

## Intranasal Medication Delivery – Nothing to Sneeze At

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Speaker has nothing to disclose

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## Learning Objectives

1. Describe the proper methods and equipment necessary for the intra-nasal administration of medications in the emergency department
2. List the medications that may be administered intra-nasally, their indications, dosing and special considerations for administration of those medications

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## Mucosal Atomizing Device

- Atomizes medication for intranasal delivery
- Max volume is 2ml per nostril
- Preferred volume is ½ to 1 ml per nostril
- Will be stocked in ED and EMS supply

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## Medications for Nasal application

- Naloxone – decreased risk for administration by health professionals
- Lidocaine – for placement of NG tube.
- Lidocaine & oxymetazoline – for anterior epistaxis
- Midazolam – acute childhood seizures and sedation.
- Opiates – pain control
- Sedation – minor procedure (under pharmacy review)
- Glucagon – hypoglycemia

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## Intranasal Narcan® Dosing

- Narcan® dosed same as inj. Narcan®
- Maximum of 1 ml per nostril 2mg dose administer 1ml per nostril
- Nasal passage must be clear in order to be effective
- Patient may experience some irritation and discomfort
- Not recommended for patients with facial trauma

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## Intranasal Lidocaine Dosing for Nasal Gastric tube placement

- Draw up 4.5 ml 4% preservative free lidocaine (may use with oxymetazoline)
- 1.5 ml of lidocaine into operative nasal pharynx (inhale through nose if awake)
- 3 ml of lidocaine (remove atomizer) inject into oral pharynx - Gargle and swallow if alert. Wait 3 min. before placement of NG tube
- May repeat with ½ dose if needed
- Recommended dose of 4mg/kg

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2% or 4%

Patient Wt	Maximum	Volume ml	Volume ml
Kg	dose mg	2% Lidocaine	4% Lidocaine
3-5	12-20	0.75	
6-10	24-40	1.5	
11-15	44-60	2.5	
16-20	64-80	3.5	
21-25	84-100	4.5	
26-30	104-120	6	3
31-35	124-140	7	3.5
34-40	144-160	8	4
41-45	164-180	9	4.5
46-50	184-200	10	5
51-55	204-220		5.5
56-60	224-240		6
61-70	244-280		7
71-80	284-320		8
81-90	324-360		9
91-100	364-400		10

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### Lidocaine & oxymetazoline dosing for epistaxis

- 1-1.5 ml of oxymetazoline in a 3 ml syringe
- 0.5 ml of 4% lidocaine
- Have patient blow nose
- Place all of medication in nasal passage and have patient inhale.
- Place cotton ball soaked in oxymetazoline into nose (may remove after 15 min)
- Patient may use oxymetazoline Q8 hr x 48-72 hr

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### Intranasal midazolam for the treatment of acute seizures

- Less respiratory depression when compared to rectal diazepam
- SaO<sub>2</sub> in patients administered intranasal midazolam did not vary compared to rectal diazepam
- Seizures control was greater in patient administered midazolam
- Less treatment failure and recurrence in midazolam groups

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### Intranasal midazolam for the treatment of acute seizures

- Dose 0.2mg/kg body weight
- Patient ages 3 month to 12 years
- Included febrile seizures and all types of epilepsy
- 0.12ml added for dead space
- Dose rounded to nearest 0.1ml

Intranasal Midazolam vs Rectal Diazepam in Acute Childhood Seizures.  
Madhumita Bhattacharyya, MD, Venna Kalra, MD and Sheffali Gulati, MD  
Pediatric Neurology Vol. 34 No. 5

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### Midazolam Dosing Chart

Patient	Weight	Volume	Patient	Weight	Volume
Age (yrs)	(Kg)	(ml)	Age (yrs)	(Kg)	(ml)
Neonate	3	0.3	7	24	1.1
< 1	6	0.4	8	26	1.2
1	10	0.5	9	28	1.3
2	14	0.7	10	30	1.4
3	16	0.8	11	32	1.4
4	18	0.9	12	34	1.5
5	20	1	Small Teen	40	1.8
6	22	1	Adult	> 50	2

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### Intranasal opiates for pain control

- Adult and pediatric minor painful injuries/procedures
- Orthopedic trauma not requiring IV or prior to IV
- Burn dressing change
- Re-packing wounds such as abscesses
- Any time IM is considered IN may be used

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**Dosing fentanyl 50 mcg/ml**

- 2-3 mcg/kg
- Administer ½ dose per nare
- ¼ to ½ ml is ideal
- Volumes >2 ml may be titrated with 2<sup>nd</sup> dose 5-10 min later
- Monitor for respiratory depression
- May repeat ½ dose every 5-10 min until desired effect achieved
- Consider sufentanil when large volumes of fentanyl are needed

Patient Weight (Kg)	Fentanyl dose (mcg)	Fentanyl dose (ml)
3-5	10	0.3
6-10	20	0.5
11-15	30	0.7
16-20	40	0.9
21-25	50	1.1
26-30	60	1.3
31-35	70	1.5
36-40	80	1.7
41-45	90	1.8
46-50	100	2.0
51-55	110	2.3
56-60	120	2.5
61-70	140	2.9
71-80	160	3.3
81-90	180	3.7
91-100	200	4.0

0.1 ml added for dead space

Use sufentanil or ½ dose per nare / titrate dose

**Dosing Sufentanil 100 mcg/ml**

- 0.6-1.5 mcg/kg
- Administer ½ dose per nare
- ¼ to ½ ml is ideal
- Volumes >1 ml may be divided into each nostril or titrate dose
- Monitor for respiratory depression
- May repeat ½ dose every 5-10 min until desired effect achieved
- Not for use in children (fentanyl is preferred)

Patient Weight (Kg)	Sufentanil dose (mcg)	Sufentanil dose (ml)
3-5	use fentanyl	use fentanyl
6-10	use fentanyl	use fentanyl
11-15	use fentanyl	use fentanyl
16-20	15	0.4
21-25	19	0.5
26-30	23	0.55
31-35	26	0.6
36-40	30	0.7
41-45	34	0.8
46-50	38	0.85
51-55	41	0.9
56-60	45	1.0
61-70	53	1.15
71-80	60	1.3
81-90	68	1.45
91-100	75	1.6

0.1 ml added for dead space

1/2 dose per nare

**Intranasal Glucagon**

- Dissolve 2 mg of glucagon (2 vials) with 1 ml diluent provided (½ ml per vial)
- Load syringe with 2 mg (1 ml) of glucagon
- Attach nasal atomizer
- Place ½ of the dose in each nostril
- Effect should be noticed within 5 minutes
- (may use with glucose paste or D50)

**What medications may be delivered by the nasal route?**

- A. Midazolam
- B. Fentanyl
- C. Diazepam
- D. Sufentanil

**What is the dose for fentanyl for IN administration?**

- A. 4-5 mcg/kg
- B. 0.2-0.3 mcg/kg
- C. 1-2 mg/kg
- D. 2-3 mcg/kg