National Diabetes Services Scheme

An Australian Government Initiative

NDSS Helpline 1800 637 700
ndss.com.au

The needs of people with diabetes in disasters and emergencies

A guide for emergency services and local councils

Your trusted partner in diabetes care

ADEA is a National Health Professional Body Agent for the NDSS.

diabetes australia

The NDSS is administered by Diabetes Australia

Version 4 April 2025. First published November 2015. NDSSA4B013

Contents

Foreword

Many Australians live with chronic conditions, such as diabetes. Disasters and emergencies such as bushfires, floods and cyclones can put the health of a person with diabetes at risk.

Planning at individual, community and national levels helps ensure preparedness and effective responses to disasters and emergencies. Recent disasters in Australia have highlighted a variable level of disaster readiness and response at all levels.

In 2015 an Expert Reference Group was established to develop a set of resources that would support and educate people with diabetes, the community and relevant authorities. The reference group identified the need for:

- the development of plans for individuals to manage the risks of the sudden impact of a disaster or emergency on the management of their diabetes
- resources to assist in the implementation of individual self-management plans after a disaster or emergency
- a broad community education program having regard for the large number of individuals affected by diabetes in disasters or emergencies.

One outcome was the development of this guide. The guide was updated in 2021 and again in 2025 to reflect current knowledge and guidelines for disaster management.

The intent of the guide is to reduce morbidity and mortality of those with diabetes in natural disasters and emergencies, while minimising the strain on hospital resources.

I extend my thanks to the members of the 2015 Expert Reference Group who contributed to the development of this resource. Many thanks also to those who provided their feedback on subsequent versions of the booklet (see acknowledgments).

Susan Davidson
Chief Executive Officer
Australian Diabetes Educators Association

Disasters can significantly disrupt the ability of people with diabetes to manage their condition, putting their health at risk.

Executive summary

Disasters are unpredictable and destructive. They can cause significant damage, injury, illness, loss, trauma and grief. Australia's diverse landscape means that disasters such as bushfires, floods, severe storms, heatwaves, earthquakes and tropical cyclones occur regularly across the continent.

As a consequence of climate change, the intensity and frequency of heatwaves and drought, and the number of days with fire weather conditions, have increased and are projected to continue increasing.[1–3] The health effects of these events are also likely to increase and disproportionately affect priority populations, including people with chronic conditions such as diabetes, and First Nations people and people living in rural and remote Australia, who are at increased risk of diabetes.[4,5] Excessive heat can exacerbate existing health conditions, including diabetes, cardiovascular disease and kidney disease.[6–9]

Despite a significant increase in morbidity and mortality in those with chronic conditions following disasters, the focus in disaster response and recovery has been on acute medical conditions and first aid. Over recent years, there has been a shift to considering the effects of disasters on people with chronic conditions when planning for emergencies and natural disasters.[10–14] The United Nations Sendai Framework for Disaster Risk Reduction 2015–2030 recommends that people with chronic conditions should be included in the design of policies and plans to manage their risks before, during and after disasters, including having access to life-saving services.[15]

Raising awareness of the importance of self-management is an integral part of keeping people with diabetes and other chronic conditions out of both the hospital system and the immediate response units after a natural disaster. This helps keep those limited resources that may be available to those who require immediate medical attention for acute conditions.

Having a self-management plan in place for a person with diabetes or other chronic conditions is imperative in these situations.[14,16,17] However, there is still a significant proportion of the population that will remain unprepared. This is particularly the case amongst high-risk populations, for example, older people. People who are normally resilient and well-versed at self-managing their diabetes can also experience difficulties with their diabetes management during an emergency, due to the interruption of their normal support systems.

Recovery from an emergency can take many years, affecting individuals and communities in very different ways. Recovery time can sometimes be shorter for people who have spent time pre-planning for a natural disaster or emergency.[18]

There are many other resources available on disaster preparedness and recovery and this guide can be used alongside these resources, many of which are listed in **Appendix 1**. This guide focuses on the key considerations for people living with diabetes during and after a disaster or emergency situation.

This guide is designed for organisations and personnel who deal with disasters and emergencies during the planning stages such as local disaster management groups (local council) as well as those who deal with 'on-the-ground' situations during and after a disaster has occurred, such as those managing evacuation centres.

Diabetes and disasters fast facts

Disasters can significantly disrupt the ability of people with diabetes to manage their condition, putting their health at risk.

Many people with diabetes rely on insulin, blood glucose monitoring equipment, and other diabetes medications, and ensuring these supplies are available is vital.

Difficulties in accessing essential diabetes supplies and nutritious food, combined with high stress and disruptions to routine, can lead to potentially dangerous fluctuations in blood glucose levels and increase the risk of long-term diabetes-related complications.

Emergency services, volunteers and disaster planning organisations can reduce the impact of disasters and emergencies on people with diabetes by understanding, planning for, and addressing their needs.

For emergency services and volunteers

Ensure access to insulin: All people with type 1 diabetes need insulin to stay alive, either given by multiple daily injections or through an insulin pump. Not having access to insulin is life-threatening for these people.

Assist with diabetes tasks where required: Most people with diabetes will manage their own diabetes, including taking insulin or other medications and monitoring blood glucose levels. However, they may need assistance in an emergency situation.

Know the symptoms of low and high blood glucose levels: It is important that you understand the signs of hypoglycemia (low blood sugar) and hyperglycemia (high blood sugar) and can provide prompt care for people with these symptoms.

Store insulin correctly: Insulin should be refrigerated (2–8°C) where possible (**do not freeze**). When in use, insulin can be kept at room temperature (up to 25°C) for up to 28 days. If refrigeration is not available, keep insulin cool and away from direct sunlight. Do not discard insulin that has been exposed to higher temperatures if there is no alternative supply.

Observe strict infection control: When people with diabetes are giving insulin or monitoring blood glucose levels in a group setting (e.g. a temporary shelter), observe strict infection control to prevent transmission of blood-borne infections such as hepatitis B, hepatitis C and human immunodeficiency virus (HIV).

