Product Monograph

Including Patient Medication Information

NARCAN® NASAL SPRAY

Naloxone Hydrochloride Nasal Spray

Solution for Intranasal Use

2 mg/0.1 mL and 4 mg/0.1 mL

Opioid Antagonist

Emergent Operations Ireland Limited

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Date of Authorization:
2026-05-07

Date of revision
2026-06-17

Imported by:

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Control Number: 302362

Recent Major Label Changes

- None at the time of the most recent authorization.

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Certain sections or subsections that are not applicable at the time of the preparation of the most recent authorized product monograph are not listed.

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Part 1: Healthcare Professional Information

1. Indications

NARCAN NASAL SPRAY (naloxone hydrochloride nasal spray) is indicated for:

- Emergency use to reverse known or suspected opioid overdose, as manifested by respiratory and/or severe central nervous system depression.

NARCAN NASAL SPRAY can be administered by a bystander (non-health care professional) before emergency medical assistance becomes available, but it is not intended to be a substitute for professional medical care. Emergency medical assistance (calling 911) should be requested immediately when an opioid overdose is suspected, before administering naloxone.

1.1. Pediatrics

Pediatrics (<18 years of age): Based on the limited available data, caution should be exercised in administrating NARCAN NASAL SPRAY to neonates (see 7 Warnings and Precautions, Acute Opioid Withdrawal Syndrome, and 7.1.3 Pediatrics).

1.2. Geriatrics

Geriatrics (>65 years of age): Evidence from clinical experience suggests that use in geriatrics is not associated with differences in response compared to the younger population (see 7.1.4 Geriatrics).

2. Contraindications

- Patients who are hypersensitive to this drug or to any ingredient in the formulation or component of the container. For a complete listing, see the 6 Dosage Forms, Strengths, Composition, and Packaging.

3. Serious Warnings and Precautions Box

- Emergency medical assistance (calling 911) should be requested immediately when an opioid overdose is suspected, before using naloxone (see 7 Warnings and Precautions, General, Rebound Opioid Toxicity).
- Individuals with a satisfactory response to an initial dose of naloxone should be kept under continued surveillance (see 7 Warnings and Precautions, General, Rebound Opioid Toxicity). Caregivers administering naloxone should be prepared to act in response to or assist the patient in cases of potential adverse reactions such as aggressive reactions, convulsions and vomiting. Special attention is warranted if naloxone is administered to a neonate or a pregnant woman (see 7 Warnings and Precautions, General, Acute Opioid Withdrawal Syndrome and 7.1 Special Populations, 7.1.1 Pregnancy, 7.1.3 Pediatrics, and 4 Dosage and Administration).

4. Dosage and Administration

4.1. Dosing Considerations

- Emergency medical assistance (i.e. calling 911) should be requested immediately when an opioid overdose is suspected, before administering naloxone (see 7 Warnings and Precautions,

General, Rebound Opioid Toxicity). NARCAN NASAL SPRAY is not a substitute for emergency medical care.

- Since the duration of action of most opioids exceeds that of naloxone, the patient should be kept under continued surveillance and repeated doses of naloxone should be administered, as necessary (see 7 Warnings and Precautions, General, Rebound Opioid Toxicity).

4.2. Recommended Dose and Dosage Adjustment

Recommended Initial Dosing

In all cases, the lowest available strength of NARCAN NASAL SPRAY should be used as the initial dose.

Dosing in Neonate Patients and pediatrics below 2 years of age

If NARCAN NASAL SPRAY is procured with the intention of use in this population, the pharmacist may suggest alternate formulations of naloxone (e.g. for intramuscular administration) which allow for smaller doses of naloxone.

Naloxone could trigger an acute opioid withdrawal syndrome in the dependent neonate which may be life-threatening if not recognized and properly treated. **Naloxone should be administered to neonates only if clearly needed** (see 7.1.3 Pediatrics).

Dosing in Pregnant Women

Naloxone could trigger an acute opioid withdrawal syndrome in the opioid-dependent pregnant woman, which may precipitate preterm labor or fetal distress (see 7.1.1 Pregnancy). To reduce the risk an acute opioid withdrawal syndrome in the opioid-dependent pregnant woman, the lowest available strength of NARCAN NASAL SPRAY should be used as the initial dose.

Repeat Dosing

- The requirement for repeat doses of NARCAN NASAL SPRAY depends upon the amount, type, and route of administration of the opioid being antagonized;
- If the patient does not respond within 2-3 minutes to the first dose of NARCAN NASAL SPRAY, administer an additional dose of naloxone every 2-3 minutes (if additional doses are available), using a new NARCAN NASAL SPRAY device for each dose, until the desired response is obtained. If no response is obtained after 5 doses of the 4 mg NARCAN NASAL SPRAY or 10 doses of the 2 mg NARCAN NASAL SPRAY, an opioid overdose is unlikely to be the cause of the symptoms. In these cases, additional supportive and/or resuscitative measures may be helpful while awaiting emergency medical assistance;
- Once a desired response is obtained, continue surveillance of the patient while awaiting for emergency medical assistance and administer subsequent doses as necessary if the patient relapses back into respiratory depression;
- Administer NARCAN NASAL SPRAY in alternate nostrils with each dose.

4.4. Administration

NARCAN NASAL SPRAY is for intranasal use only. No additional device assembly is required.

Because treatment of suspected opioid overdose must be performed by someone other than the patient, be sure to inform caregivers, family members, and other persons around the patient about the presence/location of NARCAN NASAL SPRAY in the home as well as the PATIENT MEDICATION

INFORMATION and *Quick Start Guide.*

The pharmacist (or other health care professionals providing advice to patients) should instruct the patient or caregiver to read the PATIENT MEDICATION INFORMATION and the *Quick Start Guide* at the time they obtain NARCAN NASAL SPRAY and to become familiar with the administration procedures. As well, the pharmacist should emphasize the following instructions to the patient or caregiver:

