight hours of fasting). There is no need to fast for an HbA1c.

The treating doctor will consider the suitability of each diagnostic test for the resident. An OGTT may not be practical and too onerous for residents in aged care. A HbA1c assay will not pick up a recent diagnosis, as it measures a 3-month average of blood glucose. Also, HbA1c may not be accurate if the resident has:

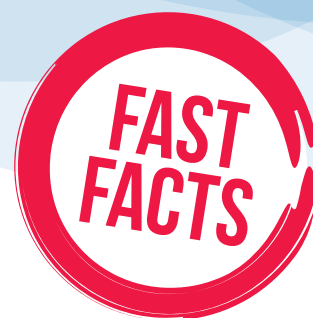
- » chronic renal failure
- » chronic liver disease
- » iron deficiency or vitamin B12 anaemia
- » any disorder of decreased erythropoiesis (ability to make blood cells)
- » rheumatoid arthritis
- » been on long-term aspirin
- » had blood loss or transfusion.

A plasma glucose test, HbA1c or an oral glucose tolerance test (OGTT) or a combination of these, as determined by the doctor, may be required to diagnose diabetes.



5. Management in the residential care setting

5. Management in the residential care setting



For older people living in residential aged care, helping them maintain the best quality of life should be the main principle of diabetes management.

Monitoring blood glucose levels is one way to do this, but it is just part of an overall management plan. Diabetes care requires a balance between healthy eating, physical activity and medicines, such as tablets and/or insulin. Stress, illness and other comorbidities can also have an effect on a resident's diabetes.



medicine



insulin



food



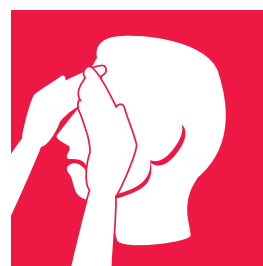
exercise



stress



illness



**other
comorbidities**

5. Management in the residential care setting



Management aims for older people with diabetes living in aged care are not the same as those for many other older people with diabetes. Many residents in aged care are frail with reduced life expectancy. There are many with cognitive impairment or dementia, who often cannot communicate how they are feeling.

The management aims are to:

- » maintain the resident's quality of life
- » prioritise avoiding low or high blood glucose levels which cause dangerous or uncomfortable symptoms
- » enable residents to participate and manage components of their care.

Tailor diabetes management targets for each resident as these will vary from person to person. They need to be personalised according to functional status, comorbidities and life expectancy.

Diabetes management approaches depend on a range of factors including:

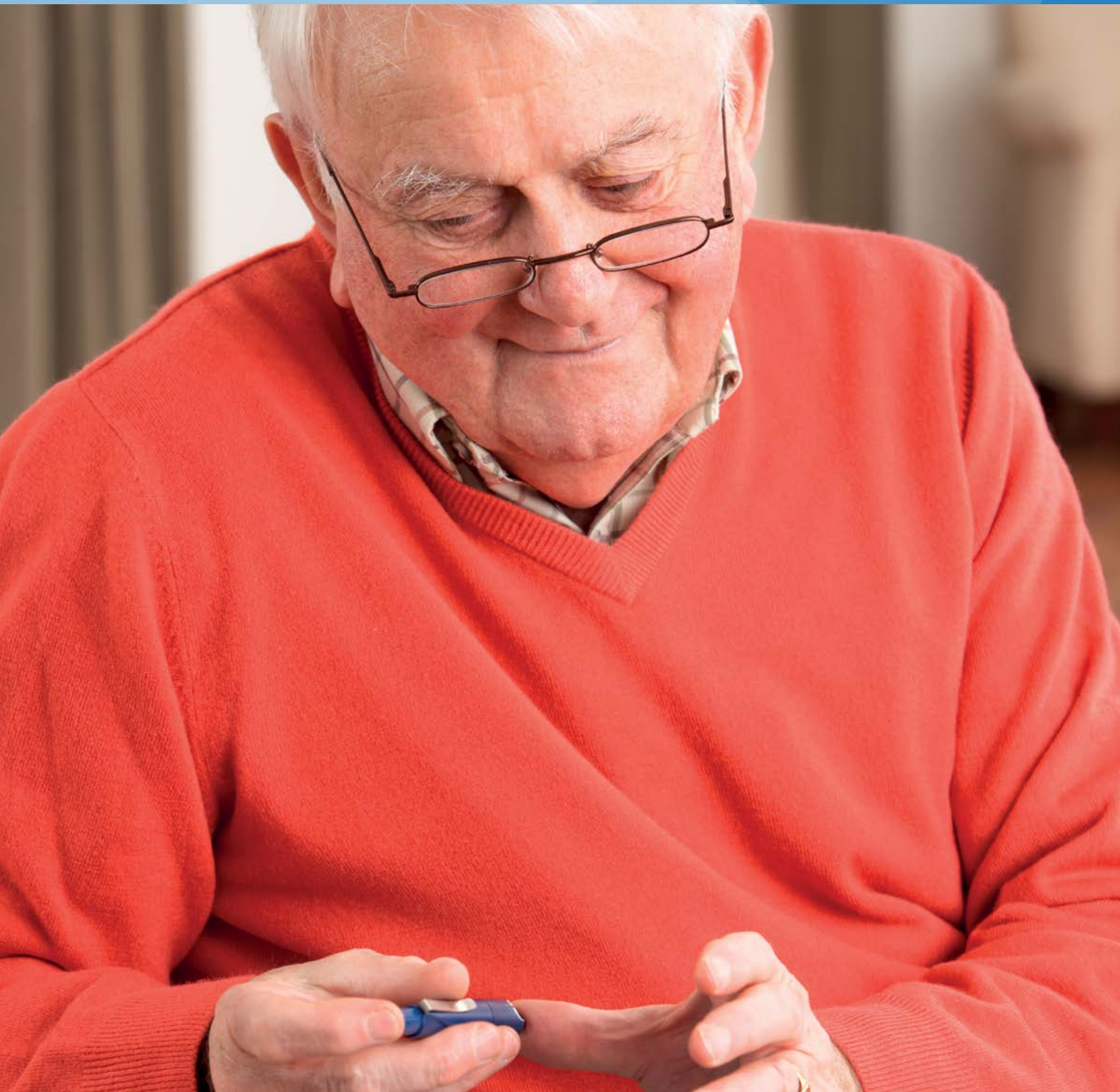
- » the person's level of activity and health
- » whether they have comorbidities (other medical conditions)
- » whether they have diabetes complications
- » their unique circumstances (e.g. frailty, dependency in performing activities of daily living, life expectancy).

Diabetes management needs to be tailored to the residents needs through discussion between the doctor, the resident and/or their family. This information needs to be reviewed regularly and changes documented in order to ensure resident safety and quality of life.

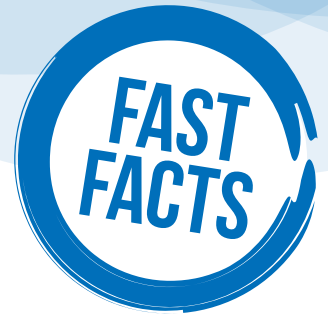
Actions

The resident's diabetes management needs to be clearly defined including:

- individualised management targets for each resident
- continuing the resident's normal or pre-care setting routine whenever possible
- if the resident is self-managing their diabetes, including blood glucose monitoring and injecting, they need to be regularly reviewed by the medical team to ensure that it is still appropriate and safe
- access to diabetes education for the resident and their family
- access to regular diabetes education and training for all staff
- providing nutritious and tasty meals which suit the resident's food preferences, culture, and eating and swallowing ability.



6. Blood glucose monitoring



6. Blood glucose monitoring

One aim of diabetes treatment is to keep blood glucose levels (BGLs) within a specified range. This helps to avoid low (hypoglycaemia) and high (hyperglycaemia) levels.

Target BGLs should be set for each individual but reviewed regularly by their health care team. In an aged care setting this is especially important because an individual's recommended range can change over time, as they get older or as other health needs change.

The frequency and timing of blood glucose monitoring should also be tailored to each resident. Some may not require any monitoring, some twice a day and others more often. The frequency and timing may be changed over time or during certain periods such as during an illness.

The way to check BGLs is by using a blood glucose meter. To use the meter, place a test strip in the meter and add a small drop of blood from a finger-prick onto the testing strip. The meter then reads the strip, and a number comes up on the screen. This number is the BGL.

Some residents may be able to check their own BGLs and independence should be encouraged; others may need assistance from staff. Staff performing blood glucose monitoring should be trained in how to do this and in how to respond to readings recorded. If BGLs fall outside the recommended range, it is important to report this to a supervisor or registered nurse.

It is important to record the BGL in the appropriate chart, along with any actions resulting from the readings.

To provide a long-term pattern of blood glucose management an individual will have a blood test that measures the BGL over the past two to three months. This test is arranged by the treating doctor and is called an A1c or a Haemoglobin A1c (HbA1c).

Residents whose type 2 diabetes is managed by diet and activity alone, or oral medicines which do not cause a low glucose (such as metformin) may not require regular blood glucose checks and the HbA1c may be used to monitor their diabetes.



6. Blood glucose monitoring



Blood glucose monitoring can be an important part of diabetes management.

It refers to monitoring and interpreting results, reviewing patterns of blood glucose levels, and taking action to manage them.

Blood glucose monitoring implemented should be relevant to each resident's health care needs and diabetes management.

While many residents may be able to monitor their own BGLs and manage their diabetes effectively, others may require support or assistance from staff. Before they can provide this help, staff will need competency-based training to perform structured, relevant blood glucose monitoring, and be reviewed on a regular basis.

Tips & traps: BGL essentials

When performing blood glucose monitoring, it is important that staff:

- understand and interpret the BGLs and emerging patterns
- identify actions to take in relation to specific levels
- recognise when to report and/or seek medical review
- understand that target blood glucose levels will be different for each resident.

Each agency or RACF should have well defined policies and procedures, such as:

- » a training program for staff performing blood glucose measurements
- » quality improvement procedures

- » regular maintenance of equipment (including appropriate and safe storage of blood glucose meters and test strips)
- » external quality assurance of meters (some blood glucose meter companies offer this service).

Blood glucose monitoring should be tailored to each resident's health care needs and diabetes management.

Management aims

Achieving near-normal BGLs, and preventing long-term complications, may not be the priority management aims in residents who are not healthy and active. The priority in this instance is to minimise uncomfortable symptoms, the risk of hypoglycaemia (low BGL) and of falls and maintain quality of life.

Older people with diabetes have a higher risk of experiencing hypoglycaemia than those who are young and fit. This may be partly due to co-existing medical problems such as malnutrition, kidney failure or dementia. Older people may have more difficulty recognising or being able to report when their blood glucose is falling. The main risk of hypoglycaemia is in those who take blood glucose-lowering medicines. Some medicines carry a higher risk of hypoglycaemia than others – for example, insulin and sulphonylureas. People who manage their diabetes with only diet and lifestyle and no medicines, do not experience hypoglycaemia.

For further information about types of medicines, refer to **Chapter 10 Glucose-lowering medicines for type 2 diabetes**.

6. Blood glucose monitoring



Target blood glucose levels

In order to prioritise minimising the risk of hypoglycaemia (low BGL) while avoiding symptoms of hyperglycaemia (high BGL), different targets have been set for older people in aged care.

The McKellar Guidelines for Managing Older People in Residential and Other Care Settings are a set of guidelines for nursing and medical staff in Australia that were developed in 2014.

The McKellar guidelines indicate that individuals will vary, but the recommended blood glucose target range for most older people in residential aged care is 6–15 mmol/L. This range is different to other diabetes guidelines but is aimed at both improving the quality of life of residents while minimising the risks of falls and other serious consequences of hypoglycaemia. This means that:

- » low blood glucose (hypoglycaemia) is regarded as generally less than 6 mmol/L, especially in frail older people, and
- » too high blood glucose (hyperglycaemia) generally occurs when blood glucose is greater than 15 mmol/L, especially if it is consistently above 15 mmol/L.

The following targets have been proposed before and after meals for older people – but diabetes care providers should suggest targets specific to the individual and their circumstances.

Before meals	2 hours after meals
6–8 mmol/L	Up to 15 mmol/L

Causes of variations in blood glucose levels

BGLs increase or decrease for a number of reasons, including:

- » meal availability or quality impacting on intake (especially of carbohydrate foods)
- » a missed dose or overdose of blood glucose-lowering medicine
- » alterations to blood glucose-lowering medicines
- » anything that results in a decrease or increase in food intake including change in appetite, changed food quality or dining experience
- » an increase or decrease in exercise or physical activity
- » emotional stress
- » illness, infection and/or pain
- » medicines (such as prednisolone) used to treat other health conditions.
- » alcohol ingestion, particularly on an empty stomach
- » illicit drug use.

False readings may also occur if there are problems with:

- » a person's BGL measurement technique
- » the blood glucose meter or strips
- » hands not washed prior to taking BGL (do not use alcohol swabs).

The frequency and timing of blood glucose monitoring should be tailored to each individual.

6. Blood glucose monitoring



Guidelines on blood glucose monitoring

The frequency and timing of blood glucose monitoring should be tailored to each resident and should depend on health assessment recommendations made by the health professional in consultation with the resident and/or their family/carers, as appropriate. How often BGLs are monitored will depend on the resident's health status, disease status, comorbidities, blood glucose targets, current medicines regimen, quality of life and life expectancy.

Tips & traps: People are different

A blood glucose monitoring routine should be devised for each resident based on their individual needs and circumstances, as discussed with the resident and their family, doctor and/or diabetes educator.

The frequency of blood glucose monitoring needs to be increased when the resident is experiencing:

- » ill health or stress
- » changes in routine (for example, when first admitted to aged care)
- » changes in eating habits
- » changes to their medicines, particularly insulin and sulphonylureas or the commencement of medicines known to increase BGLs (for example, glucocorticoids such as prednisolone and dexamethasone, some antipsychotics etc)
- » changes in levels of physical activity
- » symptoms of hypoglycaemia
- » symptoms of hyperglycaemia
- » night sweats, morning headaches, nightmares, or unexplained higher than normal fasting blood glucose which can be indications of nocturnal hypoglycaemia (low BGL at night).

Blood glucose measurement: type 2 diabetes

There are two common ways in which BGLs are measured. The first is BGL monitoring which indicates the BGL at that exact time. The second is checking HbA1c (Glycosylated Haemoglobin), which gives an indication of longer term (e.g. over 3 months) glycaemic control. The results of a BGL check are reported in different units to the results of a HbA1c and so the targets for these are also different.

Which method is used and how often it is done will vary from person to person. These decisions will be influenced by factors such as the type of diabetes they have, the way their diabetes is managed and the purpose of monitoring.

BGL monitoring is very individualised. Someone managing their diabetes with lifestyle modification alone or low intensity medicines such as metformin alone, may not check BGLs at all, or only do it rarely if they feel unwell.

In contrast, people using more intensive treatments, especially those that are more likely to cause hypos (for example, sulphonylurea, insulin) or require dose adjustment on a day-to-day basis according to BGLs (e.g. short-acting insulins) may check BGLs several times a day.

Most people with diabetes will have their HbA1c checked once or twice a year. While HbA1c is a very useful measure some medical conditions or procedures affecting the blood (e.g. anaemia or transfusion) may influence the HbA1c result and this needs to be considered by medical staff.

6. Blood glucose monitoring



Initially, and when there is a change in management, or BGLs have not been stable, BGLs should be measured three to six times per day, that is:

- » before meals, and
- » two hours after breakfast, lunch and dinner
- » occasionally overnight (between 0200 and 0300).

When BGLs are stable and in the desired range:

- » talk to the resident's doctor, diabetes educator or nurse practitioner about whether blood glucose monitoring is appropriate
- » personalise blood glucose monitoring so it benefits the resident.

If blood glucose monitoring is deemed appropriate, it would be usual to:

- » test BGLs once or twice a day, either before meals or two hours after meals (this will depend on the resident's usual blood glucose management and whether there is a need for specific monitoring)
- » consider changing the time of testing so that, over a week or so, all pre-meal and two-hour post mealtimes have been checked at least once, and a pattern may be revealed
- » occasionally test between 2.00am and 3.00am (if nocturnal hypoglycaemia is suspected).

Blood glucose measurement: type 1 diabetes

Initially, or when stabilising BGLs, take measurements at least three to six times a day, that is, at least:

- » before breakfast (fasting)
- » before lunch
- » before dinner
- » at bedtime
- » occasionally measure overnight between 2.00am and 3.00am to check for nocturnal hypoglycaemia
- » occasionally measure two hours after starting a meal to assess after-meal BGLs and whether the dose of insulin needs to be changed.

Residents with type 1 diabetes may need to continue to monitor their BGLs three to six times a day, as their insulin is often adjusted according to their readings.

It is not useful or effective to measure just once or twice a day at the same time (e.g. before breakfast and before dinner) because this does not provide important information about patterns or variations during the day.

6. Blood glucose monitoring



How to measure blood glucose levels

Blood glucose meters are designed to be easy and simple to use. However, each type of meter varies slightly in technique, so you need to be familiar with different meters used by residents. You should be trained in the use of different types of meters, and your competency should be checked regularly.

Steps to follow when using a blood glucose meter:

- » follow the manual instructions
- » wear disposable gloves
- » check measurement strips have not expired
- » re-code the meter with each new box of strips. (**Note:** very few modern meters need to be re-coded)
- » select a single-use, disposable lancet (finger pricker) set to the best depth for each person
- » ensure the resident's hands are clean and dry before pricking their finger. Cleaning can be done with water and soap – DO NOT use alcohol wipes
- » use the side of their fingertip, towards the top but away from the nail bed, as the preferred site for obtaining a drop of blood as shown here



- » place a drop of blood on a strip, as directed in the manual, and wait for the result to appear
- » if an error message appears, check the manual to find the fault – then correct the fault and repeat the procedure
- » when the correct BGL appears, record the number and the time of measurement
- » dispose of the sharps in a sharp's container.

People with type 1 diabetes may need to continue to monitor their BGLs three to six times a day, as their insulin is often adjusted according to their readings.

Note: Some blood glucose meters allow for monitoring from a different site, such as the forearm or the thigh. While this is not recommended, it may be indicated for some residents due to health problems that might make finger pricking difficult e.g. oedema following mastectomy. The use of an alternative site should be discussed with the resident's health care team.

6. Blood glucose monitoring



Tips & traps: BGL charts

- All blood glucose measurements should be recorded in the appropriate chart, along with any actions resulting from the readings.
- The chart should be able to show any patterns that become clear from the readings.
- There should be space on the chart to record actions taken due to the blood glucose reading and depending on the resident's target range.
- The chart needs to be relevant, easy to read and developed in consultation with all staff who may be using it, including the doctor and diabetes educator.

Some blood glucose meters provide a computer download function, allowing a graph or printout to be obtained directly from the person's blood glucose meter as well as being recorded in their blood glucose diary or chart. There should also be a record of any actions taken as a result of the readings.

Actions

- Residents and staff of RACFs must be educated in all aspects of blood glucose monitoring, and the different care levels needed for each resident.
- All RACFs must have protocols for sharps disposal management and bodily fluid precautions.
- Regular blood glucose meter quality control checks must be performed and recorded to ensure the meter's accuracy.
- All residents with diabetes should register with the National Diabetes Services Scheme (NDSS). If eligible they can purchase subsidised blood glucose monitoring strips. Refer to [Chapter 21](#) for more information about the NDSS.
- Contact NDSS to find out where to access meter testing control solutions and other blood glucose monitor supplies.

6. Blood glucose monitoring



New technology for self-monitoring glucose levels

Finger prick checks only reveal blood glucose at a single point in time. New technology allows monitoring glucose levels continuously throughout the day or night. Devices that do this fall into two categories -continuous glucose monitoring and flash glucose monitoring devices.

