

Practice Guideline

APPROVED BY: Population and Public Health Program Director
 Population and Public Health Medical Director

TARGET
REVIEW DATE
2023

PAGE
1 of 10

Date: September 25, 2020

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Purpose and Scope

To provide practice guidance for the management of suspected anaphylaxis by Public Health Nurses (PHN) working in Winnipeg Regional Health Authority (WRHA) Population Public Health (PPH) in all public health service settings.

Background and Definitions

This guidance is based on the Public Health Agency of Canada, *Canadian Immunization Guide*¹, and other evidence-based sources for the management of suspected anaphylaxis.²⁻⁷ This guidance supersedes the former 2008 Manitoba Health *Anaphylaxis Management Protocol*, repealed in August 2020.

Epinephrine (also known as adrenaline) is the treatment of choice for management of anaphylaxis in community and health care settings and **administration should not be delayed**. It prevents and relieves upper airway swelling, hypotension and shock, and causes increased heart rate, increased force of cardiac contractions, increased bronchodilation, and decreased release of histamine and other mediators of inflammation. Epinephrine reaches peak plasma and tissue concentrations rapidly.

The [*Regulated Health Professions Act of Manitoba*](#)⁸ provides an exemption to reserved acts in section 5(3) when rendering first aid or temporary assistance in an emergency, which applies to Registered Nurses administering epinephrine in a suspected anaphylaxis.

Diphenhydramine (i.e. Benadryl®) is NOT indicated in anaphylaxis and is no longer included in anaphylaxis management kits. 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. H₁ antihistamines relieve localized and less severe systemic allergic reactions, and the only useful clinical effect is the improvement of itch and hives.²⁻⁵

Anaphylaxis is a serious, potentially life-threatening allergic reaction to foreign antigens; it has been proven to be associated with vaccines. Anaphylaxis is rare with an estimated range of occurrence of 1-10 episodes per million doses of vaccine administered. Anaphylaxis is preventable in many cases and treatable in all (PHAC, 2020).



Practice Guideline

Management of Suspected Anaphylaxis in WRHA Population and Public Health

APPROVED BY: Population and Public Health Program Director
 Population and Public Health Medical Director

Date: September 25, 2020

Updated:

TARGET
REVIEW DATE
2023

PAGE
2 of 10

Procedure

1. PREPARATION

Although rare, anaphylaxis should be anticipated in any context that involves administration of a vaccine by any route, or medication or treatment by injection (e.g. intradermal tuberculin skin tests⁹, intramuscular (IM) administration of Bicillin® L-A). **Anaphylaxis management kits must be available wherever these services are offered.**

Pre-vaccination or treatment screening includes screening for a history of anaphylaxis and identification of potential risks. It should include questions about possible allergy to any component of the vaccine(s) or treatments being considered in order to identify if there is a contraindication to administration.

Most instances of anaphylaxis begin within 30 minutes after administration of vaccine or medication by injection. Therefore, clients receiving treatments or medications by injection are encouraged to remain in the service area for 15 minutes post administration; 30 minutes is a safer interval when there is a specific concern about possible allergy.

Anaphylaxis Management Kits:

- Anaphylaxis management kits should be readily available wherever vaccines are administered (by any route), and where treatments or medications are administered by injection (e.g. Bicillin® L-A intramuscular treatment and tuberculin skin tests).
- It is the responsibility of the PHN to ensure there is a properly stocked anaphylaxis management kit available when providing these treatments.
- Epinephrine and other emergency supplies should be checked on a regular basis and replaced when expired and/or used.
- The kits can be stored at room temperature and securely closed to protect the epinephrine from exposure to light.

List of Recommended Items:

- A clear, concise summary of the anaphylaxis emergency management protocol
- Dosage tables with recommendations for epinephrine by age (for when weight is not known)



Practice Guideline

Management of Suspected Anaphylaxis in WRHA Population and Public Health

APPROVED BY: Population and Public Health Program Director
 Population and Public Health Medical Director

Date: September 25, 2020

Updated:

TARGET
REVIEW DATE
2023

PAGE
3 of 10

- Three ampoules of injectable epinephrine 1 mg/mL packed for protection from light (amber glass ampoules are adequately protected)
- Three of each: 25 gauge 1 inch and 25 gauge 1.5 inch safety engineered needles, with 1 mL syringes for epinephrine administration.¹ (combined safety engineered needle/syringes are preferred).
- Alcohol swabs and band aids (*note: epinephrine administration without use of alcohol swab to cleanse injection site first is acceptable to expedite care*)

In clinical setting, also consider stocking:

- CPR face mask with one-way valve. Stethoscope and sphygmomanometer with blood pressure cuff of sizes appropriate to clients served.