Provide regular and appropriate food: People with diabetes need access to regular meals and appropriate food choices to manage blood glucose levels.

Ensure access to clean drinking water: People with diabetes are at an increased risk of dehydration, especially if blood glucose levels are elevated, and having access to safe, clean drinking water is essential.

Provide appropriate wound care: Wound care is particularly important for people with diabetes, due to the increased risk of infections and longer healing time.

For disaster-planning organisations

Consider these key diabetes needs when disaster planning:

Education and training

» Ensure volunteers and emergency services receive basic training on diabetes management to better support those affected during emergencies.

Clear, consistent communication

» Clearly communicate the treatment and care needs of people with diabetes and ensure they are well understood, especially the needs of people with type 1 diabetes and those with diabetes-related complications such as cardiovascular and kidney disease.

» Provide clear and consistent messages about where people with diabetes can go for assistance after a disaster.

Access to supplies

» Ensure health services maintain surplus medication supplies, particularly insulin.

» Streamline processes for people with diabetes to access medication and other diabetes management supplies following a disaster, considering potential supply chain disruptions.

Power and charging devices

» Many people with diabetes, particularly those with type 1, use continuous glucose monitoring devices and insulin pumps, some of which require regular charging and therefore access to back-up power or charging devices.

Refrigeration

» Provide refrigeration for insulin storage. Where possible, insulin should be kept refrigerated (2–8°C).

Food and water

» Secure access to safe, clean water and appropriate foods. This should include a regular supply of carbohydrate-containing foods and rapid-acting carbohydrate foods or fluids for treatment of hypoglycaemia.

Hygiene

» Ensure good hygiene practices are implemented at evacuation centers and shelters to minimise infection risk and understand that people with diabetes may be at higher risk.

Health professionals

» Deploy health professionals with an understanding of diabetes management to areas impacted by a disaster.


Around 1 in 20 Australians
are living with diabetes.

Diabetes overview

What is diabetes?

Diabetes is a complex chronic health condition affecting many Australians.

In 2021, just over 1.3 million Australians were living with diagnosed diabetes, including people with type 1 diabetes type 2 diabetes and other diabetes, but not gestational diabetes.[19] This equates to around 1 in 20 Australians living with diabetes.[19]

There are three main types of diabetes: type 1 diabetes, type 2 diabetes and gestational diabetes. There are also several less common types of diabetes that are not discussed in this guide.

Diabetes occurs when:

- the pancreas does not produce any insulin, or
- the pancreas does not produce enough insulin, and/or
- the body does not use insulin properly (referred to as insulin resistance).

Insulin is a hormone that is essential for life, and which allows glucose from the food we eat to pass from the bloodstream into our cells to provide energy.

In diabetes, lack of insulin or insulin resistance results in elevated blood glucose levels (hyperglycaemia), which can cause both short-term and long-term adverse health outcomes.

People with all types of diabetes can develop long-term health problems associated with elevated blood glucose levels. These include:

- cardiovascular disease
- stroke
- peripheral vascular disease
- retinopathy (damage to the small blood vessels in the eye)
- nephropathy (kidney disease)
- neuropathy (damage to the nerves in different parts of the body).

Optimal management of diabetes is important to reduce the risk of these long-term health problems. The way someone manages their diabetes will depend on the type of diabetes they have and can change over time.

Type 1 diabetes

Type 1 diabetes is an autoimmune condition where the body can no longer make insulin because of the destruction of insulin-producing beta-cells in the pancreas.

When insulin is no longer produced by the pancreas, it needs to be replaced via injections or an insulin pump. Without insulin, a person with type 1 diabetes can develop life-threatening diabetic ketoacidosis (DKA) due to insulin deficiency and the inability to use glucose as a fuel.

Type 1 diabetes accounts for around 10% of all diabetes. It usually presents in childhood (after 12 months of age) or young adults but can develop at any age.

Type 2 diabetes

Type 2 diabetes is the most common form of diabetes, accounting for around 85% of all diabetes.

Type 2 diabetes results from a combination of insulin deficiency and insulin resistance, where muscle cells are resistant to the action of insulin being produced by the body. While lifestyle changes are the first line of treatment, many people with type 2 diabetes will require oral or injectable glucose-lowering medication, and some will eventually need insulin.

Type 2 diabetes is usually diagnosed in older adults over 40 years but is becoming more in common in children and young people. It is more common in people with a family history of type 2 diabetes, and among Aboriginal and Torres Strait Islander people and individuals from Pacific Islander, Indian and Chinese ethnic backgrounds. Is also more common in people who carry excess weight, particularly around the middle.

Gestational diabetes

Gestational diabetes is diabetes which develops during pregnancy and resolves after the birth. It usually develops around weeks 24 to 28 of pregnancy but can be diagnosed earlier. It affects around 12–14% of pregnancies.

Gestational diabetes occurs because some hormones made by the placenta cause insulin resistance. It is more common in people with a family history of type 2 diabetes or who are from an Aboriginal and Torres Strait Islander, African, Melanesian, Polynesian, South Asian, Chinese, Southeast Asia, Middle Eastern, Hispanic or South American background.

Most people initially manage their gestational diabetes with healthy eating, regular exercise and blood glucose monitoring. However, some will need insulin during their pregnancy. Managing blood glucose levels during pregnancy is essential to ensure the health of the mother and baby.

How is diabetes managed?

Medications

While some individuals with type 2 diabetes will initially manage their blood glucose levels with lifestyle modification, most will need medication over time. There are several different classes of oral glucose-lowering agents available, which work in different ways to lower blood glucose levels. There are also two classes of injectable medications: insulin and GLP-1 receptor agonists. Many people with diabetes will need a combination of different glucose-lowering agents to manage their blood glucose levels.

