

Intranasal Medication Administration via the Mucosal Atomization Device (MAD)-Adults

Site Applicability:

VCH-PHC: Acute and Long-term care sites.

PHSA: BCMHSUS

Practice Level:

RN, RPN, LPN – Basic skill

Limits: LPNs do not administer medications for analgesia via the intranasal route

Need to Know:

- The Intranasal Mucosal Atomization Device (MAD) is used for the atomization of medications across the nasal and oropharyngeal mucous membranes. It is a fast, effective treatment for acute and chronic pain, incident dyspnea and seizure rescue. Medications are absorbed directly into the blood stream, brain and CSF via the olfactory mucosa.
- Key benefits are; painless administration, less invasive route than injection, rapid onset, and eliminates the risk of needle stick injury.
- Consider alternative delivery methods for cases in which mucous, blood and/or vasoconstrictor use will impair absorption via the intranasal route.
- **Contraindications** to intranasal medications include allergies, Upper Respiratory Tract Infection (URTI), maxillofacial trauma, friable nasal tissue and concerns of increased intracranial pressure (ICP); when nasal suctioning is inadequate or not possible or when the patient requires C-Spine precautions that prohibit extension or turning of the neck
- The intranasal medication route is indicated when the patient is unable to tolerate the oral route, IV access cannot be obtained, individual has little subcutaneous tissue or cannot tolerate injection.
- The MAD is for single use only and intended for the administration of one medication in one MAD syringe.
- Use the highest concentration of the medication available to decrease the volume needed.
- If unsure whether a medication can be administered intranasally, contact pharmacy

Equipment and Supplies

- MAD 100 or 300 Device (See [Appendix A](#))
- MAD 100 syringe or 1 mL luer lock syringe (if using MAD 300)
- Blunt Needle with filter, for drawing up medication
- Non sterile gloves

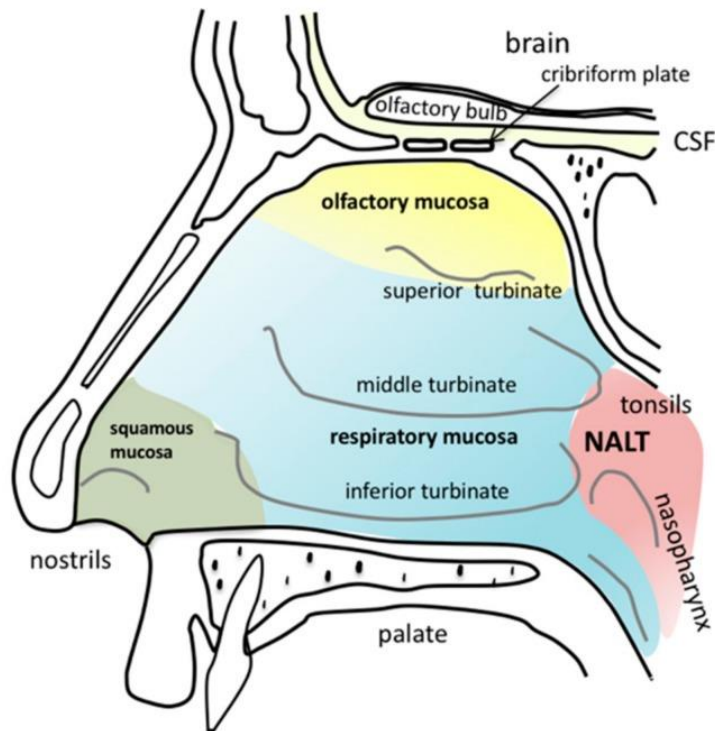
This material has been prepared solely for use at Providence Health Care (PHC), Provincial Health Services Authority (PHSA) and Vancouver Coastal Health (VCH). PHC, PHSA and VCH accept no responsibility for use of this material by any person or organization not associated with PHC, PHSA and VCH. A printed copy of this document may not reflect the current electronic version.

- Medication for injection and priming. Highest concentration of drug with lowest volume is ideal
- Alcohol swabs for medication vial or ampoule

Procedure

Assessment:

- Conduct pain assessment and/or respiratory assessment and determine if the patient requires PRN medication
- Intranasal medication is usually ordered to treat pain, dyspnea, or sometime seizures
- Assess the patient to ensure the nasal cavity is free of blood or mucous. Suctioning of nasal cavity prior to medication administration may enhance delivery if tolerated by patient
- Assess for [contraindications](#) to the intranasal route.



Administration of Medication via the Intranasal Atomization Device

Note: Dead space volume may vary with atomizer brand

1. Ensure [Rights of Medication Administration](#).
2. Explain procedure to patient/family.
3. Perform hand hygiene. Put on gloves.
4. Disconnect MAD from included syringe via Luer lock system (if necessary).
5. Attach filtered needle to syringe and withdraw desired volume of medication and eliminate remaining air.
 - a. MAD 100 device with syringe - dead space is 0.15 mL. Fill syringe with dose volume plus 0.15 mL.