What is continuous glucose monitoring?

A continuous glucose monitor (CGM) is a small wearable device that measures glucose levels throughout the day and night. A sensor is inserted and worn on the abdomen or arm. The readings can be sent via Bluetooth from the sensor via a transmitter to a device (like a phone, tablet or receiver) or to an insulin pump. The device can alert when glucose levels are too low or too high. CGM devices also display trend arrows to show a glucose level is rising, falling or steady.

What is flash glucose monitoring?

A flash glucose monitoring (Flash GM) device is like a CGM device, except that you have to scan the sensor with a reader or smartphone to get a reading. The sensor is worn on the arm. A flash GM device does not alert if blood glucose levels are low or high and does not connect to an insulin pump.

Continuous glucose monitoring and flash glucose monitoring devices measure glucose differently from blood glucose meters. There can be differences between devices and blood glucose meters. Always confirm a low or high continuous or flash glucose monitoring reading with a blood glucose finger prick check.

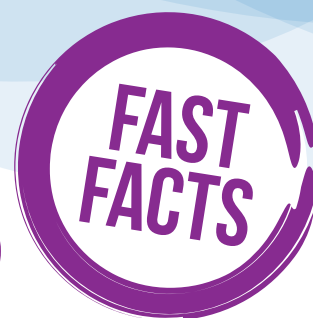
These devices are not routinely recommended for people who do not require insulin or who are not at risk of hypoglycaemia.

Fully subsidised continuous glucose monitoring devices and flash monitoring devices are available through the CGM Initiative for people with type 1 diabetes, aged 21 and over, who have valid concessional status.



7. Hypoglycaemia (low blood glucose level)

7. Hypoglycaemia (low blood glucose level)



Hypoglycaemia (often known as a ‘hypo’) means a low BGL. Hypoglycaemia is dangerous, and can be fatal in older people.

It can occur in people who inject insulin or take certain diabetes medicines, and it can happen quickly. It does not occur in people who manage diabetes through a healthy eating plan without using medicines. Causes of hypoglycaemia can include:

- » too much insulin or diabetes medicine
- » reduction in concurrent medicine such as prednisolone or dexamethasone without adjusting the glucose-lowering treatment at the same time
- » a delayed or missed meal
- » eating only part of a meal and skipping the carbohydrates such as the potatoes, rice, bread or fruit
- » planned or unplanned exercise
- » drinking alcohol.

The images below show some signs and symptoms of hypo that people may experience.



- » sudden dizziness or weakness, particularly in the legs (‘jelly legs’), which may present as stroke-like symptoms



- » hunger
- » tingling around the mouth and face



- » sweating (usually a cold sweat)



- » tachycardia (an abnormally fast heart rate) or palpitations



- » feelings of anxiety or unspecified fear



- » poor concentration



- » drowsiness

Actions

- A hypo needs to be treated immediately even if there are no obvious symptoms. If it is not treated quickly, the resident’s BGL will continue to fall and their condition may progress to:
 - o confusion
 - o loss of consciousness/seizures
 - o in extreme cases, coma and death.
- DO NOT leave the resident alone.
- If you are not trained in how to treat a hypo, call for a supervisor immediately.
- For more information about hypos, read the next section.

The resident who is having the hypo may not recognise the signs and symptoms – and they may not be obvious to other people, either.

7. Hypoglycaemia (low blood glucose level)



Hypoglycaemia is a common and acute short-term diabetes-related complication. It is often referred to as 'a hypo' or 'low blood glucose'.

Hypoglycaemia is a serious complication of diabetes, and potentially life-threatening in older people.

Hypoglycaemia can have catastrophic results in older people which can:

- » bring on major cardiovascular events (such as a heart attack and stroke-like symptoms, or even sudden death)
- » increase the risk of falls (and fractures)
- » lead to hypothermia (if episodes are prolonged in cold weather)
- » reduce quality of life
- » compromise comfort
- » affect cognitive function (including short-term memory).

Hypoglycaemia most often occurs in people on insulin therapy or certain glucose-lowering medicines that can cause hypos (that is, sulphonylureas). Generally, people whose diabetes is only controlled by diet and medicines such as metformin or DPP-4 inhibitors have a very low risk of having a hypo.

For more information, see **Chapter 10 glucose-lowering medicines - for type 2 diabetes**.

Hypoglycaemia is defined as a BGL that is:

- » below the person's target range, or
- » low enough to cause symptoms.

The target BGL range should be aimed at

preventing hypos, which generally occur at less than 6.0 mmol/L – especially in frail older people on insulin or sulphonylurea. The target BGL range for most residents is 6–15 mmol/L, but it should be tailored according to the hypo risk of each resident by their health practitioner(s) (doctor, medical specialist, endocrinologist and/or diabetes educator).

Causes of hypoglycaemia

Hypos can be caused by a broad range of things, including:

- » not having enough carbohydrate in the meal, or less than normal
- » delaying or missing a meal
- » increasing or doing unplanned physical activity
- » doing more strenuous activity than normal
- » taking too high a dose of their medicine, or a longer-acting sulphonylurea, or taking it at the wrong time (generally, long-acting sulphonylureas should be avoided in older people)
- » taking too much insulin, or taking it at the wrong time, for example, not timing insulin with meals
- » consuming too much alcohol, especially on an empty stomach.

7. Hypoglycaemia (low blood glucose level)



Signs and symptoms of hypoglycaemia

Hypos can come on quickly and the early symptoms are not always recognised by older people, due to the ageing process. Residents may report some or all of the following symptoms however it is important that staff discuss with residents and their family/ carer what hypo symptoms they may have experienced in the past, as they may have symptoms not listed:

- » sudden dizziness or weakness, particularly in the legs ('jelly legs'), which may present as stroke-like symptoms
- » hunger
- » tingling around the mouth and face
- » sweating (usually a cold sweat)
- » tachycardia (an abnormally fast heart rate) or palpitations
- » feelings of anxiety or unspecified fear
- » poor concentration
- » drowsiness.

Early hypo signs and symptoms may not be obvious in older people, so they may not be picked up by staff or even the resident themselves. Some signs to look for include:

- » a change of colour in their face – either pale (which is more usual) or flushed
- » difficulty speaking
- » vagueness
- » a change in behaviour (for example, aggression or being weepy, happy, dreamy or relaxed when they are not usually)
- » napping before meals
- » loss of balance, or falls
- » hallucinations or confusion.

If it is not addressed quickly, the BGL will continue to fall and the resident's condition may progress to:

- » confusion
- » loss of consciousness/seizures
- » in extreme cases, coma and death.

Reducing the risk of hypoglycaemia

A key approach to reduce the risk of a resident having a hypo is to have a documented hypo management plan which includes:

- » individual signs and symptoms (ask the resident and family)
- » preferred and appropriate hypo treatments (e.g. to suit individual tolerances and taste)
- » considerations around swallowing risks (e.g. thickened fluids) and enteral/PEG feeding should a resident be unable to swallow safely due to hypo.
- » a standing order and guidance for administration of subcutaneous glucagon.

To reduce the risk of hypo, residents should eat regular, nutritious meals and snacks, as well as extra carbohydrate when they do any additional activity. Ensure the correct doses of medicines, including insulin, are given at the correct time. When a resident loses their appetite or are eating poorly, their doctor needs to review the diabetes medicine dose. In particular, medicines that carry a higher risk of hypoglycaemia such as a sulphonylurea or insulin. It may also be appropriate to consider a referral to a dietitian.

The body's response to diabetes medicines changes with age and this may require a person's treatment to be reviewed in terms of drug choice and dose regularly.

7. Hypoglycaemia (low blood glucose level)



Management of hypoglycaemia

Hypos come on quickly and can be dangerous, so they must be treated immediately.

When you notice changes in a resident's cognitive function and mental state such as confusion, you need to treat this as a unique event. DO NOT assume it is just a part of 'getting old'.

If able, take a blood glucose measurement to work out whether the confusion they are experiencing relates to hypoglycaemia. If you think the resident is showing signs of hypoglycaemia, and it is not possible to measure their BGL immediately, treat as a hypo and then check their BGL when you can.

If the resident's cognitive function stays the same even when their BGLs return to normal, you should arrange for further medical assessment and review.

Tips & traps: Hypos are different too

Each person reacts differently to hypoglycaemia and they often respond differently to medicine.

Thus, it is essential to document in their care plan the specific individual signs and symptoms with hypoglycaemia and their individualised management plan.

If the person has a hypo immediately before an insulin injection or tablet dose:

- treat the hypo following the guide below, making sure the person's BGL is stable, then
- administer their insulin or tablets as prescribed (do not withhold prescribed medicine), and
- call the person's doctor for review.

7. Hypoglycaemia (low blood glucose level)



Hypoglycaemia treatment

An individual hypo management plan should be devised for each resident according to any special dietary requirements they may have. This plan should include a BGL target and a hypo can be defined below that target with or without symptoms.

If the resident is conscious and able to swallow, follow steps (A1) to (A6) (or your organisation's policy and procedure for hypo management).

	Give the person just ONE of the following items.	
	Quantity	Food/drink
(A1)	Half a can (180mls)	Regular (not diet) soft drink, OR
	150 ml	Fruit juice, OR
	3	Glucose tablets, OR
	6 or 7	Jelly beans, OR
	3 teaspoons	Sugar or glucose dissolved in warm water, tea or coffee, OR
	3 teaspoons	Jam or honey, OR
	150ml or 100g	Appropriate texture-modified food or thickened fluid (juice may need to be thickened, other options may be sweetened yoghurt or pureed fruit)
(A2)	After you have given them one of these items, wait for 10 – 15 minutes and then measure the resident's BGL again.	
(A3)	If the resident's BGL has not increased, or if they feel no better, repeat the original approach.	
(A4)	If the BGL has increased, follow up with the resident's next normal meal OR, if the normal meal is more than 15–20 minutes away, with ONE of the following items.	
	Quantity	Food/drink
	1 serve	longer-acting carbohydrate (eg one slice of bread), OR
	1 serve	fruit (eg 1 apple, 1 banana, 3 apricots, 1 pear), OR
	1 small tub	yoghurt, OR
	100ml or 100g	Appropriate texture-modified carbohydrate food or thickened fluid (thickened milk or puree fruit or potato)
(A5)	Stay with the resident until their BGL is above 6mmol/L (or within their individualised target range). DO NOT leave them until they: <ul style="list-style-type: none"> » are symptom-free and comfortable » have another carer or can care for themselves. 	
(A6)	If BGL remains between 4-6mmol/L after two treatments, contact their doctor. If BGL remains less than 4.0mmol/L after two treatments call an ambulance.	

7. Hypoglycaemia (low blood glucose level)



If the resident is unconscious or unable to swallow, follow steps (B1) to (B7).

(B1)	Always follow and comply with your RACF's emergency policy/protocol.
(B2)	DO NOT give anything by mouth.
(B3)	DO NOT leave the resident alone.
(B4)	Depending on your RACF policies/procedures, and if trained, administer a Glucogen® injection or immediately arrange for someone else to do it. See 'Tips & traps' below.
(B5)	If the resident is unconscious, place them in the coma position, maintain their airway, and seek medical help immediately.
(B6)	Call 000 and state 'diabetic emergency', then provide the resident's name and address and any medicine they have already been given.
(B7)	Inform the resident's doctor, and document this contact (see 'Actions').

Tips & traps: Glucogen® hypo kit

Anyone who is prescribed insulin or a sulphonylurea should have ready access to a Glucogen® kit in case they have a hypo and they cannot swallow, or they are unconscious. The kit should be prescribed and documented by their doctor.

Glucogen® is a hormone that is also produced in the pancreas which has the opposite effect from insulin, and it speeds up people's recovery from hypoglycaemia. Glucogen® comes pre-measured in a syringe – so it is impossible to give too much – and the full amount should be given to adults.

The syringe is inserted under the skin (subcutaneously), into the muscle (intramuscularly) or into a vein (intravenously).

The treatment can be administered by any person who has had the relevant training.

Note: Your RACF's emergency policies or protocols will clarify whether it is your responsibility to administer glucagon and whether an ambulance should be called. Each facility's policy will reflect the legal and other requirements because each state and territory have different legislation governing the issue.

7. Hypoglycaemia (low blood glucose level)

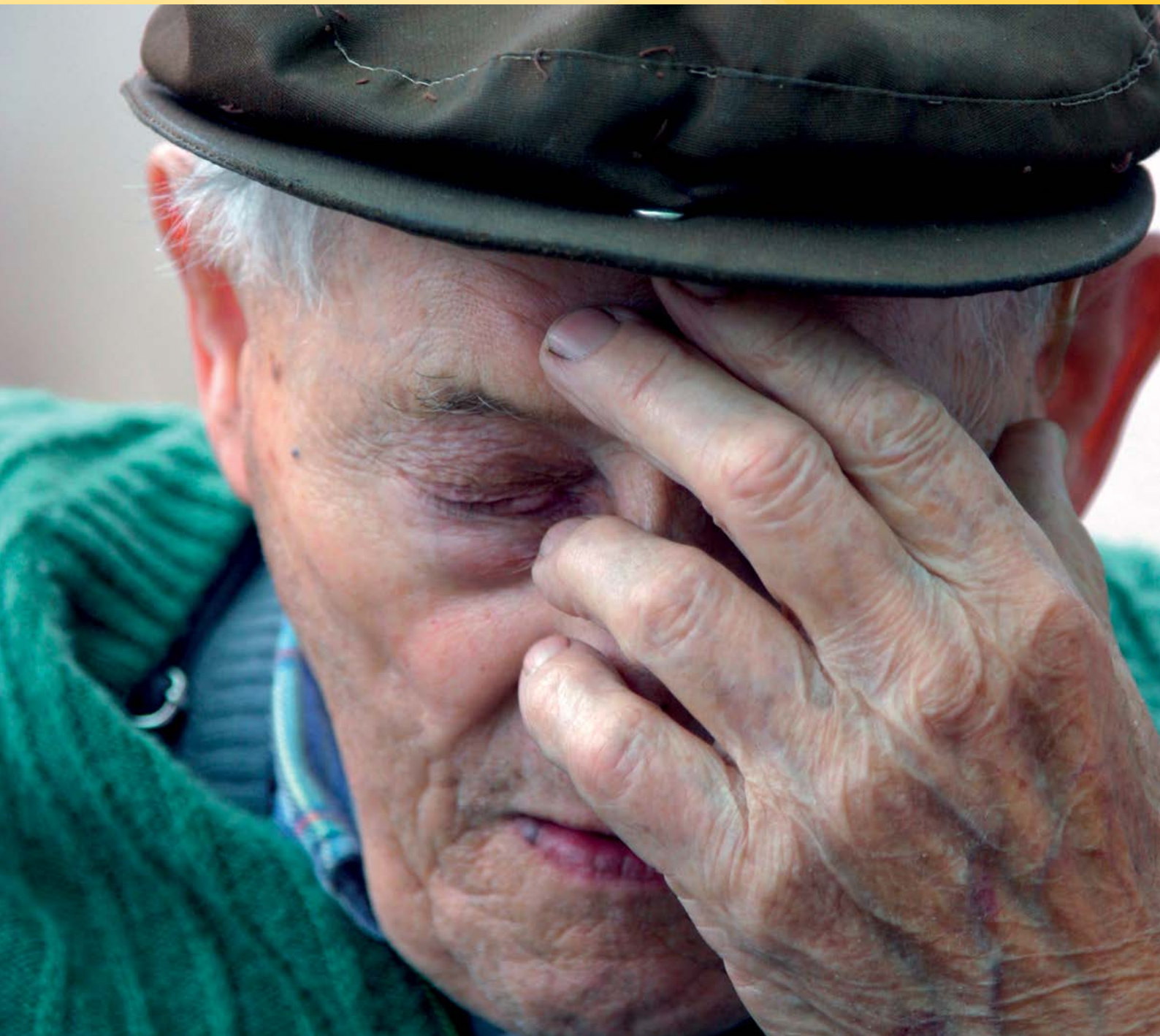


Actions

Once the resident has been stabilised, or taken to hospital, document the:

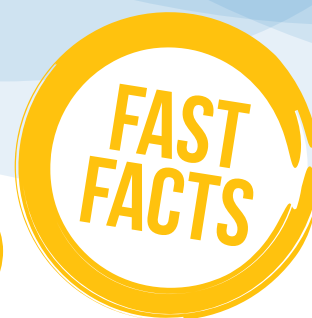
- time of the hypo
- BGL measurements that were taken (including how frequently they were taken and what results were recorded)
- management approach (including any emergency protocols that were followed)
- treatment given
- people involved or consulted during the episode
- assessment taken to determine what caused the hypo
- actions taken to prevent a recurrence
- outcome of the management approach
- follow-up required (e.g. notifying the resident's doctor or requesting a review)
- resident's care plan update, as required.

Hypos come on quickly and can be dangerous, so they must be addressed immediately.



8. Hyperglycaemia (high blood glucose level)

8. Hyperglycaemia (high blood glucose level)



Hyperglycaemia can occur in anyone who has diabetes, when their BGLs are too high. It often happens slowly but it can also happen suddenly, depending on the cause.

Causes of hyperglycaemia may include:

- » too little insulin or diabetes medicine
- » food intake not being covered adequately by insulin or medicine
- » excess carbohydrate consumption
- » a decrease in activity
- » illness, infection, injury or pain
- » emotional stress
- » medicine used to treat other illnesses, such as steroids
- » their insulin pump not working properly (this can bring on hyperglycaemia suddenly).

Below are some of the signs and symptoms of hyperglycaemia the person may feel:

- thirst (although this is often absent in older people)
- drier than normal skin and lips
- a urinary tract infection
- increased/excessive amounts of urine
- poor healing
- oral or genital thrush.



Older people sometimes feel no symptoms but others might notice the following:

- sunken eyes
- abnormal fatigue (the person may spend the day sleeping in a chair)
- abnormal vagueness or disinterest
- a fruity smell on the breath (in people with type 1 diabetes)
- difficulty in rousing them.



Actions

- A high BGL every now and then is not a problem. However, action should be taken if the reason for the resident's high BGL is unknown; if they have had high BGLs for several days; or if they have symptoms of hyperglycaemia.
- If you notice a resident with any symptoms of hyperglycaemia, or if you are not trained in hyperglycaemia management but you think something is 'not quite right', let your supervisor know.
- If you are trained in hyperglycaemia management, follow your RACF's guidelines.
- For more information about hyperglycaemia, read the next section.

8. Hyperglycaemia (high blood glucose level)



Hyperglycaemia for residents in aged care is defined in the McKellar guidelines as a BGL above 15 mmol/L. The target level may be reviewed and decreased or increased by the person's health practitioner over time, depending on the person's age, function, health, diabetes management and progression, and quality of life.

Hyperglycaemia can develop quickly, depending on the cause, but it usually develops over several days or even weeks. Short-term hyperglycaemia may cause significant distress, such as irritability or confusion, while prolonged hyperglycaemia is linked with micro-vascular and macro-vascular complications.

In older people, it can be difficult to identify signs of hyperglycaemia due to functional, cognitive and age-related changes. Many hyperglycaemia features are similar to those of delirium, so it is important to exclude hyperglycaemia as the cause. This makes it essential to undertake blood glucose monitoring in residents who show signs of changing cognitive function or confusion.

Other symptoms include fatigue, which can be dismissed as part of the ageing process, and polyuria (excessive urination) which may present as urge incontinence or urinary incontinence. Residents can also lose the ability to recognise when they are thirsty, which can be problematic. Mild or persistent hyperglycaemia (not high enough for the resident to show symptoms or become ill) can still cause harm over the long term.

