Decision Support Tool (DST) for the use of naloxone HCl (Narcan) in the management of suspected opioid overdose in outreach and harm reduction settings

Introduction

Opioid overdose that is not detected or treated in a timely manner can lead to neurological damage or death from respiratory depression or arrest. Naloxone is a safe treatment that can be used to help prevent these outcomes in situations where opioid overdose is suspected.

The purpose of this decision support tool is to assist Registered Nurses working in **outreach or harm reduction settings** in using naloxone to help manage patients who have overdosed on opioids or in situations where an opioid overdose is likely.

Further information on opioids as a class of drugs is provided in Appendix A.

Information on naloxone HCl (Narcan)[1,2]

Classification	Synthetic opioid antagonist
Mechanism	Competes for opioid receptor sites. Displaces previously administered opioids from their receptors. No pharmacological activity on its own.
Indications	Opioid-induced collapse; hemodynamic instability and respiratory depression due to suspected opioid overdose; Cardiovascular collapse with airway compromise due to suspected opioid overdose.
Contraindications	Hypersensitivity to naloxone
Dose	0.4 mg to 0.8 mg initial dose followed by repeat doses of 0.4 mg as indicated to an maximum of 2-5 mg
Route of Administration	IM or SC
Onset	Less than 2 min
Duration of Action	30 to 60 minutes
Elimination	Liver; half-life of 30 to 90 minutes
Side Effects	**CNS** Excitation due to abrupt reversal of opioid or narcotic induced analgesia Tremulousness **CVS** Tachycardia Hypertension Arrhythmias **Skin** Sweating **Emotional state** Irritable Agitated Confused/startled **GI** Nausea Vomiting Diarrhea Cramping **Other** Pain/pain crisis (if opioid used for pain management)
Special Considerations	Can cause abrupt state of opioid withdrawal in the physically dependent patient. Side effects such as agitation and aggressiveness can be symptoms of opioid withdrawal. Naloxone's half –life (30 to 90 minutes) is shorter than that of all opioids; therefore, a patient must be observed until the opioid effect has worn off. Special attention should be given to clients that may have ingested long acting opioids such as methadone. Patients treated with naloxone should be encouraged to go to hospital.

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Clinical features of opioid overdose

Signs and symptoms of opioid intoxication include:[2,3,4]

- Decreased respiratory rate – **a respiratory rate of <10-12/min is the best clinical predictor of opioid intoxication**[2]
- Altered mental status ranging from mild euphoria or lethargy to coma
- Constricted (miotic) pupils – the absence of constricted pupils does NOT exclude opioid toxicity
- Low to normal heart rate and blood pressure
- Hypoventilation
- Decreased bowel sounds
- Dry skin

Ongoing assessment of opioid intoxication should largely be based on respiratory rate and mental status/level of consciousness.[2]

Clinical features of opioid withdrawal

Signs and symptoms of opioid withdrawal include:[2]

- Anxiety and irritability
- Dilated (mydriatic) pupils
- Sweating
- Nausea and vomiting
- Diarrhea

Other causes of decreased level of consciousness

Other causes of decreased level of consciousness should be considered if there is no clinical response after administering 2 to 5 mg of naloxone.[3]

The differential diagnosis of opioid intoxication includes toxic and nontoxic conditions that can alter the mental status and/or respiratory rate.[3]

Many drugs can produce coma like effects. Alcohol, clonidine and sedative-hypnotics are the most frequently seen. Bradycardia and hypotension are more prominent in clonidine intoxication. There is little constriction of pupils in alcohol intoxication and no change in bowel sounds. Sedative-hypnotics usually result in sedation with a lesser degree of respiratory depression compared to opioids.

Coingestants can also confound the diagnosis of opioid intoxication.[3]

Medical conditions producing coma may be mistaken for opioid overdose or can be concomitant.[3] Other conditions that should be considered broadly during assessment are acute neurological presentations of HIV opportunistic infections, sepsis, metabolic causes such as hypoglycaemia and electrolyte disturbances, and structural causes such as head trauma and intracranial hemorrhage.[2,3]

