

# GUIDELINE FOR THE ADMINISTRATION OF NALOXONE

Original Authors	[REDACTED]	
Adapted for use at The Walton Centre by:	[REDACTED]	
Responsible Director:	Medical Director	
Approved by and date:	Drug and Therapeutics Committee	November 2022
Document Type:	CLINICAL GUIDELINE	Version 2.0
Scope:	All trust employees.	
Document Approval, History/Changes	Version 2.0 3 years review and update- adapted from LUHFT merged document Changes from version 1.0 -AVPU / Sedation score replaces GCS -Inclusion of buprenorphine reversal algorithm For further information contact the Governance Department on [REDACTED]	

**Think of the environment...Do you have to print this out this document? You can always view the most up to date version electronically on the Trust intranet.**



## 1. Introduction

**Naloxone** is a specific antidote for opioid toxicity; it is a pure opioid antagonist with little or no agonist activity.

Naloxone administration is potentially life-saving in cases of severe opioid toxicity.

Naloxone also has a role in the reversal of the adverse effects of opioids.

All opioids can cause **respiratory and CNS depression**.

## 2. Recognition of opioid adverse effects and toxicity:

- Patient is receiving opioids
- Respiratory rate is less **than 8 breaths/minute**
- Sedation score (surgical NEWS) of **2** (asleep difficult to wake) **OR** Conscious level (medical NEWS) **P** or **U**
- Oxygen de-saturation may occur
- Small or pinpoint pupils (confirmatory sign only, may occur as a side effect without toxicity)

Other common side effects of opioids include dizziness, nausea, pruritus and urinary retention.

## 3. Prescribing guidance

Naloxone should be prescribed on the electronic prescribing system using the available protocols, unless the patient is being cared for in an area using paper prescription charts (critical care, theatres)

Naloxone infusions must be prescribed using the **Naloxone IV Infusion Prescription- Administration Chart**

The dosing regimen chosen (**complete or partial reversal**) should be based on:

- Severity of toxicity (i.e. presence of respiratory depression / respiratory arrest)
- Urgency of situation
- Patient Factors (previous opioid use, palliative diagnosis)
- Aim of treatment: complete reversal or partial reversal

**Complete reversal (page 4)** – to reverse all opioid effects (analgesic and adverse effects).

**Partial reversal (page 5)** – to reverse or reduce opioid-induced adverse effects e.g. respiratory depression or urinary retention, without fully reversing the analgesic component.

Complete reversal carries a risk of recurrence of pain and/or an acute withdrawal syndrome, in patients with a history of chronic opioid use. This may warrant the use of lower doses (partial reversal) particularly where respiratory depression is less immediately life threatening.

A more controlled approach is required (partial reversal) in palliative care or where rebound pain is likely to be a significant issue. However, this must be carefully balanced against the risk of respiratory arrest and death without prompt administration of naloxone.

Naloxone is administered as an injection. An effect is seen within 2 minutes of intravenous (IV) injection; usually as an increase in the respiratory rate, a reduction in the level of sedation and a rise in blood pressure (if compromised). The effect lasts for 45 – 60 minutes after IV administration. This is shorter than the duration of action of most opioids. Close monitoring and

repeated injections may be necessary as per the complete and partial reversal algorithms (see page 4 – 5).

**Repeat dosing may also be required where there has been a significant overdose with any opioid or to prevent relapse into respiratory depression following initial treatment of toxicity.**

#### **Opioids with special considerations:**

- **Methadone.** Patients may require repeated dosing or a continuous intravenous naloxone infusion due to its long duration of action.
- **Buprenorphine** toxicity may not be fully reversed by naloxone (see page 6 for specific management of buprenorphine toxicity)
- **Opioid patches (fentanyl and buprenorphine)** must be located and removed. The opioid in these patches will continue to have an effect for a minimum of 24 hours after removal from the skin.
- **Mixed overdose (opioid plus another CNS depressant (e.g. benzodiazepine),** additional treatments may be required. Toxbase should be accessed for specific detail related to other drugs ingested (contact AED clinician for support accessing Toxbase)

#### **Monitoring**

Patients who are being managed as suspected opioid toxicity, irrespective of the severity or presence of respiratory depression, should have **regular observations (RR, sedation/AVPU score, BP): every 15 minutes for 2 hours, every 30 minutes for 4 hours, then 4 hourly thereafter, until increased frequency of observations is deemed unnecessary by clinician** (this should be documented in the patients clinical notes and nursing staff caring for patient informed).