- Always seek emergency medical assistance (i.e. call 911), or ask someone to call for you, in the event of a suspected opioid overdose. If you encounter problems on how to administer NARCAN NASAL SPRAY or any other problem, the 911 operator will guide you.
- As soon as the 911 call is made or while someone else is calling for you, administer the lowest available strength of NARCAN NASAL SPRAY as quickly as possible because prolonged respiratory depression may result in damage to the central nervous system or death. Since the duration of action of most opioids exceeds that of naloxone hydrochloride and the suspected opioid overdose may occur outside of supervised medical settings, always keep the patient under continued surveillance until emergency personnel arrive.
- Additional doses of NARCAN NASAL SPRAY, using an additional NARCAN NASAL SPRAY device, may be required until emergency medical assistance becomes available:
  - If the patient responds to the first dose of NARCAN NASAL SPRAY but relapses back into respiratory depression before emergency assistance arrives, administer repeated doses of NARCAN NASAL SPRAY as necessary.
  - If the patient does not respond to the first dose of NARCAN NASAL SPRAY after 2-3 minutes, administer repeated doses of naloxone as necessary.
- **Do not reuse NARCAN NASAL SPRAY.** Each NARCAN NASAL SPRAY device contains a single dose of naloxone and cannot be reused.
- Administer NARCAN NASAL SPRAY in alternate nostrils with each dose.
- Administer NARCAN NASAL SPRAY according to the printed instructions in the PATIENT MEDICATION INFORMATION or *Quick Start Guide*.
- Place the patient on their back. Prior to administration, be sure the device nozzle is inserted in either nostril of the patient, and provide support to the back of the neck to allow the head to tilt back. In young children, the nozzle may not fit in the nostril. In this case, make sure the nozzle seals the nostril before administration.
- Do not prime or test the device.
- To administer the dose press firmly on the device plunger.
- Remove the device nozzle from the nostril after use.
- Turn patient on their side as shown in the PATIENT MEDICATION INFORMATION or *Quick Start Guide*.

5. Overdose

In view of the indication and the broad therapeutic margin, overdose of NARCAN NASAL SPRAY is not expected.

6. Dosage Forms, Strengths, Composition, and Packaging

Table 1 – Dosage Forms, Strengths, and Composition

Route of Administration	Dosage Form/ Strength/Composition	Non-Medicinal Ingredients
Intranasal	Solution for intranasal administration 2 mg/0.1 mL (20 mg/mL) 4 mg/0.1 mL (40 mg/mL)	benzalkonium chloride disodium ethylenediaminetetraacetate sodium chloride hydrochloric acid to adjust pH purified water

NARCAN NASAL SPRAY is supplied in:

- One carton containing 2 sprayer devices each providing a single 2 mg dose of naloxone hydrochloride in a 0.1 mL intranasal spray; or
- One carton containing 2 sprayer devices each providing a single 4 mg dose of naloxone hydrochloride in a 0.1 mL intranasal spray; or
- One carton containing 6 sprayer devices each providing a single 4 mg dose of naloxone hydrochloride in a 0.1 mL intranasal spray.

Description

NARCAN NASAL SPRAY 2 mg/0.1 mL

Each sprayer containing 0.1 mL of aqueous solution for intranasal administration contains: 2 mg naloxone hydrochloride, benzalkonium chloride (preservative), disodium ethylenediaminetetraacetate (stabilizer), sodium chloride, hydrochloric acid to adjust pH, and purified water.

NARCAN NASAL SPRAY 4 mg/0.1 mL

Each sprayer containing 0.1 mL of aqueous solution for intranasal administration contains: 4 mg naloxone hydrochloride, benzalkonium chloride (preservative), disodium ethylenediaminetetraacetate (stabilizer), sodium chloride, hydrochloric acid to adjust pH, and purified water.

Latex-Free: NARCAN NASAL SPRAY is not made with dry natural rubber.

7. Warnings and Precautions

See 3 Serious Warnings and Precautions Box.

General

In the absence of opioids, in opioid naïve people, naloxone administration shows essentially no pharmacologic activity. In opioid dependent people, naloxone may trigger an acute opioid withdrawal syndrome (see 7 Warnings and Precautions, General, Acute Opioid Withdrawal Syndrome).

The effectiveness of naloxone has not been assessed in people with intranasal conditions such as abnormal nasal anatomy, nasal symptoms (i.e., blocked and/or runny nose, nasal polyps, etc.) or in people having a product sprayed into the nasal cavity prior to naloxone administration. It is unknown if these conditions affect naloxone's effectiveness. If NARCAN NASAL SPRAY is procured with the intention of using it in people that may present these conditions, the pharmacist may suggest other route of administration (e.g. intramuscular).

Naloxone does not counteract overdoses due to: barbiturates, benzodiazepines, psychostimulants (e.g., cocaine, amphetamines, methylphenidate, etc.), alcohol, or any other non-opioid drug such as non-

opioid tranquilizers, anesthetics or sedatives. However, mistakenly administering naloxone to a person that is unconscious because of a non-opioid overdose or for other reasons is unlikely to create more harm.

Rebound Opioid Toxicity

Rebound opioid toxicity is the re-emergence of an opioid overdose manifestation, including respiratory depression, following the temporary reversal of the opioid overdose with naloxone. The patient who has responded satisfactorily to naloxone should be kept under continued surveillance and repeated doses of naloxone should be administered as necessary until the emergency medical services take charge of the patient (see 4 Dosage and Administration). Repeated doses are often required as the duration of action of most opioids exceeds that of naloxone, and therefore, re-emergence of opioid overdose manifestation is likely.

Acute Opioid Withdrawal Syndrome

NARCAN NASAL SPRAY should be administered with caution to persons who are known or suspected to be physically dependent on opioids. In such cases, an abrupt reversal of opioid effects may precipitate an acute opioid withdrawal syndrome. The severity of such a syndrome will depend on the degree of physical dependence, the dose and potency of the opioid that induced the overdose, and the dose of naloxone administered.

The signs and symptoms of an acute opioid withdrawal syndrome include, but are not limited to: body aches, pain, fever/pyrexia, sweating/hyperhidrosis, runny nose, sneezing, piloerection, yawning, weakness, asthenia, shivering, chills, tremor/trembling, convulsions/seizures, nervousness, restlessness, irritability, aggressive behavior, diarrhea, nausea, vomiting, abdominal cramps, increased blood pressure, and tachycardia. In the dependent neonate, signs also include excessive crying as well as hyperactive reflexes and the acute withdrawal may be life-threatening if not recognized and properly treated (see 7.1.3 Pediatrics).

Emergency medical assistance (i.e. calling 911) should be requested immediately when an opioid overdose is suspected. Monitor the patient for the development of the signs and symptoms of opioid withdrawal. Caregivers administering naloxone to any patient should always be prepared for potential reactions associated with acute opioid withdrawal syndrome and to assist the patient to minimize harm when experiencing these reactions. For example, a patient should be positioned in lateral decubitus to prevent choking if vomiting occurs; sharp or dangerous objects should be moved away in case of convulsions to protect the patient from injury, but the patient should not be restrained.

Cardiovascular

Rare cases of cardiac arrest, tachycardia and ventricular fibrillation have been reported after naloxone administration. These cases may have been confounded by the effects of other drugs or other effects such as prolonged hypoxia. A direct relationship to naloxone has not been established.

Gastrointestinal

Naloxone administration could trigger gastrointestinal reactions including diarrhea, nausea, vomiting and abdominal cramps (see 7 Warnings and Precautions, General, Acute Opioid Withdrawal Syndrome). If vomiting occurs, the patient should be positioned in lateral decubitus to prevent choking.

