Anaphylaxis: Initial Emergency Treatment by Nurses (*Adult & Pediatric*)

Clinical Decision Support Tool

Contents

1.0 Site Applicability

If anaphylaxis is suspected, based upon clinical presentation and possible exposure to a trigger, treatment should be provided as outlined in this document.

All Acute, Community, Long Term Care sites and non-hospital settings

***Exception**:* when an alternate practice standard/procedure, clinical decision support tool or medical order is in effect for initial emergency treatment of anaphylaxis.

Note: All nurses (RN, RPN and LPN) who immunize without an order must follow the Decision Support Tools (DST) – BC Communicable Disease Control Manual, Chapter 2: Immunization; Part 3 Management of Anaphylaxis in a Non-Hospital Setting established by the BC Centre for Disease Control (BCCDC). The clinical direction in both of these documents is identical.

In this document *client* refers to patient, client or resident.

2.0 Scope of Practice Limits and Conditions

This decision support tool is intended for use by nurses.

Following an assessment and nursing diagnosis of anaphylaxis, Registered Nurses (RN), Registered Psychiatric Nurses (RPN) and Licensed Practical Nurses (LPN) may carry out the initial emergency management of anaphylaxis:

- regardless of the causative agent;
- without an order;
- across all healthcare settings (i.e. hospital and non-hospital)

2.1 Conditions on Practice

A. Administration of epinephrine

Prior to administering epinephrine for the emergency management of anaphylaxis:

1) RN, RPN and LPN must follow this decision support tool.
2) RPN and LPN must successfully complete additional education [**Anaphylaxis Initial Emergency Treatment by Nurses (*Adult & Pediatric*)**. Available on Learning Hub]

   This education is recommended for RNs.

B. Administration of oxygen

Health Authority/employer practice limits may apply.

If available in the practice setting, prior to initiating oxygen therapy:

1) LPNs must follow a decision support tool and complete additional education.

3.0 Policy Statement

Clients who have been treated for anaphylaxis must have immediate follow up by a physician or Nurse Practitioner.

In the community, long term care and ambulatory settings, clients who have been treated for anaphylaxis must be transferred to hospital via ambulance.

4.0 Need to Know and Key Points

Anaphylaxis occurs with exposure to a trigger (see Appendix A) in a susceptible individual. Onset of symptoms usually occurs in minutes but can occur hours after exposure to a trigger.

Death from anaphylaxis *may* occur as a result of severe respiratory complications, cardiovascular collapse, or both.

Early administration of intramuscular (IM) Epinephrine is first line treatment for anaphylaxis to prevent death and there is no known equivalent substitute.

There is no contra-indication to epinephrine administration in anaphylaxis.

Epinephrine:

- Acts on smooth muscle of the bronchial tree reducing bronchospasm
- Counteracts histamine-induced vasodilation
- Increases cardiac output
- Reduces histamine release

Note: *Diphenhydramine (Benadryl) is* ***NOT INDICATED*** *in anaphylaxis.*

Antihistamines are not indicated as initial first line treatment in the emergency management of anaphylaxis as there is no effect on respiratory or cardiovascular symptoms and they are of little clinical importance in life-threatening anaphylaxis based on current evidence.

H1 antihistamines (e.g. Benadryl) relieve localized and less severe systemic allergic reactions and the only useful clinical effect is the improvement of itch and hives.[4, 13, 14]

5.0 Assessment and Nursing Diagnosis of Anaphylaxis

Early recognition of anaphylaxis is essential to ensure timely intervention.

Assess the client for signs and symptoms of anaphylaxis. These generally involve two or more body systems. See **Table 1** for clinical scenarios and body systems involved.