The main classes of glucose-lowering medications are:

- Biguanides
- Sulphonylureas
- Glitazones
- DPP-4 inhibitors
- Alpha-glucosidase inhibitors
- SGLT2 inhibitors
- GLP-1 receptor agonists (injectable)
- Insulin (injectable).

Sulphonylureas and insulin can increase the risk of hypoglycaemia (low blood glucose level), and SGLT2 inhibitors can increase the risk DKA, particularly if someone has a gastrointestinal illness (vomiting or diarrhoea) and/or is not eating much or not consuming adequate amounts of carbohydrate.

Insulin

Insulin is the only treatment for type 1 diabetes and is essential for life for these individuals. Many people with type 2 diabetes and some people with gestational diabetes also use insulin.

Insulin lowers blood glucose levels by moving glucose from the bloodstream into the muscle cells to use for energy.

Insulin is available in several types:

- rapid-acting
- short-acting
- intermediate-acting
- long-acting
- mixed (combination).

Insulin is given using an insulin pen or syringe, or via an insulin pump.

Unless they are using an insulin pump, most people with type 1 diabetes will use a rapid-acting insulin several times a day with meals and long-acting insulin once or twice a day. Some people with type 2 diabetes who require insulin will also need multiple daily injections, while others may only use long-acting or a mixed insulin.

Insulin doses can vary widely between individuals and need to be carefully matched with food intake and activity levels to keep blood glucose levels within the target range and to reduce the risk of hypoglycaemia (low blood glucose levels) or hyperglycaemia (high blood glucose levels).

Blood glucose monitoring

Monitoring blood glucose levels is an important part of diabetes management. Monitoring helps someone with diabetes learn how different factors (such as medication/insulin, food, activity, stress and illness) affect their blood glucose levels and whether they are keeping their levels within their individual target range.

Self-monitoring of blood glucose levels (SMBG) is recommended for people who:

- take insulin
- have gestational diabetes
- take oral diabetes medications which could cause hypoglycaemia
- have an intercurrent illness
- have unstable blood glucose levels or who are undergoing a change in their diabetes management.

Blood glucose levels can be checked using a blood glucose meter and strips or a continuous glucose monitoring (CGM) device. Approximately 70% of Australians with type 1 diabetes currently use CGM.[20]

- **Blood glucose monitoring** involves pricking the skin with a lancet device to draw blood, then applying the blood onto a strip that is placed in a blood glucose meter. This device measures the glucose levels in the blood and provides the user with a blood glucose reading.
- **Continuous glucose monitoring** involves wearing a small monitor that measures glucose levels continuously and sends the readings to a display device. The device also displays arrows to show whether glucose levels are rising, falling or steady and can sound alarms if the wearer's glucose levels are outside their target range. CGM devices comprise a sensor, inserted just under the skin and a transmitter which is contained within the sensor or attaches to the sensor and sends glucose readings to a compatible smartphone (via an app), wireless receiver, or insulin pump which displays their glucose data. There are several CGM devices available in Australia.

Ketone monitoring

When the body has insufficient insulin to use glucose as a fuel, it starts breaking down fat, resulting in the production of ketones by the liver. Ketones can usually be used by the cells for energy and are excreted by the kidneys but without sufficient insulin, they are overproduced and build up in the bloodstream.

High levels of ketones can lead to a condition called diabetic ketoacidosis (DKA), which is a medical emergency and requires hospitalisation. DKA is discussed further on page 13.

It is recommended that people with type 1 diabetes and those with type 2 diabetes who are at risk of DKA learn to monitor their own ketones. Early detection and management of ketones can reduce the risk of DKA.

Ketones can be measured in the blood (in a similar way to monitoring blood glucose levels) or urine (using urine ketone strips), but blood ketone monitoring is more accurate so is recommended over urine monitoring. Normal blood ketone levels are below 0.6 mmol/L (or negative/trace on urine check). If ketones are above this, people with diabetes should follow their sick day management plan. If blood ketones are above 3.0 mmol/L (or large on urine check) urgent medical care is required.

Diabetes-associated risks and complications

Hypoglycaemia

Hypoglycaemia (also known as a hypo) is a low blood glucose level, defined as a blood glucose level below 4.0 mmol/L. It can occur in people taking insulin and some types of oral diabetes medications (sulphonylureas). Immediate treatment is required to avoid progression to severe hypoglycaemia and loss of consciousness.

Risk factors for hypoglycaemia

Several factors can increase the risk of hypoglycaemia including:

- delaying or missing a meal or snack
- not eating enough carbohydrates at a meal or snack
- taking too much insulin or oral diabetes medication
- increased physical activity without additional food intake or reducing insulin dose
- drinking alcohol
- vomiting or diarrhoea.

Symptoms of hypoglycaemia

Each person with diabetes may experience different signs and symptoms of hypoglycaemia.

Common symptoms of hypoglycaemia include:

- weakness, trembling or shaking
- sweating
- light headedness/dizziness
- lack of concentration/behaviour change
- tearfulness/crying
- numbness around the lips and fingers.

If not treated early, the following can occur, due to lack of glucose to the brain:

- loss of coordination
- confusion
- aggressive behaviour
- slurred speech
- loss of consciousness
- fitting/seizures.

Treatment of hypoglycaemia

If a hypo is suspected, check the person's blood glucose level and provide treatment if the blood glucose level is below 4 mmol/L. If you can't check the blood glucose level and the person is showing some symptoms of a hypo, then treat it as a hypo just in case.

The recommended treatment of hypoglycaemia is to give 15 g of rapid-acting carbohydrate, which could be any of the following:

- 6 or 7 jellybeans
- 3 teaspoons sugar or honey
- half glass fruit juice
- half can regular (sugar-sweetened) soft drink
- glucose tablets equivalent to 15 g of carbohydrates.

After 10–15 minutes, recheck the blood glucose level and if it has not increased, repeat the treatment above.

Once the blood glucose level is above 4mmol/L, if the person won't be having their next meal within 20 minutes, it is recommended they have a longer-acting carbohydrate snack such as:

- one slice of bread
- one glass of milk or soymilk
- one piece of fruit
- 2-3 pieces of dried apricots, figs or other dried fruit
- one tub natural low-fat yoghurt.

