

Practice Alert

Buccal & Intranasal Midazolam for Epilepsy

May 2023

Key points

- This practice alert is for participants with epilepsy and prescribed midazolam, and the providers who support them. For information on general epilepsy management, see: [Practice Alert: Epilepsy management](#).
- Midazolam is a short-acting sedative and muscle relaxant that is often used to treat prolonged or repeated seizures (clusters) in people with epilepsy.
- Midazolam can rapidly stop the seizure, reducing the likelihood of complications such as cognitive impairment and neuronal damage. In some cases, midazolam can be lifesaving.
- Buccal (inside the cheek) and intranasal (inside the nose) routes of administration for midazolam are used in the community because they work quickly and do not require injections.
- Registered providers administering buccal or intranasal midazolam to participants should be trained in administration, including how to monitor potential side effects and how to respond should they occur.¹

What is Midazolam?

Midazolam belongs to the group of drugs known as benzodiazepines and must be prescribed by a doctor. Midazolam is a short-acting sedative and muscle relaxant used as a once-off PRN (used as required) for emergency treatment of seizures. Prolonged or repeated seizures (clusters) are medical emergencies which need to be treated as quickly as possible to avoid further complications, such as cognitive impairment and neuronal damage. Midazolam acts by reducing the abnormal electrical activity in the brain which aims to stop the seizure and prevent more seizures occurring.

If a participant's doctor prescribes midazolam, training is required so midazolam can be delivered in the community using buccal or intranasal administration methods. Information regarding a

¹ NDIS Practice Standards - Management of medication: Each participant requiring medication is confident their provider administers, stores and monitors the effects of their medication and works to prevent errors or incidents.

participant's midazolam administration should be recorded in an emergency medication management plan or in other document that is completed and signed by a doctor.

Epilepsy Management Plans

Also known as Seizure Management Plans

An epilepsy management plan enables providers and workers to understand how to support a participant to manage their epilepsy, how to respond to an individual's different seizure types and provide individualised emergency response procedures.

Providers should ensure participants have an epilepsy management plan that has been developed with the participant in consultation with health professionals such as their general practitioner, epilepsy nurse or neurologist. An epilepsy management plan may be developed by a nurse and should be signed off by a doctor if it includes medications.

Epilepsy management plans should be reviewed every 12 months, or as otherwise indicated. An epilepsy management plan should also describe indicators for early review.

For further information on epilepsy management plans, see [Practice Alert: Epilepsy management](#).

Emergency Medication Management Plans

If a participant is prescribed buccal or intranasal midazolam, specific prescription and administration details will be included in their emergency medication management plan. An emergency medication management plan should be kept together with, or form part of, a participant's epilepsy management plan.

The emergency medication management plan should include:

- Details of the prescribed medication, dosage, route of administration and side effects
- Serious side-effects to be aware of and how to respond
- What seizure types the medication has been prescribed for
- When and how the medication should be administered
- What to monitor following administration of the medication, and for how long
- When to call an ambulance and/or seek medical review
- Record keeping requirements
- Details of the person's regular pharmacist (if applicable).
- Storage requirements
- Any other support requirements recommended by the prescribing doctor.

Emergency medication management plans must only be completed and signed off by the prescribing doctor and should be reviewed annually, or earlier if circumstances for administering the medication change.

Supporting participants

Providers should monitor participants' health, safety and wellbeing, and support participants to manage their epilepsy by accessing appropriate health services.

Providers should support participants by:

Ensuring good practice:

- Work with the participant to have epilepsy management and/or emergency medication management plan developed to meet their needs.
- Work with the participant to undertake any risk assessments required around high-risk activities, such as swimming. These activities are different for everyone and should be guided by the participant and the person developing their plan.
- Ensure workers are trained and prepared to administer midazolam if required.
- Consider that a participant may have a preference for who trains their workers (i.e.: a trusted epilepsy nurse or organisation) and may want to contribute to the training sessions.

Assisting with engaging health professionals:

- Assist participants with access to specialist epilepsy services such as epilepsy nurses, educators and specialist neurologists.
- Organise longer appointment times for doctor visits to ensure time for an epilepsy review.
- With the participant's permission, provide any seizure records or progress notes relevant to their doctors' appointment.
- Ensure any relevant support strategies are used, such as accompanying participants to appointments and supporting communication.
- If possible, pre-fill plan templates with information already known, such as seizure triggers and types of seizures a participant experiences.
- Work with the participant's pharmacist to ensure midazolam is stored safely and that additional supplies such as syringes are refilled as needed.

Maintaining awareness:

- Ensure that assistive technologies are used as prescribed and that devices are maintained.
- Ensure that records of seizures are kept, for example, the length of time a seizure goes for and what triggers are observed. Check with a person's doctor or other health professionals for further information.
- Ensure indicators for a neurologist or epilepsy plan review are monitored. This should be recorded in a participant's epilepsy management plan.