Neurologic

Convulsions or seizures after naloxone administration have been rarely reported and the relationship between naloxone and convulsion or seizure is unclear. If convulsions or seizures occur, sharp or dangerous objects should be moved away to protect the patient from injury but the patient should not be restrained.

Perioperative Considerations

Post-Operative Consideration

Several instances of hypotension, hypertension, ventricular tachycardia and fibrillation, dyspnea, pulmonary edema and rare cases of cardiac arrest have been reported. Death, coma, and encephalopathy have been reported as sequelae of these events.

These events have primarily occurred in post-operative patients with pre-existing cardiovascular disorders and/or other drugs may have contributed to the adverse effects.

A direct relationship to naloxone has not been established.

Psychiatric

Irritability and aggressive behavior are among the manifestations of an acute opioid withdrawal syndrome, which may be precipitated when naloxone is administered to a person who is physically dependent on opioids (see 7 Warnings and Precautions, General, Acute Opioid Withdrawal Syndrome). Caregivers administering naloxone to any patient should always be prepared to manage potential aggressive reactions.

Respiratory

Naloxone is not effective against respiratory depression due to non-opioid drugs (see 7 Warnings and Precautions, General). A single dose of naloxone may not reverse respiratory depression (or reversal may be incomplete) if the opioid overdose is caused by certain partial agonist opioids such as buprenorphine and pentazocine or highly potent opioids such as fentanyl or its analogs. Additional doses of naloxone administered at close intervals may be required in such cases (see 4.2 Recommended Dose and Dosage Adjustment).

Similarly, an opioid overdose caused by very large doses of any opioid may also require administration of multiple doses of naloxone at close intervals (see 4.2 Recommended Dose and Dosage Adjustment). In addition to naloxone, other resuscitative measures such as maintenance of a free airway, artificial ventilation and cardiac massage could be executed by a bystander (non-health care professionals) if the bystander knows how to perform the maneuvers. Moreover, vasopressor agents should be employed (if available) whenever necessary if a health care professional is present.

7.1. Special Populations

7.1.1. Pregnancy

There are no adequate and well-controlled studies in pregnant women.

Reproduction studies performed in mice and rats at doses up to 12 times the human dose revealed no evidence of impaired fertility or harm to the fetus due to naloxone.

Administration of naloxone to an opioid-dependent pregnant woman may induce an acute opioid withdrawal syndrome (see 7 Warnings and Precautions, General, Acute Opioid Withdrawal Syndrome), which may precipitate preterm labor or fetal distress. Because of this risk and because animal reproduction studies are not always predictive of human response, naloxone should be used during pregnancy only if clearly needed (see 4 Dosage and Administration).

7.1.2. Breastfeeding

It is not known whether naloxone is excreted in human milk. Studies in nursing mothers have shown that naloxone does not affect prolactin or oxytocin hormone levels.

7.1.3. Pediatrics

Accidental opioid exposure is possible in the pediatric population. Naloxone administration may cause an acute opioid withdrawal syndrome which may be life threatening in opioid dependent neonates if not recognized and properly treated (see 7 Warnings and Precautions, General, Acute Opioid Withdrawal Syndrome). Clinical data is limited and naloxone should be administered to a neonate only if clearly needed (see 4 Dosage and Administration). As for any use of naloxone, emergency medical assistance (i.e. calling 911) should be requested immediately, before administering naloxone in a neonate.

7.1.4. Geriatrics

Geriatric patients have a greater frequency of decreased hepatic, renal, or cardiac function and of concomitant disease or other drug therapy. Therefore, the systemic exposure of naloxone hydrochloride can be higher in these patients.

Clinical studies of naloxone hydrochloride did not include sufficient numbers of subjects aged 65 and over to determine whether they respond differently from younger subjects. Other reported clinical experience has not identified differences in responses between the elderly and younger patients.

8. Adverse Reactions

8.1. Adverse Reaction Overview

In clinical studies, nasal edema, nasal inflammation, nasal dryness, nasal congestion, muscle spasms, musculoskeletal pain, headache, dizziness, constipation, nausea, toothache, rhinalgia, xeroderma, and blood pressure increased were reported.

Abrupt reversal of opioid effects in persons physically dependent on opioids may result in body aches, pain, fever/pyrexia, sweating/hyperhidrosis, runny nose, sneezing, piloerection, yawning, weakness, asthenia, shivering, chills, tremor/trembling, convulsions/seizures, nervousness, restlessness, irritability, aggressive behavior, diarrhea, nausea, vomiting, abdominal cramps, increased blood pressure, and tachycardia. In the neonate, it may result in excessive crying and hyperactive reflexes as well (see 7 Warnings and Precautions, General, Acute Opioid Withdrawal Syndrome).

Hypotension, hypertension, ventricular tachycardia and fibrillation, dyspnea, pulmonary edema, and cardiac arrest have been associated with the use of naloxone post-operatively. Death, coma, and encephalopathy have been reported as sequelae of these events (see 7 Warnings and Precautions, Cardiovascular, and Perioperative Considerations). Excessive doses of naloxone hydrochloride in post-

operative patients have resulted in significant reversal of analgesia and have caused agitation.

Seizures have been reported to occur infrequently after the administration of naloxone; however, a causal relationship has not been established.

9. Drug Interactions

9.1. Drug-Drug Interactions

Interactions with other drug products have not been established.

9.2. Drug-Food Interactions

Interactions with foods have not been established.

9.3. Drug-Herb Interactions

Interactions with herbal products have not been established.

9.4. Drug-Laboratory Test Interactions

Interactions with laboratory tests have not been established.

10. Clinical Pharmacology

10.1. Mechanism of Action

While the mechanism of action of naloxone hydrochloride is not fully understood, the pre-ponderance of evidence suggests that naloxone antagonizes the opioid effects by competing for the same receptor sites.

10.2. Pharmacodynamics

NARCAN NASAL SPRAY prevents or reverses the effects of opioids, including respiratory depression, sedation, and hypotension. It can also reverse the psychosomimetic and dysphoric effects of agonist-antagonists such as pentazocine. NARCAN NASAL SPRAY is an essentially pure opioid antagonist, i.e., it does not possess the agonistic or morphine-like properties characteristic of other opioid antagonists; naloxone does not produce respiratory depression, psychosomimetic effects or pupillary constriction.

Naloxone has not been shown to produce tolerance or to cause physical or psychological dependence.

10.3. Pharmacokinetics

Following administration, naloxone hydrochloride is rapidly distributed in the body. Naloxone hydrochloride is metabolized in the liver, primarily by glucuronide conjugation, and is excreted in urine.