Persistent high BGLs also slow the healing of any wounds or infections and should be treated, as white cell function is impaired when the blood glucose is higher than 11.1 mmol/L.

Hyperglycaemia may be related to the progressive nature of type 2 diabetes. It will require an increase or change in routine medicine used to manage the BGLs, and increased blood glucose monitoring may be needed during this adjustment time.

Regular blood glucose monitoring will make it easier to identify and manage hyperglycaemia in residents who may not be able to recognise or report symptoms. Levels which are mildly but consistently above the resident's target range can be identified by blood glucose monitoring and should be reported to their treating doctor or diabetes educator.

Hyperglycaemia can develop quickly, depending on the cause, but it usually develops more slowly, often over several days or even weeks.

8. Hyperglycaemia (high blood glucose level)



Signs and symptoms of elevated BGLs

Older people may be less likely to report symptoms of hyperglycaemia, but they may report some or all of the following:

- » thirst (although this is often absent in older people)
- » drier than normal skin and lips
- » a urinary tract infection
- » increased/excessive amounts of urine
- » poor healing
- » oral or genital thrush.

Even if residents with diabetes do not report the signs and symptoms of hyperglycaemia themselves, you or other people around them may notice some changes. Check their BGLs to confirm or exclude hyperglycaemia: a rise in BGL may be the first sign of an acute illness.

Some signs that may be observed include:

- » sunken eyes
- » abnormal fatigue (the person may spend the day sleeping in a chair)
- » abnormal vagueness or disinterest
- » a fruity smell on the breath (in people with type 1 diabetes or type 2 diabetes at risk of DKA including those taking SGLT2 inhibitors), with urinary or blood ketones* present
- » difficulty in rousing them.

* Ketones are formed when the body does not have enough insulin. Glucose remains in the blood stream and cannot be used for energy. When this happens, the body converts fat into ketone bodies as a poor alternative source of energy. Ketones are acidic, and when enough build up in the body, the person becomes ketoacidotic

Tips & traps: Ketoacidosis

Ketoacidosis is a sign of insufficient insulin, and it is a serious, life threatening condition. It develops gradually over hours or days.

Most cases of ketoacidosis occur in people with type 1 diabetes; it very rarely occurs in people with type 2, for example those who are on SGLT2 inhibitors. It requires hospitalisation, as treatment requires intravenous insulin, potassium and fluids to correct.

Early signs/symptoms of ketoacidosis include:

- deep sighing breathing (known as Kussmaul's respiration)
- flushed cheeks
- abdominal cramping
- nausea and vomiting
- dehydration (marked diuresis)
- rapid or faster heart rate than normal (at rest)
- sweet acetone breath which may smell like nail polish remover.

Late signs/symptoms include:

- respiratory distress
- absence of Kussmaul's respiration
- slow or slower heart rate than normal (at rest)
- low blood pressure
- low body temperature (below 35°C)
- altered conscious state, leading to coma.

8. Hyperglycaemia (high blood glucose level)



Ketones should be checked if a person with type 1 diabetes has a BGL greater than 15 mmol/L or appears unwell, dehydrated or confused, or if they are vomiting. Some residents with type 2 diabetes may also require ketone checks when they are unwell, especially if they are on certain diabetes medicines. **In this instance, their doctor should be notified immediately.**

Ketones can be checked using a blood ketone monitor (following the manufacturer's instructions).

There is a delay in the development of urinary ketones, which means hyperglycaemia occurs before ketones are present in the urine. Consequently, monitoring blood glucose and blood ketones is a more accurate and timely option to manage high glucose level.

Causes of high blood glucose levels

High BGLs can have a number of causes, including:

- » poor administration timing of blood glucose-lowering medicines or insulin in relation to meals
- » an inadequate dose of blood glucose-lowering medicines or insulin

- » an omitted/missed dose of medicines or insulin which lower blood glucose
- » too much carbohydrate in a meal
- » illness, infection and/or pain
- » emotional stress/adrenaline
- » less physical activity than usual
- » medicines used to treat other medical conditions, such as prednisolone steroids
- » insulin pump not working properly (which can make hyperglycaemia happen suddenly)
- » newly diagnosed diabetes that is not yet properly controlled.

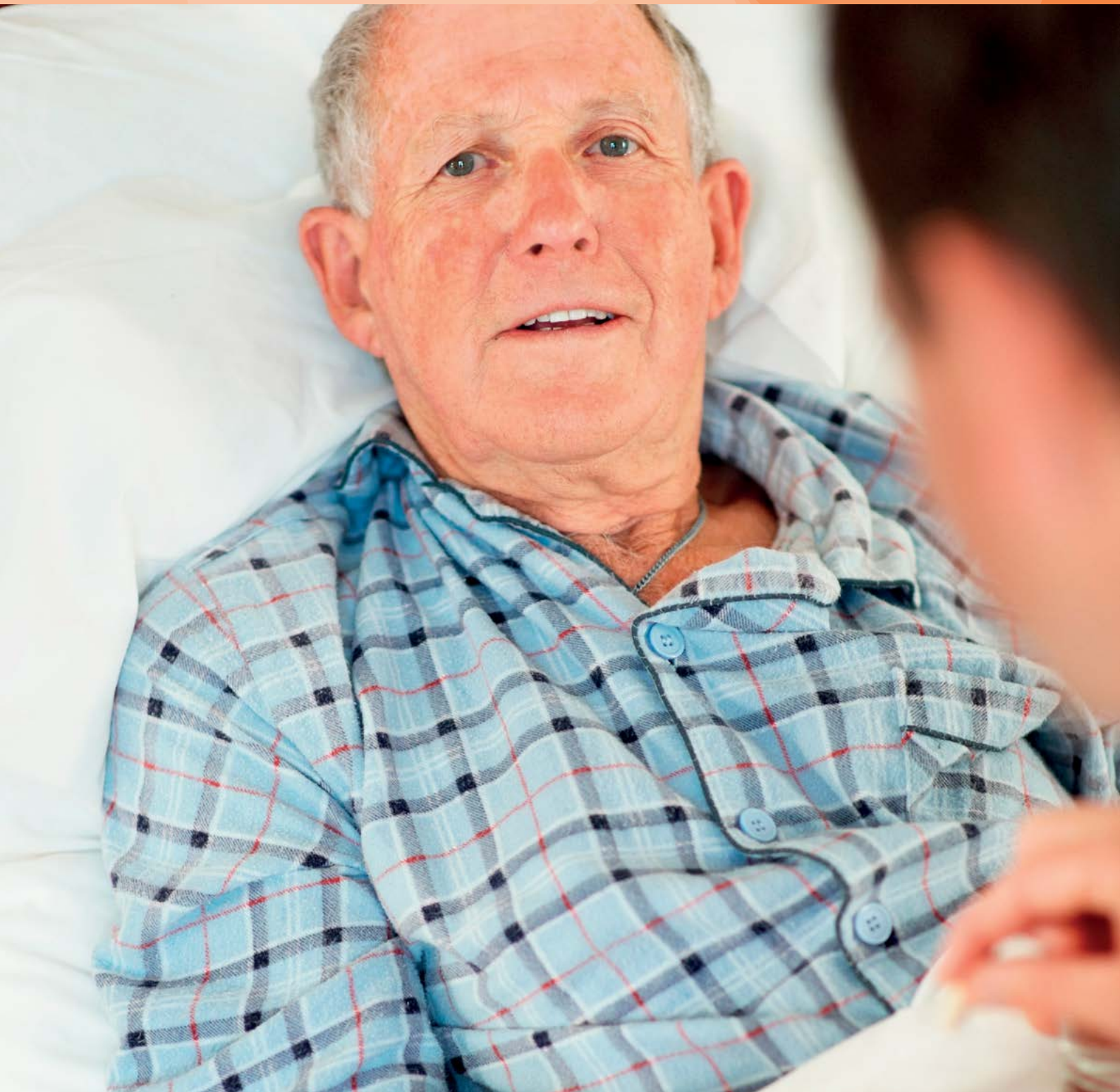
Be aware that a blood glucose meter may also show an incorrect high BGL due to:

- » poor measurement technique (for example, resident's hands not washed)
- » a faulty blood glucose meter or strip (check the expiry date)
- » the meter has not been Quality Control checked recently.

Remember to ensure that blood glucose meters are Quality Control checked regularly and are working properly.

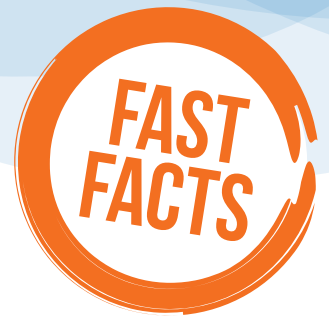
Actions

- Implement sick day care if indicated (see the next section).
- Arrange a medicines review if hyperglycaemia persists.
- Consult with the doctor because laboratory and other diagnostic investigations may be needed.
- Consider referral to a dietitian.



9. Sick day management

9. Sick day management



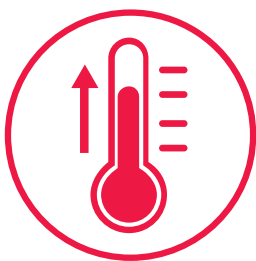
Being sick can make things more difficult for a resident with diabetes. The illness might cause their blood glucose levels to rise, and it might also make it harder to manage their diabetes.

How diabetes is managed during an illness depends on whether the resident has type 1 or type 2 diabetes. Residents may need more frequent blood glucose monitoring and more insulin (if they usually take insulin).

Actions

- Take action when you notice the symptoms or signs of an illness.
- If you think a resident is sick, tell a supervisor and/or follow the resident's care plan or your organisations' procedure.
- If you are trained, follow the sick day management guidelines in the next section.

Symptoms may include



fever



sore throat



runny or
stuffy nose



muscle or
body aches



headache



tiredness



cough



diarrhoea



vomiting

9. Sick day management



Residents with diabetes should have a 'sick day plan' developed in conjunction with their family and doctor/diabetes educator. In a RACF, it is the nurse's role to action the sick day plan when needed.

Illness usually causes a rise in a resident's BGLs. It is important that action is taken promptly when symptoms and signs of illness are observed or reported, like a cold or the flu, or infections (such as a urinary tract infection or a skin infection).

If a resident with diabetes becomes unwell, follow steps (1) to (6).

	Assess the resident's cond
(1)	<ul style="list-style-type: none"> » Manage/treat the symptoms of the underlying illness where possible. » Contact the resident's doctor if further treatment/review is required.
	Monitor them:
(2)	<ul style="list-style-type: none"> » Measure BGLs every two to four hours and record the results. This should be individualised to the resident and will depend on their diabetes management and medicine/insulin requirements. » Monitor their temperature, pulse, respirations and blood pressure four-hourly and record these details.
	Continue to treat:
(3)	<ul style="list-style-type: none"> » Advise or supply extra fluids and ensure the resident drinks them. Caution: be aware of residents on fluid restriction. Seek medical assistance if resident is vomiting. » Make sure the resident continues to take their diabetes medicines – unless it is changed by the treating doctor. » Maintain a fluid balance chart.
	If the resident has type 1 diabetes or type 2 diabetes at risk of DKA including those taking SGLT2 inhibitors:
(4)	<ul style="list-style-type: none"> » Check their blood for the presence of ketones. » If ketones are present, report this to the resident's doctor. » Check the resident every four hours until ketones are no longer present.
	Increase or change the resident's medicines as prescribed by their doctor:
(5)	<ul style="list-style-type: none"> » Resident's treated with tablets may need insulin for the duration of the illness. » Resident's with type 1 diabetes will likely need more insulin to manage their BGLs.
(6)	Document – in the resident's notes – all treatment and care that has been given.

9. Sick day management



Actions

Maintain clear and concise documentation of all:

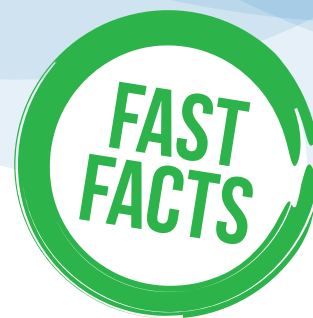
- observations (including those made by staff and those reported by the resident and their family)
- measurements, including blood glucose monitoring and implementation of additional charting (such as a fluid balance chart)
- actions taken and care given
- changes or updates to the resident's care plan
- reporting to appropriate health practitioners for review/treatment, phone calls made or received (in relation to care/treatment).

In a RACF, it is the nurse's role to action the sick day plan when needed.



10. Glucose-lowering medicines for type 2 diabetes

10. Glucose-lowering medicines for type 2 diabetes



Glucose-lowering medicines are prescribed for people with type 2 diabetes when their condition has progressed to the point where their blood glucose can no longer be effectively managed by diet and physical activity alone. In some cases, because some people with type 2 diabetes have been living with the condition undiagnosed for some time, this may occur soon after diagnosis.

More than 85% of people with type 2 diabetes eventually require glucose-lowering medicines.

Glucose-lowering medicines are different from insulin.

The way a person's body uses medicines can change as they age or have other medical conditions and medicines can work differently if they have a poor appetite, miss a meal or become less active.

Actions

- Follow the 'five rights', or your organisation's policy and procedures, when administering medicine:

Staff should administer:

- **the correct medicine**
 - **to the correct person**
 - **in the correct dose**
 - **by the correct method**
 - **at the correct time.**
- Let your supervisor know if a resident skips a meal, as this may affect their BGLs.

10. Glucose-lowering medicines for type 2 diabetes



Glucose-lowering medicines are prescribed for people with type 2 diabetes when their condition has progressed to the point where their blood glucose can no longer be effectively managed by diet and physical activity alone. A healthy diet and regular physical activity, however, remain vital in helping to manage blood glucose and lipids, even when the person has progressed to needing glucose-lowering medicines.

There are various types of glucose-lowering medicines used to manage type 2 diabetes, and they work in different ways. It is important to recognise that glucose-lowering medicines are different from insulin. Most glucose-lowering medicines increase the quantity of insulin within the circulation and/or increase the body's capacity to use the body's own insulin.

In Australia, there are currently seven classes of medicines used to manage type 2 diabetes. Recent developments have provided some medicines for type 2 diabetes that are injected but are not insulin.

Individual medicines within each class may have different effects and side effects for each person.

(1) Metformin

Metformin is the first glucose-lowering medicine a person with type 2 diabetes is prescribed unless it is contraindicated. Metformin has been used for many years and is considered a safe drug. It has a good effect on blood glucose and generally does not cause hypoglycaemia on its own.

Metformin does not cause weight gain and it can be used with other glucose-lowering medicines and insulin.

Metformin is also available in various combinations with other glucose-lowering medicines, for example Trajentamet (metformin and linagliptin), Jardiamet (metformin with empagliflozin).

Generic or chemical name	Some brand names	Metformin lowers blood glucose by:	The most common side effects are:
Metformin	Diabex, Diaformin, Formet, Metforbell, Glucohexal, Glucomet, Glucophage, Genrx metformin, Genepharm metformin	<ul style="list-style-type: none"> » reducing the amount of glucose released into the blood from the liver » slowing down the amount of glucose absorbed from the small intestine » helping the muscle, liver and other cells become more sensitive and better able to take up insulin. 	<ul style="list-style-type: none"> » some nausea when the drug is first started » a metallic taste in the mouth » diarrhoea.
Metformin ER	Diabex XR, Diaformin XR, Metex XR		

10. Glucose-lowering medicines for type 2 diabetes



Precautions

- » When kidney function declines, there is the risk that metformin levels may build up in the person's body, unless the dose is reduced. Although metformin is generally a very safe medicine, a build-up increases the chances of a very rare side-effect called lactic acidosis. This can be serious, and it is for that reason that metformin doses will need to be reduced as kidney function falls, and the drug avoided altogether when kidney function is very poor (eGFR < 30mls/min).
- » A variety of situations can increase the risk of lactic acidosis, directly or indirectly, these include heart failure, dehydration, serious infections, shock and certain radiology tests. Metformin should be ceased during periods of intercurrent illness in order to reduce the risk of lactic acidosis.

Actions

- Document - diarrhoea, vomiting or other conditions that might lead to dehydration.
- Inform the resident's doctor if diarrhoea does not resolve within a few days of starting metformin, even if the dose is lowered, the resident's doctor should be contacted, and metformin cessation considered.

10. Glucose-lowering medicines for type 2 diabetes



(2) Dipeptidyl peptidase 4 inhibitors

There are five dipeptidyl peptidase 4 (DPP-4) inhibitors on the market in Australia.

DPP-4 inhibitors stimulate the secretion of insulin, by enhancing the effect of hormones known as incretins. They are sometimes described as 'incretin enhancers'. DPP4 effect incretins by stimulating insulin secretion in a selective way, i.e. only when the body needs insulin to lower glucose levels. Consequently, there is a low risk of these medicines causing hypoglycaemia, unless they are combined with a sulphonylurea or insulin.

DPP4s can be used with a sulphonylurea or SGLT2 inhibitor but are most often used in combination with metformin. Because of this, most of the DPP-4 inhibitors are available in combination tablets that also contain metformin.

DPP4 inhibitors are also available in various combinations with other glucose-lowering medicines, for example Janumet (metformin and sitagliptin), Steglujan (ertugliflozin and sitagliptin).

Generic or chemical name	Some brand names	DPP4 inhibitors lower blood glucose by:	The most common side effects are:
Sitagliptin	Januvia	<ul style="list-style-type: none"> » increasing the hormone that stimulates the pancreas to release extra insulin » reducing the amount of glucose (which increases BGLs) that is released into the bloodstream by the liver. 	» nausea
Vildagliptin	Galvus		» an increased risk of infections, particularly upper respiratory tract infections and urinary tract infections
Alogliptin	Nesina		» headaches
Linagliptin	Trajenta		» dizziness
Saxagliptin	Onglyza		» an itchy rash
			» in extreme cases, anaphylaxis or angio-oedema.

Precautions

Dose adjustment or stopping DPP-4 inhibitors is recommended for residents with kidney or liver impairment.

10. Glucose-lowering medicines for type 2 diabetes



(3) Sulphonylureas

This class of tablets can cause hypoglycaemia.

The sulphonylurea family includes several medicines, all of which work in the same way and have similar precautions. The most widely used sulphonylurea is gliclazide.

Sulphonylureas reduce BGLs by stimulating insulin secretion from the beta-cells of the

pancreas. There are also some extra-pancreatic effects such as an improved sensitivity of the peripheral tissues for insulin and a decrease of glucose production by the liver.

Sulphonylureas can be used in combination with metformin and a number of other medicines for diabetes.

Generic or chemical name	Some brand names	Sulphonylureas lower blood glucose by:	The most common side effects are:
Gliclazide	Glyade, Mellihexal, Nidem, Genrx Gliclazide	» causing the pancreas to produce more insulin.	All sulphonylureas are capable of causing hypoglycaemia. They can result in: » weight gain » skin rashes » stomach upsets » occasionally, jaundice (yellowing of the skin or the whites of eyes).
Glycazide ER	Diamicon MR, Glyade MR, Oziclide MR		
Glibenclamide	Daonil, Glimel		
Glipizide	Melizide®, Minidiab		
Glimepiride	Amaryl, Dimirel, Aylide, Diapride, Gilmepiride Sandoz		

Precautions

- » Generally, sulphonylureas are not suitable for residents in aged care due to the hypo risk in the context of renal or liver impairment.
- » Sulphonylureas should be taken immediately before a meal, and meals should be regularly timed with equal amounts of carbohydrates to prevent hypoglycaemia.
- » Long-acting sulphonylureas (such as glibenclamide or glimepiride) are particularly hazardous in older people who miss meals, and should be avoided. Where kidney function is reduced, long acting sulphonylureas or their active metabolites can accumulate, putting residents at risk of prolonged hypoglycaemia.
- » Consider whether poor/variable appetite and food intake may be contraindications for the slow release or long acting variations of sulphonylureas.