**Naloxone administration may be appropriate in the absence of respiratory depression.**

#### **If NO IV access**

Give Naloxone 400 microgram\* by Intramuscular (IM) or subcutaneous (SC) injection

Repeat every 2 to 3 minutes, up to a maximum of 2mg

(\*200 – 400 microgram IM/SC every 2 to 5 minutes may be considered in palliative patients)

#### **Incident reporting**

Any unplanned\* administration of naloxone must be reported as an incident on the trust incident reporting system (Datix) so that the circumstances leading to the need for naloxone can be investigated.

## References

1. British National Formulary (online) London: BMJ Group and Pharmaceutical Press. Joint Formulary Committee. <http://www.medicinescomplete.com> [Accessed May 2021]
2. Injectable medicines guide (Medusa) Naloxone monograph <https://medusa.wales.nhs.uk/IVGuideDisplayNewFormat.asp?DrugNo=2684> [accessed May 2021]
3. UK Poisons Information Service (Toxbase). Naloxone. <http://www.toxbase.org/NTIS> [accessed June 2021]
4. UK Medicines Information (UKMI) Q&A 227.2. What naloxone doses should be used in adults to reverse urgently the effects of opioids or opiates? [accessed online, <http://www.ukmi.nhs.uk> June 2015]
5. Summary of Product Characteristics. Naloxone injection 400 microgram/ml (Hameln pharmaceuticals Ltd). [https://www.medicines.org.uk/emc/medicine/21095/SPC/Naloxone+400+micrograms+ml+solution+for+Injection+\(hameln\)/#gref](https://www.medicines.org.uk/emc/medicine/21095/SPC/Naloxone+400+micrograms+ml+solution+for+Injection+(hameln)/#gref) [accessed May 2021]
6. Wilcock, A et al. Palliative Care Formulary. 7<sup>th</sup> Edition. pp 422. Pharmaceutical Press.

# Adult with Suspected Opioid Toxicity

## Complete reversal

In severe respiratory depression or respiratory arrest:  
initiate bag mask ventilation with oxygen 15 L/min and call SMART [redacted] or senior clinician [redacted] while preparing the NALOXONE for administration

Use Partial Reversal (SEE PAGE 5) for:  
Palliative patients  
Acute pain management (e.g. PCA)  
Chronic opioid analgesic use  
Conscious sedation

