NSW Health

Safe use of CLONazepam oral liquid

SAFETY INFORMATION 011/25

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Content reviewed by:	Medication Safety Expert Advisory Committee, Agency of Clinical Innovation Aged Care, End of Life and Palliative Care, Paediatric and Mental Health Networks, Cerner eMM Application Specialists and other key stakeholders.
Distributed to:	Chief Executives; Directors of Clinical Governance; Director, Regulation and Compliance Unit
KEY MESSAGE:	Inform clinicians of the risk associated with the use of clonazepam oral liquid, and provide recommendations and risk-mitigation strategies to reduce risks associated with its prescribing, dispensing and administration.
We recommend you also inform:	Directors, Managers and Staff of: • Medical Services • Pharmacy Departments • Nursing and Midwifery • Palliative Care • Psychiatry and Mental Health • Aged Care • Neurology • Paediatrics • Neonatal services • Digital Health/ICT Drug and Therapeutics Committees. All other relevant clinicians, departments and committees.
Website:	https://www.health.nsw.gov.au/sabs/Pages/default.aspx http://internal.health.nsw.gov.au/quality/sabs/index.html
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Situation

There is a risk of dose errors associated with the prescribing and administration of CLONazepam (Rivotril®) oral liquid. Causes of dose errors can include:

- confusion between the number of 'drops' vs the volume in 'mL'
- confusion between the dose in 'mg' vs the volume 'mL'
- incorrect conversion between 'mg' to 'drops'
- inappropriate administration technique.

Errors associated with CLONazepam oral liquid have the potential to result in serious adverse effects to patients including drowsiness, respiratory depression, or coma.

Background

CLONazepam is a long-acting benzodiazepine[1] used in the treatment of epilepsy in infants, children and adults[2], as well as for managing agitation, anxiety, terminal restlessness and seizures in patients undergoing end of life care[3].

CLONazepam (Rivotril®) oral liquid is available in a **2.5 mg/mL strength** contained within a 10 mL amber glass bottle and is often prescribed in patients with difficulty swallowing tablets, or for patients requiring sublingual administration. The bottle features a 'controlled-release' dropper device within the neck of the bottle (see Figure 1), to allow for dosing in **drops (1 drop contains 0.1 mg CLONazepam)**[2].

The Product Information for Rivotril® oral liquid states to 'measure the prescribed dose of Rivotril® oral liquid as DROPS only[2] (see Figure 2).'

Figure 1: CLONazepam (Rivotril®) oral liquid (without the lid).

Figure 2: Product packaging indicating administration in 'DROPS only'.

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Assessment

There are varying approaches to the prescribing and administration of CLONazepam oral liquid within NSW Health. Some clinicians may remove the dropper or insert a syringe with a needle into the dropper hole. This can potentially widen the dropper hole and cause dosing inconsistencies if the dropper is subsequently used for dosing.

In NSW Health, oral liquid medicines are typically dosed in millilitres (mL) – refer to Section 3.2 of the NSW Health Policy Directive *Medication Handling* (PD2022_032). However, prescribing and administration practices for CLONazepam oral liquid currently vary between facilities, with use of 'drops' or 'mg' or 'mL'.

Additionally, there is currently no guidance or standardisation for the documentation of oral liquids by 'drops' in accountable drug registers. This can lead clinicians to document by 'mL' introducing the potential for dose conversion errors.

Clinicians frequently move between facilities, Local Health Districts (LHDs), and Specialty Health Networks (SHNs). Without a standardised approach, this movement increases the risk of errors due to unfamiliarity with local prescribing and administration practices and can impact patient safety.

Recommendations

CLONazepam oral liquid should only be used when solid dose forms of CLONazepam are not suitable. The 0.5 mg and 2 mg tablets can be dispersed in water, refer to Advanced Pharmacy Australia's *Don't Rush to Crush* Handbook, accessible via CIAP for further information.

