



Medical Direction and Practices Board

White Paper

Oxytocin

Oxytocin — Oxytocin is structurally similar to vasopressin and secreted by the posterior pituitary gland. Stimulation of oxytocin receptors in the muscles of the uterine wall leads to uterine contractions, minimizing postpartum hemorrhage (PPH).

Effectiveness — A meta-analysis of randomized trials showed that oxytocin was more effective than placebo/no treatment for reducing postpartum hemorrhage (PPH) ≥ 500 mL which is the reason it is being added to the Maine EMS prehospital formulary.

Administration — Intravenous (IV) administration of oxytocin is preferable to intramuscular (IM) administration because it is more effective, dosing is likely more precise, and onset of action is more rapid, but IM injection is an acceptable alternative for patients who do not have IV access.

IM administration of 10 units oxytocin is an acceptable alternative to IV infusion, but it is somewhat less effective than IV oxytocin. Onset of action is slower (three to seven minutes versus less than one minute with the IV route), but the clinical effect lasts longer (probably ≥ 1 hour versus three to five minutes with the IV route). Simplicity of administration and elimination of the need to mix and titrate a drip, make IM administration more feasible/desirable for prehospital settings and therefore the MDPB has included the IM route in the 2023 Maine EMS Protocols.

Side effects — Most side effects of oxytocin are related to the dose and rate of administration. Relaxation of vascular smooth muscle cells and peripheral vasodilation are associated with flushing. Rapid IV administration (i.e., IV bolus) of a high dose of oxytocin can cause serious side effects, such as hypotension and tachycardia, which may lead to chest pain, cardiovascular collapse, and death. Rarely, large doses of oxytocin given for a prolonged period have caused water retention, leading to hyponatremia and its sequelae. Oxytocin can prolong the QT interval, but an electrocardiogram is not needed routinely before use.

Hypersensitivity to the medication is the only contraindication to use.