10. Glucose-lowering medicines for type 2 diabetes



Actions

- Ensure food is provided after the resident takes a sulphonylurea and that they eat appropriate regular meals and snacks.
- Be on the lookout for any episodes of hypoglycaemia.
- Know how to manage/treat hypoglycaemia.
- Document all hypoglycaemia episodes.
- Look for patterns that may indicate a dose reduction is advisable, and refer the resident to their doctor.
- Seek medical advice if the resident is fasting for any reason.
- Monitor weight gain, as this can be a result of the treatment of frequent hypoglycaemia.

(4) Glucagon-like peptide-1 receptor agonists

GLP1RAs have similarities to DPP-4 inhibitors because they work on the incretin system; however, they do this in a slightly different way. The body responds to these drugs in a similar way to naturally occurring incretin hormones, secreting insulin only when the body needs it. These medicines also have an effect to slow the movement of food through the gut, which makes people feel full sooner, so they eat less. These agents also increase satiety, so weight loss is a common side effect. In residents who have poor appetites or lower body weight, this may be an undesirable side effect. In others this may be a compelling reason to prescribe GLP1RAs.

As a result of the selective effect on insulin secretion there is a low risk of GLP1RAs causing hypoglycaemia, unless they are combined with a sulphonylurea or insulin.

The GLP1RAs typically cause people to lose around 3kg in weight and some people lose more.

GLP1RAs are a protein and are inactivated when taken orally, therefore, must be given by injection under the skin of the abdomen.

With twice daily GLP1RAs the resident is started on low dose and this is usually then increased to the full dose a few weeks later. Once weekly injections can be commenced without the need for titration. This is done to minimise the risk of side effects, especially nausea and vomiting. Even with this precaution, some patients may have bothersome nausea and vomiting when they first start treatment, but in around three-quarters of people these side-effects will settle down.

GLP1RAs are not a substitute for insulin, and they are not suitable for people with type 1 diabetes.

10. Glucose-lowering medicines for type 2 diabetes



Generic or chemical name	Some brand names	GLP1RAs lower blood glucose by:	The most common side effects are:
Exenatide Dulaglutide Semaglutide	Byetta, Bydureon Trulicity Ozempic	<ul style="list-style-type: none"> » stimulating the pancreas to produce insulin » reducing the amount of glucagon released from the pancreas » slowing down the movement of food through the gut to allow more steady absorption, which helps the person feel full and reduces appetite. 	<ul style="list-style-type: none"> » nausea, vomiting and diarrhoea » heartburn » abdominal pain » headaches and dizziness » pancreatitis » altered renal function » appetite reduction and weight loss » less effective absorption of other medicines due to slowing the passage of food through the gut.

Precautions

- » GLP1RAs are not recommended for people with severe gastrointestinal disease, severe kidney disease or a history of pancreatitis.
- » If a resident experience any symptoms of acute pancreatitis, such as ongoing, severe stomach pain, a doctor must be notified immediately.

Actions

- The doctor should be notified if the resident experiences nausea, vomiting or diarrhoea that continues for more than 24 hours.
- Monitor for hypoglycaemia if the resident's treatment is combined with a sulphonylurea or insulin. Dose adjustment may need to be considered by their doctor to prevent hypoglycaemia.

10. Glucose-lowering medicines for type 2 diabetes



(5) Sodium-glucose transporter inhibitors

Sodium-glucose transporter (SGLT2) inhibitors are the newest family of medicines for diabetes. Due to their ability to reduce cardiovascular disease and slow progression of kidney disease, they are increasing in popularity. They are recommended as second line medicines after metformin in a broad range of patients.

The SGLT2 inhibitors work by increasing the amount of glucose that is excreted into urine by the kidneys.

SGLT2 inhibitors are usually added to other drugs when diabetes management needs to be improved. Whilst they can be combined with a variety of other medicines, they are most often

given alongside metformin. Because of this, SGLT2 inhibitors are available in combination tablets that also contain metformin. SGLT2 inhibitors come in various combination tablets with other glucose-lowering medicines.

Taken on their own or with metformin, they rarely cause hypoglycaemia, but they may increase the risk of hypo when combined with a sulphonylurea or insulin.

SGLT2 inhibitors can be taken with or without food. Because of the way they work, SGLT2 inhibitors may cause some weight loss, lower blood pressure and have a mild diuretic effect.

Generic or chemical name	Some brand names	SGLT2 inhibitors lower blood glucose by:	The most common side effects are:
Dapagliflozin Empagliflozin Ertugliflozin	Forxiga Jardiance Steglatro	» decreasing the amount of glucose that is re-absorbed from the kidneys so that it goes out through the urine rather than staying in the blood.	» increased urinary tract infections and genital thrush » low blood pressure (especially in those taking diuretics).

SGLT2 inhibitors are also available in various combinations with other glucose-lowering medicines, for example Xigduo (dapagliflozin with metformin); Glyxambi (empagliflozin with linagliptin).

10. Glucose-lowering medicines for type 2 diabetes



Precautions

- » SGLT2 inhibitors should not be taken by people with severe kidney problems. Discuss regular kidney function checks (eGFR) with the treating doctor.
- » SGLT2 inhibitors can be problematic in people who are taking diuretics or who are dehydrated for other reasons as they also increase urine output.
- » SGLT2 inhibitors have been linked to diabetic ketoacidosis (DKA) and in many cases this has occurred in people with near normal glucose levels. Risk factors for the development of DKA in the context of these drugs includes very restricted carbohydrate intake, dehydration, active infection or in those undergoing a surgical procedure.

Actions

- Contact the resident's doctor if they experience any signs or symptoms of metabolic acidosis (such as nausea, vomiting, anorexia, abdominal pain, excessive thirst, difficulty breathing, confusion, unusual fatigue or sleepiness).
- Residents being treated with SGLT2 inhibitors should be assessed for DKA when they are unwell or present with signs or symptoms of metabolic acidosis in order to prevent delayed diagnosis and patient management.
- Contact the resident's doctor if they are taking SGLT2 inhibitors and they experience recurrent or persistent urinary tract infections and/or genital thrush.

(6) Alpha glucosidase inhibitors

Acarbose works to lower blood glucose by blocking the absorption of carbohydrate in the gut.

When used alone, acarbose does not cause hypoglycaemia. However, if used with sulphonylureas it can result in hypoglycaemia.

Acarbose is not widely used as it commonly causes gut side-effects, particularly bloating, wind and diarrhoea; also, because it needs to be taken with each meal, so typically several times a day.

Note: In patients taking acarbose, hypoglycaemia must be treated with pure glucose in the form of glucose tablets, gel or Lucozade™. This is because the action of acarbose prevents any other form of sugar being absorbed rapidly.

Acarbose should be started at a low dose and then increased for maximum effect. It should be taken before meals, swallowed whole with a liquid before the meal, or chewed with the first few mouthfuls of food.

10. Glucose-lowering medicines for type 2 diabetes



Generic or chemical name	Some brand names	Acarbose lower blood glucose by:	The most common side effects are:
Acarbose	Glucobay	» slowing down the digestion and absorption of certain carbohydrates in the intestine.	The major side effects are: » bloating, flatulence (wind) and diarrhoea (these are major problems for many users and the main reason most people stop using acarbose) » hepatitis, so liver function tests should be monitored.

Precautions

Acarbose should not be taken by people with a history of:

- » intestinal obstruction
- » inflammation or ulceration of the bowel (e.g. ulcerative colitis or Crohn's disease)
- » severe kidney disease
- » hernia
- » previous abdominal surgery.

Actions

- Contact the resident's doctor immediately if they are taking acarbose and they experience abdominal or gastrointestinal problems.
- Ensure pure glucose is available for hypoglycaemia treatment if required.

10. Glucose-lowering medicines for type 2 diabetes



(7) Thiazolidinediones (glitazones)

There are two medicines in this family, pioglitazone and rosiglitazone.

These medicines effectively lower BGLs but are now generally only used when other drugs are not suitable, as there are a number of potentially serious side effects (e.g. fluid retention), especially with rosiglitazone.

Glitazones take up to six weeks to start having an effect on BGLs and can be prescribed with metformin and/or sulphonylureas. It does not need to be taken with food.

Generic or chemical name	Some brand names	Glitazones lower blood glucose by:	The most common side effects are:
Rosiglitazone Pioglitazone	Avandia Actos	<ul style="list-style-type: none">» increasing the effect of the person's own insulin by making muscle, fat and liver cells more sensitive to insulin» reducing the amount of glucose released from the liver into the bloodstream.	<ul style="list-style-type: none">» glitazones may cause weight gain. This is not thought to be harmful, but it can be very discouraging» they can also cause fluid accumulation and should not be prescribed for people with heart failure or cardiac disease.

Precautions

- » People taking glitazones have an increased rate of broken bones in the hands, upper arms and feet, which can be particularly problematic in older people. Women are at particularly increased risk.

Actions

- Contact the resident's doctor immediately if they are taking a glitazone and they develop swollen ankles, feet or legs, or experience more difficulty breathing than normal as this may be the result of fluid accumulation.
- Be aware that the resident may need:
 - o nursing measures to ease the problem, such as oxygen or raised feet
 - o to be weighed daily, and their weight recorded until the problem has resolved
 - o special skin care, particularly if the ankles, feet or legs are swollen.

10. Glucose-lowering medicines for type 2 diabetes



Combination medicines

Most people with type 2 diabetes take a combination of more than one glucose-lowering medicine to maintain target BGLs. Some medicines are offered as a combination which includes both classes in one tablet. This also acts to reduce the overall number of tablets the person is taking and can reduce error and confusion about which tablets to take and when.

Examples of these include Janumet, Galvumet and Trajentametet. As all these combination medicines contain metformin, people with contraindications to using metformin should

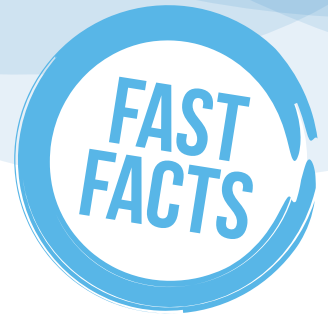
not take any of these combination diabetes medicines. Refer to the previous details in this section in relation to any medicine that may be present in the combination.

Note: many residents may need their medicines to be crushed. However, it is important to remember that not all medicines can be crushed. Always refer to medicine guidelines before crushing.



11. Insulin

11. Insulin



Insulin is produced in the beta cells of the pancreas:

- » in all people with type 1 diabetes, their pancreas cannot produce its own insulin, so they need insulin every day
- » in people with type 2 diabetes, their pancreas is not producing enough insulin, or the insulin is not working well enough
- » at the beginning, many people with type 2 can manage their diabetes with diet and exercise (though some will require glucose-lowering medicines straight away), but as they get older, and their diabetes progresses, they may need glucose-lowering medicines or insulin.

Insulin cannot be taken orally, via tablets or capsules: it must be given using a needle, insulin pen device or pump.

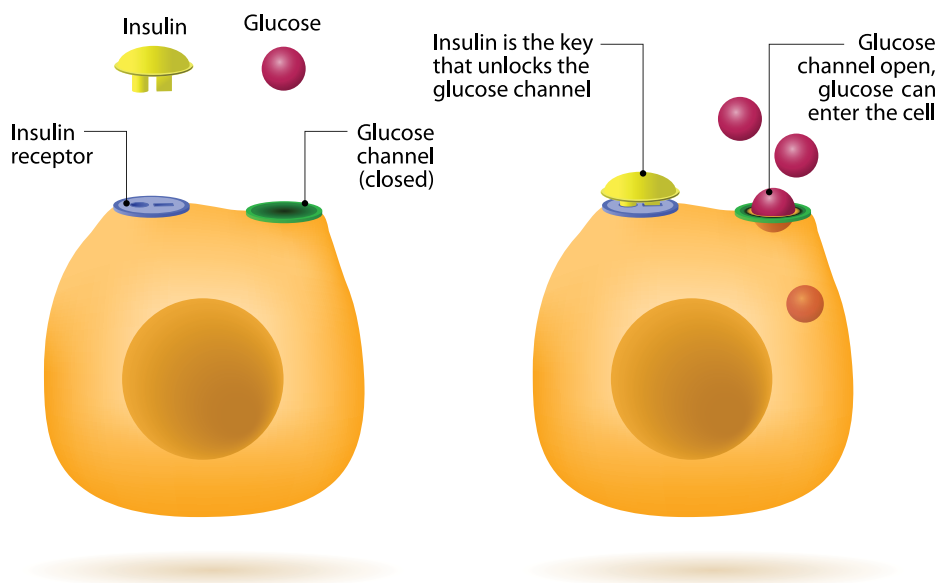
There are different types of insulin, including rapid-acting, short-acting, intermediate-acting, long-acting and pre-mixed insulin.

Depending on the resident and type of insulin and insulin-giving device being used, the insulin may be given once a day or several times a day, depending on their needs.

If you are going to give insulin to residents, you must be trained to do so.

Insulin cannot be taken orally, via tablets or capsules: it must be given using a needle, insulin pen device or pump.

How does insulin work?



11. Insulin



Insulin is produced in the beta cells of the pancreas. Its main functions in adults are to:

- » control the manufacture and release of glucose from the liver
- » control the release of glucagon from the alpha cells of the pancreas
- » facilitate the transport of glucose from the bloodstream and deposit it in the target cells of the body.

In this way, insulin helps to keep the BGLs of the body at an optimal level.

When the body is unable to produce insulin, as in type 1 diabetes, or produce enough effective insulin, as in type 2 diabetes, insulin must be provided from a source outside the body. More than a quarter of people with type 2 diabetes require insulin.

Insulin is metabolised by the kidneys and excreted in urine. As people get older, and as their kidneys age and become less efficient, they metabolise insulin more slowly, which means insulin lasts longer in their bodies. As a result, older people and people with kidney problems may need to reduce their insulin dose.

Insulins are produced in a laboratory and are almost identical to (and therefore classed as) human insulin.

A more recent development has been in analogue or designer insulins. These insulins have had their amino acid sequence manipulated to produce a desired effect. This means the insulin is more rapid-acting, or longer lasting, with a flatter profile. The peak is the time when the insulin is working most effectively, and the risk of hypoglycaemia is at its greatest.

Note: While all insulin has an established mode of action, including onset, peak and duration (as shown in the next table), this is a guide only, and there may be differences between individuals.

If a resident using insulin has regular, unexplained hypoglycaemia episodes, their insulin doses should be reviewed, and renal function assessed by their treating health practitioner.

11. Insulin



Types of insulin

There are several different types of insulin. In Australia all insulin is human insulin (although there is an arrangement for using beef insulin under specific medical advice).

There are different types of insulin available in Australia, and they vary in their profile (action time), as shown below.

Rapid-acting insulin (analogues)

Insulin type	Rapid-acting analogue
Onset	Works within 5–15 minutes after injection
Peak	Peak action within 1–3 hours
Duration	Gone from the body in 4–5 hours
Appearance	Clear
When to administer	Should be injected immediately before a meal (i.e. when the food is on the table or when just starting the meal). If the person does not start eating within 15 minutes of injecting this insulin, they may have a hypoglycaemic episode. This insulin is usually given at breakfast, lunch and dinner, and then a long-acting insulin is given at bedtime. This regimen is commonly used by people with type 1 diabetes.
Generic or chemical name	Brand name
Aspart	Novorapid
Lispro	Humalog
Glulisine	Apidra

Ultra-rapid-acting insulin

Insulin type	Ultra-rapid-acting analogue
Onset	Works within 2–5 minutes after injection
Peak	Peak action within 1–3 hours
Duration	Gone from the body in 4–5 hours
Appearance	Clear
When to administer	Should be injected immediately before a meal (i.e. when the food is on the table or when just starting the meal) but it can be given up to 20 minutes after a meal. If the person does not start eating within 15 minutes of injecting this insulin, they may have a hypoglycaemic episode. This insulin is usually given at breakfast, lunch and dinner, and then a long-acting insulin is given at bedtime. This regimen is commonly used by people with type 1 diabetes.
Generic or chemical name	Brand name
(Fast-acting) Aspart	Fiasp

11. Insulin



Short-acting insulin (human)

Insulin type	Short-acting human insulin
Onset	Works within 30 minutes after injection
Peak	Peak action within 1–6 hours
Duration	Gone from the body in 6–8 hours
Appearance	Clear
When to administer	Should be injected half an hour (30 minutes) before a meal.
Generic or chemical name	Brand name
Human insulin	Actrapid
Regular soluble insulin	Humulin R

Use with caution in residential aged care, especially for residents with kidney disease, due to their long half-life which can cause hypoglycaemia.

Intermediate-acting insulin

Insulin type	Intermediate-acting insulin
Onset	Works within 1.5 hours after injection
Peak	Peak action within 4–12 hours
Duration	Gone from the body in 12–16 (up to 24) hours
Appearance	Cloudy – needs to be mixed gently before use
When to administer	Used in combination with rapid or short-acting insulins for people with type 1 diabetes or type 2 if an intensive insulin regimen is needed. Used for people with type 2 diabetes injected once or twice a day, usually in combination with other glucose-lowering medicines. When used as above, it is most commonly injected either in the evening (at bedtime) or before breakfast, or at both of these times.
Generic or chemical name	Brand name
Isophane	Protaphane
Isophane (NPH)	Humulin NPH

Use with caution in residential aged care, especially for residents with kidney disease, due to their variable peak and long half-life.

11. Insulin



Long-acting analogue insulin

Insulin type	Long-acting analogue insulin
Onset	Works within 1–4 hours after injection
Peak	Peak action – very slight peak
Duration	Gone from the body in 12–24 hours (36 hours for Toujeo)
Appearance	Clear
When to administer	<p>Most commonly injected either in the evening at bedtime or before breakfast. Needs to be administered at a similar time every day. The risk of experiencing hypoglycaemia is reduced in insulins with a flatter profile.</p> <p>Note: Glargine cannot be mixed with any other insulin.</p>
Generic or chemical name	Brand name
Detemir	Levemir
Glargine	Semglee, Optisulin
Glargine (300U/mL)	Toujeo

11. Insulin



Pre-mixed insulin

Mixed insulins are made up using two different types of insulin: one rapid or short-acting combined with an intermediate or ultra-long acting.

With the development of safe pre-mixed insulins, there is rarely (if ever) the need to prescribe two insulins that need to be mixed in a syringe immediately before injection.

There are a number of combinations of insulin that come in pre-mixed insulin pens and injection devices. Almost everyone who needs mixed insulin can be accommodated with a suitable insulin and an easy-to-use device for injection.