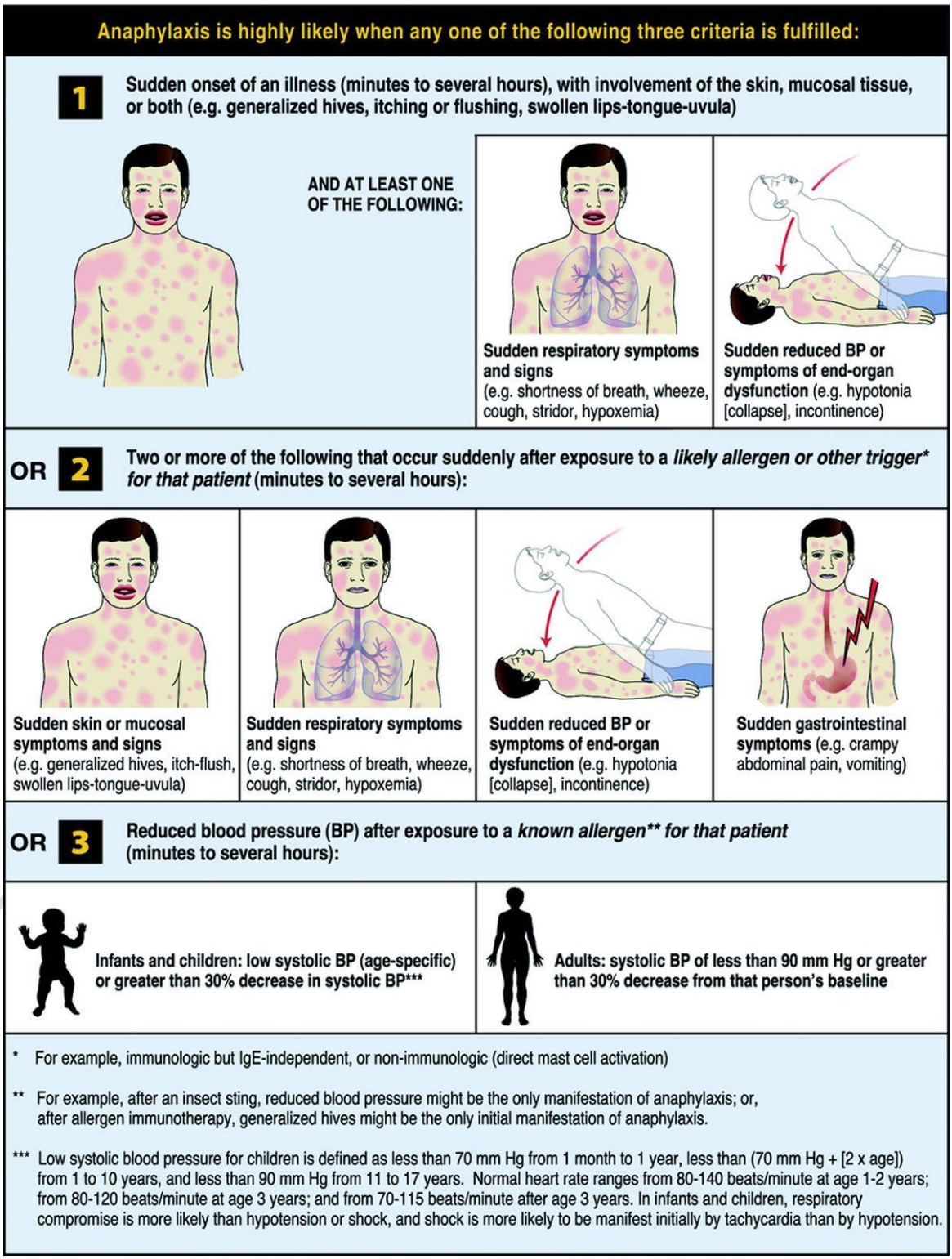
IMPORTANT: Anaphylaxis can occur **without** presence of hives.

Table 1: Clinical Scenarios and Body Systems Involved with Anaphylaxis.

Clinical Scenario	**(1) No Clear Trigger**	**(2) Suspected Trigger** **(new food, drug or immunization)**	**(3) Accidental Exposure to Known Allergen** **(Same as column 2 or↓ BP)**
SIGNS & SYMPTOMS ***Onset Minutes to Hours***	• Skin/mucosal or both **+ Plus at least one of the following:** • Respiratory Compromise • Reduced Blood Pressure or Associated Symptoms	**TWO OR MORE of the following:** • Skin/mucosal • Respiratory Compromise • Reduced Blood Pressure or Associated S/S • Persistent GI	**REDUCED BLOOD PRESSURE ONLY** • Child – Low Systolic or decrease greater than 30% • Adult – Systolic 90 or decrease greater than 30% from baseline

Refer to Image 1: **World Allergy Organization Anaphylaxis Guideline Poster** on page 4 of this document for a detailed description of signs and symptoms to inform the assessment and nursing diagnosis of anaphylaxis.

