

Immunization Directive

Number:	Imm - 1
Topic:	Anaphylaxis Management and Administration of Epinephrine
Approved:	October 2004
Reviewed:	
Revised:	September 14, 2021

Procedure

Administer aqueous epinephrine as part of the initial non-hospital management of anaphylaxis according to established guidelines.

Involvement of a Delegated Controlled Act: Yes No

Controlled Act #5: Administering a substance by injection or inhalation. This is a controlled act, which is in the scope of nursing practice. A member of the College of Nurses of Ontario may perform a procedure within the controlled acts authorized to nursing if a physician or nurse practitioner orders it.

Controlled Act #8: Prescribing, dispensing, selling or compounding a drug as defined in the Drug and Pharmacies Regulation Act, or supervising the part of a pharmacy where such drugs are kept.

Delegation of the Controlled Act

- This delegation applies to all Registered Practical Nurses (RPN), Registered Nurses (RN) and Public Health Nurses (PHN) employed by the Simcoe Muskoka District Health Unit (SMDHU) who have the knowledge, skills and judgment to administer the medication safely.
- Delegation of Controlled Acts in the provision of a public health program under the authority of a Medical Officer of Health is acknowledged by the College of Physicians and Surgeons as falling under circumstances where the Controlled Act may be delegated in the absence of a physician order and in the absence of the doctor-patient relationship.
- Identification of Risks: The risk of treatment includes the potential for a serious reaction or allergy along with the possibility that the client will experience medication side effects. These risks are minimized by reviewing contraindications and medical history and by instructing clients where possible on how to reduce the occurrence or severity of side effects.
- See SMDHU Policy LG0104 - *Delegation of Controlled Acts* for responsibilities of the delegator, program manager and staff. See SMDHU Policy GEN0105 - *Directives & Standing Orders* for approval process and quality assurance. See SMDHU Policy LG0101 – *Consent for Treatment* for information pertaining to obtaining consent.

Indications

The SMDHU supports the use of aqueous epinephrine 1:1000 for non-hospital management of anaphylaxis.

Definition of Anaphylaxis:

Anaphylaxis is a clinical syndrome characterized by:

- Sudden onset AND
- Rapid progression of signs and symptoms AND
- Involving multiple (≥ 2) organ systems

Anaphylaxis is a potentially life-threatening allergic reaction to foreign protein antigens. Changes develop over several minutes and involve at least two body systems. The most frequently involved systems are skin (80% to 90% of anaphylaxis cases), respiratory (up to 70% of cases) and less often cardiovascular and gastrointestinal (each up to 45% of cases). Up to 15% of cases may also manifest central nervous system changes of uneasiness, altered mental status, dizziness, or confusion. Features of severe anaphylaxis include obstructive swelling of the upper airway, marked bronchospasm and hypotension. Hypotension can progress to cause shock and collapse.

The most common signs and symptoms include: itchy urticarial rash, progressive, painless swelling about the face and mouth (which may be preceded by itchiness, tearing, nasal congestion or facial flushing), respiratory symptoms (including sneezing, coughing, wheezing, labored breathing and upper airway swelling indicated by hoarseness and/or difficulty swallowing), gastrointestinal symptoms (including crampy abdominal pain and vomiting) and hypotension.

In young children and infants, fussiness, irritability, drowsiness, lethargy, reduced level of consciousness, and somnolence are common in presentation. Additionally, low systolic BP (age specific) or greater than 30% decrease in systolic BP is frequently seen in this population. (Canadian Pediatric Society position statement: *Emergency Treatment of Anaphylaxis in Infants and Children. Reaffirmed Feb 28, 2018. Accessed December, 2020*).

Anaphylaxis must be distinguished from fainting (vasovagal syncope), anxiety and breath-holding spells, which are more common and benign reactions. Symptoms that are progressive or increasing in severity are more likely to represent anaphylaxis.

Key distinguishing features of anaphylaxis and vasovagal syncope.

Clinical Features	Anaphylaxis	Vasovagal Syncope
Onset from time of immunization	Within minutes up to 4 hours after injection; most within 2 hours	During or within minutes of injection
Skin	Urticaria, angioedema, pruritus, erythema	Generalized pallor, cold clammy skin
Respiratory	Cough, wheeze, stridor, respiratory distress, rhinorrhea, sneezing	Normal respiration – may be shallow but not laboured
Cardiac	Tachycardia	Bradycardia
Neurologic	Sense of severe anxiety and distress; loss of consciousness- no improvement once supine in head down position	Sense of light-headedness; loss of consciousness – improves once supine or in head down position; may be transient jerking of the limbs and eye rolling

Source: Canadian Immunization Guide, Anaphylaxis and other Acute Reactions following Vaccination

Swelling and urticarial rash at the injection site:

Swelling and urticarial rash (i.e., hives) at the injection site can occur but are not always caused by an allergic reaction. The swelling or hives should be observed for at least 30 minutes in order to ensure that the reaction remains localized, and if so, the vaccine recipient may leave after this observation period. Ice can be applied to the injection site for comfort. If the hives or swelling disappear and there is no evidence of any progression to other parts of the body and there are no other symptoms within the 30-minute observation period, further observation is not necessary. However, if any other symptoms arise, even if considered mild (e.g., sneezing,

nasal congestion, tearing, coughing, facial flushing), or if there is evidence of any progression of the hives or swelling to other parts of the body during the observation period, epinephrine should be given.

