DEXMEDETOMIDINE

<table>
<tr><td>Trade Name</td><td>Precedex® Pfizer</td></tr>
<tr><td>Class</td><td>Selective alpha2-adrenergic agonist</td></tr>
<tr><td>Mechanism of Action</td><td>Dexmedetomidine activates guanine –nucleotide regulatory binding proteins (G-Proteins) which in turn decrease cAMP resulting in modulation of ion channel activity in alpha2 adrenergic receptors. The presynaptic effect on alpha 2 adrenergic receptors is to inhibit release of noradrenaline which prevents transmission of pain signals. The inhibitory effect on postsynaptic neuronal receptors in the brain and spinal cord is to cause hypotension, bradycardia, sedation and analgesia.In other areas of the body dexmedetomidine causes decreased saliva production, alterations in bowel motility,contraction of vascular and other smooth muscle, increased renal secretion of water and sodium, decreased intraocular pressure and reduced insulin release by the pancreas.[1]</td></tr>
<tr><td>Indication</td><td>Sedative, opioid sparing agent</td></tr>
<tr><td>Contraindications</td><td>Use with caution with hypotension, bradycardia, ventricular dysfunction, hypovolaemia, diabetes, renal/hepatic impairment.</td></tr>
<tr><td>Supplied As</td><td>200 microgram / 2 mL vial</td></tr>
<tr><td>Dilution</td><td>IV:
<table>
<tr><th>Drug</th><th>0.9% Saline Added</th><th>Final Volume</th><th>Concentration</th></tr>
<tr><td>100mcg (1 mL)</td><td>49 mL</td><td>50mL</td><td>2 microgram/mL</td></tr>
</table>
IV: Double Strength
<table>
<tr><th>Drug</th><th>0.9% Saline Added</th><th>Final Volume</th><th>Concentration</th></tr>
<tr><td>200mcg (2 mL)</td><td>48 mL</td><td>50mL</td><td>4 microgram/mL</td></tr>
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<tr><td>Dosage</td><td>Continous infusion:
Preterm <37 weeks: 0.2 – 1 microgram/kg/hr
Term: 0.2 - 1.5 microgram/kg/hr
Dose Initiation: Start at the lower end of the dosing range and increase in steps of 0.1 – 0.2 microgram/kg/hour every hour until effect achieved
Dose Weaning: Wean dose by 0.1 – 0.2 microgram/kg/hr every 12-24 hours, unless it has been running for <24 hours when no weaning is needed</td></tr>
<tr><td>Guardrails</td><td>Min Conc: 1 microgram/mL Max Conc: 4 microgram/mL
Soft Min: 0.03 microgram/kg/hr Hard Max: 1.5 microgram/kg/hr
Soft Max: 1.2 microgram/kg/hr Default: 0.2 microgram/kg/hr</td></tr>
</table>

Administration	Demedetomidine is used in NICU for sedation and as an opioid sparing agent. To avoid rebound side effects the infusion needs to be weaned before stopping. The only exception to this is if the infusion has been running for <24 hours and then it can be stopped without weaning.
Compatible with	**Solution:** Glucose 5% and Sodium chloride 0.9% **Y-site:** aciclovir, adrenaline, allopurinol, amikacin, aminophylline, amiodarone amphotericin B liposomal, ampicillin, atenolol , atropine sulfate, azithromycin, aztreonam, buprenorphine hydrochloride, calcium chloride, calcium gluconate cefazolin, cefepime,cefotaxime, cefoxitin ceftazidime, cefuroxime, ciprofloxacin, clindamycin , dexamethasone, digoxin, dobutamine, dopamine, ephedrine sulfate, erythromycin, fentanyl, fluconazole, gentamicin, heparin, imipenem/cilastatin, insulin, lipid, magnesium sulfate , mannitol meropenem, methylprednisolone, metoclopramide, metronidazole , midazolam , morphine, naloxone, noradrenaline, octreotide, pancuronium, phenobarbital, phenylephrine ,piperacillin/tazobactam potassium chloride , potassium phosphates , procainamide, prochlorperazine, promethazine, propofol, propranolol, ranitidine, , remifentanil, rocuronium, sodium acetate, sodium bicarbonate, sodium phosphates, sulfamethoxazole/trimethoprim, tacrolimus, teniposide, theophylline, thiopental sodium, ticarcillin/clavulanate, tobramycin, TPN, trimethoprim/sulfamethoxazole, vancomycin, vasopressin, vecuronium, verapamil, voriconazole, zidovudine.
Incompatible with	Amphotericin B conventional,colloidal, amphotericin B lipid complex, diazepam, garenoxacin, gemtuzumab, irinotecan, pantoprazole, phenytoin.
Interactions	Increased risk of hypotension when used concurrently with propofol or midazolam. Enhancement of effects expected when used in combination with sedative, hypnotics and opioids
Monitoring	Heart rate, blood pressure, oxygen saturation, respiratory rate, urine output.
Stability	Store at room temperature.
Storage	Single use, discard any remaining contents of the vial after opening
Adverse Reactions	Bradycardia, hypotension, sinus arrest, (with rapid infusion). Fever, nausea, vomiting, atrial fibrillation, anaemia, leucocytosis, oliguria, hypoxia, pulmonary oedema, pleural effusion, thirst. **Withdrawal and rebound symptoms** (hypertension, agitation, tachycardia, dilated pupils, diarrhoea, increased muscle tone, emesis)
Metabolism	Metabolised by the liver, metabolites 95% excreted in urine 4% in faeces. It is unknown whether metabolites are active. Half life of parent compound = 6 minutes, metabolite = 2 hours.

References	1. http://www.micromedexsolutions.com/micromedex2/librarian/# 2. Drug Profile: Dexmedetomidine KEMH and PCH Pharmacy NeonatalClinical Care Unit. Dept of Health Western Australia 2017 3. Finkel JC and Elrefai A The use of dexmedetomidine to facilitate Opioid and Benxodiazepine detoxification in an infant. Anesth Analg2004;98:1658-9 4. Carter BS and Brunkhorst J. Neonatal Pain Management. www.seminperinat.com 5. Whalen LD, DiGennaro JL, IrbyGA et al. Longterm dexmedetomidineuse and safety profileamong critically ill children and neonates. Pediatr Crit Care Med. 2014 Oct;15(8):706-14. 6. Chrysostomou C, Schulman SR, Herrera Castellanos M, Cofer BE, Mitra S, da Rocha MG, Wisemandle WA, Gramlich L. A phase II/III, multicenter, safety, efficacy, and pharmacokinetic study of dexmedetomidine in preterm and term neonates. J Pediatr. 2014;164:276-82.e1-3. 7. Potts AL, Anderson BJ, Warman GR, Lerman J, Diaz SM, Vilo S. Dexmedetomidine pharmacokinetics in pediatric intensive care--a pooled analysis. Paediatr Anaesth. 2009;19:1119-29. 8. Potts AL, Warman GR, Anderson BJ. Dexmedetomidine disposition in children: a population analysis. Paediatr Anaesth. 2008;18:722-30. 9. www.uptodate.com 10. www.anmfonline.org 11. Campos-Baeta Y. et al Physicochemical Compatibility of Dexmedetomidine With Parenteral Nutrition. Nutrition in Clinical Practice. Sep 2019. https://doi.org/10.1002/ncp.10391
Updated By	A Lynn, B Robertshawe Jan 2018 A Lynn, M Wallenstein, B Robertshawe May 2021 A Lynn, B Robertshawe May 2023 (change concentration) Aug 2023 (compatibility with TPN/Lipid)