Image 1: World Allergy Organization Anaphylaxis Guideline Poster



(Adapted from Canadian Pediatric Society, 2018)

Anaphylaxis must be distinguished from fainting (vasovagal syncope) and anxiety (panic attack). See Table 2: Signs and Symptoms of Anaphylaxis versus Fainting and Anxiety.

Table 2: Signs and Symptoms of Anaphylaxis versus Fainting and Anxiety

	Anaphylaxis	Fainting	Anxiety
Definitions	A potentially life threatening allergic reaction that is rapid in onset and progression of symptoms.	Temporary unconsciousness caused by diminished blood supply to the brain due to painful stimuli or emotional reaction.	Protective physiological state recognized as fear, apprehension, or worry
Onset	• rapid onset and progression of symptoms • occurs minutes to hours after exposure to trigger • recovery dependent on response to treatment	• sudden onset • occurs before, during or shortly after trigger (e.g. sight of the needle) • recovery occurs within 1-2 minutes	• sudden onset • occurs before, during, or shortly after trigger (e.g. sight of the needle) • recovery generally occurs within 1-2 minutes
Skin/Mucosal	• localized subcutaneous (or sub mucosal) swelling and tingling to face and mouth • hives – may be delayed • warm, itchy, red and blotchy	• pale • excessive perspiration • cold, clammy	• pale • excessive perspiration • cold, clammy
Respiratory	• labored breathing - hoarse voice, throat tightness, rapid breathing, wheezing, coughing, nasal flaring, nasal and chest congestion • rhinitis (stuffy or runny nose, itchy watery eyes and sneezing) • shortness of breath, stridor, retractions, chest pain and cyanosis	• breathing normal or shallow, irregular and labored	• breathing rapid and shallow (hyperventilation) • **breath-holding in children**
Cardiovascular	• weak and rapid pulse • hypotension alone after an exposure can represent anaphylaxis • **hypotension is less common in children** • shock	• slow, steady pulse • decreased systolic and diastolic	• rapid pulse • normal or elevated systolic
Gastrointestinal	• nausea, vomiting, diarrhea • abdominal pain or cramping • dysphagia (difficulty swallowing) • **drooling in children**	• nausea	• nausea
Other	• anxious or feeling of "impending doom" • **sudden lack of energy (lethargy) in children** • **quietness or sleepiness in children** • headache, light-headedness or dizziness • decreased level of consciousness • uterine cramps	• fearfulness • light-headedness • dizziness • numbness, weakness • sometimes accompanied by brief clonic seizure activity	• fearfulness • light-headedness • dizziness • numbness, weakness • tingling around lips and spasm in the hands and feet associated with hyperventilation

NOTE: Bolded text indicates symptoms specific to **pediatric** clients.

6.0 Anaphylaxis Response Kit Contents

- Copy of this Decision Support Tool
- 4 ampoules of EPINEPHrine 1mg/mL
- 4 – 1 mL syringes
- Needles (25 to 27 gauge)
    - 4 - 1 inch
    - 4 - 1½ inch
- Alcohol swabs

Check medication vials and equipment. Replace if outdated.

Client Owned Auto-injector of Epinephrine

A client's own auto-injector of epinephrine may be used to administer epinephrine in situations where a delay in administration of epinephrine may occur (e.g. kit not readily available).

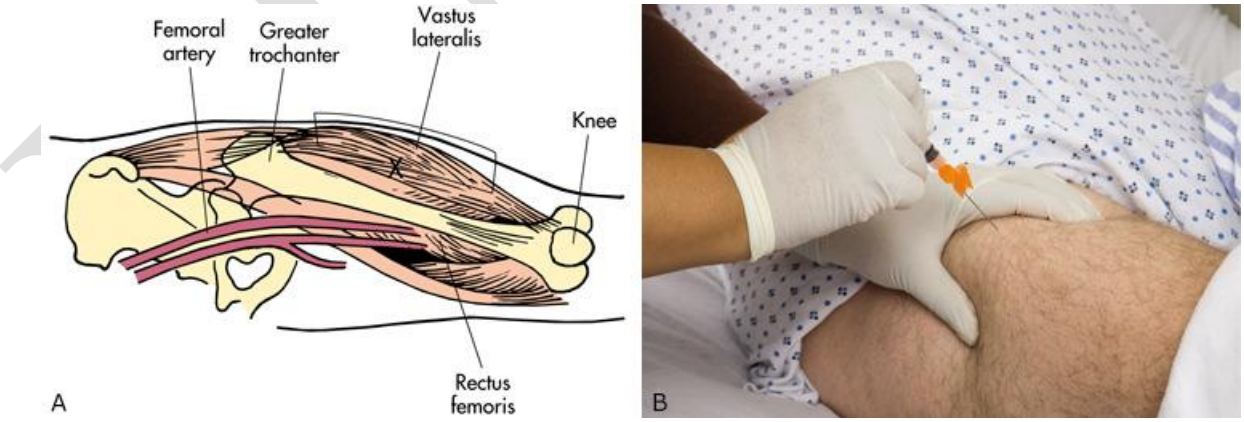
Clinical judgement is required.