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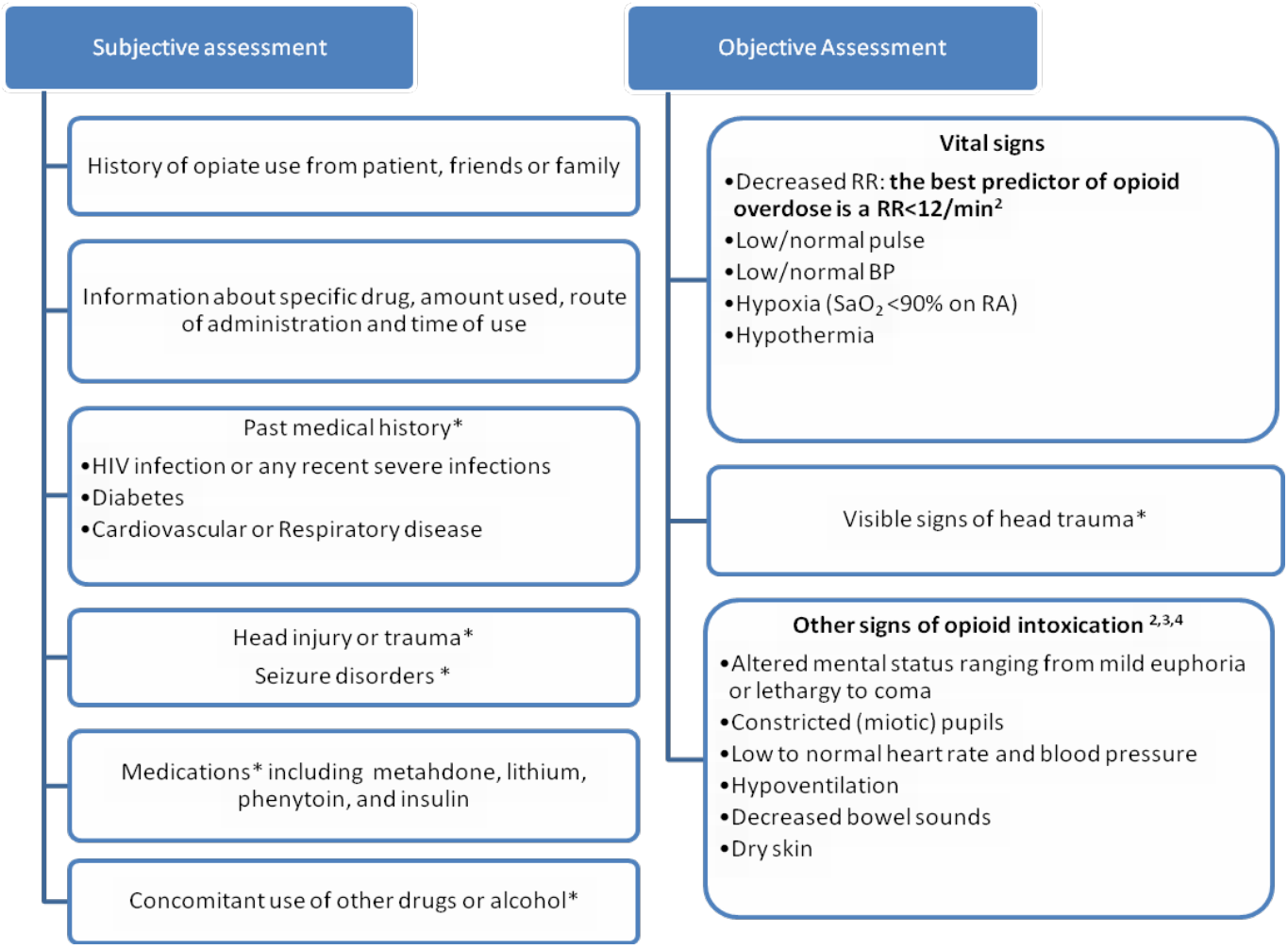
Assessment

Subjective and objective assessments should be rapidly performed to determine if opioid overdose is suspected and whether naloxone administration is indicated. The assessment should also look for factors that might complicate the management of overdose in the harm reduction or outreach setting and thus trigger more rapid referral to a hospital setting. When available, subjective information from patients, family and friends should be taken however objective findings should guide clinical decision-making.



***These complicate management and trigger more rapid referral to hospital.**

Management [2,3]

If opioid overdose is suspected following subjective and objective assessment and contraindications and complicating factors are not present begin management. Management should be carried out in conjunction with Adult Basic Life Support, where indicated, as naloxone is an adjunct to these protocols.

The goal of naloxone administration is to achieve adequate spontaneous ventilation.[3] In the absence of signs of opioid withdrawal, there is no maximum dose of naloxone that can be administered. However, if a clinical effect does not occur after 2 to 5 mg, other causes of decreased level of consciousness should be considered and transfer to hospital should be initiated.[3]

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Management Protocol

Stage	1: "Drowsy"	2: "Nodding"	3: "Unresponsive"
Assessment	• RR >10-12/min • SaO_2 >90% on RA* • Glasgow Coma Scale (GCS) 14 to 15	• Spontaneous respirations <10-12/min • SaO_2 81% to 90% on RA* • Glasgow Coma Scale (GCS) 10 to 13	• Apneic – no spontaneous respirations or gasping • SaO_2 80% or lower on RA* • Glasgow Coma Scale (GCS) <10 • **Call 911 if GCS is 10 or lower**
Call 911?	**No**	**Yes**	**Yes**
Management	• Observe according to agency policy/ability • If no improvement or if respiratory rate or mental status worsens proceed to Stage 2 or 3	• Apply O_2 mask according to agency policy/availability. • Administer naloxone 0.4 mg to 0.8mg IM or SC. • Repeat dose of 0.4mg every 3-5 min up to a maximum of 2-5 mg and until RR > 10-12/min • Monitor respiratory rate every 5 min for 15 min then every 10 min • Observe for two hours if able. Alternately send to hospital for observation. • If SaO_2 decreases to less than 80%, patient appears cyanotic or if respiratory rate or mental status worsens proceed to Stage 3 or refer to hospital.	• Provide cardio respiratory support according to Adult Basic Life Support protocols. If available, bag-valve mask attached to supplemental O_2 should be administered prior to and during naloxone administration to reduce the chance of acute lung injury[2] • Administer naloxone 0.4 mg to 0.8mg IM or SC. Apneic patients should receive an initial dose of at least 0.8 mg naloxone[2]Repeat dose of 0.4mg every 3-5 min up to a maximum of 2-5 mg and until RR > 10-12/min. Patients in cardiorespiratory arrest following suspected opioid overdose should be given a minimum of 1.6 mg of naloxone[2] • Observe for two hours if able. Alternately send to hospital for observation. • If respiratory rate or mental status does not improve refer to hospital.