Non-Hospital Management of Anaphylaxis Using Aqueous Epinephrine:

The following steps describe the management of **anaphylaxis** using aqueous epinephrine. Steps 1 to 4 are to be done rapidly or simultaneously.

1. Direct someone to call 911.
2. Assess airway, breathing, circulation, mental status, skin, and body weight (mass). Secure an oral airway if necessary.
 - airway: look specifically at lips, tongue and throat for swelling; if appropriate, ask individual to say his/her name to assess glottic/peri-glottic swelling
3. Place individual on his/her back (supine) and elevate lower extremities. The vaccinee should remain in this position. Fatality can occur within seconds if the vaccinee stands or sits suddenly, due to empty vena cava/empty ventricle syndrome. Exceptions to the supine position:
 - if in respiratory distress, place in a position of comfort (elevate head and chest)
 - if vomiting or unconscious, place lying on his/her side
 - if pregnant, place lying on their left side
4. Inject EPINEPHrine avoiding the limb where the vaccine(s) were injected:
 - Dose: 0.01 mg/kg body weight of 1:1000 (1 mg/mL) solution, MAX 0.5 mg (see Table below for dosage by age)
 - Route: INTRAMUSCULAR (IM) in mid-anterolateral thigh (vastus lateralis muscle)
 - Repeat every 5 minutes if symptoms persist (most patients improve in 1-2 doses)
 - Record the time of each dose

Age	Dose (mL)
2 months – 2 years	0.1mL
2 – 4 years	0.15 mL
4 – 7 years	0.2 - 0.25 mL
7 – 10 years	0.3 ml – 0.35 mL
10 – 12 years	0.4 – 0.45 mL
13 years and older	0.5 mL

[Canadian Immunization Guide, Part - 2 Vaccine Safety. Anaphylaxis and other Acute Reactions following Vaccination](#), (Evergreen edition. First Published December, 2020).

The deltoid muscle of the arm should not be used as it is not as effective as the thigh in absorbing EPINEPHrine. While the recommended site for epinephrine administration in anaphylaxis is the vastus lateralis, this may not be practical in an immunization clinic setting for the initial dose. The deltoid muscle (in the opposite arm of where the vaccine was initially given if the deltoid muscle was used for vaccine administration) may also be used for an initial dose if the vastus lateralis is not accessible. Local injection of epinephrine into an intramuscular vaccination site is contraindicated because it dilates vessels and speeds absorption of the vaccine, which triggered the allergic reaction.

5. Monitor vital signs and reassess the situation frequently.
6. If symptoms improve, keep client lying down and await transport. If no improvement in symptoms or if symptoms are worsening, dosing can be repeated twice at **5 minute intervals** for a total of three doses avoiding the limb in which the vaccination was given. A different limb is preferred for each dose to maximize drug absorption.
7. Upon ambulance arrival, provide paramedic with the yellow copy of the Anaphylaxis Treatment Worksheet.
8. Notify principal if a school clinic and parent of the student. If a community or public clinic, ask client if possible if they would like staff to notify a family member for them.
9. Notify Immunization program manager.

Contraindications and Precautions

There are no contraindications to the use of epinephrine in a person experiencing an anaphylactic reaction.

Storage and Handling:

While anaphylaxis is rare, aqueous epinephrine and other emergency supplies should be checked prior to each clinic. Emergency kit supplies (blood pressure cuffs, stethoscopes, breathing masks) should be checked to ensure they function properly and are not damaged. Each ampoule of epinephrine should be physically inspected to ensure that it has not expired, and that the ampoule is not damaged.

Epinephrine is light sensitive and needs to be stored at a temperature between 15-30° C.

Warnings:

Transient and minor side effects of epinephrine can include palpitation (pounding heartbeat), pallor (paleness), dizziness, weakness, tremor (trembling), headache, throbbing, restlessness, anxiety and fear.

Informed Consent:

Health unit staff are required to adhere to the provisions and requirements of the Health Care Consent Act to obtain an informed, specific and voluntary consent prior to care or treatment. However, the management of anaphylaxis may require emergency treatment without consent, as permitted by the Health Care Consent Act, 1996, Part 2: Emergency Treatment.

Co-administration

NACI has stated that COVID-19 vaccine can be given at the same time or at any time before or after receiving other vaccines including live, non-live, adjuvanted or unadjuvanted vaccines. As a precaution, NACI previously recommended that COVID-19 vaccines be given at least 28 days before and 14 days after other vaccines. After reviewing the evolving evidence on COVID-19 vaccines and considering the extensive data and experience of giving other routine vaccines at the same time or within days of each other, NACI has determined that a precautionary approach is no longer necessary.