2. ASSESSMENT

In anaphylaxis, signs and symptoms develop over minutes and usually involve at least two body systems (e.g. the skin, respiratory, gastrointestinal or circulatory systems). Hypotension, collapse and/or loss of consciousness may be the only sign of anaphylaxis.

The cardinal features of anaphylaxis are:

- itchy, urticarial rash is common but not required to diagnose anaphylaxis
- progressive, painless swelling (angioedema) about the face and mouth, which may be preceded by itchiness, tearing, nasal congestion or facial flushing
- respiratory symptoms, including sneezing, coughing, wheezing, laboured breathing and upper airway swelling (indicated by hoarseness and/or difficulty swallowing) possibly causing airway obstruction
- gastrointestinal symptoms, including crampy abdominal pain and vomiting
- sudden reduced blood pressure or symptoms of end-organ dysfunction (e.g., hypotonia and incontinence).
- In infants, symptoms may also include fussiness, irritability, drowsiness or lethargy.

¹ *For infants aged 2 months and older, a 1 inch needle is recommended for intramuscular injection to the anterolateral thigh/vastus lateralis.¹²

Practice Guideline

APPROVED BY: Population and Public Health Program Director
 Population and Public Health Medical Director

TARGET REVIEW DATE
2023

PAGE
4 of 10

Date: September 25, 2020

Updated:

Table 1: Frequency of occurrence of signs and symptoms of anaphylaxis
(adapted from BCCDC 2019⁶)

System	% of Episodes	Signs and Symptoms One or more sign or symptoms may be present
Skin*	Up to 80%	Hives, swelling (face, lips, tongue), angioedema, itching, warmth, redness, drooling in children
Respiratory	Up to 70%	Coughing, wheezing, shortness of breath, chest pain or tightness, throat tightness, hoarse voice, nasal congestion or hay fever-like symptoms (runny, itchy nose and watery eyes, sneezing), trouble swallowing, drooling in children
Cardiovascular	Up to 45%	Weak pulse, dizziness or light headedness, collapse, hypotension**, shock
Gastrointestinal	Up to 45%	Nausea, pain or cramps, vomiting, diarrhea
Other		Anxiety, sense of doom, headache, uterine cramps, metallic taste, suddenly quiet, sleepy or lethargic in children

*skin signs, such as hives are present in ~80% of cases, but may develop after other symptoms have already occurred. Anaphylaxis may present without hives. **Hypotension may be the only sign of anaphylaxis.

3. INTERVENTION

Steps for basic management of anaphylaxis in a non-hospital setting are as follows (steps a, b, c, d should be done in quick succession):

- a) **Assess** circulation, airway, breathing, mental status, skin.
- b) **Remove/stop the offending agent/drug** (if possible)
- c) **Administer epinephrine intramuscularly in the vastus lateralis (mid- anterolateral aspect of the thigh):** 0.01 mg/kg body weight of 1 mg/mL injectable solution – see dosing tables. **If weight is known, provide weight-based dosing for children rather than age-based dosing for greater accuracy. The minimum dose is 0.1 mg, and the maximum dose is 0.5 mg** (see age-based dosing table on page 6 and Appendix).

Record the time of the dose.

- d) **Call Code Blue or 911/Ambulance**
- e) **Re-assess circulation, airway, breathing**

Practice Guideline

APPROVED BY: <input checked="" type="checkbox"/> Population and Public Health Program Director <input checked="" type="checkbox"/> Population and Public Health Medical Director		TARGET REVIEW DATE	PAGE
Date: September 25, 2020	Updated:	2023	5 of 10

- f) **Position** the client in recumbent position: on their back or in a position of comfort if there is respiratory distress; elevate the lower extremities. Place the client on their side if vomiting or unconscious. Pregnant anaphylactic clients should be placed semi-recumbent on their left side with their legs elevated.
- g) **Monitor/continuous observation:** check vital signs every 5 minutes until transfer of care. If oxygen available, treat hypoxia (goal of SpO₂ above 92%).
- h) **Repeat epinephrine:** IM every 5 minutes to a maximum of 3 doses for ongoing signs and symptoms of anaphylaxis. Alternate legs (IM site) for multiple doses if possible.
- i) **Document and provide handover to Paramedics:** Suspected offending agent/vaccine/drug; time of onset and nature of symptoms; interventions provided including timing and administration of epinephrine; response to treatment.
 - o Ensure the client's current and future records are clearly marked with a history of a suspected anaphylaxis following the suspected offending agent/vaccine/drug.