### Complete reversal

With respiratory depression and significant urgency

**Target response:**

- RR > 8 breaths/min
- Conscious level: A or V

**OR**

- Sedation score < 2

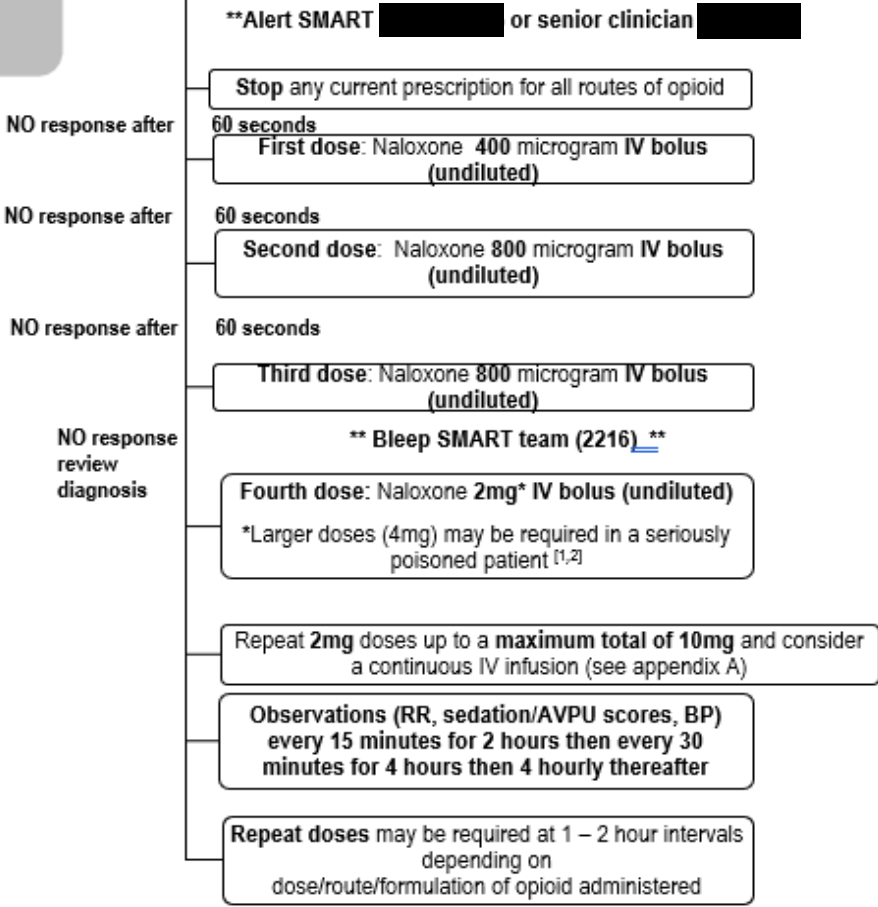
**Sedation score**

0 = awake & orientated  
1 = asleep, easily woken  
2 = asleep, difficult to wake

**AVPU score**

A = Alert  
V = Responds to Voice  
P = Responds to Pain  
U = Unresponsive

TOXBASE® is the reference for the most up to date information for managing overdose.



**Important**

- Stop any current prescription for opioids via all routes – check all prescriptions (paper e.g. PCA, syringe driver and EPMA). Remove any patches.
- If no response is observed after 4mg of naloxone:
  - Call SMART Bleep [redacted]
  - Review the diagnosis
  - Attempt to confirm if treating a definite opioid overdose as another CNS depressant may have been administered and require additional treatment.
- Naloxone half life is shorter than the duration of action of most opioids – close monitoring, repeated dosing or a continuous IV infusion may be needed.
- For further advice, including restarting analgesia contact: **inpatient pain team**

PATIENTS REQUIRING A CONTINUOUS INFUSION OF NALOXONE SHOULD BE REFERRED TO AN APPROPRIATE CLINICAL AREA FOR ONGOING MONITORING

## Adult with Suspected Opioid Toxicity Partial reversal

In severe respiratory depression or respiratory arrest: initiate bag mask ventilation with oxygen 15 L/min and alert SMART [redacted] while preparing the NALOXONE for administration

### Partial reversal

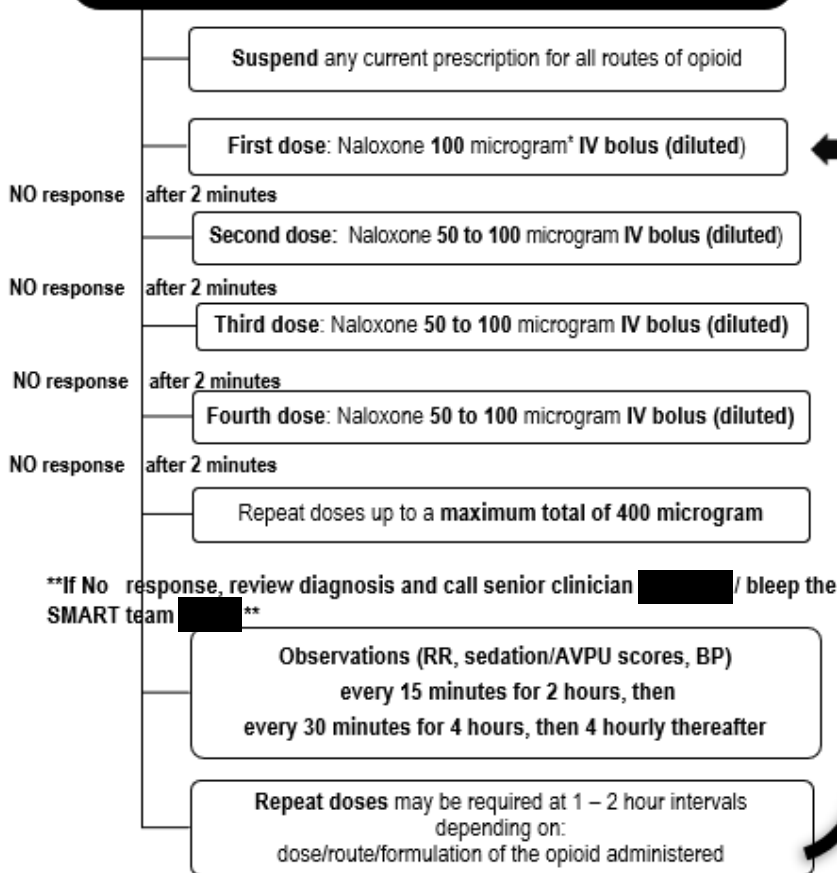
Use only when situation not immediately life-threatening

