The Newcastle upon Tyne Hospitals NHS Foundation Trust

Dexmedetomidine in Critical Care

Version No.:	1
Effective From:	13 May 2015
Expiry Date:	13 May 2018
Date Ratified:	13 May 2015
Ratified By:	Dr Jon Walton, on behalf of the Critical Care Guidelines Group

1 Introduction

Dexmedetomidine is a selective α_2-agonist. It is used to induce light sedation (0 to - 3 on the RASS) in critically ill patients. Unlike many other sedative agents, it does not cause respiratory depression and does not require cessation to allow for extubation.

2 Guideline scope

Dexmedetomidine is on formulary within the Trust for the following indications:

- Traumatic brain injury (TBI) patients, with no respiratory problems but who need to have prolonged ventilatory support due to severe agitation, confusion and a requirement for propofol/midazolam

- Young, male overdose of MDMA/PMA/'legal' highs who have prolonged ventilation for reasons of lack of potent enough sedative agent not causing respiratory depression

It should be initiated only following discussion with a consultant intensivist.

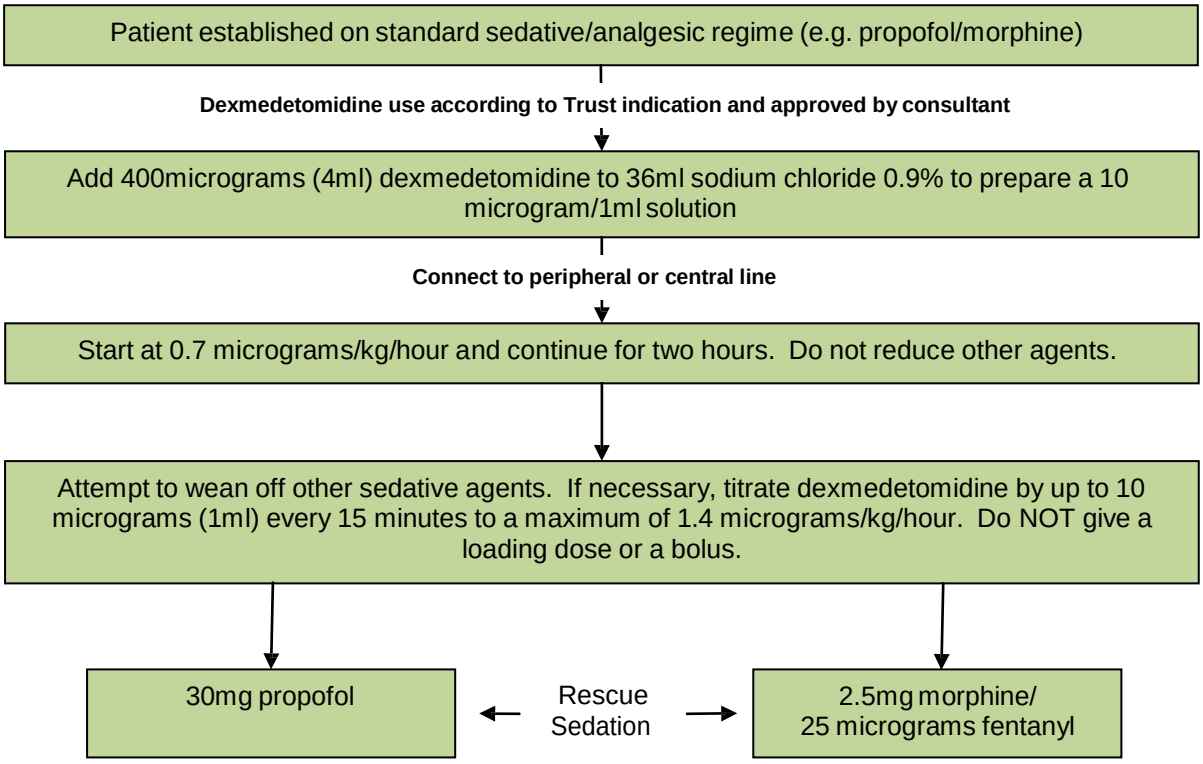
This guideline is intended for consultation by any healthcare professional involved in the prescribing/administration/monitoring of treatment with dexmedetomidine in patients on adult critical care units within the Newcastle upon Tyne Hospitals NHS Foundation Trust.

3 Main body of the guideline

3.1 Dose

Starting dexmedetomidine

See flow chart below. Usual infusion rate is between 0.2 and 1.4 micrograms/kg/hour.