If a person is unconscious, drowsy or unable to swallow, **this is an emergency and no food or drink should be given by mouth.**

- Place the person on their side, making sure their airway is clear.
- Give an injection of glucagon (see below) if available and you are trained to give it.
- Phone for an ambulance (if possible) stating a 'diabetes emergency'.
- Wait with the person until an ambulance arrives.
- When they regain consciousness, the person will require carbohydrates to maintain their blood glucose level.

Glucagon

Glucagon is a hormone that raises the blood glucose level and is injected in a similar way to insulin. It is used to treat severe hypoglycaemia in people with diabetes.

If a person can treat their own hypo, they do not need glucagon. However, if they are unable to swallow, are drowsy or unconscious, a glucagon injection can be given by another person who is trained to give the medication. It is recommended that individuals who use insulin have a glucagon kit in their emergency medical supplies.

Hyperglycaemia

Hyperglycaemia is defined as a high blood glucose level – a level which is above an individual's target blood glucose range. Hyperglycaemia can occur in all individuals with diabetes, regardless of the type of diabetes they have or the treatment. It can develop slowly or rapidly, depending on the circumstances

Risk factors for hyperglycaemia

Several factors can increase the risk of hyperglycaemia including:

- infection or illness
- emotional or physical stress
- decreased activity levels
- diabetes medication issues including insufficient diabetes medication, forgetting or omitting diabetes medication or incorrect administration or timing of diabetes medication
- excess food intake or food not matched with insulin or medication
- certain medications e.g. steroids.

Symptoms of hyperglycaemia

With mild hyperglycaemia, a person may not have any obvious symptoms. If they develop gradually, symptoms may go unrecognised or be attributed to other factors. For many people, symptoms may not occur until blood glucose levels are significantly elevated (e.g. around 15 mmol/L).

In undiagnosed or untreated type 2 diabetes, symptoms often develop gradually over time. In undiagnosed type 1 diabetes, or if someone with type 1 diabetes isn't taking enough insulin, symptoms usually develop rapidly. In all types of diabetes, symptoms can develop rapidly during illness or infection.

Common symptoms of hyperglycaemia include:

- frequent urination
- increased thirst
- fatigue/lethargy
- blurred vision
- recurrent and persistent infections (e.g. thrush, cystitis, skin/wound infections)
- weight loss.

If not detected and treated early, hyperglycaemia can develop into an emergency, including diabetic ketoacidosis, (usually occurs in type 1 diabetes) and hyperosmolar hyperglycaemic state, (usually occurs in older adults with type 2 diabetes. These conditions are discussed further in the following pages.

Treatment of hyperglycaemia

For individuals with type 1 diabetes, hyperglycaemia should be managed by:

- giving extra doses of rapid-acting insulin
- more regular monitoring of blood glucose levels
- regular checking of ketone levels
- drinking extra water
- seeking urgent medical care if the person has persistent vomiting, blood glucose levels remain high and/or if they have high levels of ketone in their blood or urine.

For people with type 2 diabetes, treatment will depend on how they manage their diabetes and which medication they are taking. It is normal for blood glucose levels to go up and down throughout the day but if levels remain high for a few days, medical advice should be sought as soon as possible.

Diabetic ketoacidosis

Diabetic ketoacidosis (DKA) occurs mainly in people with type 1 diabetes but can also develop in some individuals with type 2 diabetes. It results from a lack of insulin, preventing glucose from being used as fuel. When the body has insufficient insulin to use glucose as a fuel, it starts breaking down fat, resulting in the production of ketones. As ketone levels increase in the blood, ketoacidosis develops

While DKA most commonly occurs in newly diagnosed type 1 diabetes, it can also occur in those who have a known diagnosis, particularly during times of illness or infection, if they accidentally or intentionally do not take insulin or in those using an insulin pump, if the pump fails to deliver insulin. It can also occur in some individuals with type 2 diabetes, particularly those who produce little insulin of their own.

People with type 2 who are taking sodium-glucose transport protein (SGLT2) inhibitors may be at risk of euglycaemic DKA (where ketones are high but blood glucose levels are within the target range), particularly if they are unwell, are not eating much or following a low carbohydrate diet, or are fasting.

DKA is a medical emergency and requires hospitalisation.

Typical symptoms of DKA include:

- tiredness/drowsiness
- dry or flushed skin
- nausea, vomiting or abdominal pain
- rapid deep breathing (Kussmaul's respiration)
- ketotic breath (a fruity, acetone-like odour)
- confusion/disorientation.

Hyperosmolar hyperglycaemic state

Hyperosmolar hyperglycaemic state (HHS) occurs in people with type 2 diabetes and is more common in older individuals. People with HHS have extremely high blood glucose levels (often above 40 mmol/L) and dehydration but no ketones.

HHS usually occurs because of severe physical stress or illness such as a heart attack or stroke, burns, infection, vomiting or diarrhoea.

Typical symptoms of HHS include:

- thirst
- dry mouth
- polyuria
- dehydration (can be extreme)
- altered state of consciousness.

Like DKA, HHS is a medical emergency and requires hospitalisation.

Disaster planning organisations and emergency personnel should understand how to support the needs of people with diabetes during a disaster or emergency.

Diabetes management and disasters

What are disasters?

Disasters are a serious disruption to community life which threatens or causes death or injury in that community as well as damage to property which is beyond the day-to-day capacity of authorities. A disaster is defined by the need for special mobilisation and organisation of resources other than those normally available to those authorities.[21]

In Australia, disasters occur regularly from extreme weather-related events, including:

- bushfires
- floods
- cyclones
- storms
- heatwaves
- droughts.

How disasters can affect people with diabetes

People living with diabetes are more vulnerable to the stresses and disruptions of disaster. Diabetes management can deteriorate both during and after a disaster, particularly in people who require insulin.[10,13] Some effects can last months.