This material has been prepared solely for use at Providence Health Care (PHC), Provincial Health Services Authority (PHSA) and Vancouver Coastal Health (VCH). PHC, PHSA and VCH accept no responsibility for use of this material by any person or organization not associated with PHC, PHSA and VCH. A printed copy of this document may not reflect the current electronic version.

- b. MAD 300 device is supplied without a syringe - dead space is 0.06 mL. Fill syringe with dose volume plus 0.06 mL.
6. Remove filtered needle.
7. Connect the MAD tip to the syringe and twist on.
8. Request that the patient lies down in bed, or tilt the patient's head back slightly if able to follow direction.



9. Hold the forehead or occiput of the head stable with non-dominant hand.
10. Place the MAD tip firmly against one nare and press up and outward, toward the top of the ear on that side.
11. Compress the syringe plunger briskly to deliver half of the medication as an atomized mist into one nare. Usual volume is 0.3 mL and maximum volume is 0.5 mL per nare for adults. Some sources quote 1 mL as maximum volume per nare but limiting the maximum volume to 0.5 mL per nare reduces the risk of inadequate dosing due to medication run off.
12. Place MAD tip in other nare to spray other nasal cavity with remaining dose. If dose volume greater than 0.5 mL per nare then alternate nare and deliver the medication in 5 to 10 minute intervals until total volume administered (may not be possible for indication of seizure rescue). Delivery into both nares enhances surface area available for absorption.
13. Instruct patient to keep head tilted back slightly for a few minutes. The patient may gag or cough during administration.
14. Offer the patient a tissue to wipe any drainage and instruct them not to blow their nose immediately after medication administration.
15. Discard the MAD and syringe in sharps disposal after administering the dose of medication.

This material has been prepared solely for use at Providence Health Care (PHC), Provincial Health Services Authority (PHSA) and Vancouver Coastal Health (VCH). PHC, PHSA and VCH accept no responsibility for use of this material by any person or organization not associated with PHC, PHSA and VCH. A printed copy of this document may not reflect the current electronic version.

16. Assess patient's response to the medication. Nasal drug onset is rapid; onset 5 minutes following administration and peak effect at 20 minutes.

Documentation

1. After administration of medication via the MAD device, document the following in the patient health record:
 - Dose, date and time of administration in the MAR
 - Patient's tolerance of the procedure, including sedation level (if appropriate)
 - Any patient/family teaching provided
 - Indication for using the intranasal route
2. Ongoing documentation includes:
 - Assessment of the nares and interventions to maintain patency
 - Any pain / discomfort / irritation during and following procedure
 - Response to the medication
 - Any patient or family teaching provided

Related Documents

- [Preparation of Parenteral Medications for administration by Syringe](#) (PHC Pharmacy Policy)
- [Parenteral Drug Therapy Manual](#)

References

- Allen et al (2016). "Effectiveness of Atomized Methadone on the Buccal Mucosa in the Last Days of Life: An Innovative Delivery Route When Patients Can No Longer Swallow" J Palliat Care Med, 6:2
- Bailey, A. M., R. A. Baum, et al. (2017). "Review of Intranasally Administered Medications for Use in the Emergency Department." J Emerg Med **53**(1): 38-48.
- Farnia, M. R., A. Jalali, et al. (2017). "Comparison of intranasal ketamine versus IV morphine in reducing pain in patients with renal colic." Am J Emerg Med **35**(3): 434-437.
- Good, P.K, Jackson et al (2009) "Intranasal sufentanil for cancer associated breakthrough pain" Palliat Med **23**(1): 54-8
- Kress, H.G, et al (2009) "Efficacy and tolerability of intranasal fentanyl spray 50 to 200 micrograms for breakthrough pain in patients with cancer: a phase III, multinational, randomized, double blind, placebo-controlled, crossover trial with a 10-month, open-label extension treatment period" Clinical Therapeutics **31**(6): 1177-1191
- Pires, A. Fortuna, A., Alves, G. and Falcao, A. (2009) "Intranasal Drug Delivery: How, Why and What for?" Journal of Pharmacy and Pharmaceutical Sciences, **12**(3):288-311
- Rech, M. A., B. Barbas, et al. (2017). "When to Pick the Nose: Out-of-Hospital and Emergency Department Intranasal Administration of Medications." Ann Emerg Med **70**(2): 203-211.

- Schrier, L., R. Zuiker, et al. (2017). "Pharmacokinetics and pharmacodynamics of a new highly concentrated intranasal midazolam formulation for conscious sedation." Br J Clin Pharmacol **83**(4): 721-731.
- Smith, D., H. Cheek, et al. (2017). "Lidocaine Pretreatment Reduces the Discomfort of Intranasal Midazolam Administration: A Randomized, Double-blind, Placebo-controlled Trial." Acad Emerg Med **24**(2): 161-167.
- Teleflex (2019) Intranasal Atomization Drug Delivery. Accessed Jan 16 2019 at www.teleflex.com
- Therapeutic Intranasal Drug Delivery <http://intranasal.net>
- Thronaes, M et al (2015) "Efficacy and tolerability of intranasal fentanyl spray in cancer patients with breakthrough pain" Clinical Therapeutics **37**(3): 585-96
- Weiner, S. G., P. M. Mitchell, et al. (2017). "Use of Intranasal Naloxone by Basic Life Support Providers." Prehosp Emerg Care **21**(3):
- Winnipeg Regional Health Authority (2009) Palliative Care Program Intranasal Medication Administration by Mucosal Atomization Device (MAD). Accessed Jan 16 2019 at www.VirtualHospice.ca