Note: EpiPen® delivers 0.3 mg of epinephrine and EpiPen Junior® delivers 0.15 mg of epinephrine.

7.0 Injection Location Considerations

The correct site of intramuscular (IM) administration of epinephrine is ALWAYS the vastus lateralis located at the middle third of the *lateral thigh* [See image 1].

Image 1: Vastus Lateralis Injection Site



A, Landmarks for vastus lateralis site. **B,** Administering intramuscular injection in vastus lateralis site. (From Perry, A.G., Potter, P.A., Ostendorf, W.R. [Eds.]. [2018]. *Clinical nursing skills & techniques* [9th ed.]. St. Louis: Elsevier.)

Notes*:*

- If immunization/medication has been administered to both legs, give epinephrine IM at least 2.5 cm (1 inch) from original injection site**.**
- Administration of epinephrine through the clothing is acceptable in emergency situations.

8.0 Intervention: Initial Emergency Treatment of Anaphylaxis

ASSESS client for signs & symptoms of anaphylaxis
Circulation, Airway, Breathing (CAB) Skin, Mental Status and GI

↓

Remove/Stop the offending agent/drug (if possible)

↓

ADMINISTER
EPINEPHrine Intramuscular **(IM) Only**

Adults (14 years and older)	**Children under 14 years**
0.5 mg (of 1 mg/mL)	0.01mg/kg (of 1mg/mL) to max 0.5 mg/dose
IM vastus lateralis	**IM** vastus lateralis *See Appendix A for dose by age*

↓

CALL Code Blue or 911

↓

RE-ASSESS CAB

↓

Place in Recumbent Position / Elevate Legs (if possible)

Perform Simultaneously

↓

ADMINISTER Oxygen for Hypoxia (If available)
Goal: SpO_2 above 92%

↓

CONTINUOUS OBSERVATION
VITAL SIGNS Q5 Minutes until Transfer of Care

↓

REPEAT EPINEPHrine (IM) Q5 Minutes PRN x 2 doses
for **ongoing signs and symptoms of anaphylaxis**
(to a **maximum** of **3 total doses**)

***Adults* (14 years and older)**	***Children* under 14 years**
0.5 mg (of 1 mg/mL)	0.01 mg/kg (of 1mg/mL) to max 0.5 mg/dose
IM vastus lateralis	**IM** vastus lateralis *See Appendix B for dose by age*

↓

INITIATE IV Access (if possible)
DO NOT ADMINISTER EPINEPHrine via IV Route

↓

DOCUMENT & PROVIDE HANDOVER to CODE TEAM or PARAMEDICS

- Time of onset and nature of symptoms
- Interventions provided including timing and amount of epinephrine
- Response to treatment

9.0 Client / Family Education

Clients who have experienced anaphylaxis and their families should receive education including:

- Information on anaphylaxis being a potentially life threatening allergic reaction
- Avoiding triggers
- The emergency steps to take in case of anaphylaxis:
    - Carry your prescribed epinephrine auto-injector
    - Administer prescribed epinephrine auto-injector immediately
    - If in a hospital, long term care home or other institution: summon help
    - If in the community, or at home: call an ambulance
- Follow up with your physician, nurse practitioner, allergist or other appropriate resource to:
    - Develop an anaphylaxis action plan including self-administration of epinephrine
    - Obtain medical identification (e.g. MedicAlert®)
    - Undergo testing to confirm triggers
    - Explore ways that sensitivities to triggers may be reduced

Suggested client teaching resources:

- Health Link BC. (2018) Severe Allergic Reaction (Anaphylaxis)
- Food Allergy Canada. (2017) Allergic Reactions Could You Save a Life

10.0 Documentation

- Document the following in the health record:
    - Assessment
    - Nursing diagnosis of the condition
    - Interventions carried out
    - Client's response
    - Follow-up actions, transfer of care and client teaching
- Enter client allergy status as per employer policies to ensure communication to other providers.