Insulin type	Pre-mixed insulin
Onset	Varies depending on combination
Peak	Varies depending on combination
Duration	Gone from the body in 12-16 (up to 24) hours
Appearance	Cloudy
When to administer	<p>Should be gently rolled and rocked before every use to ensure it's mixed together.</p> <p>Commonly given twice a day at breakfast and dinner, but occasionally used three times a day. Less frequently, mixed insulins are used once a day in combination with oral hypoglycaemic medicines.</p> <p>Humalog Mix and NovoMix need to be injected immediately before a meal, as the rules for the rapid-acting insulin component are the same as for rapid-acting insulins.</p> <p>Mixtard and Humulin should be injected half an hour before a meal, as the rules for the short-acting insulin component are the same as for short-acting insulins.</p>
Generic or chemical name	Brand name
Pre-mixed rapid-acting insulins	
Lispro 25%/lispro protamine 75%	Humalog Mix 25
Lispro 50%/lispro protamine 50%	Humalog Mix 50
Aspart 30%/aspart protamine 70%	NovoMix 30
Pre-mixed short-acting insulins	
Neutral 30% /isophane70%	Humulin 30/70
Neutral 30% /isophane70%	Mixtard 30/70
Neutral 50% /isophane50%	Mixtard 50/50

11. Insulin



Insulin type	Pre-mixed ultra-long insulin
Onset	5-15 minutes
Peak	1-3 hours
Duration	Gone from the body in 72 hours
Appearance	Clear
When to administer	<p>Should be gently rolled and rocked before every use to ensure it is mixed together.</p> <p>Given once a day with largest meal of the day (breakfast, lunch or dinner). If needed, the time of day of injection can be changed to coincide with the largest meal of the day.</p> <p>Or, can be given twice a day (with breakfast and with dinner).</p> <p>Ryzodeg needs to be injected immediately before a meal, as the rules for the rapid-acting insulin component are the same as for rapid-acting insulins.</p> <p>As the long-acting component can last for 2-3 days, caution is required for those residents who have to fast for a procedure or lose their appetite. Monitor BGLs closely.</p>
Generic or chemical name	Brand name
Aspart 30%/degludec 70%	Ryzodeg 70/30

New advances in insulin

For many years all insulins have been a standard strength, containing 100 units per mL. A small number of insulins are now available with a higher concentration (e.g. 200 or 300 units per mL), which means that people using these insulins are able to inject a small volume. Using these higher strength insulins is most useful for people who need high doses of insulin.

Research suggests that reducing the volume of the injection can improve insulin absorption and reduce glucose variability. These concentrated insulins, such as Toujeo, are now widely used in Australia.

11. Insulin



Administering insulin

Follow the 'five rights', or your organisation's policy and procedures, when administering insulin or any medicine:

Staff should administer:

- » the correct medicine
- » to the correct person
- » in the correct dose
- » by the correct method
- » at the correct time.

Where to administer insulin

Where possible, RACF residents should be supported to continue to self-manage their diabetes, including self-administering insulin when/while they can.

Residents should be informed and supported and, where required, assisted by staff to monitor and check their injection sites. Follow these tips and traps.

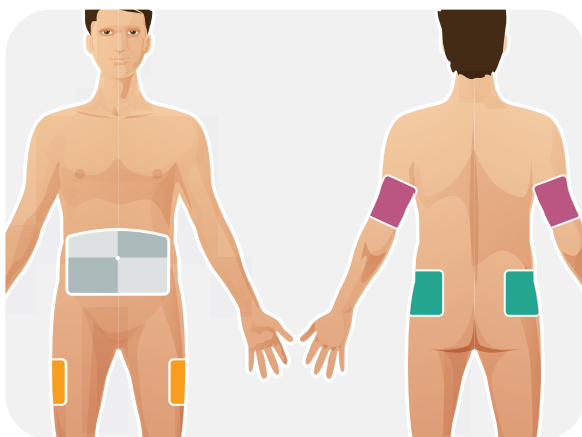
Sliding scale or supplementary insulin dosing should be used with extreme caution in residential aged care due to the potential increased risk of hypoglycaemia.

11. Insulin

MORE
DETAILS

Tips & traps: Injecting insulin

- A new needle must be used for each injection.
- Insulin is best administered in the abdomen because it provides a more regular rate of absorption, as it is not as affected by muscle action. Insulin can, however, be injected in the leg, buttock or arm. The leg or buttock can be useful for night-time administration.
- The injection site should be changed with each injection, rotating around the abdomen. The resident should be given clear information and education about the need to assess injection sites.
- The area immediately around the belly button should be avoided, as should the groin area, stretch marks and any scar tissue.
- Check the skin on and around the chosen site before injecting. Do not inject into any lumps under the skin, or bruises (lipohypertrophy) as this can cause an irregular insulin uptake and should be avoided until the lump subsides.
- Lumps are most easily detected by gently palpating the resident's abdomen (or other injection sites) while they are standing upright or lying flat. This simple test can be carried out:
 - o once a week for residents who are injecting insulin four or more times a day, or
 - o between once a fortnight and once a month for residents having insulin injected less than four times per day.
- Where lumps occur (related to insulin use), this indicates the same area has been used too frequently for injections. This area should be avoided until lumps have disappeared.
- Lumps may also be detected by sight. Take the opportunity to look for lumps and palpate whenever practical (for example, during assisted showering), and educate the resident so they can detect the lumps themselves, if appropriate.



- 1 Abdomen
- 2 Thighs
- 3 Arms
- 4 Buttocks



11. Insulin



Hypoglycaemia and insulin administration

Timing of insulin doses is extremely important in reducing risk of hypoglycaemia and reducing the variability of blood glucose levels for residents.

1. Administering insulin at the same time from day to day ensures the action of the insulin remains relatively consistent.
2. Administering rapid acting or pre-mixed (analogue) insulins too soon before the resident eats puts them at risk of a hypo. For example, injecting NovoMix30 over 15 minutes before they start eating their breakfast.

Tips & traps: hypoglycaemia and insulin administration

It is unlikely you would need to withhold insulin after a hypoglycaemic episode.

First, treat the hypo, and then give the prescribed insulin dose immediately before or with the meal. See [Chapter 7](#) for more detail.

Always seek medical advice before withholding insulin. Occasionally a dose reduction may be indicated and will be directed by the treating doctor.

If an area of lipohypertrophy has been detected, the resident's insulin doses may need to be reviewed and decreased once injections are administered into a non-affected site.

Choosing an insulin device

Insulin can be administered by syringe, insulin pen device or an insulin pump.

While insulin syringes are available in Australia, they are best avoided in residential aged care because:

- » they do not come with a needle length less than 8mm, where 4-6mm length is recommended
- » there is a potential and serious risk of dosing error when drawing up insulin, especially as more concentrated insulins are becoming available (e.g. Toujeo).

Insulin pen devices make injecting simpler and more convenient. Re-usable insulin pen devices are used with 3ml insulin cartridges. Insulin pens are made to fit specific brands of insulin and are not interchangeable. Pen needles can be used with any brand of pen and are available in 4mm, 5mm and 6mm lengths.

Injecting knowledge and skills training should be provided at least annually for all involved, including residents, carers and staff. This training is best provided by a credentialed diabetes educator, but it could be delivered by a doctor, nurse practitioner or endocrinologist.

Insulin pen devices

All insulins in Australia are available in pre-filled disposable pens/devices. Pre-filled pens manufactured by different companies have slight differences but operate in the same way and are easy to use. The InnoLet device for protaphane and Mixtard insulins, incorporates a dial for dosing which is different to other pen devices. They can be obtained from pharmacies on prescription. Pre-filled pens/devices are included in the cost of the dispensed insulin.

11. Insulin



Some insulins also come in refills (pen-fills) for non-disposable pen devices. Non-disposable pen devices can be obtained through pharmacies that are NDSS Access Points. These non-disposable pen devices are available free-of-charge.

Pen needles are available in a range of sizes (i.e. 4mm, 5mm, 6mm, and 8mm lengths). Use of 4mm, 5mm or 6mm needles is recommended.

Pen needles are obtained free-of-charge for people with diabetes who are enrolled in the NDSS with specified details that injectable glucose-lowering medicine is required. Pen needles can be obtained through NDSS Access Point pharmacies. Refer to [Chapter 21](#) for more NDSS information.

Pen devices and cartridges are to be used by one person only and should never be shared due to the risk of cross-contamination. This applies even if a new needle is used for each injection.

Syringes and pen needles are for single use only.

Needle-stick injury can be minimised by nurses' use of safety needles or safe needle disposal systems (e.g. sharps containers with clamps). Residents who self-administer should safely dispose of their own needles. Safety needles are not designed for self-administration.

Note: There is different legislation governing medicines in each state and territory. For information about the control, use and administration of insulin in your location, you should refer to the relevant drugs and poisons Act. As each RACF's policies and procedures must comply with the legislation, you should adhere to your RACF's policy in relation to administering insulin and all other medicines.

Facility considerations

Development, implementation and evaluation of appropriate policies and procedures for RACFs and education strategies to ensure effective care is provided.

Organisations should protect the person with diabetes, the public and staff from blood-borne illness and disease by ensuring their specific injection control policies reflect best practice and evidence. Employees should have access to training that supports best practice.

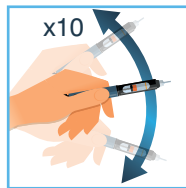
11. Insulin



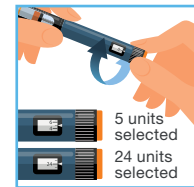
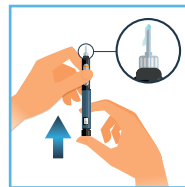
How to use an insulin pen or device

Correct injection technique is important to ensure optimal diabetes management.

- 1 Mix with gentle roll, mix cloudy insulins only (novomix 30, protaphane).



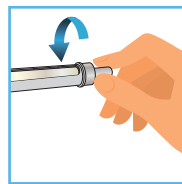
- 3 Prime needle with 2 units, holding pen upright dial up dose: second nurse to check.



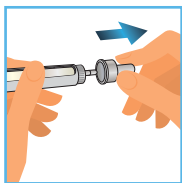
- 2 Attach a new needle (**Note:** safety needles and safe needle disposal systems are available to minimise risk of needle stick injury).



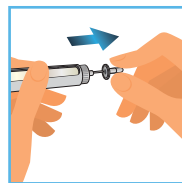
a. Remove paper tab



b. Screw onto pen

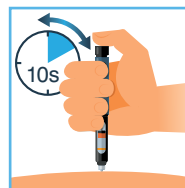


c. Remove outer cap



d. Remove inner cap

- 4 Inject and hold for 10 seconds.



- 5 Safely remove and dispose of needle if using safety needles, see manufacturers guidelines.



11. Insulin



Tips & traps: Good injecting technique

- Avoid injecting insulin into the muscle, by choosing your site carefully and:
 - o use a shorter needle length (4mm - 6mm), or
 - o use a skin fold and/or inserting the needle on an angle.
- Use a site rotation tool to document each injection to avoid lumps and bruising.
- Routinely inspect injection sites for lumps, and document any lumps so they can be avoided.
- Remove and safely dispose of the needle immediately after injection – DO NOT recap the insulin pen needle.
- Insulin and pre-filled insulin devices in current use should be kept at room temperature, up to 30 degrees, and discarded after 28 days; put a label date on an insulin pen whenever you first use it.
- Insulin and pre-filled insulin devices not in current use should be kept in an appropriate fridge but DO NOT allow them to freeze.
- Do not use insulin if it:
 - o will not mix
 - o is frozen or has previously been frozen (see the temperature log for the insulin fridge)
 - o has been exposed to heat above 30 degrees
 - o has formed crystals that will not dissolve when mixed
 - o is discoloured, usually with an orange tinge.

In these cases, the insulin should be returned to the pharmacy.

- Bruising occasionally occurs. This is more common in residents who are taking blood thinners. It is not usually a cause for concern unless it happens constantly for no apparent reason. All bruising should be documented.

11. Insulin



Insulin pumps

There are many brands of insulin pumps available in Australia. While they are all slightly different, they basically operate similarly.

Insulin pumps are designed to deliver a dose of background rapid-acting insulin (the basal dose) continuously. The basal rate can be increased or decreased for different periods of the day. Additionally, extra doses of the rapid-acting insulin are delivered at mealtimes, or when needed (bolus dose).

Insulin pumps have a reservoir of rapid-acting insulin. The pump is connected to the body via a thin plastic tube and a cannula inserted subcutaneously, usually in the abdomen. This tube and cannula must be changed every two to three days. If left in place longer, there is an increased risk of problems with insulin delivery, infection and abscess at the insertion site.

Insulin pumps are more commonly used by people with type 1 diabetes (but not by everyone with type 1 diabetes). They are not commonly used for people with type 2 diabetes. Decisions about using insulin pumps are made by specialist diabetes health practitioner teams together with the person with diabetes.

Insulin pumps can enable better blood glucose

management, but they require diligence on the part of the person using them. If used poorly, a pump will not deliver a better blood glucose result than multiple daily injections.

Pump consumables (parts that need to be changed regularly) are subsidised through the NDSS for those who are eligible (type 1 diabetes).

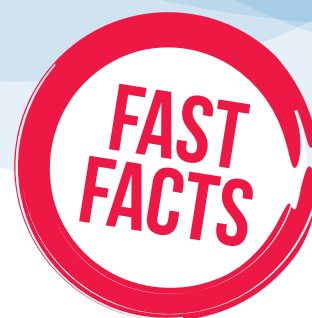
An older person using an insulin pump who is moving to an RACF will need a higher level of care, support and supervision. A medical review should be undertaken when they are admitted assessing the person's capacity, ability and willingness to continue to self-manage their diabetes. This includes their insulin pump, their level of blood glucose management and whether alternative insulin management is indicated. This should be done in consultation with the person and their family or support network.

A competent resident in an RACF, maintaining target blood glucose levels, may choose to continue to self-manage using an insulin pump, and be effectively supported by appropriately qualified staff to do so.



12. Complications and screening

12. Complications and screening



Managing diabetes well helps to prevent or delay diabetic complications, and to reduce their severity. High blood glucose, with any type of diabetes, can damage parts of the body. High blood glucose over an extended period can damage blood vessels.

This in turn results in damage to the organs reliant on those blood vessels. Diabetes accelerates many age-related health issues.

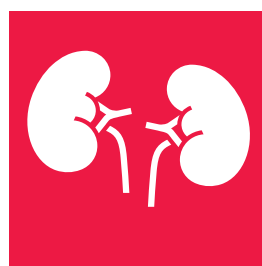
Diabetes complications can include:



heart attack, stroke or heart failure



vision problems



kidney disease and kidney failure



decreased blood supply to the legs



gastrointestinal problems



sexual health problems



dental problems



increased risk of deafness



increased risk of infection



various skin problems



increased risk of depression and dementia

All people with diabetes should have annual complications screening by their health care team to identify and monitor any issues.

12. Complications and screening



Research has demonstrated that optimal management of diabetes helps to prevent or delay complications and reduce their severity.

Diabetes-related health problems include:

- » heart attack, stroke or heart failure
- » vision problems, such as retinopathy, maculopathy, cataract leading to blindness
- » kidney disease and kidney failure
- » decreased blood supply to the legs which can lead to blood vessel and nerve damage to the feet causing ulceration, poor wound healing and the risk of amputation
- » gastrointestinal problems
- » sexual health problems in both genders
- » dental problems
- » increased risk of deafness
- » increased risk of infection
- » various skin problems
- » increased risk of depression and dementia.

Best practice in diabetes management recommends an annual 'complications screening' by a doctor to assess metabolic control and the presence of diabetes-related health problems. These tests are important in managing, preventing or minimising the risk of long-term complications developing in older people.

Complication screening involves an annual assessment, or cycle of care, that may include:

Glycaemic management

Glycated haemoglobin (HbA1c) is assessed via venous blood and should be taken six-monthly for people with well managed diabetes and three-monthly for people with less stable diabetes.

For most people, the target HbA1c is less than or equal to 7.0% (53mmol/mol). However, in residents of aged care, this may be too restrictive and may result in frequent hypoglycaemic episodes, particularly concerning if there is an underlying cardiac condition. If the resident is not suffering any discomfort – such as thirst, polyuria, thrush, tiredness or delayed healing of wounds – an HbA1c of 7.0- 8.0% or 53- 64 mmol/mol is acceptable. For residents who are very frail, have a number of comorbidities and limited life expectancy, an HbA1c target of 8.5% or 69 mmol/mol is recommended.

Lipid profile

Lipid profile should be assessed at least annually for people with a normal lipid profile, or six to twelve monthly for people who have an abnormal lipid profile or who are being treated with a lipid-lowering agent. A healthy lipid profile is one with a total cholesterol (TC) of less than 4.0 mmol/L, low density lipoprotein (LDLs) less than 2.0 mmol/L for primary prevention and less than 1.8 mmol/L for secondary prevention (i.e. residents who have suffered an atherosclerotic adverse event such as a heart attack or stroke). High density lipoprotein (HDLs) greater than 1.0 mmol/L and triglycerides less than 1.5 mmol/L represent the current targets.

12. Complications and screening



Renal function

Renal (kidney) function should be checked at least annually for serum creatinine/eGFR and microalbuminuria/proteinuria (types of protein increased in the urine). If the resident already has evidence of microalbuminuria or proteinuria, three to six-monthly checks are recommended.

Liver function

Routine monitoring of liver function tests in residents with type 2 diabetes should occur at the start of drug therapy, and annually for residents with diabetes as part of complications screening. Some oral hypoglycaemic agents, such as metformin, may not be recommended in people with impaired liver function.

Blood pressure

Blood pressure should be measured three monthly for residents with hypertension (high blood pressure).

Treatment goals for a resident with diabetes are less than or equal to 140/90 mmHg and 130/80 mmHg for those with established cardiovascular or kidney disease, although once again, targets should be individualised.

Foot assessments

For residents without known foot problems, foot assessments should still be undertaken by a podiatrist once a year.

Residents with a history of foot problems should be assessed every three to six months. Problems might include Charcot's joint, ulcers or amputation, or active foot problems such as deformities (including bunions or hammer toes).

A similar schedule should be adopted for residents with peripheral neuropathy or peripheral vascular disease. The podiatrist will advise on the most appropriate review schedule.

These foot assessments should be in addition to daily foot hygiene routines.

Eye examinations

Eye examinations should be performed by an optometrist or ophthalmologist on diagnosis and every second year if no retinopathy is found. If minimal non-proliferative diabetic retinopathy (NPDR) is found, eye examinations should be annual. If moderate NPDR or proliferative diabetic retinopathy is found, the resident should be referred by their doctor or optometrist to an ophthalmologist as soon as possible.

Depression and anxiety

Depression and anxiety disorders in residents should be assessed by a qualified mental health professional, ideally by an aged care psychiatrist or a clinical psychologist. Following this, appropriate treatment and management can be planned.

Symptoms of depression or anxiety can be monitored using self-report questionnaires, such as the:

- » Geriatric Depression Scale
- » Geriatric Anxiety Scale
- » Hospital Anxiety and Depression Scale.

12. Complications and screening



Cognitive status

A cognitive function assessment should be undertaken by a doctor to assess residents as part of planning their diabetes care and education.

It is important to use a test geared to the individual and to undertake this at a time and place that best reflects their full ability and capacity. The resident should ideally not be affected by adverse circumstances, such as tiredness, an over-stimulated or unfamiliar environment, an unknown care provider, or the presence (or not) of a family member or support person.

Risk factors for altered cognitive function include:

- » older age
- » vascular disease
- » hyperglycaemia
- » hypoglycaemia
- » how long the resident has had diabetes.

Tests of general cognitive function can include:

- » Mini-Mental State Examination
- » Abbreviated Mental Test Scope
- » General Practitioner Assessment of Cognition
- » Rowland Universal Dementia Assessment Scale (useful for people from non-English speaking backgrounds)
- » Psychogeriatric Assessment Scale
- » Montreal Cognitive Assessment (specially to assess mild cognitive impairment)
- » Confusion Assessment Method
- » Montreal Assessment Tool.

Other assessments

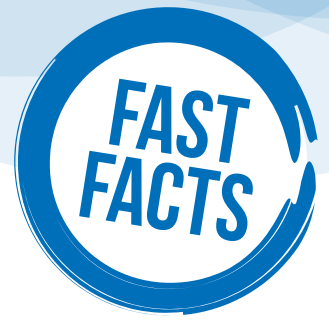
Other assessments of residents with diabetes that can be undertaken include reviews of:

- » nutrition and weight
- » diabetes self-care capacity
- » the sick day management plan
- » oral health
- » immunisation status
- » hypo risk assessment.