The study "Naloxone-Ph1a-002" was conducted to determine the PK of 4 different approaches to administer 3 different intranasal (IN) doses [2 mg (2 mg spray in one nostril), 4 mg (2 mg spray in each nostril), 4 mg (4 mg spray in one nostril), and 8 mg (4 mg spray in each nostril)] of naloxone compared to a 0.4 mg dose of naloxone administrated IM.

Study Demographics and Trial Design

Table 2 – Summary of Patient Demographics

Study#	Trial design	Dosage, route of administration and duration	Study subjects (n = number)	Mean age (Range)	Gender
Ph1a-002	Inpatient, Open-Label, Randomized, 5-Period, 5-Treatment, 5-Sequence, Crossover Study	Treatment A 2 mg - One Spray 20 mg/mLIN Treatment B 4 mg - Two Sprays (1 per nostril) 20 mg/mLIN Treatment C 4 mg - One Spray 40 mg/mLIN Treatment D 8 mg - Two Sprays (1 per nostril) 40 mg/mLIN Treatment E 0.4mgIM	n = 30	35.9 years (22 - 55 years)	Female = 12 Male = 18

Subjects in study Naloxone-Ph1a-002 were more frequently male (60.0%), and more frequently African American or Black (76.7%). Two subjects were of Hispanic ethnicity. Subjects had an average height of 173.3 cm, weight of 80.1 kg, and a mean (range) body mass index (BMI) of 26.5 (19.6 to 29.8) kg/m^2.

Participants were assigned to one of 5 sequences (Table 2), with 6 participants planned in each sequence. On the day after clinic admission, participants were administered study drug in randomized order with a 4-day washout period between doses until all 5 treatments had been administered. Blood was collected for PK analysis prior to administration and up to 12 hours after each dose; ECG, vital signs, and other AE assessments were performed.

Thirty participants were randomized and received at least one dose of naloxone; 28 (93%) completed the study. One male participant was discontinued on Day 5 prior to receiving the second treatment due to a predose systolic blood pressure (BP) reading greater than 140 mmHg.

Study Results

Table 3 – Geometric Mean Pharmacokinetic Parameters (CV%) of Naloxone Following Intranasal Administration and Intramuscular Injection of Naloxone to Healthy Subjects

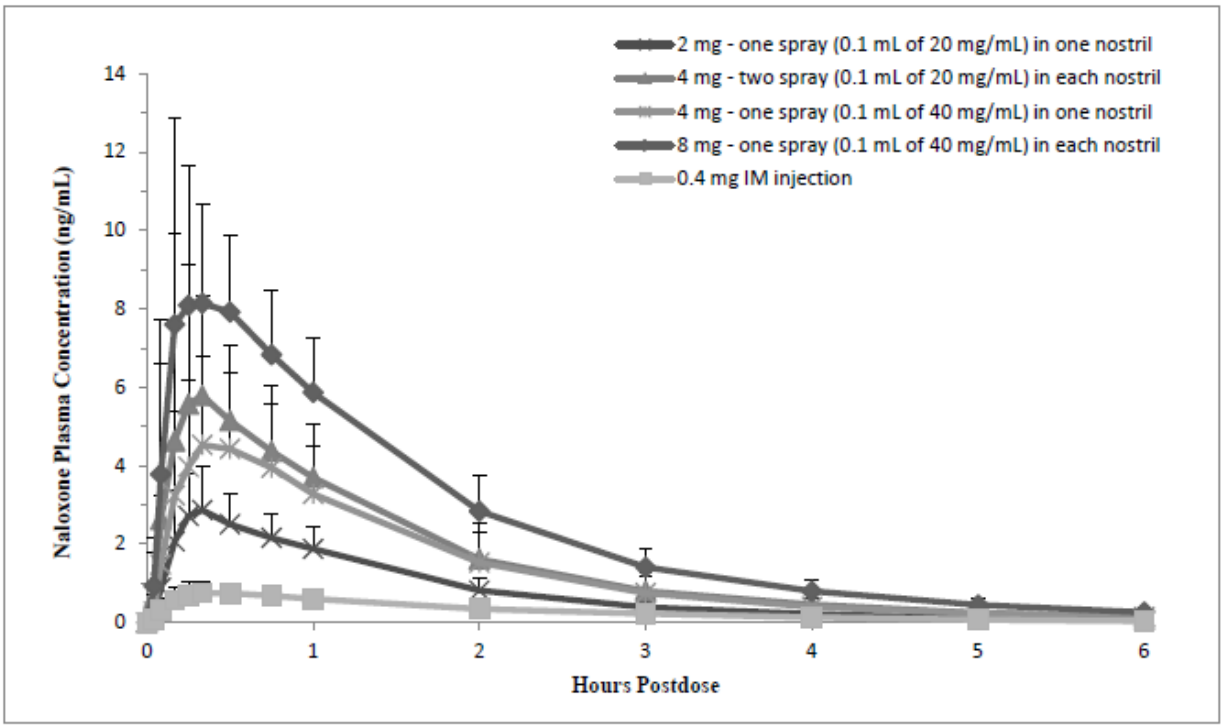
Parameter	Treatment A 2 mg - One Spray 20 mg/mL IN (N = 29)	Treatment B 4 mg - Two Sprays 20 mg/mL IN (N = 29)	Treatment C 4 mg - One Spray 40 mg/mL IN (N = 29)	Treatment D 8 mg - Two Sprays 40 mg/mL IN (N = 29)	Treatment E 0.4 mg IM (N = 29)
λz (1/h)	0.382 (34.9)	0.310 (34.5)	0.334 (29.5)	0.330 (32.4)	0.557 (25.9)
t½ (h)	1.81 (34.9)	2.23 (34.5)	2.08 (29.5)	2.10 (32.4)	1.24 (25.9)
t_{max} (h)[a]	0.33 (0.25, 1.00)	0.33 (0.17,0.57)	0.50 (0.17, 1.00)	0.33 (0.17, 1.00)	0.38 (0.08, 2.05)
C_{max}(ng/mL)	2.92 (34.3)	6.20 (31.9)	4.83 (43.1)	9.70 (36.0)	0.877 (30.5)
C_{max}/Dose (ng/mL/mg)	1.46 (34.3)	1.55 (31.9)	1.21 (43.1)	1.21 (36.0)	2.19 (30.5)
AUC_{o-t} (h*ng/mL)	4.51 (27.2)	9.32 (24.0)	7.87 (37.4)	15.3 (23.0)	1.72 (22.9)
AUC_{o-t}/Dose (h*ng/mL/mg)	2.25 (27.2)	2.33 (24.0)	1.97 (37.4)	1.91 (23.0)	4.29 (22.9)
AUC_{o-inf} (h*ng/mL)	4.56 (26.9)	9.43 (24.0)	7.95 (37.3)	15.5 (22.7)	1.76 (22.6)
AUC_{o-inf} /Dose (h*ng/mL/mg)	2.28 (26.9)	2.36 (24.0)	1.99 (37.3)	1.93 (22.7)	4.40 (22.6)
AUC% Extrapolated (%)	1.06 (56.5)	0.935 (60.1)	0.965 (53.5)	0.963 (69.3)	2.18 (57.5)
CL/F (L/h)	438 (26.9)	424 (24.0)	503 (37.3)	518 (22.7)	227 (22.6)
Dose Normalized Relative BA (%)vs.IM	51.9 (21.7)	53.6 (22.5)	46.7 (31.4)[b]	43.9 (23.8)	100
Cmax/Dose Ratio (IN vs. IM)(%)	66.6 (41.4)	70.7 (37.7)	56.6(47.5)[b]	55.3 (41.4)	100