Prescribing

When prescribing CLONazepam oral liquid in electronic Medication Management (eMM) systems or a paper medication chart, the following should be included in the medication order:

- the dose should be prescribed in MILLIGRAMS followed by the dose in DROPS for example '1 mg = 10 drops'
- include the medicine strength (2.5 mg/mL)
- include "0.1 mg = one drop" dose equivalence.

See Figure 3 for an example of an order sentence within the Cerner electronic Medication Management (eMM) system, and Figure 4 for the display of this order sentence on the Medication Administration Record (MAR).

CLONazepam 2.5 mg/mL oral liquid (0.5 mg = 5 drop(s), Oral, Liquid, BD, (0.1 mg = 1 drop) Count drops into a spoon to give the mixture)

Figure 3: Example of a Cerner eMM order sentence.

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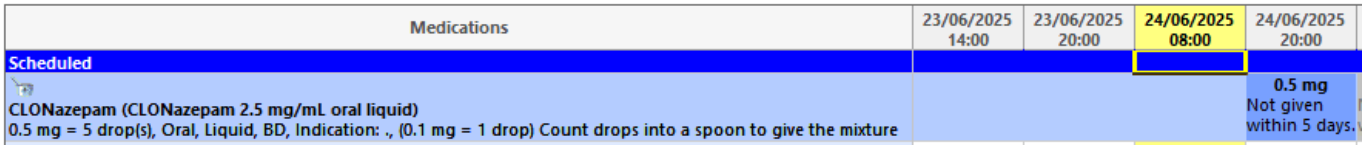
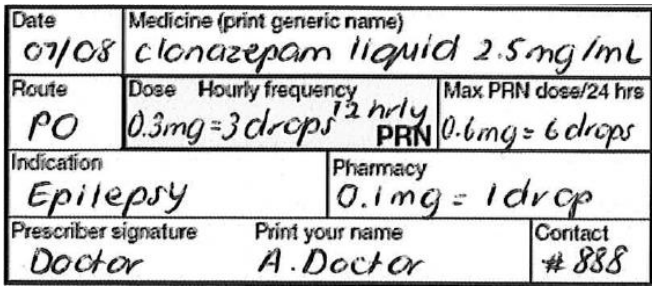


Medications	23/06/2025 14:00	23/06/2025 20:00	24/06/2025 08:00	24/06/2025 20:00
Scheduled				
CLONazepam (CLONazepam 2.5 mg/mL oral liquid) 0.5 mg = 5 drop(s), Oral, Liquid, BD, Indication: ., (0.1 mg = 1 drop) Count drops into a spoon to give the mixture				0.5 mg Not given within 5 days.

Figure 4: Example of a clonazepam order on the Cerner eMM Medication Administration Record (MAR).

For an example of the prescribing requirements on a paper-based medication chart please see Figure 5 below.



Date	Medicine (print generic name)		
07/08	clonazepam liquid 2.5mg/mL		
Route	Dose	Hourly frequency	Max PRN dose/24 hrs
PO	0.3mg=3 drops	12 hrly PRN	0.6mg = 6 drops
Indication	Epilepsy	Pharmacy	0.1mg = 1 drop
Prescriber signature	Doctor	Print your name	A. Doctor
Contact	# 888		

Figure 5: Example of charting a clonazepam oral liquid order on paper chart.

Dispensing

- All inpatient supply/distribution should include a cautionary label with the dose equivalence on the bottle.
- Consider adding a signature 'sig' code into the local pharmacy dispensing software system with the following annotation:

"0.1 mg = one drop. Prescribe in milligrams and drops. Administer drops using a plastic medicine cup or a plastic/metal spoon."

Facilities may adapt the annotation to suit their local context.