***If pulse oximetry is not available, cyanosis is a clinical sign of hypoxia. Under optimal lighting conditions and in a patient who has normal hemoglobin level and no dark skin pigmentation, frank cyanosis corresponds to a SaO2 of about 66%.**

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Follow-up care

In the following special circumstances referral to nearest emergency department or inpatient assessment following naloxone administration is recommended:

- Patient is pregnant or breastfeeding (as this may cause withdrawal in neonate or newborns of opioid dependent mothers)
- Patient may have consumed methadone
    - Methadone is a long-acting opioid with a half-life much longer than naloxone. Intoxication from methadone should be managed in closely. Intoxication from methadone can cause QT_c prolongation and Torsades de Pointes[3]
- Exposure route to opioid is unknown, alternate routes, such as body packing, that can result in prolonged or continued absorption
- Concurrent alcohol use. Life-threatening delirium tremens may occur with recent alcohol use
- Concurrent acetaminophen (Tylenol) overdose
- Concern for concurrent use of other drugs or illicit substances
- Signs of acute lung injury, such as crackles and wheezes, hypoxia, and occasionally frothy sputum are present
    - Acute lung injury is a potential adverse effect of morphine, heroin, methadone, and other opioids and in some cases occurs with reversal of opioid toxicity and recovery from opioid-induced respiratory depression with naloxone[3]
- Presence of injuries or medical comorbidities contributing to altered mental status and respiration rate which will not be reversed with naloxone use alone

For these special circumstance, observation of the patient should continue until respiration and mental status are normal and naloxone has not been administered for two to three hours. In the absence of these conditions, observation of the patient should continue until respiration and mental status are normal after one hour observation. If the above conditions cannot be ruled out make arrangements for extended observation.

Patient Education

- Explanation of events leading to the decision to administer naloxone
- Explain that the effects of naloxone start wearing off after 30-60 minutes while most opioids last much longer. This is why it is important to stay with a patient until help arrives or for at least 2 hours
- If patient is opioid dependant, let them know when naloxone wears off, withdrawal symptoms will subside
- Explain the importance of not taking more opioids because overdose can return
- Give patient specific harm reduction informed education in response to higher risk groups (see Appendix F).
    - Connect with doctor about respiratory, hepatic, or renal function tests
    - Educate about the additive effects of medications or alcohol
    - Not using alone if possible
    - Do ‘testers’ (try a small portion first)
    - After a period of abstinence tolerance is reduced consider using less, change route of administration (eg. Switch from IV use to oral/nasal administration)
    - Ask if they would consider incorporating family or friends into safety plan and educating those identified about overdose

Documentation

Document according to your institution’s policies.

References

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Appendix A. Basic Information on Opioids[2,3]

The term opioid refers to natural and synthetic substances with morphine-like activity.

Opioids have analgesic and central nervous system (CNS) depressant effects, as well as the potential to cause euphoria. Morphine is the prototypical opioid. Heroin is a derivative of morphine and is the opioid most commonly abused by injection.

Opioid dependence or addiction is defined as continued use of opioids despite significant opioid-induced problems; these problems may be cognitive, behavioral, or physiological. Repeated drug use results in opioid tolerance, withdrawal symptoms, and compulsive drug taking.

Commonly abused opioids:[2]

- Codeine
- Heroin
- Morphine
- Meperidine
- Methadone
- Hydromorphone
- Fentanyl
- Opium
- Pentazocine
- Oxycodone

Appendix B. Glasgow Coma Scale (GSC)

EYE RESPONSE (E)	Open spontaneously	4
	Open to verbal command	3
	Open in response to pain	2
	No response	1
VERBAL RESPONSE (V)	Talking/Oriented	5
	Confused speech/Disoriented	4
	Inappropriate words	3
	Incomprehensible sounds	2
	No response	1
MOTOR RESPONSE (M)	Obeys commands	6
	Localizes to pain	5
	Flexion/Withdrawal	4
	Abnormal flexion	3
	Extension	2
	No Response	1
	TOTAL	3-15

Teasdale, J. (1974). Assessment of coma and impaired consciousness. A practical scale. *Lancet* **2** (7872): 81–4.