a: Median (minimum, maximum)

b: N=28 for Relative Bioavailability (BA) and Cmax/Dose ratio of Treatment C

Figure 1 – Mean ± SD Plasma Concentration of Naloxone, (a) 0-6 h and (b) 0-1h Following Intranasal Administration and Intramuscular Injection

(a)



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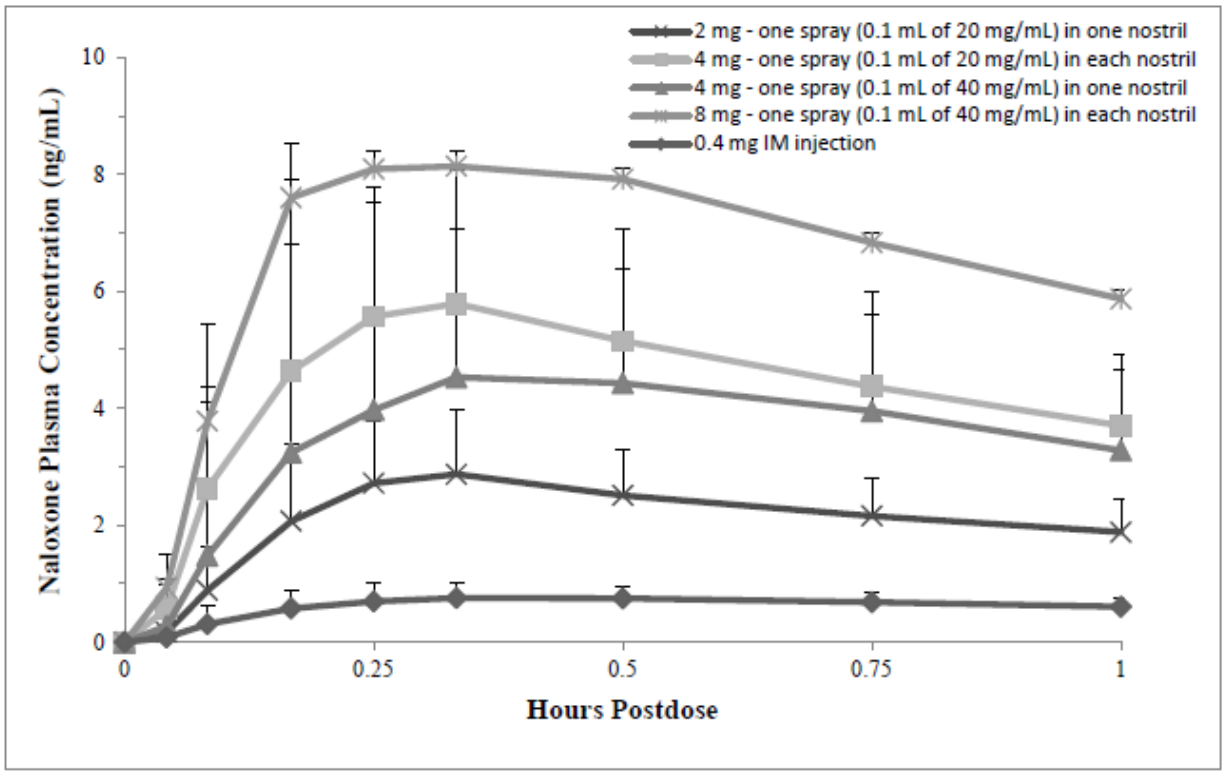


Naloxone plasma concentrations were at measurable concentrations 2.5 minutes after IN administration, the first collection time point, in all but 2 samples. The median t_{max} values after IN and IM dosing ranged from 20 to 30 minutes, indicating that naloxone was absorbed quickly following either route of administration.

Dose proportionality for the 4 IN doses of naloxone was assessed using the ratio of the dose-normalized geometric mean values (R_{dnm}) of C_{max} and $AUC_{o\text{-}inf}$, The R_{dnm} value (90% confidence interval (CI)) value for C_{max} was 0.831 (0.744-0.927); for $AUC_{o\text{-}inf}$, the R_{dnm} value was 0.847 (0.786-0.912). Both C_{max} and $AUC_{o\text{-}inf}$ increased slightly less dose proportionally, as indicated by R_{dnm} values less than 1 and confidence intervals that were outside the range of 0.80-1.25.

Evaluations were also done to compare the geometric mean ratios (GMR) of the dose-normalized PK parameters for one spray versus 2 sprays of the 20 mg/mL formulation; similar comparisons were done for the 40 mg/mL formulation. The GMRs for the PK parameters were between 94% and 97% when one spray (2 mg) and 2 sprays (4 mg) were delivered using the 20 mg/mL formulation. The values of the 90% CI for both $AUC_{o\text{-}t}$ and $AUC_{o\text{-}inf}$ were within 80-125% for the GMR while the values for C_{max} were 78.7 to113%. For the 40 mg/mL formulation, the GMRs and 90% CIs for all 3 PK parameters were within the 80-125% range when results using one spray (4 mg) and two sprays (8 mg) were compared.

The conclusions of the PK study were that the naloxone nasal formulation can deliver a dose of naloxone intranasally with approximately 50% the bioavailability of IM administrations. As such, a 2 mg and 4 mg intranasal dose will provide a dose similar to intramuscular doses of 1 mg and 2 mg, respectively. The t_{max} is approximately the same as injectable naloxone indicating that time to onset of action will be similar.

11. Storage, Stability, and Disposal

Store NARCAN Nasal Spray in the packaging provided. Store at room temperature or refrigerated, between 2°C and 25°C. Excursions permitted up to 40°C. Do not freeze or expose to excessive heat above 40°C. Protect from light.

NARCAN Nasal Spray freezes at temperatures below -15°C. If this happens, the device will not spray. If NARCAN Nasal Spray is frozen and is needed in an emergency, do NOT wait for NARCAN Nasal Spray to thaw. Get emergency medical help right away.