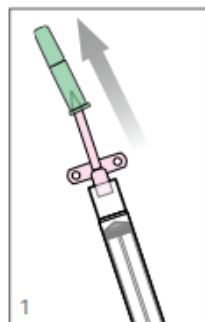
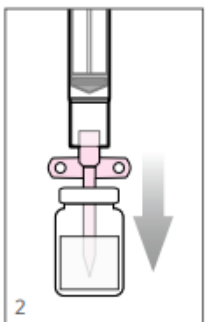
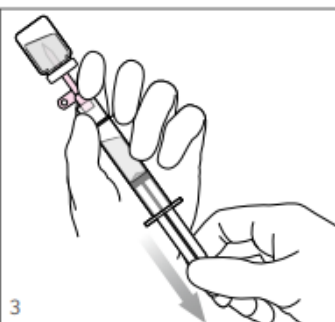
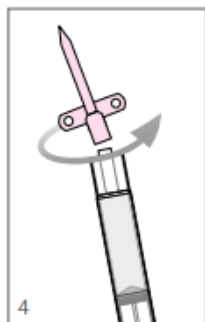
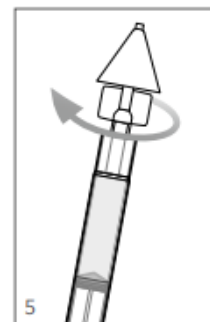
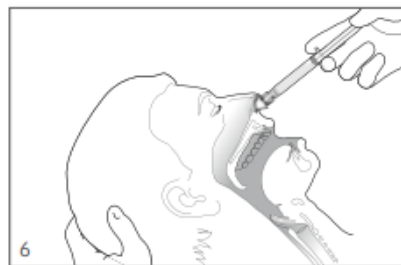
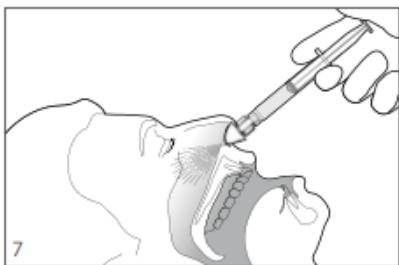
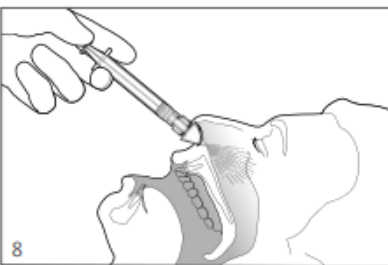
Appendix A: MAD Nasal: Intranasal Mucosal Atomization Device

MAD Nasal™ Intranasal Mucosal Atomization Device Specifications	
Typical Particle Size	30 – 100 microns
System Dead Space	MAD100/MAD110/ MAD130/MAD140 = 0.15 mL MAD1400S = 0.16 mL MAD300 = 0.06 mL
Tip Diameter	0.17 inches (4.3 mm)



User Guide

Procedure

- 
Remove and discard the green vial adapter cap
- 
Pierce the medication vial with the syringe vial adapter
- 
Aspirate the proper volume of medication required to treat the patient (including medication to account for the dead space in the device)
- 
Remove (twist off) the syringe from the vial adapter and discard in sharps container
- 
Attach the MAD Nasal Device to the syringe via the luer lock connector
- 
Using the free hand to hold the occiput of the head stable, place the tip of the MAD Nasal Device snugly against the nostril aiming slightly up and outward (toward the top of the ear)
- 
Briskly compress the syringe plunger to deliver half of the medication into the nostril
- 
Move the device over to the opposite nostril and, repeating steps 6 and 7, administer the remaining medication into the nostril if indicated

This material has been prepared solely for use at Providence Health Care (PHC), Provincial Health Services Authority (PHSA) and Vancouver Coastal Health (VCH). PHC, PHSA and VCH accept no responsibility for use of this material by any person or organization not associated with PHC, PHSA and VCH. A printed copy of this document may not reflect the current electronic version.

First Released Date:	05-DEC-2022		
Posted Date:	05-DEC-2022		
Last Revised:	05-DEC-2022		
Last Reviewed:	05-DEC-2022		
Approved By: <i>(committee or position)</i>	PHC	PHSA	VCH
	PHC - Practice Consultant, Professional Practice	Director, PHSA Nursing Professional Practice	Nursing Pract Initiatives Ld, Prof Practice Admin Coastal Operations Director, Surgical Services, Executive Offices Director, Professional Practice for Nursing & Allied Health, Professional Practice Executive Director Professional Practice and Education, Nursing, Professional Practice Prof Prac Dir, Nrsg & AlldHlth, Office of the CNO RegDir, PP & ClinEd, Nurs& AH, Professional Practice Director, Pharmacy Informatics & Automation, Quality and Medication Safety, Lower Mainland Pharmacy Services