Disasters can affect a person's ability to manage their diabetes in several ways, including:[10,13]

- difficulties accessing medications, including insulin
- lack of refrigeration to store insulin correctly
- reduced access to power to charge insulin pumps and mobile phones or reader devices which display continuous glucose monitoring (CGM) readings
- reduced availability of glucose and ketone monitoring equipment and supplies

- changes to their usual routine, including mealtimes, activity levels and sleep
- changes to diet/reduced availability of food and water
- changes to physical activity levels
- increased stress levels, anxiety and fear
- a change in priorities from diabetes management to dealing with the immediate situation
- loss of access to their usual diabetes health care services
- the need to evacuate at short notice without enough of their medications and diabetes supplies and without their medical prescriptions.

These changes to a person's diabetes management can result in hyperglycaemia (high blood glucose levels) or hypoglycaemia (low blood glucose levels). If not addressed urgently, this could lead to loss of consciousness, coma and death. Continuity of management of diabetes is therefore essential, particularly making sure that routine diabetes medication and monitoring are not disrupted.

People with diabetes and other chronic conditions need to be prepared for events that may result in a need to shelter in place or evacuate for an extended period.

Information and resources for people with diabetes about disasters and emergencies are available at **ndss.com.au/naturaldisasters.**

Caring for people with diabetes during and after a disaster or emergency

An increasing challenge for health systems is maintaining treatment and care for people with chronic conditions such as diabetes during and after a disaster or emergency.[10,11]

A disaster often results in reduced access to:[10,11]

- medications
- services
- housing
- safe water
- nutritious food
- power to charge diabetes equipment (such as pumps and CGM devices) and refrigerate insulin.

People with diabetes (and other chronic conditions) are more vulnerable to the effects of these disruptions. A significant number of deaths after a disaster are because of inadequate health care services to cater for pre-existing conditions like diabetes.

Emergency services and volunteers can support people with diabetes during disasters and emergencies by understanding the key aspects of diabetes management and how they can be addressed in an emergency situation.

Key aspects of diabetes management to consider in an emergency[10–12,14,17,22]

Education and awareness

- Volunteers and emergency services should receive basic training on diabetes management to better support those affected during emergencies.
- Training should include how to recognise the signs of hypoglycemia (low blood sugar) and hyperglycemia (high blood sugar) and how to provide prompt care in people with these symptoms.

Critical medication and diabetes supplies

- Many people with diabetes rely on insulin, blood glucose monitoring equipment, and other diabetes medications, and ensuring these supplies are available is vital.
- During and after a disaster or emergency, the availability and appropriate storage and handling of diabetes medications and supplies may be a problem.

Insulin

- All people with type 1 diabetes need insulin to stay alive, either given by multiple daily injections or through an insulin pump. Not having access to insulin is life-threatening for these individuals.
- Many people with type 2 diabetes and some women with gestational diabetes also need one or more doses of insulin a day to manage their blood glucose levels.
- Individuals with diabetes will usually give their own insulin, however they may need assistance in an emergency situation.
- Insulin can be affected by heat and should be kept refrigerated (2-8°C) where possible. However, insulin that is being used can be stored at room temperature (up to 25°C) for up to 28 days.
- Where refrigeration is not available, insulin should be kept as cool as possible (but not frozen) and away from direct sunlight. Freezing will damage insulin and make it unsuitable for use.
- **Insulin which has been exposed to higher temperatures should not be discarded if an alternative supply is not available**. There is some evidence that in difficult living situations, such as after a disaster, that insulin can be stored at room temperature for up to 6 months and at higher temperatures up to 2 months without a clinically relevant loss of insulin potency.[23]
- If a person's usual type of insulin is not available, it is vital to seek medical advice before substituting with a different type of insulin. Guidelines are available for health professionals for switching insulin types during a disaster or emergency.
- Insulin is available from pharmacies without a prescription in emergency situations.

Medications

- Medications that are exposed to flood or unsafe water may become contaminated. This contamination may lead to conditions that can cause serious health effects.
- Even medications in their original containers should be discarded if they have been exposed to flood or contaminated water.
- For life-saving medications, if the container is contaminated but the contents appear unaffected, (for example, the pills remain dry), they may be used until a replacement is obtained. However, if pills are wet, they are potentially contaminated and should be discarded.

Blood glucose monitoring

- Regular monitoring of blood glucose levels is an important part of managing diabetes for many people, especially for those taking insulin.
- People with diabetes will usually monitor their own blood glucose levels, however they may need assistance in an emergency situation.
- When in a group setting during a disaster (e.g. a temporary shelter), strict observance of infection control is required to prevent transmission of blood borne conditions such as hepatitis B, hepatitis C and HIV.

Diabetes care procedures

- Most people with diabetes will manage their own diabetes including taking insulin or other medications and monitoring blood glucose levels, however they may need assistance in an emergency situation.
- When in a group setting (e.g. a temporary shelter) during a disaster, strict observance of infection control is required to prevent transmission of blood borne conditions such as hepatitis B, hepatitis C and HIV.
- Sharps containers should be made available for disposal of used insulin pen needles, syringes and lancets. If a sharps container is not available, another empty container should be designated for the use of sharps disposal and marked accordingly.
- Insulin pen needles and syringes should only be used once. However, in an emergency where pen needles and syringes are in short supply, people with diabetes may need to re-use pen needles and syringes rather than dispose of them after each use. In this case, needles and syringes should only be used by the same person.
- Each person with diabetes should have their own blood glucose meter. In a situation where this is not possible, the device must be cleaned and disinfected with 1:10 dilution of household bleach and clean water between uses. Lancet devices and lancets (used to obtain blood) should only be used by the same person.
- If people with diabetes need help with their diabetes management, it is important to use gloves during any procedure that involves potential exposure to blood or body fluids and to change gloves and perform hand hygiene (wash hands with soap and water or use an alcohol hand gel) between contacts. However, it is acknowledged that this may not always be possible (e.g. if gloves or hand sanitisers are not available) and volunteers and emergency services should do the best they can in the circumstances with the resources they have available.