11.0 Reporting

Suspected anaphylaxis adverse reactions related to drug or immunization administration are reported as required by employer policy:

- Patient Safety Learning System (PSLS) or equivalent (as required)
- Long Term Care settings must report adverse event to licensing body (as required)
- If the trigger for anaphylaxis is the result of an immunization, complete the following:
    - BCCDC Worksheet for Events Managed as Anaphylaxis Following Immunization
    - BCCDC Adverse Event Following Immunization (AEFI) Case Report Form

References

1. Simons, F.E. et al. (2011). World Allergy Organization guidelines for the assessment and management of anaphylaxis. *World Allergy Organization Journal*. 4:13-37. Retrieved from http://www.waojournal.org/content/4/2/13
2. Simons, F.E. et al. (2015). 2015 Update of the evidence base: World Allergy Organization anaphylaxis guidelines. *World Allergy Organization Journal*. 8:32. Retrieved from https://waojournal.biomedcentral.com/articles/10.1186/s40413-015-0080-1
3. Campbell, R.L., Kelso, J.M. Anaphylaxis: acute diagnosis. *UpToDate*. Retrieved April 19th, 2017 from https://www.uptodate.com/contents/anaphylaxis-acute-diagnosis?source=see_link
4. Campbell, R.L., Kelso, J.M. Anaphylaxis: emergency treatment. *UptoDate*. Retrieved June 8, 2018 from https://www.uptodate.com/contents/anaphylaxis-emergency-treatment?source=search_result&search=anaphylaxis&selectedTitle=2~150
5. BC Centre for Disease Control. (2013). Section V – Management of Anaphylaxis in a Non-Hospital Setting. *Communicable Disease Control Immunization Program*. Vancouver: BC Centre for Disease Control. Retrieved from http://www.bccdc.ca/resource-gallery/Documents/Guidelines%20and%20Forms/Guidelines%20and%20Manuals/Epid/CD%20Manual/Chapter%202%20-%20Imms/SectionV_Anaphylaxis.pdf
6. Canadian Society of Allergy and Clinical Immunology. (2016). *Anaphylaxis in Schools and Other Settings 3rd Edition Revised*. Canadian Society of Allergy and Clinical Immunology. Retrieved from http://resources.allergyaware.ca/download/anaphylaxis-3rd-edition-revised.pdf
7. College of Registered Nurses of British Columbia. (2017). *Scope of Practice for Registered Nurses*. Vancouver: College of Registered Nurses of British Columbia. Retrieved from https://www.crnbc.ca/Standards/Lists/StandardResources/433ScopeforRegisteredNurses.pdf
8. College of Registered Psychiatric Nurses of British Columbia. (2017). *Scope of Practice for Registered Psychiatric Nurses: Standards, Limits and Conditions*. Vancouver: College of Registered Psychiatric Nurses of British Columbia. Retrieved from http://www.crpnbc.ca/wp-content/uploads/2017/02/2016-03-15-Revised-Scope-with-disclaimer-updated-Feb-13-2017.pdf?v=410
9. College of Licensed Practical Nurses of British Columbia. (2017). *Scope of Practice for Licensed Practical Nurses*. Vancouver: College of Licensed Practical Nurses of British Columbia. Retrieved from https://www.clpnbc.org/Documents/Practice-Support-Documents/Scope-of-Practice-ONLINE.aspx
10. Health Canada. (2016). *Food Allergies: Information for Consumers.* Retrieved from http://www.hc-sc.gc.ca/fn-an/securit/allerg/fa-aa/index-eng.php
11. Epinephrine. (n.d.). In *Lexicomp.* Retrieved from https://online.lexi.com/lco/action/home
12. Muraro, A. et al. (2014). Anaphylaxis: guidelines from the European Academy of Allery and Clinical Immunology. *Allergy*. 29: 1026-1045. Retrieved from http://onlinelibrary.wiley.com/doi/10.1111/all.12437/full