Prompt administration of epinephrine is the priority and should not be delayed.

Failure to administer epinephrine promptly may result in greater risks to the client with anaphylaxis, compared to using epinephrine improperly. If uncertain if client is experiencing anaphylaxis, err on the side of treatment. **There are no contraindications to the use of epinephrine.** If time is lost early in the treatment of an acute anaphylactic episode, subsequent management can become more difficult.

Epinephrine 0.01 mg/kg body weight per dose using a 1 mg/mL injectable solution should be administered into the mid-anterolateral aspect of the thigh. The deltoid muscle of the arm is not as effective as the thigh in absorbing epinephrine, thus should not be used. Scissors may be needed to cut clothing to establish access. If scissors are not readily available, epinephrine may be administered through clothing. Although there is a slightly increased risk of infection, timely administration of epinephrine is the priority. The risk of infection can be addressed once the person has stabilized.

Practice Guideline

**Management of Suspected Anaphylaxis in WRHA
Population and Public Health**

APPROVED BY: Population and Public Health Program Director
 Population and Public Health Medical Director

TARGET REVIEW DATE
2023

PAGE
6 of 10

Date: September 25, 2020

Updated:

Table 2: Dosing Guidelines for Epinephrine (1 mg/mL solution) by age. For children less than 13 years old, use weight-based dosing when possible (0.01 mg/kg body weight).

Epinephrine dose (1 mg/mL)	Age Range
0.1 mg (or 0.1 mL)	Less than 2 years of age
0.15 mg (or 0.15 mL)	2 years – 7 years
0.3 mg (or 0.3 mL)	8 – 12 years
0.5 mg (or 0.5 mL)	13 years or older

Mild and transient adverse effects such as pallor, tremor, anxiety, palpitations, headache and/or dizziness may occur within minutes after injection of a recommended dose of epinephrine.

Clients experiencing anaphylaxis should not suddenly sit or stand. Instead, they should be placed on their back with their lower extremities elevated or, if they are experiencing respiratory distress or vomiting, they should be placed in a position of comfort (e.g. on their side or semi-recumbent) with their lower extremities elevated is possible. Pregnant anaphylactic clients should be placed semi-recumbent on their left side with their legs elevated. Inform EMS if you are aware that the person experiencing anaphylaxis is on beta-blockers as beta-blockers may inhibit the effects of epinephrine.

4. POST-EVENT FOLLOW UP

- Offer de-briefing for staff members involved in anaphylaxis management, and consider debriefing or support for family members or others involved in the anaphylaxis event.
- If anaphylaxis in a minor occurred in a setting with no guardian present (e.g. school-based immunization program), notify the legal guardian as soon as possible.
- Use RL6 to report patient safety events such as; occurrences and critical incidents online. Report as: Provision of Care; Code 25/Medical Emergency.

Practice Guideline

APPROVED BY: <input checked="" type="checkbox"/> Population and Public Health Program Director <input checked="" type="checkbox"/> Population and Public Health Medical Director		TARGET REVIEW DATE 2023	PAGE 7 of 10
Date: September 25, 2020	Updated:		

- If anaphylaxis occurred following an immunization, complete the [Manitoba Adverse Events Following Immunization Form](#)¹¹ and the [Side Effect Reporting Form from the Canada Vigilance Program](#)¹³ for medications or treatment by injection and forward to the respective Communicable Disease Coordinator.
- Replenish/replace anaphylaxis kit, as needed.