Dietary needs

- Individuals with diabetes need access to regular meals and appropriate food choices to manage blood glucose levels.
- Missing meals or snacks can lead to hypoglycaemia in those who use insulin or sulphonylureas.
- A few healthy options that have a relatively long shelf life and do not require refrigeration for storage include canned fruit, savoury biscuits (crackers, crispbreads), muesli bars, dried fruit and nut mix, popped corn and baked beans. Fresh fruit and wholegrain bread are also good options if available.

Clean water

- People with diabetes are at an increased risk of dehydration, especially if blood glucose levels are elevated.
- Having access to safe, clean drinking water is essential.
- It is also important to have access to clean water for hand washing prior to monitoring blood glucose levels, giving insulin and changing pump infusion sites.

Wound care

- The risk of injury during and after a natural disaster or emergency is high.
- Wound care is of particular importance for people with diabetes, due to increased risk of infections and longer healing time.
- Steps to avoid infection should be taken for any wound, no matter how small. Even a minor wound can become infected.
- Dirty water, soil and sand can all cause infection, even in very small amounts.
- People with diabetes should keep their feet protected and dry to avoid infections and conditions such as trench foot, which can develop when feet are wet for long periods.
- Any wound or rash has the potential to become infected and should be assessed by a medical practitioner as soon as possible.

Mental health

- Stress from disasters can increase blood glucose levels and make diabetes management more difficult.
- People with diabetes may be at a higher risk of mental health conditions.
- Psychological support should be considered as part of care following a disaster.

Coordination of care

- Where possible, organise collaboration with health professionals to ensure continuity of diabetes management, including telehealth options where needed.
- Following a disaster or emergency people with diabetes need to visit their GP for ongoing review, monitoring of their diabetes and adjustment to medication as needed.

Disaster preparation and diabetes

When preparing for disasters, local disaster management groups should consider how to maintain treatment and care options for people with chronic health conditions such as diabetes during and after a natural disaster or emergency.[11,12]

Research shows that access to medication, medical services, water, treatment and care, power and food are key influences on the ability of people with chronic health conditions such as diabetes to self-manage their condition following a disaster.[22] It is important that these key influences are reflected in disaster plans and strategies.[22]

Planning should include:[11,12]

- ensuring effective communication about common chronic conditions with the people affected by disasters, emergency services and healthcare providers
- equipment to help people with diabetes to manage their condition
- appropriate and safe housing/shelter
- access to essential medications
- good sanitation
- continuity of care from medical and pharmaceutical services
- access to clean water
- communication about how to access health care and support for their condition.

These elements, when integrated, provide the basis for reducing the impact of disasters and emergencies on people with chronic conditions such as diabetes.

Key diabetes needs to consider when disaster planning[12,14,24]

Water and food

- Ensure access to safe, clean water.
- Ensure access to appropriate foods, including a regular supply of carbohydrate-containing foods for those at risk of hypoglycaemia.
- Ensure access to rapid-acting carbohydrate foods for treatment of hypoglycaemia for those at risk.
- Understand the needs of those with additional dietary requirements, such as people with co-existing kidney disease or coeliac disease.

Communication

- Ensure the treatment and care needs of people with diabetes are well understood and communicated. This is particularly important for those at highest risk, including people with type 1 diabetes and those with diabetes-related complications such as cardiovascular and kidney disease.
- Provide education, fact sheets and guidance regarding diabetes management to people with diabetes, volunteers and healthcare providers in disaster-prone areas.
- Provide clear and consistent messages about where people with diabetes can go for assistance after a disaster.
- Develop targeted preparedness messaging specific to individuals with diabetes, encouraging them to prepare a diabetes emergency kit and list of emergency contacts.

Medical supplies

- Ensure health services maintain surplus medication supplies, particularly insulin.
- Streamline processes for people with diabetes to access medication following a disaster, considering potential supply chain disruptions.
- Provide necessary equipment for diabetes management, including insulin pens, pen needles or syringes, glucose and ketone meters, monitoring strips, and sharps disposal containers.

Power and equipment

- Provide back-up power or charging devices for people who are reliant on medical equipment (including continuous glucose monitoring devices and some insulin pumps).
- Provide refrigeration for insulin storage.

Services

- Be aware of the range of services that help support people with diabetes, including hospital care, outpatient services, GP clinics and pharmacies.
- Have contingencies in place to ensure treatment and care services are easily accessible and maintained during and after a disaster or emergency.
- Consider transport options for accessing services and the capacity of these services following a disaster.
- Use telehealth to provide access to health services where needed.
- Maintain mental health services to address the psychological impacts of disasters on individuals with diabetes.

Sanitation

- Ensure good hygiene practices are implemented at evacuation centres and shelters to minimise infection risk and understand that people with diabetes may be at higher risk.
- Provide access to facilities for proper waste disposal, particularly sharps disposal for individuals using injectable medications.

Workforce

- Deploy health professionals with an understanding of diabetes management to areas impacted by a disaster.
- Ensure sufficient diabetes healthcare workers are available to meet the increased demand during and after disasters.

Accommodation

- Provide suitable and safe accommodation which provides access to basic treatment and care.
- Provide accommodation in a location that ensures easy access to treatment and care.

Resources to support people living with diabetes

Information and resources have been developed for people with diabetes to ensure they know how to prepare and are able to self-manage their diabetes before, during and after a disaster or emergency.

Topics include:

- How to plan for disasters
- Preparing an emergency kit
- Hot weather and diabetes
- FAQs

These resources were developed through extensive consultation with health professionals, credentialled diabetes educators (CDEs), emergency services and people with diabetes.