Administration

- Check the order includes the dose in both milligrams (mg) AND drops.
- If a medication order is unclear or ambiguous, the administering clinician must contact the pharmacist, prescriber or authorised delegate for clarification prior to administering the dose – see NSW Health Policy Directive *Medication Handling* (PD2022_032).
- Invert the bottle and administer **by counting the number of drops** into a **plastic** medicine cup or a **plastic/metal** spoon, and mix with a small amount of water, tea or fruit juice if required – see Advanced Pharmacy Australia's *Don't Rush to Crush* Handbook, accessible via CIAP for further information.
    - Do not administer drops directly into the patient's mouth from the bottle, as overdosing can occur easily.
    - Avoid using paper cups and wooden spoons for administration, as they may absorb the dose or leave residue.

- Each time the bottle is opened, make sure the dropper is tightly secured within the neck of the bottle.
- Ensure ongoing adherence to the '5 Rights' of safe and accurate medication administration, including independent second checks to minimise the risk of errors – see NSW Health Policy Directive *Medication Handling* (PD2022_032).
- The bottle should **not be accessed with a syringe** except when used in neonates.
    - For neonatal dosing information, clinicians should refer to the relevant Australasian Neonatal Medicines Formulary monograph.
    - If bottles are used to prepare doses for neonates, they should be clearly labelled to prevent further use of the 'controlled-release' dropper device within the neck of the bottle.

Other considerations

- The dropper should not be removed from the bottle to avoid risk of overdose.
- Medication reconciliation – ensure medication history accurately captures patient's CLONazepam dose. In the Cerner eMR, the history should be configured to capture the patient's dose in milligrams.
- Documentation – each bottle of CLONazepam (Rivotril®) oral drops contains 250 drops (25 mg) and doses should be documented in drops in the accountable drug register to ensure accuracy, as the medication is administered in drops and not in millilitres.
- Under facility procedures, Schedule 4 Appendix D medication packs may be moved to a medication trolley for the purpose of administering doses during a medication round – see Section 5.4.3 Storage of Schedule 4 Appendix D medications of the NSW Health Policy Directive *Medication Handling* (PD2022_032).
- Report and review incidents related to clonazepam oral liquid in the local incident management system (for example, ims+, including both near misses and actual errors), and to the TGA.
- Clinicians should take extra precautions when prescribing, dispensing and administering CLONazepam oral liquid, and when communicating information surrounding medicines during transitions of care.
- Patients and caregivers should be provided with appropriate education from experienced nurses and pharmacists who are proficient in the use of the product being prescribed, including any specific requirements, and this information should be clearly documented during transitions of care (for example, on discharge).
- Governance committees should liaise with local electronic Medication Management (eMM)/ICT teams to update configurations for clonazepam oral liquid in the eMM to display the dose as MILLIGRAMS followed by DROPS, for example, 0.2 mg = 2 drops. Local configurations and eMM systems in use may differ between districts.
    - In the Cerner eMM, use of the M-type synonym enables the display of dose in the desired format – MILLIGRAMS followed by DROPS.

  - Adequate testing should be conducted to ensure that the correct number of drops is displayed across the potential dose range, and that the dose is not shown in 'mL' in the administration window, as this may cause confusion for administering clinicians.
- Educate staff responsible for prescribing, preparing and administering of CLONazepam oral liquid regarding these requirements. Ensure rotational, after hours and casual staff are aware of local policies, guidelines and resources related to prescribing and administering of CLONazepam oral liquid.

References

1. Basit et al, National Library of Medicine, 2023. *Clonazepam*. Available from: https://www.ncbi.nlm.nih.gov/books/NBK556010/
2. Pharmaco Products Pty Ltd, 2025. *Rivotril® (clonazepam) – Product Information*. Available from: https://www.ebs.tga.gov.au/ebs/picmi/picmirepository.nsf/PICMI?OpenForm&t=&q=clonazepam
3. Therapeutic Guidelines Limited, 2023. *Terminal care: care in the last days of life*. Available from: https://tgldcdp.tg.org.au.acs.hcn.com.au/viewTopic?etgAccess=true&guidelinePage=Palliative%20Care&topicfile=terminal-care-in-last-days-of-life&guidelinename=Palliative%20Care&sectionId=toc_d1e813#toc_d1e813