13. Healthy eating

13. Healthy eating



Healthy eating and diabetes

People with diabetes should eat the same healthy foods as other residents: they do not need a special diet, and they can eat desserts and some sugar in foods.

It is common in aged care for residents to lose their appetite or have problems with swallowing, saliva flow and oral health or dental issues. If a resident express concern about any of these, or

they are evident to you, let a supervisor know.

Losing weight when you are older can sometimes do more harm than good. If residents lose muscle, this can affect their functional ability and make them more prone to falls.

Read the following 'Tips & traps' for advice about how to help residents maintain a healthy diet.

Tips & traps: Encourage healthy eating

- Meals, drinks and snacks can be the thing most residents in aged care look forward to each day so always do everything you can to make that time as enjoyable as possible.
- Ensure that the dining environment (whether a dining room or tray set up) is as pleasant as possible and that everything is within easy reach, packets opened, lids removed.
- For resident's with limited vision, provide a clear description of the meal and where each item is in front of them.
- If the resident has dentures, make sure they are in place, and that they are clean and fit well. It is important that they are checked regularly.
- Check that the resident has no mouth problems, such as a dry mouth, furred tongue, ulcers or tooth decay. Make sure their mouth is moist before meals.
- If the resident has a small appetite, provide smaller, attractively presented meals.
- If a resident has difficulty swallowing, has wet or 'gurgly' sounding voice or increased coughing/choking during a meal, refer them to a speech pathologist for assessment.
- Where swallowing difficulties necessitate alteration to the texture of food and drinks, always ensure you let the resident know what they are eating or drinking, if the modification has altered its appearance, and encourage intake to avoid the resident missing out on nutrition and hydration.
- Carbohydrates provide energy and are an important source of fibre, vitamins and minerals. Carbohydrates can be found in potatoes, corn, bread, pasta, rice, cereals, lentils, fruit, milk and yoghurt.
- The amount of carbohydrate in the food residents eat has the biggest effect on their blood glucose:
 - o too much carbohydrate can cause blood glucose levels to rise
 - o too little carbohydrate can cause blood glucose levels to fall.
- For residents who are on a glucose-lowering medicine (insulin or a sulphonylurea), skipping their meals could cause hypoglycaemia. If they do not eat their meal, encourage them to have some carbohydrate from a different source (for example milk shake, toast or bread, fruit juice, custard or dessert).

13. Healthy eating



For residents with diabetes it is vital to avoid the impacts of low blood glucose, however using dietary strategies to avoid high blood glucose can come at a cost to adequate nutrition and hydration.

It is essential that all residents are provided with adequate nutrition and hydration to support their physical and mental health and to minimise the risk of pressure injury, falls and ill health. All residents are at increased risk of nutritional deficiencies including Vitamin B12, D and C, magnesium, iron, zinc, calcium and folate.

Poor appetite and reduced thirst acuity can significantly reduce the intake of food and fluids and are common among aged care residents. Dehydration can have serious consequences-impacting cognition, wound healing and falls risk. Weight loss even in residents assessed as being overweight or obese contributes to loss of body muscle which can worsen diabetes symptoms as well as contribute to falls, pressure injury and illness.

An assessment by an accredited practicing dietitian (APD) to determine a resident's individual dietary and nutritional requirements is an important part of diabetes management in aged care. A dietitian needs to be involved where a resident requires texture modified food and/or drinks, or where dietary supplements are ordered to ensure appropriate and adequate food and fluids are available.

Many residents may have medical, cognitive and physical impairments that mean they are less able to achieve an adequate intake of food and drink. They may require assistance with eating and drinking, prompting or adjustments to the texture or style of food.

In those requiring assistance or extra encouragement to achieve adequate intake the role of staff providing that with empathy and attention to the dignity of the resident at all times

cannot be understated. Kind encouragement, a smile, care and attention to the dining environment and anything else that achieves a few more mouthfuls is just as important as the food.

For residents with type 1 diabetes, or those with type 2 at risk of hypoglycaemia (identified in a hypo risk assessment) every missed mouthful increases their hypo risk so your role in ensuring food and drinks are consumed is vital.

Individual assessment is always important but in most cases the goals of diabetes management in aged care should be to avoid dietary restriction and tight control practices due to the higher risk of malnutrition.

Dietary goals for residents with diabetes

Some of the goals of nutrition in aged care are the same as the eating advice provided to all older people. The need to focus on sugar itself is less important in aged care than is the overall meal plan and especially providing quality food that people enjoy.

Malnutrition and dehydration are significant problems in aged care and there are many contributing factors with serious consequences. The situation is no different for those with diabetes, and for them, dietary restriction can increase the chance of malnutrition/dehydration occurring, so it needs to be avoided.

What is vital is that the food/drink in aged care provide adequate protein, energy and micronutrients to all people living there. Residents tend to eat better when they are provided foods they recognise and enjoy, that bring back good memories and that they can easily chew and swallow. When they need assistance, they eat better with encouragement and respectful help.

13. Healthy eating



Foods considered treats can be of great benefit in supporting an appetite in decline and thus have an important place for many residents, including those with diabetes.

The primary focus of all decisions around food for those with diabetes must be on meeting the overall nutritional needs of the resident, rather than tight control of blood glucose levels. It is preferable to make medicines changes rather than impose dietary restrictions to control blood glucose levels.

The standard menu, including snacks and desserts will be suitable for all residents, including those with diabetes. There is no need to provide a specific 'diabetes' diet.

Some residents with diabetes have additional dietary considerations. For instance, they may need more frequent and/or regular meals, snacks and drinks as part of their diabetes management plan, outside the normal mealtime routine of the facility. This additional food and drink is vital to them avoiding hypoglycaemia.

Specific nutrients

Protein

Older adults need more protein than younger adults. Those who are ill, have wounds or recovering from illness or a fall can need significantly more again to assist repair and recovery. As a result, protein foods should feature at every meal and sometimes an addition between meals or as a supplementary drink may be required.

Where there has been weight loss or for those with pressure injuries, a dietitian can assist to determine the appropriate protein and nutritional intake to assist.

A protein intake of about 1.2g/kg body weight per day is ideal for older adults in aged care.

Carbohydrates

Carbohydrate requirements depend on gender, body size and composition, activity levels and weight gain or loss so should be individualised. In general, they should make up between 40-50% of the diet.

What is most important in diabetes in aged care is not the type or food source of the carbohydrate but the total amount, which again needs to be individualised.

Carbohydrate foods must be provided at each meal and in between meals for those with type 1 diabetes, or those at risk of hyperglycaemia.

Fat

For all residents, advice on fat intake needs to adopt a wider perspective including considering quality of life, risk of malnutrition, life expectancy, and cardiovascular disease risk among other factors. What is vital is that the enjoyment of food is maintained to avoid impacts on nutritional status.

Weight loss is to be avoided in residents – whether they have diabetes or not- and fat provides useful kilojoules (kJ) and adds appeal to many foods which assists weight management.

Fibre

Bowel issues are common among residents in aged care. Ensuring adequate dietary fibre to maintain regular bowel habits and help regulate blood glucose is important. The amount of fibre needs to be individualised and, if it needs increasing do it gradually while ensuring adequate fluid intake.

13. Healthy eating



Textured/modified and special diets

The input of a dietitian is important where textual alterations are made to food and drinks and where supplements/enteral (tube) feeding are being considered. A dietitian can ensure that the needs of an individual's diabetes and their nutrition/hydration are balanced.

Some thickening products are made from food starch that is metabolised into glucose and can potentially contribute to hyperglycaemia

There are a number of diabetes-specific supplements and enteral diets that may be required in the short or long- term. These are preferable to standard formulas because they have a lower impact on blood glucose levels.

Menu planning in aged care

Menu planning is a complex task. It needs to consider not only nutritional requirements and diabetes management but also the resident's food preferences and choice, their enjoyment, consumption and tolerance of their meals, as well as their fluid intake.

It is important that the menu planning process takes into consideration the needs and choices of all residents, including those with diabetes.

Food and nutrition have a role in meeting the physical and functional needs of resident's in aged care and adding to their quality of life.

In line with the Aged Care Quality Standards, RACFs need to uphold their responsibility of providing safe, adequate, nutritious and enjoyable food and involve residents in planning and delivery of meals. Residents need and should be provided with the right food to maintain their health and wellbeing and help to manage their diabetes. Unnecessary restrictions can result in poor intake and subsequent malnutrition.

Menu and nutritional quality care review

An Accredited Practising Dietitian (APD) has the qualifications, knowledge and skills to provide an expert nutritional assessment and dietary advice.

APDs are able to:

- » assess individual nutritional requirements (including interpreting laboratory tests about micro-nutrient status)
- » develop individualised eating plans
- » assess the physiology and impact of disease on macro-and micro-nutrient digestion, absorption and metabolism
- » assess appropriate enteral formulas and regimens
- » provide expert advice on menus to meet the food and nutrition needs of residents with diabetes
- » carry out a comprehensive menu review.

13. Healthy eating



More information

Following are resources for more information on nutrition and diet:

- » Healthy eating & diabetes: a guide for aged care facilities (2012)

Published by the Diabetes Centre at the Queen Elizabeth Hospital, South Australia, this guide specifically looks at the needs of people with diabetes in aged care. It covers hypoglycaemia and hyperglycaemia, sick days and some recipes

- » Best Practice Food and Nutrition Manual for Aged Care Facilities 2018 Bartl and Bunney.

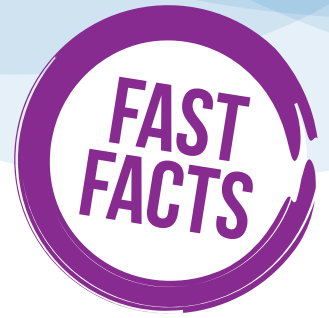
Actions

Discuss with a dietitian and a diabetes educator the best meal choice and 'back-up plan' depending on the resident's medicines and individual appetite, likes and dislikes.



14. Sexual health

14. Sexual health



Sexual health is often overlooked in residents who live in aged care. However, sexual health and sexual health problems should be assessed and managed in the same way as any other health concern.

Sexual health includes being able to maintain healthy intimate relationships. Sexual function is affected by low and high BGLs (blood glucose levels) and by long-term diabetes complications. Sexual health problems caused by diabetes complications can include erectile dysfunction in men and vaginal dryness in women.

Actions

- Make sure sexual health is acknowledged as important.
- If you think a resident is having sexual health problems, tell your supervisor.

14. Sexual health



Diabetes can have an effect on sexual desire and function in both men and women.

Common causes of sexual difficulties in people with diabetes

Sexual health problems, such as erectile dysfunction, prior to diagnosis, or before blood glucose is managed effectively, can result from:

- » persistent high BGLs
- » overweight or obesity, particularly around the abdomen
- » regular intake of alcohol, particularly if this is consistently above the recommended guidelines
- » smoking
- » hypertension
- » some medicines, particularly those used to reduce blood pressure
- » physical tiredness
- » stress
- » vaginal thrush.

After many years of diabetes, any of the above plus:

- » in men, damage to the blood vessels and nerves of the penis
- » in women, damage to the blood vessels and nerves of the vulval area
- » in both women and men, kidney disease.

Suggestions for treatment

There are a range of treatments for erectile dysfunction in men. Much less is known about the underlying cause of sexual problems in women. Treatment for women may include the use of antifungal creams and vaginal lubricants.

Sexual health and sexual problems should be assessed and managed in the same way as any other health concern. Health practitioners should undertake a sexual health assessment for people with diabetes, including older people, as part of their annual diabetes review and when sexual health problems are identified.

Sexual health and sexual problems should be assessed and managed in the same way as any other health concern.

14. Sexual health



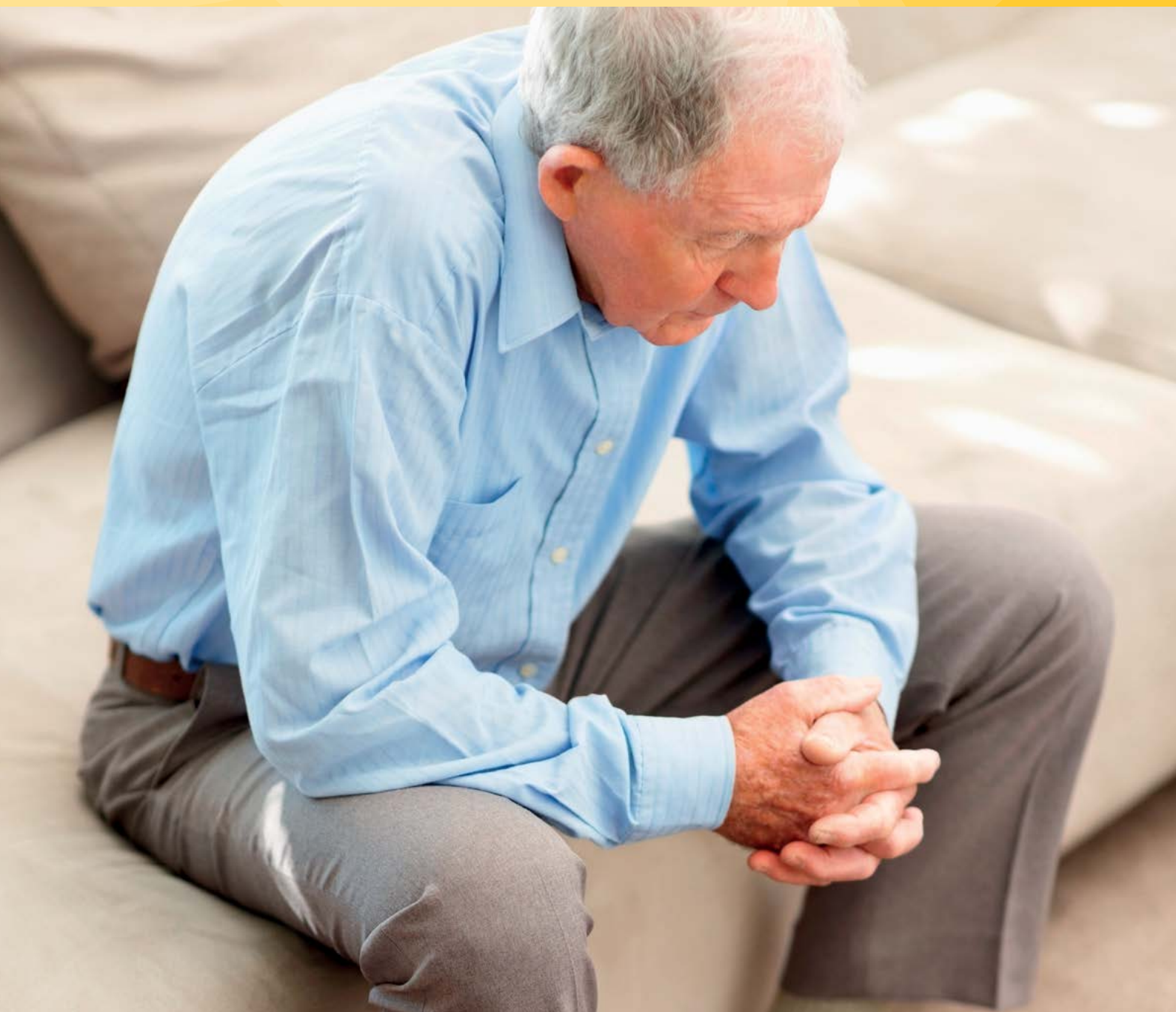
Treatment may include:

- » medicines for male sexual dysfunction, such as:
 - o oral medicines for example sildenafil (Viagra, for example) or tadalafil (Cialis)
 - o penile injections such as Caverject Impulse.
- » mechanical means, such as:
 - o penile pumps
 - o penile implants.
- » referral to a sexual health therapist/counsellor
- » antifungal medicines for women for treatment of any fungal infections
- » vaginal lubrication to reduce dryness and discomfort. Intercourse can cause damage and make sex unpleasant (which decreases the woman's desire), and breaks in the vaginal mucosa are a potential site of infection
- » counselling to assist in reframing sexual relationships and sexual activity. Body image can also be important in older people.

As people age, and as relationships change over time, it is natural for sexual relationships to undergo changes and these may or may not worry the people concerned. If changes to sexual desire and function are sudden, unexpected or distressing to the resident, this should be investigated.

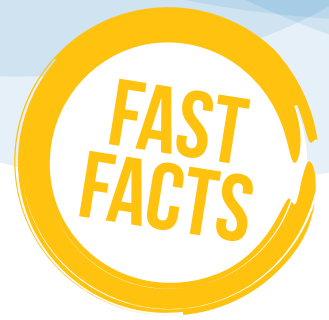
Actions

- Understand that discussion about sexual health with any person living with a chronic condition is part of their health care.
- Recognise that sexual health and sexual identity can be a significant part of older people's lives, including those living in aged care facilities.
- Undertake a sexual history as part of each resident's diabetes annual review.
- Give residents the opportunity to feel comfortable raising or discussing concerns they may have about their sexual health.
- Make sure older people have access to a safe and private environment where they can sexually express themselves.
- Include information about diabetes and its potential impact on sexual health as part of diabetes education for older people.
- Refer residents to an appropriately trained sexual health practitioner or counsellor, where indicated.



15. Mental health

15. Mental health



Depression is a condition that may affect diabetes and also be affected by diabetes

Symptoms of anxiety and depression in older people are sometimes not recognised because they are seen to be part of ‘getting old’.

It is important to tell a supervisor if you notice the following signs or symptoms in a resident:

- » sadness
- » tiredness or sleeping a lot
- » trouble falling or staying asleep
- » unexplained aches and pains
- » slowed movement or speech
- » reluctance to participate in activities
- » loss of appetite or not eating
- » neglecting personal care (if they usually do this)
- » a fixation on death or talking about self-harm or suicide.

You can also help residents manage their own health by:

- » detecting and reporting early any changes in their:
 - o behaviour
 - o mood
 - o sleep patterns
 - o appetite
 - o pain
 - o BGLs
 - o physical symptoms.
- » ensuring medicines are taken as prescribed
- » encouraging residents to eat healthy and nutritious meals (see **Chapter 13 health eating**)
- » providing opportunities for social activity and engagement with other residents, and their family members or support network (for example, encouraging them to eat meals in the dining room rather than alone)
- » encouraging their active engagement in other preferred solitary or group activities, such as reading, arts and crafts
- » providing regular opportunities for physical activity.

Symptoms of anxiety and depression in residents are sometimes not recognised because they can be seen as part of ‘getting old’

15. Mental health



Maintaining optimal mental health is as important in older age as at any other time of life. In older people, depression and anxiety can have a significant impact on their ability to self-care and self-manage their diabetes and other health conditions, placing them at increased risk of additional medical issues. Changes in cognition may further impact on mental and physical health and functioning.

Unfortunately, many people feel there is a stigma attached to depression and other mental health conditions, viewing them as a weakness of character rather than a health problem. Older people can be more hesitant to share their experiences relating to anxiety and depression with others, often ignoring symptoms over long periods of time and only seeking professional help when things reach crisis point. As a result, depression and other mental health problems in this population are under-identified by health practitioners and older people themselves.

Mood disorders (including depression and anxiety)

Mood and anxiety disorders should not be assumed to be a normal part of ageing: residents should be comprehensively assessed to identify appropriate treatment and management options.

Depression is common throughout the Australian population. One in five Australians will have depression at some time in their adult life, with older people at higher risk. It is estimated that between 10% and 15% of older people experience depression, but this rate increases to around 35% among people living in RACFs.

Mood disorders such as major depression can have a significant impact on a person's physical health and vice versa. Research shows that having diabetes more than doubles the risk of developing depression. Conversely, depression

can be a factor in the onset of type 2 diabetes.