Information and resources are available at **ndss.com.au/naturaldisasters**

Summary

1. People with diabetes are at an increased risk of poor health outcomes during and following disasters and emergencies.
2. Diabetes management can deteriorate both during and after a disaster because of reduced access to medications, diabetes equipment and supplies, medical services, safe food and water; changes to physical activity levels and routines; and increased stress levels.
3. Organisations and personnel who deal with disasters and emergencies, either during the planning stages or 'on-the-ground' during and after a disaster has occurred, should understand the needs of people with diabetes and how they can support people with their diabetes management to avoid diabetes-related emergencies.
4. People with diabetes need to be prepared for disasters and emergencies, including events that may result in a need for evacuation for an extended period.
5. People with diabetes who live in disaster-prone areas should have an individual safety plan, such as **My diabetes plan for disasters and emergencies**, which should be reviewed annually.

Appendix 1: Further resources

This guide should be read in conjunction with the following resources:

For people with diabetes

My diabetes plan for natural disasters and emergencies

This plan can help people with diabetes to manage their diabetes before, during and after a natural disaster. The plan lists important things to put in a diabetes emergency kit and can also be used to record personal details, important contact information and current medications.

Hot weather and diabetes

This webpage includes tips for people with diabetes to help them stay healthy when it is hot, including a short video.

For volunteers and emergency services

The NDSS has a range of information and fact sheets covering different aspects of diabetes management, including:

- Hypoglycaemia
- Medications
- Insulin
- Blood glucose monitoring
- Continuous glucose monitoring
- Sick day management

For those in emergency planning and/or management

AIDR Evacuation Planning handbook

This handbook outlines the nationally agreed principles for evacuation planning, using the five-stage evacuation process as a framework. The handbook incorporates guidelines for developing evacuation plans that can be applied in emergencies and disasters that may arise from a wide range of hazards.

AIDR Emergency Planning handbook

Emergency Planning (AIDR 2020) provides a generic guide for emergency planners producing community or entity emergency plans. The handbook provides nationally agreed principles for good practice in emergency planning.

AIDR Community Recovery handbook

This handbook aims to provide a comprehensive guide to community recovery in Australia. It is intended to guide and assist all organisations that help communities before, during and after a disaster.

Australian Disaster Preparedness Framework

This guide from the Australian Government National Emergency Management Agency aims to support Australia to develop the required capability to effectively prepare for and manage severe to catastrophic disasters.

For health professionals

RACGP - Managing emergencies and pandemics

The RACGP has a range of resources for GP practices on managing emergencies and pandemics including information for GPs working in disaster-affected areas, emergency planning and response factsheets and the Emergency Response Planning Tool.

AIDR Health and Disaster Management handbook

This handbook is intended to guide and assist individuals and organisations working in the health system to understand their capability and capacity to support communities before, during and after disasters.

Information for Health Care Professionals: Switching between insulin products in disaster response situations.

Recommendations from the American Diabetes Association, Endocrine Society and Breakthrough T1D (formerly JDRF) intended for use in a disaster response situation when people with diabetes are not on their usual schedule, may have limited monitoring capabilities, and/or don't have access to their prescribed insulins.

Acknowledgements

Special thanks need to go to the following people for their contribution to the development of the original version of this resource.

Expert reference group

A/Professor Glynn Kelly, MB.BS. (Hons 1). B.Sc. (Syd), NSWTC, Cert.Higher Ed., M.Med.(M.F.M.), FRACGP

Chair, Disaster Planning and Management Expert Reference Group

Chair, Royal Australian College of General Practitioners Disaster Management Network

Chief Medical Officer, St John Australia

A/Professor Penny Burns, BMed, MPHTM, PhD

Associate Clinical Professor Academic Department of General Practice, Australian National University, Canberra.

Senior Lecturer, Department of General Practice, University of Western Sydney, New South Wales

Deputy Chair, Royal Australian College of General Practitioners Disaster Management Network

ANU Medical School, Australian National University

Mr Jason Hemingway

Consumer Representative

Advisor, Cassowary Coast Local Disaster Management Group, Queensland

Professor Alicia Jenkins, MD, FRACP

Diabetes and Vascular Medicine, The University of Sydney, Sydney

Endocrinologist, St Vincent's Hospital, Melbourne

Ms Robyn Lansdowne

Disaster Nurse Coordinator, National Critical Care and Trauma Response Centre and Office of the Chief Executive, Department of Health, Northern Territory

Mr Shane Lenson, BN PhD (Cand)

Commissioner, St Johns Ambulance Australia (ACT), Canberra

School of Nursing, Australian Catholic University, Canberra

Ms Amy M Marcos, BH (Nurs), Grad Cert Diabetes Education

Credentialled Diabetes Educator, Registered Nurse Blue Care Southport Community Care, Labrador, Queensland

Ms Annabelle A Stack, BHlth Sci (Nutrition and Dietetics), Grad Cert Diabetes Education

Department of Nutrition and Dietetics, Princess Alexandra Hospital, Metro South Health, Queensland

A/Professor Jamie Ranse, RN FACN FCENA, PhD (Cand)

Faculty of Health, University of Canberra, Canberra

Ms Edith Wilson, BPharm MPS

Pharmacist, Owner (previous) of Healesville Pharmacy Victoria

Expert consultants on chronic conditions and disasters

Mr Benjamin J Ryan, MPH, BScEH

Cairns and Hinterland Hospital and Health Service, Queensland, Australia

College of Public Health, Medical and Veterinary Sciences, James Cook University, Australia

A/Professor Richard C Franklin, PhD, MSocSc, BSc

College of Public Health, Medical and Veterinary Sciences, James Cook University, Australia

World Safety Organization Collaborating Centre for Injury Prevention and Safety Promotion Royal Life Saving Society, Australia

Professor Frederick M Burkle, Jr., MD, MPH, DTM, FAAP, FACEP

College of Public Health, Medical and Veterinary Sciences, James Cook University, Australia Harvard Humanitarian Initiative, Harvard School of Public Health, Cambridge, MA, United States of America