However, NARCAN Nasal Spray may be thawed by allowing it to sit at room temperature for 15 minutes, and it may still be used if it has been thawed after being previously frozen.

Part 2: Scientific Information

13. Pharmaceutical Information

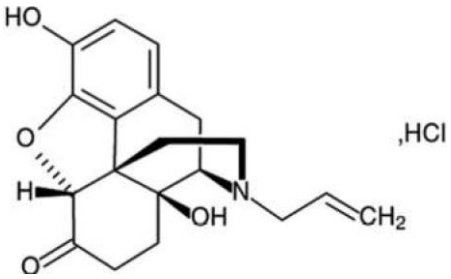
Drug Substance

Non-proprietary name of the drug substance(s): Naloxone hydrochloride

Chemical name: Mophinan-6-one, 4,5-epoxy-3,14-dihydroxy-17-(2-propenyl)-, hydrochloride, (5α)-, dihydrate 17- Allyl-4,5α-epoxy-3,14-dihydroxymorphinan-6-one hydrochloride dihydrate

Molecular formula and molecular mass: $C_{19}H_{21}NO_4 \cdot HCl \cdot 2H_2O$, 399.87 g/mol

Structural formula:



Physicochemical properties: Naloxone hydrochloride, an opioid antagonist, is a synthetic congener of oxymorphone. In structure, it differs from oxymorphone in that the methyl group on the nitrogen atom is replaced by an allyl group.

General properties of naloxone hydrochloride are outlined below:

- Appearance: Naloxone hydrochloride is a white or off-white powder.
- Solubility: Soluble in water, in dilute acids, and in strong alkali; slightly soluble in alcohol, practically insoluble in ether and in chloroform.
- Melting range: 177 °C to 180 °C Naloxone; 200 °C to 205 °C Naloxone.
- Solution pH: The pH aqueous solution is in the range 2.5 to 3.5.
- Specific rotation: -170° to -181°.

Detailed Pharmacology

On the basis of animal experiments, naloxone is a relatively specific narcotic antagonist that interacts preferentially with the mu-receptor subtypes. Naloxone is devoid of opioid agonist effects and consequently it has no abuse potential.

Very low doses of narcotic antagonists, such as naloxone, are known to elicit aversive effects in morphine-dependent animals. When the dose of naloxone is increased, a similar aversive quality is manifested in animals, which are not dependent upon opioids. Examination of the basis for the production of aversive behavior in opioid-free animals suggests that the effects of naloxone are stereospecific and may possibly involve antagonism of endogenous opioid peptides.

In addition to antagonizing the effects of opioid drugs, naloxone has been reported to influence pharmacological responses to a variety of non-opioid drugs by antagonizing the secondary effects of these agents. Some of the effects of naloxone may be unrelated to the direct occupation of opioid

receptors. For example, at very high doses naloxone appears to be a gamma aminobutyric acid (GABA) antagonist and this has been implicated in the convulsant properties associated with high doses of naloxone in rats.

Further, naloxone hydrochloride reverses the effects of opioids, including respiratory depression, sedation, and hypotension. In addition, it can reverse the psychotomimetic and dysphoric effects of agonist-antagonists, such as pentazocine and does not produce respiratory depression, psychotomimetic effects, or pupillary constriction. In the absence of narcotics or agonistic effects of other narcotic antagonists it exhibits essentially no pharmacologic activity.

14. Clinical Trials

This information is not available for this drug product.

16. Non-Clinical Toxicology

Acute and Sub-acute Toxicity

Single-dose studies have been performed in mice, rats, guinea pigs, rabbits, cats, dogs, and monkeys using various routes of administration. The compound has an LD_{50} value ranging from 52 mg/kg IV in rabbits to over 500 mg/kg when given SC to adult rats. Newborn rats were more sensitive than adult animals with an LD50 of 260 mg/kg. In mice, the IV LD_{50} was 150 ± 5 mg/kg and in rats 109 ± 4 mg/kg.

Sub-acute studies (up to 30 days of treatment) have been performed in rats, monkeys, and dogs. Rats were given SC doses of naloxone in doses up to 200 mg/kg five days per week for four weeks, with convulsions at the highest dose being the only major reaction. Monkeys exhibited convulsions at 60 mg/kg given SC for 30 days. After 4 mg/kg IV for 14 days, dogs experienced hind limb weakness as the major effect.

Carcinogenicity

Naloxone was weakly positive in the Ames mutagenicity and in the in vitro human lymphocyte chromosome aberration test, but was negative in the in vitro Chinese hamster V79 cell HGPRT mutagenicity assay and in the in vivo rat bone marrow chromosome aberration study.

Long-term animal studies to evaluate the carcinogenic potential of naloxone have not been completed.

Reproductive and developmental toxicology

Naloxone hydrochloride was administered during organogenesis to mice and rats at subcutaneous doses up to 10 mg/kg/day (equivalent to 6-times and 12-times, respectively, a human dose of 8 mg (two NARCAN NASAL SPRAY devices)) (based on body surface area comparison). These studies demonstrated no embryo toxic or teratogenic effects due to naloxone hydrochloride.

Pregnant female rats were administered 2 or 10 mg/kg naloxone subcutaneously from Gestation Day 15 to Postnatal day 21. There were no adverse effects on the offspring (up to 12-times a human dose of 8 mg/day (two NARCAN NASAL SPRAY devices) based on body surface area comparison).

REFERENCES:

1. Chang KJ, Cuatrecasas P. Multiple opiate receptors. Enkephalins and morphine bind to receptors of different specificity. The Journal of biological chemistry. 1979;254(8):2610-8.
2. Kosterlitz HW, Paterson SJ, Robson LE. Characterization of the kappa-subtype of the opiate receptor in the guinea-pig brain. British journal of pharmacology. 1981;73(4):939-49.
3. Pearl J, Harris LS. Inhibition of writhing by narcotic antagonists. The Journal of pharmacology and experimental therapeutics. 1966;154(2):319-23.
4. Downs DA, Woods JH. Morphine, pentazocine and naloxone effects on responding under a multiple schedule of reinforcement in rhesus monkeys and pigeons. The Journal of pharmacology and experimental therapeutics. 1976;196(2):298-306.
5. Stolerman IP, Pilcher CW, D'Mello GD. Stereospecific aversive property of narcotic antagonists in morphine-free rats. Life sciences. 1978;22(19):1755-62.
6. Mucha RF, van der Kooy D, O'Shaughnessy M, Bucenieks P. Drug reinforcement studied by the use of place conditioning in rat. Brain research. 1982;243(1):91-105.
7. Mucha RF, Millan MJ, Herz A. Aversive properties of naloxone in non-dependent (naive) rats may involve blockade of central beta-endorphin. Psychopharmacology. 1985;86(3):281-5.
8. Dingledine R, Iversen LL, Breuker E. Naloxone as a GABA antagonist: evidence from iontophoretic, receptor binding and convulsant studies. European journal of pharmacology. 1978;47(1):19-27.
9. Svensson A, Berntsson A, Eirefelt M, Soderpalm B. Naloxone antagonizes GABA(A)/benzodiazepine receptor function in rat corticohippocampal synaptoneurosomes. J Neural Transm. 2000;107(3):261-70.

