Dexmedetomidine INTRAVENOUS for Adults

Who can administer

Administration RESTRICTED - see Appendix 1

Important information

- **Doses in excess of the licensed maximum of 1.4microgram/kg/hour must also be authorised by consultant**.
- **AVOID** a loading dose in ICU sedation (increased adverse reactions)
- The **RCT SPICE III** (ventilated adult ICU patients) found an increased risk of mortality with dexmedetomidine in those aged 65 years or younger compared to usual standard of care. This effect was most prominent in non-surgical patients, and an increased effect was noted with increasing APACHE II scores and with decreasing age.
- There is no experience with use of this drug **for longer than 14 days**
- An unlicensed concentration of **10microgram/ml** is being used on the intensive care unit for safety and pharmacoeconomic reasons [ref 1]
- Contraindicated: acute cerebrovascular conditions
- Withdrawal symptoms (e.g., hypertension, tachycardia, delirium, agitation) may be more likely to occur in patients with a history of hypertension or those receiving drug for longer durations, with greater cumulative daily doses (e.g. >0.5mcg/kg/hr).
  In such patients, avoid abrupt discontinuation; carefully decrease dose, while monitoring for withdrawal symptoms [ref 2]
- For Y-site compatibility see below

Available preparations

Dexmedetomidine (EVER) 400 micrograms/4mL Infusion **(for use in Critical Care only)**
Dexmedetomidine (EVER) 200 micrograms/2mL Infusion **(for use in Theatres only)**

Reconstitution

Already in solution

Infusion fluids

Sodium chloride 0.9% or Glucose 5%

Methods of intravenous administration

Critical care

- Add **4ml** (400 micrograms) to **36ml** of diluent (final concentration of **10micrograms/ml**) [ref 1]

Theatres

- Add **2ml** (200 micrograms) to 48ml of diluent (final concentration of **4micrograms/ml**)

Concentrations above 4microgram/ml: administer via a large vein or preferably through a dedicated port of a central line [ref 1]

Dose in adults

A: Critical care

A1. Starting dose

- 0.7microgram/kg/**hour** - but frail patients may require lower starting doses

A2. Maintenance dose

- Normally 0.2 to 1.4microgram/kg/**hour**
- After dose adjustment, a new steady state sedation level may not be reached for up to one hour

ICU/Theatre USE ONLY: Dexmedetomidine 400microgram in 40ml: flow rates in ml/hour													
Dose (micrograms/kg/hour)	**0.2**	**0.3**	**0.4**	**0.5**	**0.6**	**0.7**	**0.8**	**0.9**	**1**	**1.1**	**1.2**	**1.3**	**1.4**
Weight (kg)	**Â**	**Â**	**Â**	**Â**	**Â**	**Â**	**Â**	**Â**	**Â**	**Â**	**Â**	**Â**	**Â**
35kg	0.7	1.1	1.4	1.8	2.1	2.5	2.8	3.2	3.5	3.9	4.2	4.6	4.9
40kg	0.8	1.2	1.6	2	2.4	2.8	3.2	3.6	4	4.4	4.8	5.2	5.6
45kg	0.9	1.4	1.8	2.3	2.7	3.2	3.6	4.1	4.5	5	5.4	5.9	6.3
50kg	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7
55kg	1.1	1.7	2.2	2.8	3.3	3.9	4.4	5	5.5	6.1	6.6	7.2	7.7
60kg	1.2	1.8	2.4	3	3.6	4.2	4.8	5.4	6	6.6	7.2	7.8	8.4
65kg	1.3	2	2.6	3.3	3.9	4.6	5.2	5.9	6.5	7.2	7.8	8.5	9.1
70kg	1.4	2.1	2.8	3.5	4.2	4.9	5.6	6.3	7	7.7	8.4	9.1	9.8
75kg	1.5	2.3	3	3.8	4.5	5.3	6	6.8	7.5	8.3	9	9.8	10.5
80kg	1.6	2.4	3.2	4	4.8	5.6	6.4	7.2	8	8.8	9.6	10.4	11.2
85kg	1.7	2.6	3.4	4.3	5.1	6	6.8	7.7	8.5	9.4	10.2	11.1	11.9
90kg	1.8	2.7	3.6	4.5	5.4	6.3	7.2	8.1	9	9.9	10.8	11.7	12.6
95kg	1.9	2.9	3.8	4.8	5.7	6.7	7.6	8.6	9.5	10.5	11.4	12.4	13.3
100kg	2	3	4	5	6	7	8	9	10	11	12	13	14
105kg	2.1	3.2	4.2	5.3	6.3	7.4	8.4	9.5	10.5	11.6	12.6	13.7	14.7
110kg	2.2	3.3	4.4	5.5	6.6	7.7	8.8	9.9	11	12.1	13.2	14.3	15.4
115kg	2.3	3.5	4.6	5.8	6.9	8.1	9.2	10.4	11.5	12.7	13.8	15	16.1
120kg	2.4	3.6	4.8	6	7.2	8.4	9.6	10.8	12	13.2	14.4	15.6	16.8

B. Theatres

B1. Initiation of procedural/awake sedation

- Give a loading infusion of 1microgram/kg **over 10 minutes**
- For less invasive procedures e.g. ophthalmic surgery give 0.5 micrograms/kg **over 10 minutes**

B2. Maintenance of procedural/awake sedation

- The maintenance infusion is usually started at 0.6 microgram/kg/**hour**
- Titrate to desired clinical effect with doses ranging from 0.2 to 1 microgram/kg/**hour**
- Adjust the rate of the maintenance infusion to achieve the targeted level of sedation

ICU USE ONLY: Dexmedetomidine 200microgram in 50ml: flow rates in ml/hour			
Dose (micrograms/kg/hour)	**Initial maintenance dose (0.6mcg/kg/hour)**	**Lower end of dosing range (0.2mcg/kg/hour)**	**Higher end of dosing range (1 mcg/kg/hour)**
Weight (kg)	**Â**	**Â**	**Â**
30kg	4.5	1.5	7.5
40kg	6	2	10
50kg	7.5	2.5	12.5
60kg	9	3	15
70kg	10.5	3.5	17.5
80kg	12	4	20
90kg	13.5	4.5	22.5
100kg	15	5	25
110kg	16.5	5.5	27.5
120kg	18	6	30

Hepatic impairment

- Use with caution. Lower doses may be required

Monitoring

- Monitor for additive effects where midazolam or propofol are concerned. Midazolam or propofol may be administered if needed until clinical effects of dexmedetomidine are established
- Monitor for cardiovascular side effects such as: bradycardia, hypotension and hypertension [(ref 2)], especially if using other agents with this side effect profile e.g. beta-blockers
- Monitor for respiratory depression, airway obstruction, dyspnoea and oxygen desaturation when administered for conscious sedation
- If concentrations above 4microgram/ml are being used, monitor the area distal to the infusion for evidence of irritation [(ref 1)]

Storage

Store below 25^{0}C

References

SPC Dexmedetomidine (EVER) Pharma 100mcg/ml concentrate (21/09/2022)

1. "Infusion concentration information". Email received from Orion Pharma via Anne Heavey on 20 March 2013. Email received from Julie Boothe 19 November 2018

2. UpToDate, accessed online 09/05/2024
3. Written communication from Dr Patrick Neligan Jan 21 2015 and November 7 2018

Therapeutic classification

Selective alpha-2 receptor agonist

BNF
CNS