Administration of buccal and intranasal Midazolam

Registered providers who administer medication must be registered for and adhere to the [Management of Medication Practice Standard](#). This standard requires registered providers to ensure: *“Each participant requiring medication is confident their provider administers, stores and monitors the effects of their medication and works to prevent errors or incidents.”*

All providers, both registered and unregistered, are required under the [NDIS Code of Conduct](#) to *“provide supports and services in a safe and competent manner with care and skill.”*

Providers should ensure workers who may need to administer buccal or intranasal midazolam receive appropriate training and education to allow them to be competent in:

- Appropriate and safe storage of midazolam
- Interpreting key information on a participant's epilepsy and Emergency Medication Management Plan

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- Administration of midazolam during an emergency situation
 - Recognising and managing potential side effects
 - Administration of first aid
 - When to seek medical help

Training updates are recommended every two years however workers should also receive training whenever there are changes or updates to a person's epilepsy management plan.

Medication administration for a participant with epilepsy should be in accordance with their epilepsy management plan, emergency medication management plan or other management plans

Make sure directions from the participant's doctor are followed as not everyone has the same procedure for midazolam administration. Unless otherwise instructed by the participant's doctor, an ambulance should be called before administering midazolam.

Buccal Midazolam

Midazolam is administered via the buccal route by slowly dripping the prescribed amount from an ampoule (a small plastic tube) into the person's mouth between the gums and cheek. Midazolam can also be transferred from an ampoule into a syringe and trickled between the gums and cheek.

For further information about buccal administration of midazolam, see [resources](#) below.

Intranasal Midazolam

Midazolam is administered via the intranasal route using a mucosal atomiser device. This device works by spraying the midazolam into the person's nose. Half a dose is administered in one nostril and the remaining dose in the other.

Midazolam can also be administered via the intranasal route by dripping the prescribed amount from an ampoule into the person's nostrils, alternating between nostrils until the full dose is given.

For further information about intranasal administration of midazolam, see [resources](#) below.

Record keeping

After every use of midazolam, the participant must be monitored. Providers should record the following in the participant's medication records:

- The date, time and length of the seizure
- Details of the seizure, what happened before, during and after
- The dose of the intranasal or buccal midazolam administered
- When the midazolam was administered
- When the ambulance was called

Participant records should also include what monitoring activities were undertaken post-administration of buccal or intranasal midazolam, and note any observed or reported side effects for follow up with the prescribing doctor.

Workers must also follow provider policies and procedures related to [Incident management and reportable incidents](#).

Side effects and risks associated with midazolam

As with all medications, there are risks associated and side effects can occur. This requires awareness, monitoring and management.

Participants should be closely monitored and observed for at least 2 hours following administration of midazolam, or until they have fully recovered and are able to resume normal activities.

Participants should be encouraged to discuss the risks, side effects and benefits of midazolam use in the community setting with their prescribing doctor.

The common side effects of midazolam are:

- respiratory depression
- sedation
- muscle weakness
- impaired balance or coordination
- dizziness or nausea
- irritability or exaggerated happiness (euphoria)

Respiratory depression is a very serious side effect of midazolam.

Respiratory depression is a serious and **sometimes life-threatening condition** if it is unmonitored and not managed.

Respiratory depression can precede serious cardiovascular conditions such as respiratory arrest (cessation of breathing), cerebral hypoxia (insufficient oxygen to the brain) or respiratory acidosis (high levels of acid in the blood due to increased carbon dioxide in the body), which can lead to premature death.

Signs include slow, shallow or erratic breathing

Breathing must be monitored after midazolam for any signs of respiratory depression.

Call 000 if you notice any changes or have concerns.

For further detailed information on side effects and contraindications of midazolam, see [Consumer Medicines Information](#).

For further information on respiratory depression, see [Practice Alert: Medicines that can cause respiratory depression](#).

For further information on aspiration and prevention of respiratory infections, see [Practice Alert: Prevention of respiratory infections](#).

Midazolam storage

Providers should be aware that midazolam is a prescription medication so it must be stored securely.

Plastic ampoules are recommended for use in community settings. Advice should be sought from the participant's pharmacist for alternative options (such as pre-filled dosed syringes) if plastic ampoules are not available. Glass ampoules are not advised.

Midazolam should be stored at temperatures less than 25°C and should be protected from light.

Once expired, midazolam should be returned to a pharmacist for safe disposal.

Emergency response

On rare occasions, participants could experience life-threatening side effects after being administered buccal or intranasal midazolam.

Workers should follow the participant's emergency medication plan if they are experiencing seizures, including instructions on when to seek medical assistance.