Patient Medication Information

READ THIS FOR SAFE AND EFFECTIVE USE OF YOUR MEDICINE

NARCAN® NASAL SPRAY

naloxone hydrochloride nasal spray

This Patient Medication Information is written for the person who will be taking **NARCAN NASAL SPRA**Y. This may be you or a person you are caring for. Read this information carefully. Keep it as you may need to read it again.

This Patient Medication Information is a summary. It will not tell you everything about this medication. If you have more questions about this medication or want more information about **NARCAN NASAL SPRAY**, talk to a healthcare professional.

Serious warnings and precautions box

- Before administering NARCAN NASAL SPRAY, call 911 for emergency medical help. Do this immediately if you suspect or are aware of an opioid overdose.
- Make sure to watch the person who received NARCAN NASAL SPRAY. You may need to give additional doses of NARCAN NASAL SPRAY until emergency medical help arrives.
- You may need to help the person who received NARCAN NASAL SPRAY. The patient may have a reaction such as becoming aggressive, shaking and/or vomiting. You will need to pay special attention when giving NARCAN NASAL SPRAY to a newborn who is less than four weeks old or a pregnant woman. Some of these reactions can be life-threatening for a newborn or a fetus.

What NARCAN NASAL SPRAY is used for:

NARCAN NASAL SPRAY is used to treat someone who has overdosed on opioids. It can be used by anyone to reverse the effects of the overdose until medical help arrives. Signs of an opioid overdose include:

- Trouble breathing or not breathing
- Extreme drowsiness
- Pale and clammy skin
- Slow or no heartbeat
- Passing out
- Unable to be woken up by touch, shaking of shoulders or shouting
- Very small pupils, like a pinpoint

It is recommended to have naloxone readily available if an opioid overdose occurs. It can be given by you to someone who has overdosed on opioids or be given to you by someone else if you are experiencing an opioid overdose. **Call 911 right away** and follow the instructions provided with NARCAN NASAL SPRAY.

How NARCAN NASAL SPRAY works:

Opioid drugs work by acting on specific receptors found in the brain and in the nervous system. When these drugs attach to those receptors, they reduce the amount of pain felt. Taking too many opioids can lead to an overdose and that can stop someone from breathing. The person may also experience other symptoms. NARCAN NASAL SPRAY stops the opioids from being attached to the receptors, which reverses the effects and symptoms of the overdose.

The ingredients in NARCAN NASAL SPRAY are:

Medicinal ingredient: naloxone hydrochloride

Non-medicinal ingredients: benzalkonium chloride, disodium ethylenediaminetetraacetate, sodium chloride, hydrochloric acid and purified water

NARCAN NASAL SPRAY comes in the following dosage form:

Spray, metered dose: 2 mg / 0.1 mL and 4 mg / 0.1 mL

Do not use NARCAN NASAL SPRAY if:

- you are allergic to naloxone hydrochloride or to any of the other ingredients in NARCAN NASAL SPRAY.

To help avoid side effects and ensure proper use, talk to your healthcare professional before you take NARCAN NASAL SPRAY. Talk about any health conditions or problems you may have, including if you:

- have nasal problems (e.g., abnormal nasal cavity, a blocked or runny nose, or nasal polyps). It is not known if having any nasal problems will impact how NARCAN NASAL SPRAY works. If NARCAN NASAL SPRAY is the only medication available to treat an opioid overdose, it should always be used.
- have heart disease, or any other heart problems.
- have recently had surgery.
- are pregnant or think you are pregnant. The use of NARCAN NASAL SPRAY may cause distress to your unborn baby. It should only be used during pregnancy when clearly needed. Tell your healthcare professional right **away** if you have used NARCAN NASAL SPRAY while pregnant.
- are breast-feeding or plan to breastfeed. It is not known if NARCAN NASAL SPRAY passes into breast milk.

Other warnings you should know about:

Opioid Withdrawal: Using naloxone on a person who is opioid-dependent may cause them to go into withdrawal. Always be prepared for potential aggressive behaviour. The person receiving NARCAN NASAL SPRAY may experience withdrawal symptoms such as:

- body aches, stomach cramps, weakness
- diarrhea
- rapid heartbeat
- fever
- runny nose, sneezing
- goosebumps, shivering or trembling
- sweating
- yawning

- nausea or vomiting
- nervousness
- restlessness or irritability
- high blood pressure

If the person is shaking or having a seizure, do not try to hold them down. Move away any sharp and dangerous objects to prevent injury. If the person is vomiting, place them on their side to prevent choking.

In an emergency, if NARCAN NASAL SPRAY is administered to an infant because no other options are available, they may experience additional withdrawal symptoms such as:

- seizures
- crying more than usual
- overactive reflexes

These symptoms can be life-threatening if not treated the right way. **If NARCAN NASAL SPRAY is given to an infant, seek immediate medical help.**

Non-Opioid Overdoses: NARCAN NASAL SPRAY does not reduce the effects of an overdose caused by any non-opioid drugs such as:

- barbiturates
- benzodiazepines
- psychostimulants (for example, cocaine, amphetamines or methylphenidate)
- alcohol
- anesthetics
- sedatives

However, giving NARCAN NASAL SPRAY to a person because of a non-opioid overdose is unlikely to cause more harm. **Make sure you get emergency help (call 911) right away.**

Heart problems: After taking NARCAN NASAL SPRAY, some patients (especially patients who have had recent surgery) may experience the following side effects:

- high or low blood pressure
- a rapid or irregular heart rate
- shortness of breath
- a build up of fluid in the lungs
- cardiac arrest (heart suddenly stops beating)

These side effects were rare. It is not known if the reactions were caused by naloxone or by the overdose.

Tell your healthcare professional about all the medicines you take, including any drugs, vitamins, minerals, natural supplements or alternative medicines.

The following may interact with NARCAN NASAL SPRAY:

There are no known interactions for NARCAN NASAL SPRAY at this time.