- Palliative care
- Acute pain management
- Chronic opioid use (ongoing analgesic effect required)
- Conscious sedation

Use complete reversal  
(SEE PAGE 4) for:

### Opioid toxicity

With respiratory depression  
and significant urgency



\* Use 50 micrograms as the initial dose for palliative care patients

#### Dilution instructions

Dilute 400 microgram (1ml) naloxone with 7ml sodium chloride 0.9% to give a 50microgram in 1ml naloxone solution

#### Target response:

- RR >8 breaths/minute
  - Conscious level = A or V
- OR
- Sedation score < 2
  - Analgesic effect maintained
  - Absence of acute withdrawal syndrome

<p><b>Sedation score</b></p> <p>0 = awake &amp; orientated</p> <p>1 = asleep, easily woken</p> <p>2 = asleep, difficult to wake</p>	<p><b>AVPU score</b></p> <p>A = Alert</p> <p>V = Responds to Voice</p> <p>P = Responds to Pain</p> <p>U = Unresponsive</p>
---	--

### Important

- Suspend any current prescription for opioids via all routes – check all prescriptions (paper e.g. PCA, syringe driver and EPMA), remove any patches
- Naloxone half-life is shorter than the duration of action of most opioids – close monitoring, repeated dosing or a continuous infusion may be needed.
- Use naloxone with caution in a patient with long term opioid use. Close monitoring of observations and maintaining or restoring pain relief is essential.
- For further advice, including restarting analgesia, contact: inpatient pain team, critical care, on-call anaesthetist or palliative care team (for palliative patients)
- If no response is observed after 400microgram of naloxone:  
Review the diagnosis  
Attempt to confirm if treating a definite opioid overdose, as another CNS depressant may have been administered.  
Review need for complete reversal (see page 4) and bleep the SMART [redacted]
- **If patient continues to show signs/symptoms of opiate toxicity needing further boluses of naloxone, consider referral to an area for ongoing monitoring and naloxone infusion (see appendix A for prescription).**
- **PATIENTS REQUIRING A CONTINUOUS INFUSION OF NALOXONE SHOULD BE REFERRED TO AN APPROPRIATE CLINICAL AREA FOR ONGOING MONITORING**

## Adult with Suspected Buprenorphine Toxicity

### Reversal of buprenorphine-induced respiratory depression<sup>[6]</sup>

**Suspend** any current prescription for all routes (including patches) of opioid. If on a transdermal patch ensure this is removed from the skin.

**Initiate** bag mask ventilation with **oxygen 15 L/min**

**First dose: Naloxone 2mg IV bolus (diluted)**

**Then commence: Naloxone Continuous Intravenous Infusion at 4mg per hour**

**Continue naloxone infusion** until the patient's condition is satisfactory then stop infusion. (<90 minutes)

**Observations (RR, sedation/AVPU scores, BP)**  
every 15 minutes for 2 hours, then  
every 30 minutes for 4 hours, then 4 hourly thereafter for  
**24 hours**

If the patients condition remains satisfactory, consider restarting buprenorphine at a reduced dose (e.g. approximately 50% of previous dose)

#### INFUSION PREPARATION

to produce a **200 microgram/ml** infusion solution

- **Check SMART team** have been called
- Draw up **10mg of Naloxone injection** (25 x 400 microgram/ml ampoules)
- Make **up to 50ml** with sodium chloride 0.9% or glucose 5%
- Always administer via infusion pump

**PATIENTS REQUIRING A CONTINUOUS INFUSION OF NALOXONE SHOULD BE REFERRED TO AN APPROPRIATE CLINICAL AREA FOR ONGOING MONITORING**



# NALOXONE

## Continuous Intravenous Infusion Prescription and Administration chart

Must **ONLY** be prescribed after discussion with Consultant/Registrar and patient has required repeat boluses to achieve the target physiological response

Forename
Surname
Hospital No.
DoB
NHS No
Or ID label

Allergies & Adverse Drug Reaction - List the medicines/substances & the nature of the reaction (Write NKDA if none)		
It is mandatory to complete this section		
Medicine/Substance	Reaction	
Sign (Name)	Date	
Allergy status not confirmed. Authority to administer medicines ceases after 24 hrs	Sign (Name)	Time & Date

Page 1 of 2
Ward
Consultant

### PRESCRIPTION: INITIAL DOSE

The initial dose should be 60% of the cumulative bolus doses (i.e. all doses required to achieve the target response as per the Complete Reversal algorithm) infused over an hour. See table below for example initial infusion rates.

