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|  | **DEXMEDETOMIDINE (PrecedexR)** |
| **General Information:** | **Pharmacology:*** Sedative, anxiolytic, analgesia, and sympatholytic agent
* Potent and relatively selective alpha-2-adrenergic receptor agonist with sedative properties. Pharmacologically similar to clonidine, but more potent

**Sedation:*** Reduces sympathetic activity and agitation, causing a state resembling non-REM sleep without impairing cognitive function
* Sedation is induced by inhibition of noradrenergic activity via activation of alpha-2 receptors at the locus ceruleus
* Produces a patient who is sedated but can be easily roused with minimal stimulation
* Minimal respiratory depression

**Analgesia:*** Acts at the posterior horns of the spinal cord where the modulation of pain impulses is mediated by the noradrenergic bulbar/spinal pathway
* Peripheral nerve mechanisms also implicated
* Reduces need for opioid analgesia

**Neuroprotective effects:*** Decreases circulating and cerebral catecholamines and CNS glutamate

**Other effects:*** Decreases CBF, CNS VO2, and mild decrease in ICP
* Decreases shivering
* Suppression of stress response to surgery and other noxious stimuli

**Use:*** May be continuously infused in mechanically ventilated patients prior to extubation, during extubation and post-extubation
* May be continuously infused for sedation in non-intubated patients prior to and/or during certain procedures such as BiPAP
* Has alternative roles in analgesia, delirium, sleep management, and ethanol withdrawal

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| **Dose:** | **Loading dose:** * Recommend starting infusion at 0.2 mcg/kg/hour **WITHOUT loading dose** in most patients, as this has decreased the incidence of bradycardia. A higher starting dose of 0.4 mcg/kg/hour may be used in intubated patients. Loading doses should only be used with AU guidance.
* Loading dose (if used) of 1 mcg/kg over 20 – 30 minutes
* Precedex must be diluted in 0.9% sodium chloride solution to achieve required concentration (4 mcg/mL) prior to administration.
* A loading dose should not be used if transitioning a patient from other sedatives

**Maintenance infusion:** * Start at 0.2 - 0.4 mcg/kg/hour and titrate to 0.1 - 0.2 mcg/kg/hour every 30 minutes to a maximum rate of 1.1 mcg/kg/hour
* Adjust rate to achieve the targeted level of sedation
* Target sedation level for non-intubated patients is generally RASS of 0 to -1
* Target sedation level for intubated patients is generally RASS of -1 to -2, but may be deeper depending on specific circumstances.

**Maximum Duration:*** Precedex is labelled for use up to 24 hours, but is routinely used for much longer durations. Use should be reviewed daily by the AU telemedicine physician.
* Precedex can be continuously infused in mechanically ventilated patients prior to extubation, during extubation, and post-extubation. It is not necessary to discontinue Precedex prior to extubation. After extubation, the dose of Precedex should be reduced by half. The mean time of continued infusion is approximately 6.6 hours, but may be longer depending on clinical circumstances.

**How to transition to dexmedetomidine from other medications:** * One hour after initiation of dexmedetomidine infusion, reduce narcotic dose by 50%
* Discontinue all other antipsychotics
* Wean propofol and/or benzodiapines slowly as dose of dexmedetomidine is titrated upward
* *Goal* is to discontinue all other antipscyhotic and sedatives within 24 hours of starting dexmedetomidine, however dexmedetomidine cannot achieve deep sedation as monotherapy. Use of narcotics, ketamine, or benzodiazepines may be required.
* Caution: patients who are on chronic benzodiapepines/narcotics may require continued use

**Stopping dexmedetomidine:*** Once patient is extubated or there is no longer a need for sedation, decrease dexmedetomidine dose by 50% and discontinue one hour later
* Abrupt discontinuation of Precedex, especially if used for long periods (days to weeks), may cause a withdraw syndrome. Withdraw can generally be avoided by using a clonidine taper.
* If indicated, start clonidine while still on dexmedetomidine. AU telemed will provide guidance on dosing, duration, and tapering.
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| **Preparation:** | * 400mcg in 100mL 0.9% sodium chloride (4 mcg/mL)
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| **Adverse Effects:** | * Hypotension (most common adverse effect, often transient and responsive to phenylephrine rescue)
* Bradycardia (may be treated with atropine)
* Sinus arrest
* Dry mouth
* Nausea
* Lack of respiratory depression
* Transient hypertension (most common during loading dose; reduced administration rate)
* May experience increased alertness or arousal upon stimulation; in isolation this should not be considered as lack of efficacy
* Prolonged exposure to dexmedetomidine beyond 24 hours may be associated with tolerance and tachyphylaxis
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| **Contraindications:** | * Use with caution in heart block or severe left ventricular dysfunction
* **Bradycardia and sinus arrest** have occurred in healthy volunteers with high vagal tone or in patients who received rapid IV administration
* **Hypotension and bradycardia** may be more pronounced in patients with hypovolemia, diabetes mellitus, chronic hypertension or in elderly
* Consider dose reduction in elderly and hepatic failure
* Should not be used during pregnancy
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| **Drug Interactions:** | * Dexmedetomidine + other anesthetics, sedatives, hypnotics, opioids may lead to enhancement of effects (analgesic requirements may be significantly reduced)
* Dexmedetomidine + vasodilators or negative chronotropic agents may lead to additive pharmacodynamic effects
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| **Monitoring Therapy:** | * Continuous heart rate and rhythm
* Blood pressure, minimum q1 hour
* Daily assessment for pain, agitation and delirium
* Oxygen saturation
* Weaning from mechanical ventilation and readiness for extubation
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| **Adult Critical Care Protocol:** | * May be administered by peripheral or central IV infusion and titrated by a nurse in the ICU
* Continuous infusions must be administered by infusion device and the pump library must be enabled.
* Placement of an arterial line for blood pressure monitoring is preferred
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