Unless the participant's doctor has given different instructions, call an ambulance **before** administering midazolam.

Following administration of midazolam:

- If possible, the participant should be placed in the recovery position (on their side), particularly if the participant has food, fluid or vomit in the mouth.
- If not possible, continue to protect and ensure an open airway, by tilting the chin upwards.
- A worker must stay with the participant until they are fully recovered or the ambulance arrives.

You should call 000 if at any time the participant has:

- Slow, shallow or erratic breathing.
- Difficulty breathing or change in facial colour.
- Or if you have any concerns or doubts about the participant's health status.

Worker Capability

Providers should consider how to increase NDIS workers' training and skills in line with the [NDIS Workforce Capability Framework](#). Areas of training and development may include:

- Administration of buccal or intranasal midazolam including monitoring potential side-effects and how to respond by specialist agencies or health practitioners in accordance with the individual's emergency medication management plan.
- General epilepsy training including seizure first aid.

Training should be updated at least every 2 years. Training can be organised through support organisations such as [Epilepsy Action Australia](#), [Epilepsy Foundation](#) and [Epilepsy Australia](#).

Provider obligations

NDIS Code of Conduct

Providers and workers must comply with the [NDIS Code of Conduct](#) when providing supports or services to NDIS participants.

The NDIS Code of Conduct requires all NDIS providers and workers who provide NDIS supports or services to NDIS participants to, among other things:

- Provide supports and services in a safe and competent manner with care and skill
- Promptly take steps to raise and act on concerns about matters that may impact the quality and safety of supports provided to people with disability.

NDIS Practice Standards

If you are a registered NDIS provider, you must comply with the [National Disability Insurance Scheme \(Provider Registration and Practice Standards\) Rules 2018](#) as part of your conditions of registration. The NDIS Practice Standards relate to the delivery of safe, quality supports and services, and the management of risks associated with the supports you provide to NDIS participants.

In delivering NDIS support and services, providers must also demonstrate compliance with the [National Disability Insurance Scheme \(Quality Indicators\) Guidelines 2018](#). The NDIS Commission's guidance on the [NDIS Practice Standards and Quality Indicators](#) provides a further resource to assist registered NDIS providers to understand their obligations.

The NDIS Practice Standards that are most relevant to this alert include:

- **Risk management:** Risks to participants, workers and the provider are identified and managed.
- **Human resource management:** Each participant's support needs are met by workers who are competent in relation to their role, hold relevant qualifications, and who have relevant expertise and experience to provide person-centred support.
- **Safe environment:** Each participant accesses supports in a safe environment that is appropriate to their needs.
- **Management of medication:** Each participant requiring medication is confident their provider administers, stores and monitors the effects of their medication and works to prevent errors or incidents.
- **Support planning:** Each participant is actively involved in the development of their support plans. Support plans reflect participant needs, requirements, preferences, strengths, and goals, and are regularly reviewed.
- **Responsive support provision:** Each participant accesses responsive, timely, competent and appropriate supports to meet their needs, desired outcomes and goals.
- **Incident management:** Each participant is safeguarded by the provider's incident management system, ensuring that incidents are acknowledged, respond to, well-managed and learned from.
- **Information management:** Each participant's information is managed to ensure that it is identifiable, accurately recorded, current and confidential. Each participant's information is easily accessible to the participant and appropriately utilised by relevant workers.

Resources

NDIS Commission resources

[Practice Alert: Epilepsy Management](#) – Epilepsy management

[Practice Alert: Medicines that cause respiratory depression](#) – Medicines that cause respiratory depression

[Practice Alert: Comprehensive health assessment](#) – Comprehensive health

[NDIS Commission Workforce Capability](#) - Workforce Capability statement.

About administering midazolam for epilepsy

[Templates for Emergency Medication Management Plans from Epilepsy Foundation](#)

[Fact Sheet: Administering Midazolam, Epilepsy Action Australia](#)

[Kids Health Information: Midazolam for seizures, Royal Children's Hospital Melbourne](#)

[Intranasal Buccal Midazolam, Epilepsy Queensland](#)

[Midazolam for status epilepticus - Australian Prescriber \(nps.org.au\)](#)

[Teaching children how to swallow tablets and capsules](#)

Epilepsy Management Plans and Emergency Medication Plans

[Epilepsy Management Plans and Emergency Medication Plans, Epilepsy Foundation](#)

[Seizure Management Planning, Epilepsy Action Australia](#)

[Epilepsy Management Plan and Emergency Medication Plans, Epilepsy Smart Schools](#)

[Emergency Management Plan - Epilepsy Queensland](#)

[Epilepsy Smart Australia](#)

Seizure first aid

[Epilepsy First Aid](#) from Epilepsy Action Australia

Add Seizure First Aid from Epilepsy Smart Australia Program

[Epilepsy Management Course](#): Course in Epilepsy Management (11106NAT)