Factors that can contribute to and/ or worsen symptoms of depression and anxiety may include:

- » moving into residential aged care
- » feeling unwell
- » experiencing pain
- » declining mobility and sensory abilities
- » being in a chronic state of stress
- » worry
- » experiences of grief and loss
- » a decrease in cognitive ability
- » fewer social relationships and less engagement in meaningful activity.

Identifying depression in older people

Depression differs from normal fluctuations in mood by the severity, persistence of symptoms and interference with psychosocial functioning. Diagnostic criteria either, ICD-10 or DSM-5, are used to assess major depression and other mental health conditions by psychiatrists and may be referred to by other mental health practitioners such as clinical psychologists.

A person's symptoms may be consistent with a diagnosis of a depressive episode or major depressive disorder according to ICD-10 and DSM-5 criteria, respectively, if for more than two weeks they have experienced one of the following, most days, most of the time:

- » felt sad, down or miserable most of the time
- » lost interest in life
- » experienced fatigue or low energy (more than usual).

If any of these are present, consideration is then given for the following symptoms.

15. Mental health



These relate to the severity of depression:

- » impaired sleep
- » persistent thoughts of death
- » impaired concentration or memory
- » lost interest or pleasure in most of their usual activities
- » reduced or increased appetite
- » agitation or slowing of movements
- » guilt or self-blame.

It is important to watch for changes in a resident's mood or behaviour. Symptoms may be different for each individual. Monitoring changes in mood and behaviour on an individual basis is essential, along with advocating for timely assessment and treatment, as this can greatly improve their wellbeing and quality of life.

Other psychiatric disorders

Research suggests that psychiatric disorders can be a risk factor for diabetes, as well as being a complication of diabetes. Mental illness – and the antipsychotic medicines widely used to treat a variety of psychiatric conditions – can contribute to people having blood glucose levels outside of their target range and can result in increases in diabetes-related complications.

Psychiatric disorders in older people can lead to increased social deprivation, poor quality of life, cognitive decline, disability, increased risk for somatic and mood disorders, and increased risk of self-harm and/or suicide. As with mood disorders, the clinical picture of psychiatric disorders in older people may be different from the picture in younger adults. Symptoms may appear less, or milder, and therefore are often under-reported to health practitioners by staff. Although many RACFs monitor and document a resident's altered behaviour, it is important not to dismiss noticeable changes as being part of the person's particular 'behaviour' or 'ageing'.

Residents may be hesitant to share their experiences relating to anxiety and depression with others.

Mental illness may contribute to people having significantly poorer health than people without mental illness. They may also have a shorter life expectancy due to cardiovascular disease, which is the main cause of death in people with impaired glucose tolerance and type 2 diabetes.

People with mental illness are at increased risk of, and should be regularly assessed and monitored for:

- » obesity
- » metabolic syndrome (being overweight and hypertensive, having high blood lipids and insulin resistance, and cardiovascular)
- » other conditions that increase their risk of heart attack or stroke
- » diabetes, even if they do not have a family history of diabetes.

Next steps

The mental wellbeing and quality of life of residents can be improved significantly through timely assessment and treatment.

Treatments may include medical treatments and/or referral to appropriate mental health specialists for psychosocial/behavioural therapies.

In addition to community mental health services (both public and non-government organisations), there are a range of government-funded initiatives available to minimise the cost to the person accessing appropriate allied health services. Access to these services can be requested by the treating doctor if they are seen as potentially beneficial to the resident.

15. Mental health



Mental wellbeing and quality of life of residents can be improved significantly by promoting active and healthy ageing. This involves creating living conditions and environments that allow older people to access more active and integrated lifestyles, in line with their functional abilities.

Training for all staff in not only recognising and reporting mood and psychiatric disorders, but also in understanding how best to support residents in their day to day living is vitally important.

More information

A useful resource is *Managing depression growing older: a guide for professionals and carers* (2012) by Kerrie Eysers, Gordon Parker and Henry Brodaty, published by Allen and Unwin, copyright the Black Dog Institute.

NDSS Diabetes and emotional health handbook.

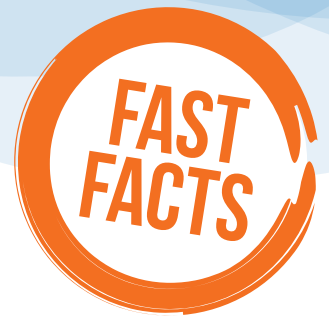
For more information about the symptoms of depression, refer to Depression in adults: recognition and management at [nice.org.uk/guidance/cg90](https://www.nice.org.uk/guidance/cg90)

The Black Dog Institute (blackdoginstitute.org.au) and Beyond Blue (beyondblue.org.au) websites also provide a range of facts sheets, resources and training for health practitioners.



16. Physical activity

16. Physical activity



Regular physical activity is good for everyone and can:

- » improve muscle strength and heart function
- » reduce tension and stress
- » increase mobility and improve balance
- » improve quality of life
- » help lower blood fats, blood pressure and BGLs
- » reduce the risk of health problems.

Exercise may seem difficult for residents in RACFs but with the help of an exercise physiologist* or physiotherapist, plans can be developed for residents with issues such as vision problems, hearing loss, reduced physical energy and flexibility, or pain.

You can help by:

- » encouraging and supporting residents to participate in activities
- » making sure residents wear comfortable, well-fitting shoes
- » checking the resident's feet after exercise for any redness or blisters
- » providing plenty of fluids during exercise
- » ensuring residents do not start new activities without checking with a supervisor
- » watching for hypoglycaemia in residents this might affect.

***Note:** An exercise physiologist is an allied health professional who specialises in designing, implementing and educating about exercise programs that prevent and manage chronic conditions and injuries.

Exercise may seem difficult for people in RACFs but with the help of an exercise physiologist* or physiotherapist, plans can be developed for residents with issues such as vision problems, hearing loss, reduced physical energy and flexibility, or pain.

16. Physical activity



Physical movement or activity is beneficial for everyone, especially older people with diabetes and/or other medical and mental health conditions. Health and wellbeing in older age can be improved with regular physical activity.

There are three main categories of physical activity that can achieve improved health, independence and wellbeing for older people:

- » endurance/fitness activities, where a major emphasis is on increasing the demand on the heart and lungs, such as brisk walking, bicycle riding, swimming and jogging
- » strength training activities, where the emphasis is on building muscle strength, such as resistance exercise, lifting weights, and stair climbing
- » balance, mobility and flexibility (stretching) activities, where the emphasis is on balance, walking, turning, going up and down steps, muscle flexibility and other mobility-related functions.

Participation in regular physical activity may help older people to:

- » improve blood glucose management
- » maintain independence
- » stabilise blood pressure
- » improve blood fats
- » reduce the risk of colon cancer
- » maintain muscle mass, strength and endurance
- » improve coordination, balance and bone strength
- » reduce the risk of falls
- » improve mood, lift depressive symptoms and increase participation in other activities.

While residents in aged care may experience differing levels of limitation in their ability to undertake physical activity, the Department of Health's Recommendations on physical activity for health for older Australians (2013) encourage regular physical activity wherever possible.

There are five main recommendations for older people:

1. Some form of physical activity, no matter their age, weight or health problems
2. Be active every day in as many ways as possible, doing a range of physical activities that incorporate fitness, strength, balance and flexibility
3. Accumulate at least 30 minutes of moderate intensity physical activity on most, preferably all, days
4. If a resident has stopped physical activity, or is starting a new physical activity, they should start at a level that is easily managed and gradually build up to the recommended amount, type and frequency of activity
5. Continue to enjoy physical activity in a manner suited to their capacity into later life, provided recommended safety procedures and guidelines are adhered to.

Special considerations

Make sure residents with diabetes are assessed by an appropriate health practitioner (doctor, physiotherapist or exercise physiologist) before starting any new physical activity. Checking BGLs and management of the person's diabetes may also be required before, during and after physical activity depending on the nature, duration and level of exercise and the person's glucose management targets.

16. Physical activity



Monitoring and management may include:

- » checking BGLs before, during and after the activity, especially if the person takes a sulphonylurea or insulin
- » ensuring appropriate treatment for a hypo is nearby during exercise
- » aiming to avoid hypoglycaemia, but if it occurs, ensuring it is recognised and treated promptly
- » monitoring levels of tiredness from exercise, as tiredness and hypoglycaemia can manifest in similar ways. Any person with symptoms of either must be checked for hypoglycaemia
- » monitoring for delayed hypoglycaemia, which can occur up to 24 hours after strenuous or unusual physical activity
- » advising on and monitoring the level of exercise where the person's BGL is greater than 15 mmol/L
- » monitoring pain and providing appropriate pain relief before or after exercise if the person has health problems that may be exacerbated by (or restrict) exercise
- » modifying physical activities for people with mobility problems that may restrict some activities, such as arthritis or a stroke, or considering recommending chair-based exercises, water exercises, light resistance training or Tai Chi
- » ensuring a focus on fun activities that encourage any level of activity. For example, older people with limited mobility, or who cannot walk and/or weight-bear, can benefit from batting a balloon while seated, or singing and moving to music. These activities encourage coordination and upper body and arm movements, laughter and breathing deeply – and they also support mental health and wellbeing

- » providing opportunities for dancing, as this is an activity that most older people enjoy and that may have been part of their physical and social activity throughout their lives. They can participate with varying levels of intensity and it is a good all-round workout.

Actions

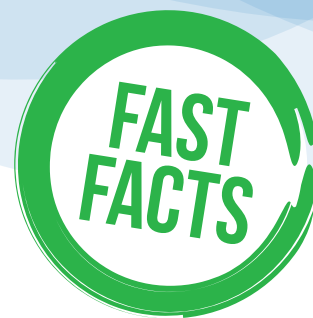
Physical activity is beneficial for all people, regardless of age – but the following precautions need to be taken to optimise its benefits:

- assess the resident's comorbidities (other medical conditions), eyesight, cognitive function, psychological state and nutritional status before recommending or starting a physical exercise routine
- modify the physical activity to accommodate their individual needs
- consider referring them to a physiotherapist or exercise physiologist to provide specialised advice on their optimal activity program
- provide appropriate and adequate pain relief for health problems that may be exacerbated by exercise and improve the resident's capacity to exercise pain-free
- check that their clothing is appropriate for the activity, and that their footwear fits well, and is supportive and protective
- make sure they take appropriate diabetes-related precautions, such as having access to a blood glucose meter and fast-acting glucose.



17. Foot care

17. Foot care



Foot care is an important part of managing diabetes. The nerves and blood vessels to the feet can be damaged by having diabetes for many years.

In older people with diabetes, foot problems may contribute significantly to:

- » pain or numbness
- » a higher risk of falls
- » the risk of significant wounds, infection and amputation.

All residents with diabetes should have a foot care plan. It is important that they – or you – undertake daily foot hygiene that includes:

- » washing and drying their feet, especially between the toes
- » moisturising the skin but avoid between the toes
- » looking at their feet and telling your supervisor about skin changes or pain.

Residents with diabetes may not be able to feel their feet, so it is important that they:

- » wear shoes that fit well
- » do not wear thongs – these are not recommended
- » check the inside of their shoe for foreign bodies or broken lining or anything else that might damage their feet
- » wear socks or stockings that are not too tight, with shoes
- » never walk in bare feet, wear shoes during the day and have slippers available at night.

The nerves and blood vessels to the feet can be damaged by having diabetes for many years.



17. Foot care



Foot care is important in relation to a range of chronic health conditions. It is essential for residents who have diabetes, as they are more likely to develop serious foot problems. This is due to reduced blood flow and nerve damage in the feet, resulting in an altered sensation. This can lead to reduced awareness of skin tears, minor cuts and abrasions, ulceration and other skin problems and injuries that are slow to heal.

Foot care should be part of the multidisciplinary health care team assessment, monitoring and review process, and part of the diabetes annual assessment.

Assessing a resident's level of foot self-care should include:

- » the resident's ability to:
 - o see their feet
 - o reach their feet
 - o provide foot care as necessary.
- » whether foot self-care has an impact on, or is affected by, other conditions (such as arthritis in the hands, the level of physical dexterity or obesity)
- » whether the resident wants to care for their own feet.

A comprehensive foot history and assessment should include assessment, monitoring and review of:

- » blisters, corns, bunions, in-growing toenails, arthritis
- » ulceration
- » amputation sites
- » poor or slow wound healing
- » skin tears, minor cuts or abrasions
- » limping after a short walk
- » footwear
- » risk factors, including falls risk
- » increased or unexplained pain in the feet
- » altered mobility which may be due to foot problems
- » the resident's level of/need for support in relation to foot and nail care.

Observation of both feet should check:

- » skin colour and moisture
- » skin integrity (checking for any blisters, corns, breaks, dry skin or callus formation)
- » thickness of toenails, including any that are deformed or overgrown, discoloured or ingrowing
- » any foot deformities, such as bunions, claw toes or hammer toes
- » gait abnormalities, such as a strange walk or a flapping walk
- » any signs of peripheral neuropathy, such as reports of burning or tingling feet, or insensitivity to pain or touch
- » the temperature of the foot and whether it is warm or cold (cold may indicate peripheral vascular disease; hot and red may indicate cellulitis)
- » the person's pulse on the top of the foot or behind the ankles.

17. Foot care



When to see a podiatrist

Podiatrists specialise in caring for people with lower limb problems, including diabetes-related problems such as poor circulation and/or nerve damage. A range of initiatives are available to minimise the cost to the person of accessing allied health services, such as Medicare rebates for people with chronic health conditions.

Older people with diabetes should have a podiatry (and multidisciplinary) assessment of their feet when they are admitted to the RACF. Follow-up reviews will occur at different times – three-monthly, six-monthly or annually depending on their needs. However, there should be an additional review when any changes are noted in their feet or their general health status.

Low-risk feet

Older people with diabetes are assessed as low risk when their feet:

- » have good blood flow
- » are warm
- » have no past history of ulcer or amputation.
- » feel normal.

To be considered low risk, the person also needs to be able to care for their own feet.

It is recommended that older people at low risk have an annual review by a podiatrist, unless otherwise specified.

High-risk feet

Older people with diabetes are assessed as high risk when they have:

- » a current ulcer
- » had a foot ulcer in the past
- » had an amputation in the past
- » decreased sensation (such as numbness)
- » corns or calluses
- » deformed, thick or discoloured toenails
- » foot deformities such as bunions, hammer toes or bony prominences
- » foot deformities that are hot to the touch.

It is recommended that older people at high risk are reviewed by a podiatrist as soon as they develop any of the above problems and have ongoing reviews as advised by the podiatrist.

Blood supply

When blood supply to the feet is insufficient, the resident (where able) may complain of cold feet and, often, leg cramps on walking or at night. Insufficient blood supply also means white blood cells cannot reach any site of broken skin on the foot and an infection is likely to occur. If not assessed and treated promptly, infections – and subsequent ulceration – may result in amputation. Any skin breakdown should therefore be reported promptly and treated aggressively by the resident's doctor or nursing staff. Intravenous antibiotics may be needed to treat the infection.

If a resident has problems with blood supply to their feet, they may need a referral to a vascular surgeon for assessment and intervention. Any change in blood supply to the feet should be reported to the resident's treating doctor so they can arrange further investigations.

17. Foot care



Nerve damage

If nerves in the feet are damaged, they cannot relay messages from the feet to the brain, or from the brain to the feet.

Older people with diabetes and early nerve damage may experience a loss of sensation (such as numbness) or they may report sensations such as pins and needles or burning feet.

When the nerve damage is complete, the person may no longer experience this discomfort, but they will lose reflexes in their feet. The belief that people with nerve damage (peripheral neuropathy) do not experience pain is often inaccurate. Although some people may experience no pain, peripheral neuropathy can be extremely painful, especially when there is infection involved. Also, it can be worse at night and cause interrupted and disturbed sleep.

Loss of sensation can also mean that people may not be aware if they tread on a sharp object, even if it pierces the skin. If they have not felt the initial damage, they may also not notice any signs or symptoms of early infection.

It is essential for people with nerve damage in their feet to have their feet regularly monitored and assessed as an important part of daily care and diabetes annual review.

Residents should be referred to their treating doctor for urgent assessment if there is any foot deformity (even when the people themselves cannot feel any problem) and/or if the foot is hot to touch.

Hygiene

For residents with diabetes, foot care and hygiene should include:

- » daily washing with warm (not hot) water and a gentle cleanser
- » careful drying, especially between the toes
- » the application of a urea-based lotion to all areas after drying except between toes (and the lotion should be massaged in completely)
- » consultation with their doctor if they notice any abnormalities or changes to their feet.

Having a daily foot hygiene routine gives people the opportunity (with the assistance of staff, if needed) to assess their feet thoroughly and identify and act on problems early.

Residents with diabetes and early nerve damage may experience a loss of sensation (such as numbness) or they may report sensations such as pins and needles or burning feet.

17. Foot care



Toenails

Some residents may be able to cut their own toenails, but you may wish to review their nail care technique. If residents cannot or would rather not, cut their toenails themselves, a regular visit to the podiatrist is the safest nail care alternative.

When observing a resident cutting their toenails, take note of their technique and make suggestions where appropriate. Check that the resident is:

- » using appropriate toenail cutters, clippers or files
- » cutting the nails after a bath or shower, when they are still soft
- » not cutting or filing the nails too short
- » cutting/filing the toenails straight across
- » carefully filing any corners or ragged edges
- » being careful not to cut the skin.

Things you should consider when observing the resident include:

- » assessing toenails for thickness/hardness, deformity, discolouration, redness, dry skin around the nails, or signs of infection (including fungal infection)
- » reporting changes to the treating doctor and/or podiatrist for review
- » referring people to a podiatrist to cut toenails that are too hard to cut, are deformed, or where there is concern for the safety of the person.

Footwear

Check the following features when assessing resident's footwear.

Socks

- » Natural fibre socks (such as wool or cotton) are best, as they are more supportive, and natural fibres are better than synthetic for wear-and-tear time and reducing sweating.
- » The socks need to fit correctly, as the wrong size will cause discomfort.
- » If the seams are prominent, wear the socks inside out.
- » Make sure the top of the sock is not too tight around the leg.

Shoes

When assessing a resident's shoes, check:

- » the condition of the shoes
- » the level of toe protection
- » the thickness/flexibility of the sole (ideally, they would have a non-slip sole about 1cm thick)
- » how the shoes are fastened (buckle, lace, velcro etc). This is a matter of individual preference and should be suited to the resident
- » what material they are made of. Natural materials, such as leather or canvas, are better than synthetic materials, to increase wear-and-tear time and reduce sweating
- » the suitability and depth of the shoe to accommodate orthotics (if needed)
- » any seams, buckles or fasteners which could cause rubbing or pressure areas.

17. Foot care



When looking at the fit of the shoes, check:

- » whether there is enough room in the shoes to accommodate any foot deformities
- » how well they fit, including the level of heel grip
- » how well/securely the shoes hold the rest of the foot and stay on the feet when the resident is walking.

When a resident is buying new shoes, advise them to consider:

- » making a cardboard outline of the foot and taking it to the shop to test it in any new shoe. If it doesn't fit properly, neither will the person's foot
- » having their feet properly measured to make sure their shoes are long enough, wide enough and deep enough to properly accommodate their feet
- » checking that the shop will give them a refund if the shoes are not worn and found to be unsuitable after purchase
- » buying the shoes in the afternoon to ensure they will fit at any time of the day (as feet often swell during the day)

- » wearing socks or stockings when trying on shoes to ensure they fit when wearing them later
- » avoiding shoes that are not supportive or safe, including:
 - o moccasin-style shoes, as the stitching doesn't stretch, and they do not hold and support a person's foot
 - o slip-on shoes, including slippers, as these also slip off and may be dangerous
 - o open-toed shoes, and shoes with narrow toes
 - o high heels, as they are difficult to walk in and may cause falls and sprains
 - o thongs, as they slip off easily and they do not support or protect the foot.