How to take NARCAN NASAL SPRAY:

Important Points:

- NARCAN NASAL SPRAY is for use in the nose only.
- Do NOT test the NARCAN NASAL SPRAY device. Do not remove NARCAN NASAL SPRAY from the packaging until ready to use.
- Each NARCAN NASAL SPRAY device contains only 1 dose and cannot be reused.
- NARCAN NASAL SPRAY is not a substitute for emergency medical care. Always call 911 before administering NARCAN NASAL SPRAY.
- NARCAN NASAL SPRAY freezes at temperatures below -15°C. If this happens, the device will not spray. Get emergency medical help **right away**. Do not wait for NARCAN NASAL SPRAY to thaw.
- Healthcare professionals may recommend using an alternate form of naloxone in newborns or children under two years of age. This is because smaller doses can be given with other forms of naloxone.

Step 1: Identify Opioid Overdose & Call for Emergency Medical Help

Check for signs of an opioid overdose:

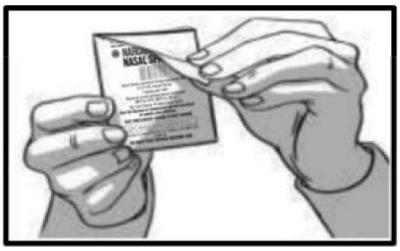
- Person does not wake up after you shout, shake their shoulders, or firmly rub the middle of their chest.
- Breathing is very slow, irregular or has stopped.
- Center part of their eye is very small, like a pinpoint.

Call 911 or ask someone to call for you.

Lay the person on their back.

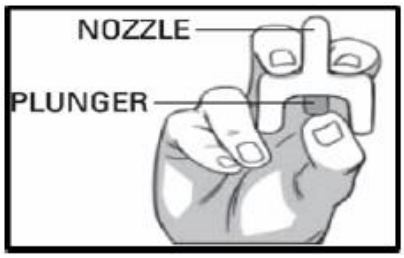
Step 2: Give NARCAN NASAL SPRAY

Remove the device from the packaging. **Do not test the device.** There is only one dose per device. Peel back the tab with the two circles (◎) to open the NARCAN NASAL SPRAY blister.

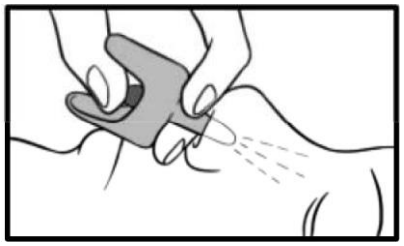


Tilt the person's head back and provide support under their neck with your hand.

Hold the device with your thumb on the bottom of the plunger and your first and middle fingers on either side of the nozzle. Do not apply any pressure until you are ready to give the dose.



Gently insert the tip of the nozzle into one nostril.
Your fingers should be right up against the nose.



If giving to a child, make sure the nozzle seals the nostril.

Press the plunger firmly with your thumb to give the dose.

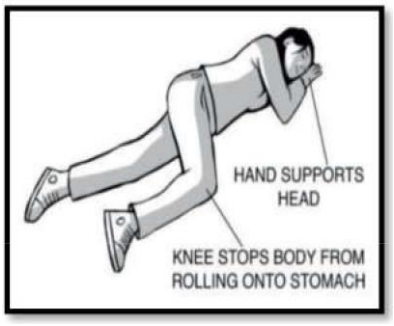
Remove the device from the nostril.

Step 3: Evaluate and support

Move the person on their side (recovery position) after giving NARCAN NASAL SPRAY. Watch them closely.

Give a second dose after 2 to 3 minutes if the person has not woken up or their breathing is not improved. **Repeat Step 2 in the other nostril**, using a new NARCAN NASAL SPRAY device.

You can give a dose every 2 to 3 minutes if more are available and needed. **Alternate nostrils with each dose.**



Perform artificial respiration or cardiac massage until emergency medical help arrives, if you know how and if it is needed.

After emergency medical help has arrived and taken over, throw away (dispose of) any used NARCAN NASAL SPRAY device(s) in a place that is away from children.

Usual dose:

- NARCAN NASAL SPRAY is available as a 2 mg or 4 mg nasal spray device.
- The lowest available strength should be used as the initial dose.
- Administer a single spray of NARCAN NASAL SPRAY into one nostril.
- If the person does not respond or responds and then relapses, additional doses of NARCAN NASAL SPRAY may be given every 2 to 3 minutes in alternating nostrils until emergency medical assistance arrives.

Possible side effects from using NARCAN NASAL SPRAY:

These are not all the possible side effects you may have when taking NARCAN NASAL SPRAY. If you experience any side effects not listed here, tell your healthcare professional.

Side effects with NARCAN NASAL SPRAY may include:

- Swelling of the nose, dryness in the nose, congested or runny nose, sneezing
- Body aches, stomach cramps, weakness
- Rapid heartbeat
- Goosebumps, shivering, chills, shaking (tremor) or trembling
- Yawning
- Nervousness
- Pain
- Aggressive behaviours, irritability, restlessness, agitation
- High blood pressure
- Nausea, or vomiting
- Diarrhea
- Fever
- Sweating
- Seizures
- Muscle spasms
- Dizziness
- Headache

Infants under 4 weeks old:

- Seizures
- Crying more than usual
- Overactive reflexes

If you have a troublesome symptom or side effect that is not listed here or becomes bad enough to interfere with your daily activities, tell your healthcare professional.

Reporting side effects

You can report any suspected side effects associated with the use of health products to Health Canada by:

- Visiting the Web page on Adverse Reaction Reporting (canada.ca/drug-device-reporting) for information on how to report online, by mail or by fax; or
- Calling toll-free at 1-866-234-2345.

NOTE: Contact your healthcare professional if you need information about how to manage your side effects. The Canada Vigilance Program does not provide medical advice.

Storage:

- Store at room temperature or refrigerated, between 2°C and 25°C. Can be stored up to 40°C only for short periods of time. Do not expose to excessive heat above 40°C. Protect from light.
- Do not freeze. NARCAN NASAL SPRAY freezes at temperatures below -15°C. If this happens, NARCAN NASAL SPRAY may be thawed by allowing it to sit at room temperature for 15 minutes. It may still be used if it has been thawed after being frozen.

- Do not remove NARCAN NASAL SPRAY from the packaging until ready to use.
- Replace NARCAN NASAL SPRAY before the expiration date on the carton. If only expired NARCAN NASAL SPRAY is available, it should be used in an overdose situation.
- Keep out of reach and sight of children.

If you want more information about NARCAN NASAL SPRAY:

- Talk to your healthcare professional
- Find the full product monograph that is prepared for healthcare professionals and includes the Patient Medication Information by visiting the Health Canada Drug Product Database website (https://www.canada.ca/en/health-canada/services/drugs-health-products/drug-products/drug-product-database.html); the manufacturer's website www.narcannasalspray.ca; via email at medicalinformation@ebsi.com; or by calling 1-844-898-0657.

This leaflet was prepared by Emergent Operations Ireland Limited.

Date of Authorization: 2026-05-07