[Buccal Midazolam - "Keeping Our Mob Healthy"](#) A resource for First Nations people

Further information and training

[Epilepsy Action Australia](#)

[Epilepsy Foundation](#)

[Epilepsy Australia Ltd](#)

[National Epilepsy Support Service - Epilepsy Smart Australia](#)

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References

- Arzimanoglou A, Lagae L, Cross JH (2014) 'The administration of rescue medication to children with prolonged acute convulsive seizures in a non-hospital setting: an exploratory survey of healthcare professionals' perspectives', *European Journal of Pediatrics*, 173, 773–779.
<https://doi.org/10.1007/s00431-013-2255-5>
- Ashrafi MR, Khosroshahi N, Karimi P, Malamiri RA, Bavarian B, Zarch AV, Kompani F (2010) 'Efficacy and usability of buccal midazolam in controlling acute prolonged convulsive seizures in children'. *European Journal of Paediatric Neurology*, 14(5), 434-438.
- Detyniecki K, Van Ess PJ, Sequeira DJ, Wheless JW, Meng TC, & Pullman WE (2019) 'Safety and efficacy of midazolam nasal spray in the outpatient treatment of patients with seizure clusters—a randomized, double-blind, placebo-controlled trial'. *Epilepsia*, 60(9), 1797-1808.
- Epilepsy Action Australia (2020) [Fact Sheet: Administering Midazolam](#) [PDF 94.35KB]. Epilepsy Action Australia, accessed 1 March 2023.
- Epilepsy Nurses Association (2019) [Best practice guidelines for training professional carers in the administration of buccal \(oromucosal\) midazolam for the treatment of prolonged and/or clusters of epileptic seizures in the community](#) [PDF]. Epilepsy Nurses Association, access 1 March 2023.
- Glaser (2016) 'American Epilepsy Society Evidence-based Guideline: Treatment of convulsive status epilepticus in children and adults: Report of the guideline committee of the American Epilepsy Society'. *American Epilepsy Society*, 16(1) 48-61.
- Government of Western Australia (2020) [Midazolam administration](#) [PDF]. Government of Western Australia, accessed 1 March 2023.
- Kutlu NO, Dogrul M, Yakinci C, and Soylu H. (2003). 'Buccal midazolam for treatment of prolonged seizures in children'. *Brain and Development*, 25(4), 275-278. doi:10.1016/s0387-7604(02)00230-9
- Maglalang PD, Rautiola D, Siegel RA, Fine JM, Hanson LR, Coles LD, and Cloyd JC (2018) 'Rescue therapies for seizure emergencies: New modes of administration'. *Epilepsia*, 59(2), 207-215. doi:10.1111/epi.14479
- McTague A, Martland T, and Appleton R (2018) 'Drug management for acute tonic-clonic convulsions including convulsive status epilepticus in children'. *Cochrane Database Systematic Review*, 1, Cd001905. doi:10.1002/14651858.CD001905.pub3
- National Institute for Health and Care Excellence (NICE) 2022 'Treating status epilepticus, repeated or cluster seizures, and prolonged seizures. NICE Guideline 217', accessed 6 February 2023.
- National Library of Medicine (n.d.) [Midazolam](#). Pub Chem, accessed 5 May 2023.
- Royal Children's Hospital Melbourne (2019) [Midazolam for seizures](#) [PDF], accessed 6 February 2023.
- Royal Children's Hospital, Melbourne (2006) [Procedural sedation learning guide for health care professionals](#) [PDF], accessed 6 February 2023.
- Smith R and Brown J (2017) [Midazolam for status epilepticus](#). *Australian Prescriber* 40: 23-5
- Therapeutic Guidelines (2021) 'Acute Management of seizures and status epilepticus', accessed 22 September 2021
- Trinka E, Cock H, Hesdorffer D, Rosetti AO, Scheffer IE, Shinnar S, Shorvon, and Lowenstein H (2015) 'A definition and classification of status epilepticus – Report of the ILAE Task Force on the classification of status epilepticus' *Epilepsia*, 56(10):1515-23. DOI 10.1111/epi.1321.

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- Ulgey A, Aksu R, & Bicer C (2012) 'Nasal and buccal treatment of midazolam in epileptic seizures in pediatrics'. *Clinical Medicine Insights: Pediatrics*, 6, 51-60. doi:10.4137/CMPed.S8330
- Wheless, JW, Meng, TC, Van Ess PJ, Detyniecki K, Sequeira DJ, and Pullman WE (2019) 'Safety and efficacy of midazolam nasal spray in the outpatient treatment of patients with seizure clusters: An open-label extension trial'. *Epilepsia*, 60(9), 1809-1819. doi:10.1111/epi.16300