

Alert	Hypertension may recur after cessation. Neonatal abstinence syndrome may recur after cessation. Evidence is insufficient to assess the efficacy and safety of clonidine for sedation and analgesia in term and preterm newborn infants receiving mechanical ventilation.
Indication	Sedation Hypertension Neonatal abstinence syndrome
Action	Clonidine is an α_2 -agonist used to produce reduction in blood pressure and sedation. Compared with dexmedetomidine, clonidine has a lower selectivity for α_2 -receptors ($\alpha_1:\alpha_2$ ratio of 1:1620 for dexmedetomidine versus 1:220 for clonidine). As central α_2 effects are sedative, clonidine is less sedating than dexmedetomidine. [1]
Drug type	Sedative, hypnotic. Centrally acting α_2 -agonist.
Trade name	Catapres Ampoules MZ Clonidine HCl Injection APO-Clonidine Tablets Catapres 100 Tablets Catapres 150 Tablets Oral solution or suspension: Compounded by pharmacy in-house (check which strength is stocked with Pharmacy Department).
Presentation	IV preparations: 150 microgram/mL ampoule Oral preparations: 100 microgram/tablet, 150 microgram/tablet Solution or suspension: Compounded by pharmacy in-house (check which strength is stocked with Pharmacy Department). IV clonidine (ampoule) may be given orally either neat or diluted with water prior to administration to give a suitable dose volume.
Dosage/Interval	Sedation: IV: Loading dose of 0.5 to 1 microgram/kg over 15 minutes followed by a continuous infusion of 0.2 microgram/kg/hour and titrate up to a maximum of 1 microgram/kg/hour in hemodynamically stable neonates. [2] ORAL: 1 microgram/kg/dose 8 hourly and titrate it up to a maximum 2 micrograms/kg/dose 6 hourly. [2, 3] [Group consensus] Acute severe hypertension: 10 microgram/kg infused over 4 hours. Additional dose of 5 microgram/kg may be given. [4] Consider continuous intra-arterial monitoring. Chronic hypertension: Oral: 0.5 to 2.5 microgram/kg/dose 6 to 8 hourly. [5, 6] Neonatal abstinence syndrome: Initial therapy: 5 microgram/kg/day divided in 6 to 8 doses (oral recommended). Increase dose by 25% every 24 hours to a maximum 12 microgram/kg/day according to neonatal abstinence syndrome scores. [7] Weaning/ceasing clonidine: If a neonate has received regular clonidine for >5 days, the dose should be weaned by about 50% each day for 2 to 3 days (reflecting an average half-life of 17 hours in neonates) before ceasing the drug. Watch for tachycardia, hypertension, sweating, agitation, but remember these may also be opioid withdrawal symptoms.

CLONIDINE

Newborn use only

2020

	Intravenous clonidine can be converted to oral/nasogastric route when requirements are less than 0.75 microgram/kg/hour. The same daily dose is divided into 3 doses for 8 hourly administration (i.e. 4 to 6 microgram/kg orally every 8 hours). [Group consensus]
Dose adjustments	Therapeutic hypothermia: no information. ECMO: no information. Renal: commence on a low dose in infants with renal impairment and adjust according to response. Hepatic: not applicable.
Maximum dose	Neonatal abstinence syndrome: 12 microgram/kg/day. [7] Hypertension: 25 microgram/kg/day has been reported. However, it is recommended to use in combination with other antihypertensive agents rather than at higher dose as a single agent. [2]
Total cumulative dose	
Route	IV Oral
Preparation	IV: Step 1: Draw up 1 mL (150 micrograms) of Clonidine and add to 4 mL of Normal Saline 0.9% to make a final volume of 5 mL with a concentration of 150 microgram/5mL or 30microgram/mL. Step 2: From the above solution draw up 1.66 mL/kg (50 microgram/kg) and further dilute with sodium chloride 0.9% to make a final volume of 50 mL with a concentration of 1 mL/hour = 1 microgram/kg/hour. Oral: Tablet: Disperse 100 microgram tablet in 20 mL sterile water. Tablet will disperse within 2 minutes. Shake or stir until an even dispersion is formed and then measure the required dose immediately. IV clonidine (ampoule) may be given orally as either neat or diluted with water prior to administration to give a suitable dose volume. Solution or suspension: Compounded by pharmacy in-house (check which strength is stocked with Pharmacy Department).
Administration	IV infusion. Use a dedicated infusion line to avoid boluses.
Monitoring	Neonatal abstinence syndrome: monitor Neonatal Abstinence Syndrome scores, cardiorespiratory observations and intermittent blood pressure. Sedation of infants on mechanical ventilation: continuous electrocardiogram (ECG) and/or oxygen saturation and continuous or intermittent blood pressure, pain and comfort scores. Hypertension: For initial treatment, continuous ECG and/or oxygen saturation, and continuous or intermittent blood pressure monitoring.
Contraindications	Hypersensitivity to the drug. Heart block or severe ventricular dysfunction.
Precautions	Rebound hypertension may occur after cessation. Rebound neonatal abstinence syndrome may occur after cessation. May need to reduce dose in infants with renal impairment.
Drug interactions	Clonidine will enhance the effects of anaesthetics, sedatives, hypnotics and opioids. Clonidine will interact with other hypertensives; NSAIDs; α 2-adrenergic blockers eg phentolamine; β -blockers; digitalis glycosides; tricyclic antidepressants; and α -blocking neuroleptics.
Adverse reactions	Hypotension, bradycardia, rebound hypertension, somnolence and xerostomia. [5]
Compatibility	Fluids: Sodium chloride 0.9%. Y-site: aminophylline, dobutamine, dopamine, epinephrine, fentanyl, heparin, ketamine, labetalol, lignocaine, lorazepam, magnesium sulphate, methadone, morphine HCl, glyceryl trinitrate, norepinephrine, potassium chloride.
Incompatibility	Y-site: midazolam, verapamil
Stability	Tablet dispersed in water: make a fresh solution for each dose and use immediately.

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	Check with Pharmacy Department for compounded oral suspension or solution.
Storage	Ampoule: Store below 25°C. Protect from light. Tablet: Store below 25°C. Check with Pharmacy Department for compounded oral suspension or solution.
Excipients	Ampoule: Sodium chloride, hydrochloric acid and water for injections. Catapres Tablet: Maize starch, lactose monohydrate, calcium hydrogen phosphate, colloidal anhydrous silica, povidone and stearic acid. APO-Clonidine Tablet: Allura Red AC, hypolose, microcrystalline cellulose, magnesium stearate, maize starch, lactose monohydrate, calcium hydrogen phosphate, colloidal anhydrous silica. Check with Pharmacy Department for compounded oral suspension or solution.
Special comments	
Evidence	Refer to full version.
Practice points	Neonatal abstinence syndrome: The optimal regimen to manage symptomatic NAS is unclear. [15] In infants with NAS secondary to opioid withdrawal, clonidine 5 microgram/kg/day up to a maximum 12 microgram/kg/day in 6-8 divided doses may reduce need for morphine treatment and duration of treatment. [7] [LOE II, GOR C] Sedation: Evidence is insufficient to show the efficacy and safety of clonidine for sedation and analgesia in term and preterm newborn infants receiving mechanical ventilation. [8] [LOE II GOR D] Chronic hypertension: Recommend to use at lower doses (2–10 µg/kg/day) in 3 or 4 divided doses) in combination with other antihypertensive agents rather than at higher dose as a single agent.
References	Refer to full version.

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