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MDWF 2070
Drug Protocol: Epinephrine

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Indication(s) for Use in C.P.M. Practice: Epinephrine is used to treat anaphylactic shock and to protect the airway in a midwifery setting.

Mechanism of Action: “Epinephrine is a sympathomimetic catecholamine that exerts its pharmacologic effects on both alpha and beta-adrenergic receptors using a G protein-linked second messenger system. It has a greater affinity for beta receptors in small doses. However, large doses produce selective action on alpha receptors. Through its action on alpha-1 receptors, epinephrine induces increased vascular smooth muscle contraction, pupillary dilator muscle contraction, and intestinal sphincter muscle contraction. Other significant effects include increased heart rate, myocardial contractility, and renin release via beta-1 receptors. Beta-2 effects produce bronchodilation, which may be useful as an adjunct treatment of asthma exacerbations and vasodilation, tocolysis, and increased aqueous humor production (Dalal, 2023).

Legal for use in your state/province: It is legal for CPMs in Washington state to administer epinephrine in the event of anaphylactic shock (WAC 246-834-250, n.d.).

Form	Dose	Route of Administration	Administration instructions	Treatment notes
Ampule or autoinjector	(1 mg/mL), 0.3 mL 1:1000	Intramuscular (IM) into the Vastus Lateralis (anterior thigh)	The provider should discontinue the drug or item causing the reaction if possible such as IV access drugs vs. oral or consumed foods, have someone call 911, prepare epinephrine .3ml including breaking the ampule and using a filter needed to pull it up, and a new needle for administration or use the autoinjector. The site should be cleaned with an alcohol wipe and then give to the patient immediately IM in the vastus lateralis. The patient should be supine with their legs elevated. Next the patient should have an IV placed if not already placed and 2-4L of LR or saline ran. The dose of epinephrine can be given again every 20 minutes up to 3 doses following the same methods of injection.	Onset: Immediate Duration: 20 min

Contraindications: Epinephrine is considered a pregnancy Category C medication under the old FDA categorization system. There are no well-controlled studies in humans, although animal studies have shown a teratogenic risk during organogenesis. It is capable of crossing the placenta. Epinephrine use requires caution when maternal blood pressure is 130/80 mm Hg or greater. Due to its effect on beta-2 adrenergic receptors causing tocolysis, epinephrine opposes the actions of oxytocin on the uterus and may delay labor. It also requires caution during anaphylaxis-induced hypotension in pregnancy as it may lead to uterine vasoconstriction, thus decreasing oxygen delivery to the fetus. Some relative contraindications include hypersensitivity to sympathomimetic drugs, closed-angle glaucoma, and anesthesia with halothane. Another unique contraindication

to be aware of is catecholaminergic polymorphic ventricular tachycardia. As is the case with prescribing any medication, all practitioners should use clinical judgment and evaluate the benefits versus risks of epinephrine (Dalal, 2023).

Adverse reactions/side effects: (Dalal, 2023)

- Central nervous system (CNS): Anxiety, dizziness, nervousness, agitation, headache, Parkinson's disease exacerbation
- Cardiovascular: Arrhythmias, chest pain, hypertension, palpitations, tachycardia, cerebrovascular accidents, ventricular ectopy, vasospasm, tissue ischemia
- Dermatologic: Gangrene at the injection site (especially in buttocks), skin necrosis with extravasation
- Endocrine: Hyperglycemia, hypokalemia, lactic acidosis
- Gastrointestinal: Nausea, vomiting, increase in AST and ALT
- Neuromuscular: Tremors, weakness
- Renal: Decreased renal perfusion
- Respiratory: Dyspnea, pulmonary edema

Storage: Store away from light sources at 20°-25°C (68°-77°F); excursions permitted to 15°-30°C (59°-86°F). Do not refrigerate. Before using, check to make sure the solution in the auto-injector is clear and colorless (Vermont department of health, n.d.).

References:

Dalal, R. (2023, May 1). *Epinephrine*. StatPearls - NCBI Bookshelf.

<https://www.ncbi.nlm.nih.gov/books/NBK482160/#:~:text=Through%20its%20action%20on%20alpha,release%20via%20beta%2D1%20receptors.>

Ross, J. & Delaney, S. (2023). Allergic reactions and anaphylaxis.

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Storage, handling, disposal: Vermont schools and epinephrine (n.d.). Vermont Department of Health.

<https://www.healthvermont.gov/>

WAC 246-834-250: (n.d.). Washington State Legislature.

<https://app.leg.wa.gov/wac/default.aspx?cite=246-834-250#:~:text=A%20licensed%20midwife%20shall%20have,education%2C%20training%2C%20and%20experience.>