Dr Peter Aitken MBBS, FACEM, EMDM, MClinEd

College of Public Health, Medical and Veterinary Sciences, James Cook University, Australia

School of Public Health, Queensland University of Technology, Australia

Project team

Ms Louise Gilmour, DipPM, AAIPM

Programme Leader, Australian Diabetes Educators Association, Canberra

Ms Helen Vaughan, BAppSc Health Education

Director, NDSS Projects, Australian Diabetes Educators Association, Canberra

References

1. The ARC Centre of Excellence for Climate Extremes (2023). The State of Weather and Climate Extremes. Available at www.climatecouncil.org.au/resources/the-great-deluge-australias-new-era-of-unnatural-disasters (accessed December 2024).
2. Climate Council (2022). The great deluge: Australia's new era of unnatural disasters. Available at www.climatecouncil.org.au/resources/the-great-deluge-australias-new-era-of-unnatural-disasters/ (accessed December 2024).
3. CSIRO (2024). State of the Climate 2024. Available at www.csiro.au/en/research/environmental-impacts/climate-change/State-of-the-Climate (accessed December 2024).
4. Beggs PJ, Zhang Y, Bambrick H, *et al.* The 2019 report of the MJA-Lancet Countdown on health and climate change: a turbulent year with mixed progress. *Med J Aust*. 2019;211(11):490–1.
5. Australian Institute of Health and Welfare (2024). Australia's health 2024: data insights: The ongoing challenge of chronic conditions in Australia. Available at. www.aihw.gov.au/reports/australias-health/chronic-conditions-challenge (accessed December 2024).
6. World Health Organization (2015). Heat and health. Available at. www.who.int/news-room/fact-sheets/detail/climate-change-heat-and-health (accessed December 2024)
7. Australian Medical Association (2015). Position Statement: Climate Change and Human Health 2004. Revised 2015. Available at www.ama.com.au/position-statement/ama-position-statement-climate-change-and-human-health-2004-revised-2015 (accessed December 2024).
8. Mason H, C King J, E Peden A, C Franklin R. Systematic review of the impact of heatwaves on health service demand in Australia. *BMC Health Serv Res*. 2022;22(1).
9. Westphal SA, Childs RD, Seifert KM, *et al.* Managing diabetes in the heat: potential issues and concerns. *Endocr Pract*. 2010;16(3):506–11.
10. Ryan B, Franklin RC, Burkle FM, *et al.* Identifying and Describing the Impact of Cyclone, Storm and Flood Related Disasters on Treatment Management, Care and Exacerbations of Non-communicable Diseases and the Implications for Public Health. *PLoS Curr*. 2015;7: ecurrents.dis.62e9286d152de04799644dcca47d9288. [Version 1].
11. Ryan BJ, Franklin RC, Burkle FM, et al. Reducing Disaster Exacerbated Non-Communicable Diseases Through Public Health Infrastructure Resilience: Perspectives of Australian Disaster Service Providers. *PLoS Curr*. 2016;8: ecurrents.dis.d142f36b6f5eeca806d95266b20fed1f. [Version 1].
12. Ryan BJ, Franklin RC, Burkle FM, *et al.* Ranking and prioritizing strategies for reducing mortality and morbidity from noncommunicable diseases post disaster: An Australian perspective. *Int J Disaster Risk Reduct*. 2018;27:223–38.
13. Ghazanchaei E, Khorasani-Zavareh D, Aghazadeh-Attari J, Mohebbi I. Identifying and Describing Impact of Disasters on Non-Communicable Diseases: A Systematic Review. *Iran J Public Health*. 2021;50(6):1143–55.
14. Tomio J, Sato H. Emergency and disaster preparedness for chronically ill patients: a review of recommendations. *Open Access Emerg Med*. 2014;6:69–79.
15. United Nations Office for Disaster Risk Reduction (2015). Sendai Framework for Disaster Risk Reduction 2015–2030. Available at www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030 (accessed December 2024).
16. Fonseca VA, Bennett MV, Booker B, *et al.* American Diabetes Association Statement on Emergency and Disaster Preparedness A report of the Disaster Response Task Force. *Diabetes Care*. 2007;30(9):2395–8.
17. Satoh J, Yokono K, Ando R, *et al*. Diabetes care providers' manual for disaster diabetes care. *Diabetol Int*. 2019;10(3):153–79.
18. Randrianarisoa A, Richardson J, Brady K, Leguy L. (2021). Understanding Preparedness and Recovery. A Survey of People's Preparedness and Recovery Experience for Emergencies. Australian Red Cross. Available at www.redcross.org.au/globalassets/cms/publications/preparedness-report-july-2021.pdf (accessed December 2024).
19. Australian Institute of Health and Welfare (2024). Diabetes: Australian facts – Summary. Available at www.aihw.gov.au/reports/diabetes/diabetes/contents/summar (accessed December 2024).
20. Diabetes Australia (2023). Submissions to the Parliamentary Inquiry into Diabetes: Improving Access to Diabetes-Related Technology and Medicines. Available at www.diabetesaustralia.com.au/submissions/ (accessed December 2024).
21. Australian Institute for Disaster Resilience (2011). National Strategy for Disaster Resilience. Available at www.knowledge.aidr.org.au/resources/national-strategy-for-disaster-resilience/ (accessed December 2024).
22. Ryan BJ, Franklin RC, Burkle FM, *et al*. Determining Key Influences on Patient Ability to Successfully Manage Noncommunicable Disease After Natural Disaster. *Prehosp Disaster Med*. 2019;34(3):241–50.
23. Richter B, Bongaerts B, Metzendorf MI. Thermal stability and storage of human insulin. *Cochrane Database Syst Rev*. 2023;11(11).
24. Mokdad AH, Mensah GA, Posner SF, et al. When Chronic Conditions Become Acute: Prevention and Control of Chronic Diseases and Adverse Health Outcomes During Natural Disasters. *Prev Chronic Dis*. 2005;2(Spec No):A04.

NDSS Helpline 1800 637 700
ndss.com.au