13. Sheikh, A., Broek, V.T., Brown, S.G.A. and Simons, F.E.R. (2007). *H_1-antihistamines for the treatment of anaphylaxis: Cochrane systematic review*. retrieved on June 8, 2018 from https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.1398-9995.2007.01435.x

14. Australasian Society of Clinical Immunology and Allergy (2017). *Acute management of anaphylaxis.* Retrieved on June 8, 2018 from https://www.allergy.org.au/images/stories/pospapers/ASCIA_Guidelines_Acute_Management_Anaphylaxis_2017_Updated.pdf

15. Medication Administration: Subcutaneous Injection. (2017, November). In *Elsevier clinical skills*. Retrieved from https://epm601.elsevierperformancemanager.com/Personalization/Home?VirtualName=interiorhealth-canada

16. Medication Administration: Intramuscular Injection. (2018, May). In *Elsevier clinical skills*. Retrieved from https://epm601.elsevierperformancemanager.com/Personalization/Home?VirtualName=interiorhealth-canada

17. Canadian Pediatric Society. (2018) *Position statement Emergency treatment of anaphylaxis in infants and children.* Retrieved August 15, 2018 from https://www.cps.ca/en/documents/position/emergency-treatment-anaphylaxis

Appendix A: Common Triggers for Anaphylaxis

The true global rate of occurrence of anaphylaxis from all triggers in the general population is unknown because of under-recognition by patients and caregivers and under-diagnosis by healthcare professionals.[1]

Numerous nursing and health care activities expose patients to common triggers for anaphylaxis. Below are some selected common triggers for anaphylaxis. Triggers for individuals can vary widely and the below list is not exhaustive.

Food	Environment	Medications / Other
• Peanuts • Tree nuts • Soy • Seafood • Shellfish • Milk • Eggs • Mustard • Wheat • Sesame	• Venom from stinging insects • Horse • Latex	• Antibiotics especially β lactams (including penicillins, cephalosporins, carbapenems) • Non-steroidal anti-inflammatories (including ASA) • Biologic medications including immunizations • Chemotherapy • Radiocontrast media (x-ray dye) • Dextrans • Substances found in illicit drugs • Blood and Blood Products • Latex Gloves

Appendix B: EPINEPHrine 1mg/ml Dose by Age Table

NOTE: Use dose by weight whenever possible.

Dose by Age (Dosing is 0.01 mg/kg to maximum of 0.5 mg)		
Age	**Dose in mg**	**Volume (1 mg/mL)**
2-6 months	0.07 mg	0.07 mL
7-12 months	0.1 mg	0.1 mL
13 months - 4 years	0.15 mg	0.15 mL
5 years	0.2 mg	0.2 mL
6-9 years	0.3 mg	0.3 mL
10-13 years	0.4 mg	0.4 mL
Greater than or equal to 14 years	0.5 mg	0.5 mL

Adapted from:

Vancouver Coastal Health & Providence Health Care Professional Practice. (September 2017) Anaphylaxis: Initial Emergency Treatment Decision Support Tool. (Draft)

Developed by:

Paula Araujo, Regional Practice Leader, Clinical Process, Interior Health

Cathy Czechmeister, Lead, Professional Practice Strategy - Nursing, Northern Health

Sheila Gordon-Payne, Lead, Professional Practice Strategy – Nursing, Northern Health

Melina Kason, Practice Consultant, Professional Practice, Island Health

Reviewed by:

Dr. Monika Naus MD FRCPC, Medical Director, Communicable Diseases and Immunization Service, BC Centre for Disease Control

Dr. Scott B. Cameron MD, PhD, FRCPC, Clinical Instructor, Division of Allergy & Immunology, Department of Pediatrics, University of British Columbia

Christine Halpert, Senior Practice Leader, Communicable Diseases and Immunization Service, BC Centre for Disease Control

Stephanie Meier, Public Health Resource Nurse, Communicable Diseases and Immunization Service, BC Centre for Disease Control

BC Provincial Health Authorities Representatives from Fraser Health, Interior Health, Vancouver Coastal Health, Provincial Health Services Authority, Providence Health

Endorsed by:

British Columbia Chief Nursing Officer Council