Quality Assurance

The program managers will ensure that:

- The directive is reviewed annually.
- Annual training opportunities are provided to all nurses who may be required to administer epinephrine.
- A current list of nurses who have received directive training is maintained.
- Newly hired or returning nurses are provided a comprehensive orientation program, including a review of all relevant resources as outlined below.
- Team meetings are held once per month to provide updates, problem-solve and review issues related to the implementation of directives.
- All medication errors are reviewed as per agency policy.

References

Ministry of Health , Ontario Public Health Standards: Requirements for Programs, Services, and Accountability, Infectious Diseases Protocol, 2020. Effective: September 4, 2020. Appendix B: Provincial Case Definitions for Diseases of Public Health Significance. *Disease: Adverse Events Following Immunization (AEFIs)*, Effective: April 2021. http://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/docs/aeфи_cd.pdf

Health Canada, Anaphylaxis and other Acute Reactions following Vaccination: Canadian Immunization Guide, Part 2 – Vaccine Safety, (Evergreen Edition, First Published December 2020). https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-2-vaccine-safety/page-4-early-vaccine-reactions-including-anaphylaxis.html?hq_e=el&hq_m=2164997&hq_l=1&hq_v=f90f54e406#a18

BC Centre for Disease Control, Communicable Disease Control Manual – Chapter 2: Immunization. Part 3 – Management of Anaphylaxis in a Non-Hospital Setting (February 2019). http://www.bccdc.ca/resource-gallery/Documents/Guidelines%20and%20Forms/Guidelines%20and%20Manuals/Epid/CD%20Manual/Chapter%202%20-%20Imms/Part_3_Anaphylaxis.pdf

Product Monograph for Aqueous Epinephrine

Ministry of Health , Ontario Public Health Standards: Requirements for Programs, Services, and Accountability, 2020

Ministry of Health, Publicly Funded Immunization Schedules for Ontario (Current as of date of Directive)

SMDHU Policy [LG0101 - Consent for Treatment](#) – Revised September 2010

SMDHU Policy [LG0104 - Delegated Controlled Acts](#) – Revised August 25, 2010

SMDHU Policy [GEN0105 – Directives & Standing Orders](#) – Revised August 25, 2010

College of Nurses of Ontario (CNO), Practice Guideline, 41019, Directives Revised June 2020

http://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/docs/aefi_cd.pdf

CNO, Practice Standard, 41007, Medication Revised January 2019

http://www.cno.org/docs/prac/41007_Medication.pdf

CNO, Practice Standard, 41071, Decisions about Procedures and Authority Revised January 2020

https://www.cno.org/globalassets/docs/prac/41071_decisions.pdf

The College of Physicians and Surgeons Policy #5-12 - Delegation of Controlled Acts (reviewed March 2021)

<https://www.cpso.on.ca/Physicians/Policies-Guidance/Policies/Delegation-of-Controlled->

Educational Resources

- Immunization Program Guidebook
- Canadian Immunization Guide, Evergreen Edition
<http://www.phac-aspc.gc.ca/publicat/cig-gci/index-eng.php>

Authorized to

All RPNs, RNs and PHNs employed by the Simcoe Muskoka District Health Unit, who have received the directive training and who have the following qualifications are authorized to administer aqueous epinephrine:

- Registered Nurses and Registered Nurses (temporary) listed as a member with the College of Nurses of Ontario with no restrictions or limitations on their registration.
- Registered Practical Nurses and Registered Practical Nurses (temporary) listed as a member with the College of Nurses of Ontario with no restrictions or limitations on their registration. Registered Practical Nurses that were registered with the College of Nurses prior to 2005 must also have an advanced medication course certificate.
- Current CPR certification Level C (updated annually).

Authorization and Approval

It is my opinion as (Associate) Medical Officer of Health ((A) MOH)) that based on the Canadian Immunization Guide Evergreen Edition section: Anaphylaxis: Initial Management in Non-Hospital Settings, the management of severe anaphylaxis may require the administration of epinephrine, and that the benefits of its administration outweigh any risks associated with its use.

The steps outlined in this directive, and training and resources available provide nurses with the necessary knowledge and skills to safely, effectively and ethically administer this medication in a clinic setting.

C. Gardner

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Medical Officer of Health

October 6, 2021

Date

Colin Lee

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Associate Medical Officer of Health

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Date

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Date

Review/Revision History

September 14, 2005 - Revised
June 20, 2006 – Revised
May 4, 2007 – Revised
June 28, 2008 - Revised
August 14, 2009 – Revised
September 10, 2009 – Revised
August 10, 2010 – Revised
July 20, 2011 - Revised
July 23, 2012 – Revised
June 18, 2013 – Revised
Nov. 25, 2013 – Revised
August 21, 2015 – Revised
August 10, 2016 – Revised
February 17, 2017 – Revised
July 12, 2018 – Revised
August 24, 2018 – Revised
July 10, 2019 – Revised
August 21, 2019 – Revised from previous directive VPD – 2
August 28, 2020 – Revised
December 9, 2020 – Revised
September 14, 2021 – Revised – added revised co-administration