

The Nova Scotia Antidote Program is pleased to present another Quarterly Report, which provides information on changes and trends in antidote therapy and reports ongoing Provincial Antidote usage.

Antidote usage July 1 to Sept 30, 2018						
Western Zone 1	Northern Zone 2	Eastern Zone 3	Central Zone 4	IWK	Quarterly Total	Year to Date
19	8	8	12	4	51	140

Highlights of antidote use during the past 3 months

A total of **51 antidotes** were used in **45 different patient cases**. Of these, 5 antidotes were used by community hospitals, 38 in regional facilities and 8 in tertiary hospitals.

- Antidotes used in community hospital EDs: DigiFab, sodium bicarbonate, and naloxone.
- Use of Naloxone was reported for 21 patients. ***To ensure we are tracking opioid overdose and naloxone use, please report cases where naloxone is used to the Poison Centre at 1-800-565-8161***
- Calcium, glucagon and insulin were used together in 2 different patient cases with ingestions of calcium channel blockers and beta blockers, along with other medication. Lipids were also used in one of these cases.
- **Sodium Bicarbonate** was reported to be used as an antidote in 13 patient cases. Five of these cases were acute or chronic salicylate toxicity, one for methotrexate toxicity and seven for treatment of a wide QRS interval, as seen on the EKG.

Methylene Blue: Supply Issues

There are currently serious supply issues with methylene blue, both 1ml and 5ml vials. This is due to an issue with sourcing the active ingredient, and there is no end date as of yet. Methylene blue is used by a number of different areas in the hospital, with the highest use likely in surgery as a marking dye.

Methylene Blue is used in critical care for the treatment of methemoglobinemia, *for which there is no alternative therapy*. It can also be used to treat vasodilatory shock in patients not responding to conventional therapy.

Current stocking recommendations: 10 x 5mL vials in Regional Kits and 3 x 5mL vials in Community Kits.

How does Methylene Blue work as an antidote?

Methemoglobinemia can be caused by chemicals that oxidize Fe²⁺ to Fe³⁺ in hemoglobin. This oxidized form of hemoglobin is called methemoglobin and has poor oxygen carrying capacity. Causes include nitrites and nitrates, local anesthetics (e.g. teething gels, benzocaine spray), aniline dyes, antimalarials, and dapsone.

Methylene blue is an effective antidote for methemoglobinemia because of its own oxidizing properties. It oxidizes NADPH, forming the reduced product leukomethylene blue, which in turn acts as a reducing agent converting methemoglobin to hemoglobin and thus restoring oxygen carrying capacity.

Methylene blue may be useful for the management of refractory hypotensive states due to sepsis, anaphylaxis, and toxin-related shock (e.g. CCBs). Methylene blue inhibits the nitric oxide-cyclic guanosine monophosphate pathway. By blocking this pathway, it prevents smooth muscle vasodilation and increases blood pressure.

Reference: Tox TidBits Feb 2015; Maryland Poison Centre