Resources and References

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Practice Guideline

**Management of Suspected Anaphylaxis in WRHA
Population and Public Health**

APPROVED BY: <input checked="" type="checkbox"/> Population and Public Health Program Director <input checked="" type="checkbox"/> Population and Public Health Medical Director		TARGET REVIEW DATE 2023	PAGE 8 of 10
Date: September 25, 2020	Updated:		

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13. Canada Medication Vigilance Program Side Effect Reporting Form, Accessible at : <https://www.canada.ca/en/health-canada/services/drugs-health-products/medeffect-canada/adverse-reaction-reporting/consumer-side-effect-reporting-form.html>

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APPENDIX

Assessment Guide and Drug Administration Record for Anaphylaxis Management

Client Name: _____ Date of Birth: _____
MFRN or PHIN _____ Name/Location of Clinic/Service: _____

Suspected trigger/offending agent: _____

Time of Onset of Signs and Symptoms _____ (*circle pertinent findings*)

- **Respiratory:** Coughing, wheezing, shortness of breath, chest pain or tightness, throat tightness, hoarse voice, nasal congestion, runny/nose and watery eyes, sneezing, drooling in children
- **Skin:** Hives, swelling (face, lips, tongue), angioedema, itching, warmth, redness, drooling in children
- **Eye/Nasal:** nasal congestion, runny/nose and watery eyes, sneezing, drooling in children, sneezing
- **Cardiovascular:** Hypotension, chest discomfort, weak pulse, dizziness, syncope, headache
- **Other:** Nausea, pain or cramps, vomiting, diarrhea, anxiety, sense of doom, headache, uterine cramps, metallic taste, suddenly quiet, sleepy or lethargic in children

Epinephrine (Adrenalin) 1 mg/mL injectable solution: Administer 0.01 mg/kg intramuscularly (IM) in the mid anterolateral thigh. Epinephrine, at the same dose as the initial one, can be **repeated** every 5 minutes as needed to a maximum of 3 doses. **Dose by weight if known (0.01 mg/kg body weight).**

Epinephrine dose (1 mg/mL)	Age Range
0.1 mg (or 0.1 mL)	Less than 2 years of age
0.15 mg (or 0.15 mL)	2 years – 7 years
0.3 mg (or 0.3 mL)	8 – 12 years
0.5 mg (or 0.5 mL)	13 years or older

	Epinephrine 1mg/mL dose	Site and route	Time	Provider signature
Dose 1				
Dose 2				
Dose 3				

Call Code Blue or 911

Called 911 at: _____ (time)

Respiration (rate/min.)	Pulse (rate/min.)	Blood Pressure	Time	Comments

Transfer to Paramedic at: _____ (time)

Printed name and designation of provider

Signature

DD/MMM/YYYY

Post-event follow up: Offer debriefing with involved staff or clients * RL6 Report of occurrence * Manitoba Adverse Event Following Immunization (AEFI) if related to vaccine * [Side Effect Reporting Form from the Canada Vigilance Program](#) for medications or treatment by injection * Replenish anaphylaxis management kit

EMERGENCY TREATMENT OF ANAPHYLAXIS

ASSESS for signs and symptoms of anaphylaxis
Circulation, Airway, Breathing, Skin, Eye/nasal, Mental Status, Gastrointestinal

REMOVE/STOP the offending or triggering agent/drug (if possible)

ADMINISTER EPINEPHRINE by Intramuscular (IM) Injection

Children under 13 dose by weight 0.01 mg/kg (of 1 mg/ml) IM to **vastus lateralis** if weight unknown refer to age/weight table

Epinephrine dose (1 mg/ml)	Age Range
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0.3 mg (or 0.3 ml)	8 – 12 years
0.5 mg (or 0.5 ml)	13 years or older

CALL CODE BLUE OR 911/AMBULANCE

REASSESS CIRCULATION AIRWAY BREATHING

PLACE IN RECUMBENT POSITION WITH LEGS ELEVATED

CONTINUOUS MONITORING: Vital signs every 5 minutes until transfer of care.
Provide O₂ for hypoxia if available (goal of SpO₂ above 92%)

REPEAT EPINEPHRINE IM every 5 min. as needed for ongoing signs and symptoms of anaphylaxis to maximum of 3 doses.
Alternate legs (IM sites) for multiple doses

DOCUMENT AND TRANSFER CARE TO PARAMEDIC Suspected offending agent/vaccine/drug; time of onset and nature of symptoms; interventions provided including timing and administration of epinephrine; response to treatment