Stopping dexmedetomidine

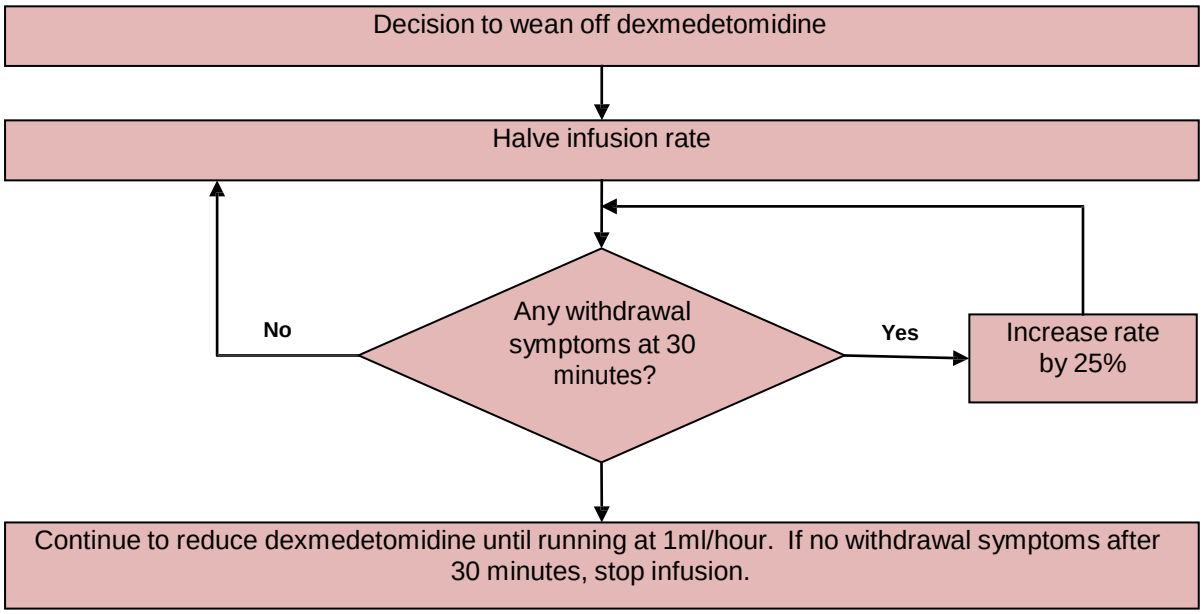


Table One: mls per hour of 10 microgram/ml solution according to patient's weight and dose

	Weight of Patient						
	40kg	**50kg**	**60kg**	**70kg**	**80kg**	**90kg**	**100kg**
0.7mcg/kg/hr	2.8	3.5	4.2	4.9	5.6	6.3	7.0
1.4mcg/kg/hr	5.6	7.0	8.4	9.8	11.2	12.6	14.0

3.2 **Administration**

Dexmedetomidine is available in a 400 microgram/4ml ampoule. One ampoule should be diluted with either sodium chloride 0.9% or glucose 5% and made up to 40ml to make a final concentration of 400 micrograms/40ml (equivalent to 10 micrograms/1ml).

3.3 **Monitoring**

- Sedation score
- Blood pressure and heart rate
- Respiratory rate

3.4 **Pharmacokinetics**

- 94% protein bound
- 95% renally excreted
- Extensive hepatic metabolism
- Elimination half-life is 1.9 to 2.5 hours

3.5 **Contraindications**

- Second or third degree AV block (unless pacemaker fitted)
- Uncontrolled hypertension
- Acute cerebrovascular disorders

3.6 **Cautions**

- Severe neurological disorders, including uncontrolled seizures
- Hepatic impairment
- Bradycardia
- Ischaemic heart disease
- Severe cerebrovascular disease (especially at higher doses)
- Spinal cord injury
- Abrupt withdrawal after prolonged use
- Malignant hyperthermia
- Pregnancy and breast-feeding
- Monitor cardiac function
- Respiratory function should be monitored in non-intubated patients

3.7 **Side Effects**

- Nausea and vomiting
- Dry mouth
- Bradycardia or tachycardia, myocardial infarction, blood pressure changes
- Agitation
- Changes in blood sugar
- Hyperthermia
- Withdrawal syndrome, e.g. agitation, hypertension, headache
- Less commonly abdominal distension, AV block, decreased cardiac output, dyspnoea, hallucinations, metabolic acidosis, hypoalbuminaemia and thirst

4 Training, implementation and resource implications

This guideline largely reflects current practice across the four adult critical care units in the Trust.

5 Monitoring (of guideline) section

This guideline will act as the standard against which prescriptions for dexmedetomidine in critical care patients can be checked.

6 References

1. British National Formulary, Ed. 68, September 2015, BMA Group & RPS Publishing, London
2. Micromedex, 'Dexmedetomidine', www.thomsonhc.com, accessed 21/1/15
3. Summary of Product Characteristics, Dexmedetomidine monograph, www.emc.medicines.org.uk, accessed 22/1/15

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Adapted From: Protocols from Manchester and Middlesbrough