When wearing new shoes, wear them for half an hour and check the feet for pressure marks or abrasions. If these are present, return the shoes to the shop and be refitted for a new pair.

If the shoes fit well on the first day, add 30 minutes of wear every day.

17. Foot care



Walking for exercise

If the resident enjoys walking and is able to do so easily and safely, walking for exercise should be encouraged.

To protect their feet from damage, check that they are wearing properly fitting walking shoes with socks. A podiatrist can also recommend appropriate shoes for walking if the resident is experiencing problems with their feet which may affect their ability to exercise.

If a resident complains of a sore foot or any discomfort after walking, their feet should be assessed immediately.

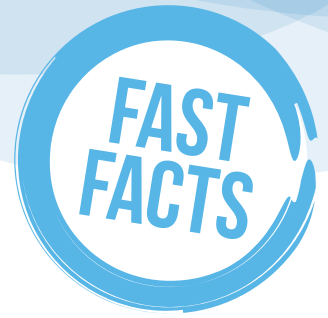
Tips & traps: If the shoe fits...

- Thongs are not recommended for older people with diabetes, especially those with high-risk feet. Nerve damage means their ability to place their foot properly is impaired, and thongs also leave toes vulnerable to injury. Residents with diabetes may not be able to feel whether their shoes fit properly, or if there is a problem inside the shoe. Each day before they put on their shoes, encourage or help them to check the inside of their shoes for a stone or a broken lining or anything else that might damage their feet.
- Encourage them to wear socks or stockings with shoes, and to wear shoes during the day and have appropriate well-fitting slippers available at night.



18. Skin care

18. Skin care



As skin ages, it becomes thinner and loses elasticity and moisture. As a result, older people's skin damages more easily, and it takes longer to heal if it gets cracks or tears.

This process is a normal part of ageing, but diabetes can speed it up. Having diabetes can also make it slower to recover from skin infections and sores.

It is important to:

- » avoid over-washing the skin
- » use warm – not hot – water to wash
- » use a pH-neutral soap or non-soap cleanser
- » pat the skin dry, rather than rubbing it vigorously
- » moisturise the entire body after each bath, shower or body wash
- » let a supervisor know if you notice any of the following in residents:
 - o redness
 - o infection
 - o cracks
 - o itching
 - o bruises
 - o swelling of any of the limbs
 - o changes in skin colour, moisture or temperature.

Having diabetes can also make it slower to recover from skin infections and sores.

18. Skin care



Healthy, intact skin protects the body organs and their functions. Healthy skin is the first barrier to infections and prevents harmful organisms from entering the body. As skin ages, it becomes thinner (sometimes very frail) and loses elasticity and moisture. Older people's skin is more vulnerable to damage and stress, sustains injury easily, and takes longer to heal. Any breakdown in skin integrity makes the body susceptible to infection.

Glands near the hair follicles produce oil and sweat to moisturise and protect the skin. The action of these glands is controlled by the micro-circulation and nervous system. Unfortunately, diabetes can affect these systems and lead to damage to the nerves affecting the glands. When this happens, the skin dries out and becomes prone to cracking, which allows bacteria to enter and increases the risk of skin infections and irritations. This process occurs in normal ageing but is accelerated by diabetes.

Residents with diabetes may need to be reminded about the importance of skin care and how to look after their skin. They are at higher risk of developing skin integrity problems if they:

- » have any broken skin or pressure area
- » have a skin infection
- » are overweight or underweight
- » have lost the subcutaneous layer of fat that acts to cushion the skin
- » have diminished sensation due to peripheral neuropathy
- » have reduced blood flow/circulation
- » have reduced mobility or spend extended periods in bed or in a chair
- » are dehydrated
- » have poor nutrition
- » experience incontinence
- » are at falls risk
- » are a smoker

- » are taking certain medicines (such as warfarin or prednisolone)
- » are confused or disoriented
- » are unable to frequently/effectively assess their skin
- » have difficulties washing or drying areas of their skin (for example, under abdominal or breast skin folds, between the toes, under their arms, around the groin and buttocks).

Older people's skin is more vulnerable to damage and stress, sustains injury easily, and takes longer to heal.

18. Skin care



Residents may need support and should be encouraged to:

- » avoid over-washing the skin
- » use warm – not hot – water to wash
- » use a pH-neutral soap or non-soap cleanser
- » not spend too long bathing, or in the pool
- » pat themselves dry thoroughly, rather than rubbing the skin vigorously
- » avoid scratching dry skin and instead apply lotion to moisturise
- » moisturise the entire skin after each bath, shower or body wash (Sorbolene is an effective, inexpensive moisturiser)
- » limit time in the sun without skin protection
- » use sunscreen.

Actions

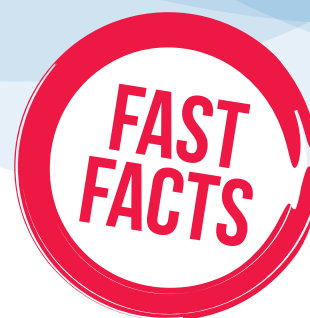
When you are observing a resident's skin condition, check for:

- colour, moisture and temperature
- skin integrity – dry skin, blisters, breaks, abrasions, injury, rashes, cracks
- any skin abnormalities, such as skin tags, dark areas, changes to moles
- any reddened areas or pressure-prone areas
- any infection or poor healing
- itching
- bruising
- swelling of any of the limbs.



19. Eye care

19. Eye care



Diabetes can cause damage to the tiny blood vessels in the back of the eye (called the retina). People with diabetes are recommended to have regular eye examinations by an optometrist or an ophthalmologist (eye doctor) to detect problems early.

It is important to make sure that diminishing sight in older people with diabetes is not assumed to be a normal part of ageing, and it should be assessed by a doctor/optometrist.

If a resident with diabetes reports any of the following, let your supervisor know:

- » sudden loss of sight or blurred vision
- » flashes of lights in their eyes
- » eye pain
- » double vision
- » redness or swelling of the eye or eyelid.

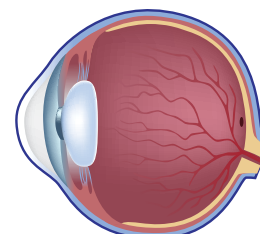
You can also help residents by ensuring they have:

- » their glasses clean and accessible, so they can wear them when needed
- » their sunglasses on when outside.

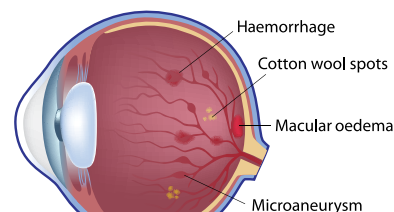
Residents with diabetes need regular eye examinations by an optometrist or an ophthalmologist (eye doctor) to detect problems early.

Development of diabetic retinopathy

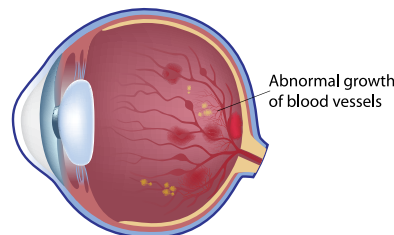
Healthy eye



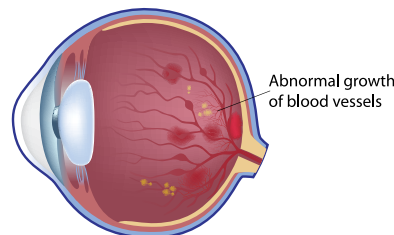
Diabetic Retinopathy



Nonproliferative Retinopathy

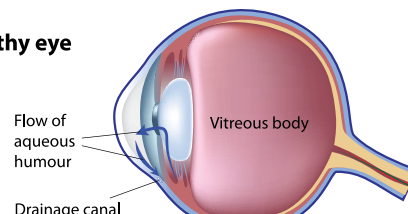


Proliferative Retinopathy



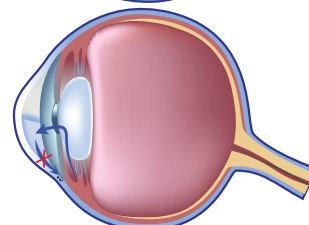
Development of glaucoma

Healthy eye

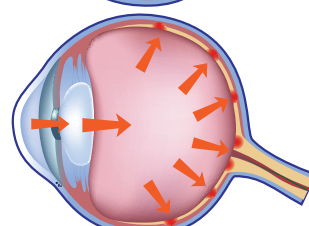


Glaucoma

1. Drainage canal blocked; build-up of fluid



2. Increased pressure damages blood vessels and optic nerve



19. Eye care



People with diabetes have an increased risk of developing eye complications which, if left untreated, can lead to reduced vision and blindness. However, 98% of serious vision loss from diabetes can be prevented with regular eye examinations and early treatment. The earlier the treatment, the better the result.

Many people with diabetes do not notice changes in their vision until the condition is very serious, so it is essential to have regular eye examinations to detect problems early. Often, diabetes-related eye complications have no signs or symptoms, and there may be no obvious deterioration in vision until the condition is quite advanced.

Persistently high blood glucose levels can increase the risk of more serious eye problems in people with diabetes, including:

- » retinopathy
- » cataracts
- » macular oedema
- » glaucoma.

Changes in vision may also be gradual and go unnoticed for some time, so people over 65 are recommended to have a regular annual dilated eye examination. It is important that diminishing sight in older people with diabetes is not assumed to be part of normal ageing.

Any significant vision problems or loss of sight should be assessed by the doctor or optometrist in the first instance, and then the resident may need to be referred to a medical eye specialist (ophthalmologist). Older people with serious eye problems should be reviewed annually by an ophthalmologist

Common signs and symptoms of vision problems (when present) may include:

- » floaters and flashes
- » blurry, blocked or dim vision
- » poor night vision
- » halos around lights or sparkles
- » sensitivity to light and glare
- » the need for brighter light for reading and other activities
- » distortion or 'holes' in the person's vision
- » more frequent need for new glasses prescriptions.

98% of serious vision loss from diabetes can be prevented with regular eye examinations and early treatment.

19. Eye care



Residents with diabetes should be assessed by the doctor, optometrist and/or eye specialist if they experience:

- » sudden loss of sight or blurred vision
- » flashes of light in their eyes
- » eye pain
- » double vision
- » redness or swelling of the eye or eyelid.

Residents with diabetes are recommended to undertake (or be assisted to undertake) eye self-care by:

- » reducing the effects of dry eyes through regular use of artificial tears during the day and lubricating ointment or gel at night
- » managing sore, red eyes and/or crusty discharge by routinely bathing eyes with tepid saline
- » having correct prescription lenses through regular eye examinations by an optometrist

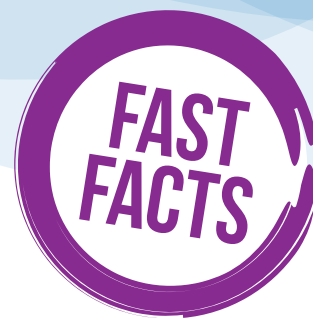
- » keeping their glasses clean and well fitting
- » ensuring their glasses are accessible throughout the day and wearing them when they should
- » ensuring appropriate sun protection by wearing appropriate ultraviolet (UV) protection, sunglasses and a hat with a broad brim when outside
- » informing their treating doctor or optometrist if they are experiencing any signs or symptoms of eye problems.

Missing diabetes eye checks can put your sight at risk. Early detection saves sight. Register for regular diabetes eye check reminders at keepsight.org.au



20. Oral care

20. Oral care



People with diabetes have more glucose in their saliva than other people, which can result in more tooth decay and gum disease.

Diabetes can also lead to some people having a dry mouth and other oral problems.

Following are some of the signs and symptoms of oral health problems. If you notice any of these in a resident who has diabetes, let a supervisor know:

- » reduced appetite
- » weight loss
- » dry mouth
- » bleeding gums
- » red, swollen gums or tongue
- » loose teeth
- » a change in the way teeth fit together, or how the person is able to bite
- » a change in the fit of dentures
- » refusal to wear dentures
- » pain or burning tongue or gums
- » ulcers
- » persistent bad breath.

People with diabetes have more glucose in their saliva than other people, which can result in more tooth decay and gum disease.

20. Oral care



Sub optimal diabetes management can increase the risk of tooth decay and periodontal (gum) disease. This is because people with diabetes have more glucose in their saliva than other people. They may also experience a dry mouth and other oral problems.

Saliva in the mouth has many functions. It acts to:

- » moisten and cleanse the mouth by neutralising acids produced by dental plaque
- » prevent infection (by providing antibodies) and reduce bad breath by controlling bacteria in the mouth
- » reduce tooth decay and gum disease by neutralising acids and preventing infection brought on by dental plaque
- » wash away dead skin cells that accumulate on the gums, tongue and cheeks
- » protect against ulcers, sores and other effects of friction
- » enable chewing and swallowing
- » aid digestion by breaking down food
- » improve the taste of food and enhance the eating experience
- » keep the lips moist and reduce the risk of dryness and cracking
- » reduce dryness and discomfort by lubricating the mouth and throat
- » lubricate the mouth to make speaking easier.

Oral health

Oral health and effective mouth care is vital to diabetes management. Residents with diabetes need to be able to enjoy a wide range of nutritious foods. If they have gum disease, pain, discomfort, tooth cavities, loss of teeth, difficulty eating, chewing and swallowing, and/or ulceration, this will be more difficult and may impact on their overall health and wellbeing

Optimal oral care for older people with diabetes includes:

- » maintaining good blood glucose management
- » encouraging the use of fluoride toothpaste if the person has their own teeth
- » checking for signs and symptoms of oral disease
- » encouraging good oral hygiene practices – that is, flossing and brushing at least twice a day
- » ensuring adequate hydration
- » treating dry mouth
- » discouraging smoking
- » arranging regular dental check-ups
- » ensuring dentures are clean, fit well and that the false plate is not damaged
- » checking for mouth, gum or cheek sores, or ulceration
- » contacting a dentist/dental therapist as soon as any problems arise.

20. Oral care

Common oral health problems associated with diabetes and ageing include:

- » tooth decay
- » periodontal (gum) disease
- » mouth ulcers
- » taste impairment
- » dry mouth
- » fungal yeast infection (Candidiasis), commonly on the tongue and palate
- » systemic infections
- » poorly fitting dentures.

Common signs and symptoms of oral health problems include:

- » reduced appetite
- » weight loss
- » dry mouth
- » bleeding gums
- » red, swollen gums or tongue
- » loose teeth
- » a change in the way teeth fit together, or how the person is able to bite
- » a change in the fit of dentures
- » refusal to wear dentures
- » pain or burning tongue or gums
- » ulcers
- » persistent bad breath.

Dry mouth

Dry mouth can be due to:

- » the side effects of many medicines
- » dehydration
- » hyperglycaemia
- » nerve damage
- » some medical conditions (including diabetes)
- » smoking
- » stress, anxiety or depression
- » infection
- » eating disorders
- » open-mouthed breathing
- » damage to salivary glands
- » sweeteners in diet drinks.

Note: Dry mouth may be caused by hyperglycaemia and should be checked with a blood glucose reading and corrected by appropriate treatment.

Certain medicines can also cause a dry mouth.

These include:

- » some cold and flu medicines
- » anti-depressants and anti-anxiety medicines
- » antihistamines
- » asthma medicines
- » anti-Parkinson's medicines
- » prednisolone
- » diuretics
- » anti-hypertensives
- » epilepsy medicines
- » some pain relievers.

The resident's doctor should be advised if any medicine they are taking causes a dry mouth, because an alternative may be available.

20. Oral care

Signs and symptoms of dry mouth include:

- » difficulty eating (chewing and swallowing) and tasting food
- » difficulty speaking
- » chapped or cracked lips
- » sticky mouth (in the corners of the mouth and lips)
- » dry crusts at the corners of the mouth
- » a dry, sore throat
- » pale gums
- » bad breath
- » a persistent, dry cough
- » white tongue (a fungal yeast infection, or Candidiasis, commonly found on the tongue and palate)
- » red, inflamed soft tissues of the mouth and throat
- » dry, matt-looking teeth (not moist and shiny)
- » headache and dizziness (sometimes).

Dry mouth should be treated by effectively managing the condition that is causing it, and by effective oral hygiene.

Older people with diabetes are recommended to (or be assisted to undertake) dental and oral self-care, including:

- » performing oral hygiene (cleaning their teeth or dentures)
- » rinsing and wiping their mouth immediately after eating
- » brushing and rinsing their dentures immediately after eating
- » using a toothpaste that contains fluoride, or a toothpaste/mouth care product specially formulated for dry mouth (e.g. Biotene)

- » using a lip balm regularly
- » always having access to water to drink throughout the day
- » rinsing regularly with water or an appropriate mouth wash
- » having a healthy diet and avoiding overly salty foods and foods/drinks with a high sugar content
- » limiting the number of citrus juices and diet drinks (water is best)
- » limiting their alcohol consumption
- » using artificial saliva or sugar-free chewing gum, where recommended.

Actions

When oral health problems develop in resident's with diabetes, early detection and referral is essential. They need review by a dentist, who may:

- put them on antibiotics
- prescribe anti-fungal medicine
- treat any ulcers
- remove tartar build up
- give them one or more fillings
- remove decayed teeth.

Alternatively, they may refer the resident to:

- a dental prosthetist, if necessary, for correcting, refitting or making new dentures for comfort and improved bite
- a periodontist, if gum problems persist.



21. National Diabetes Services Scheme

21. National Diabetes Services Scheme

The NDSS provides information, support and services and diabetes-related products at subsidised prices to people living with diabetes.

Through the NDSS, people with diabetes can access:

- » support services for practical help and guidance
- » diabetes and health information and resources
- » subsidised diabetes products.

Registration

Registration is free and open to all eligible people living in Australia diagnosed with diabetes.

It is important to register all newly diagnosed aged care residents and those residents who have diabetes who are not yet registered with the NDSS. Contact the NDSS Helpline on **1800 637 700** to:

- » update a resident's details with their new address when they move into the facility, or to advise the NDSS if the resident passes away.
- » check whether all eligible residents are registered
- » register new residents
- » update a resident's details if their diabetes management is changing to injecting insulin or a glucose-lowering medicine.

Services, products and resources

Support services for people with diabetes who live in RACFs, and resources for staff (such as this guide), are provided through state- and territory-based agents. All resources are listed on the NDSS website at ndss.com.au and agents are available through the NDSS Helpline

1800 637 700 to discuss the services and resources they offer to RACFs in their area.

A range of subsidised diabetes products can be accessed through the NDSS including:

- » subsidised blood glucose testing strips
- » subsidised urine testing strips
- » subsidised insulin pump consumables (for approved people with type 1 diabetes and meet eligibility criteria)
- » fully subsidised continuous and flash glucose monitoring products (if you have type 1 diabetes, or conditions similar to type 1 diabetes, and meet the eligibility criteria through the CGM Initiative)
- » fully subsidised insulin syringes or approved non-insulin injectable medicines.

RACF residents can receive a further discount on some NDSS products if they hold one of the following concession cards:

- » Health Care card
- » Pensioner Concession card
- » Pharmaceutical Benefits Scheme Safety Net card
- » Department of Veterans' Affairs Concession card.

You can access subsidised diabetes products at community pharmacies around Australia. The pharmacies are sometimes called 'NDSS Access Points'.

To find a community pharmacy near you:

- visit our NDSS Online Service Directory at osd.ndss.com.au
- call the NDSS Helpline on **1800 637 700**.

For more information about the NDSS, visit ndss.com.au or call the NDSS Helpline on 1800 637 700.



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NDSS Helpline 1800 637 700
ndss.com.au