Date	Time	Initial infusion rate (microgram/hr)	Initial infusion rate (ml/hr)	Prescriber's Signature Bleep number	Nurses' signature(s)	Date and time infusion started
			m/hr			
<b>Initial frequency of observations</b> (Respiratory rate [RR], AVPU, blood pressure)		Every 15 minutes				

**Prescribe 'NALOXONE INFUSION – see additional chart' on EPMA**

See continuation chart (overleaf) for further prescribing, administration records and monitoring instructions

### INFUSION PREPARATION

to produce a 200 microgram/ml infusion solution

- Check SMART team have been called
- Draw up 10mg of Naloxone injection (25 x 400 microgram/ml ampoules)
- Make up to 50ml with sodium chloride 0.9% or glucose 5%
- Always administer via infusion pump

Initial cumulative bolus dose(s) (microgram)	Initial infusion rate (microgram/hour)	Initial infusion rate (ml/hour)
400	240	1.2 ml/hr
600	360	1.8 ml/hr
800	480	2.4 ml/hr
1000	600	3 ml/hr
1200	720	3.6 ml/hr
1400	840	4.2 ml/hr
1600	960	4.8 ml/hr
1800	1080	5.4 ml/hr
2000	1200	6 ml/hr
3000	1800	9 ml/hr
4000	2400	12 ml/hr

### TARGET RESPONSE

RR _____ (breaths/minute)	(please circle) A V P or Sedation Score 0 1
------------------------------	---

#### AVPU score

A = Alert  
V = Responds to Voice  
P = Responds to Pain  
U = Unresponsive

#### Sedation score

0 = awake & orientated  
1 = asleep, easily woken  
2 = asleep, difficult to wake





# NALOXONE

## Continuous Intravenous Infusion

### Prescription and Administration Chart

Page 2 of 2

Ward

Forename  
 Surname  
 HospitalNo.  
 DoB  
 NHSNo Or ID label

Date	Time	RR breaths/min	AVPU/ Sedation score	Change in infusion rate	If a change in infusion rate required, alert clinician, prescriber to update prescription	Additional Bolus (microgram)	Infusion Rate		Change of obs frequency	Observation frequency	Prescriber's signature Bleep number	Nurses' signature(s)
							microgram /hr	(ml/hr)				
				Y/ N		Microgram			Y/ N			/
				Y/ N		Microgram			Y/ N			/
				Y/ N		Microgram			Y/ N			/
				Y/ N		Microgram			Y/ N			/
				Y/ N		microgram			Y/ N			/
				Y/ N		microgram			Y/ N			/
				Y/ N		microgram			Y/ N			/
				Y/ N		microgram			Y/ N			/
				Y/ N		microgram			Y/ N			/
				Y/ N		microgram			Y/ N			/
				Y/ N		microgram			Y/ N			/
				Y/ N		microgram			Y/ N			/
				Y/ N		microgram			Y/ N			/
				Y/ N		microgram			Y/ N			/

Observations: RR, sedation/AVPU score, BP Every 15 mins for 2 hours, every 30 mins for 4 hours, then hourly while on infusion	Ongoing Continuous Infusion Management		
Target response achieved (RR > 8 breaths/minute, A / V or sedation score < 2)	MAINTAIN	No change to rate	
RR < 8 breaths/minute and P / U or sedation score 2	INCREASE	Give 100 microgram bolus (0.5 ml of infusion solution) Increase infusion rate by 100 microgram/hour (0.5 ml/hour)	Repeat until target response observed
RR > 15 breaths/minute	REDUCE	Reduce infusion by approximately 25% of current rate	Reassess after 30 minutes. Reduce by a further 25% if RR is still > 15 breaths/min
Agitation	ESCALATE	Can be due to withdrawal or due to overdose. Clinical judgement necessary. Inform senior medical staff.	
Clinically stable (target response for 4 hours)	WEAN Over 12 – 24 hrs	Reduce infusion rate by approximately 25% every 2 hours	If RR ≤ 8 breaths/minute or target response not achieved, resume at infusion rate previously producing target response.