

Protocol for Management of Suspected Anaphylactic Shock

COMMUNICABLE DISEASE CONTROL

Summary of First Steps for Suspected Anaphylaxis

Signs and Symptoms:

Within minutes signs/symptoms can develop and do not resolve quickly with reassurance and/or re-positioning. These consist of sneezing, coughing, itchiness, “pins and needles” sensation, flushing, facial edema, hives, anxiety, respiratory difficulties, hypotension, shock or collapse.

Treatment:

- Call 911
- ABCD's of resuscitation
- Drugs (see Drug Administration Record)

Anaphylactic Shock

Anaphylactic (Allergic) Shock – This type of reaction is usually of a violent nature, often occurring with very little warning within a few seconds to minutes following administration of drugs such as vaccines, toxoids, immune globulins, antitoxins, diagnostic solution (tuberculin skin test), antibiotic (such as penicillin), pollen or other allergic extract, or after stinging by venomous insects. The following signs and symptoms may develop rapidly and dramatically: apprehension, itchiness, flushing of the face, substernal itchiness, stridorous or wheezy breathing, cyanosis, a drop in blood pressure, and loss of consciousness. Death may ensue immediately after the first sign of difficulty, or the patient may recover from the initial signs and symptoms and develop, within the next 30-60 minutes, generalized urticaria, angioedema, acute coryza, bronchial spasm, intestinal and uterine colic and diarrhea.

Anaphylactic shock should be distinguished from a syncopal episode which is characterized by pallor, slow pulse, salivation, nausea, vomiting and sweating. These syncopal signs and symptoms respond to measures taken to improve circulation to the brain: lowering of the head and/or raising the feet. For an incipient episode, having the patient take a few deep breaths may help.

Treatment of Anaphylaxis

Treatment is directed at limiting the absorption of noxious material and by countering the adverse reactions. The ABCD's of resuscitation should be followed while simultaneously calling 911.

The ABCD's refer to:

- A – airway
- B – breathing
- C – circulation
- D – drug treatment

The principles and protocol of the ABC's are covered in CPR manuals.

Scope of the Protocol

The emphasis of this protocol is the management of suspected anaphylactic shock by public health nurses in non-hospitals settings such as immunization clinics in schools and in the community. Specifically, this document focuses on the drug management of severe allergic reactions following the administration of vaccines and other immunizing agents, such as toxoids, immune globulins, antitoxins and diagnostic test solutions such as tuberculin skin test.

Drug Management Guidelines for Management of Suspected Anaphylactic Shock in Children and Adults

In order to carry out appropriate management, an anaphylaxis kit should be complete and available at the site and time that immunizing agents are being administered.

- i) **If you have not called 911, do it now!**
- ii) **Place the patient in supine position with feet elevated as tolerated**
- iii) **Epinephrine* (adrenaline) 1:1000 aqueous solution – lifesaving: first and most important drug to give!**
 - Administer 0.01 mL/kg (maximum 0.5 mL per injection) intramuscularly (IM) into an un-immunized limb. Injecting epinephrine close or into the same site as the immunizing agent is contraindicated as it dilates the blood vessels and may speed absorption of the vaccine (agent suspected of causing the severe allergic reaction). Administering the epinephrine into a large muscle, such as the vastus lateralis (thigh) muscle, achieves a more rapid and higher concentration of epinephrine into the blood stream compared to other sites.
 - If accessing the thigh muscle is problematic, and the person is older than 12 months of age, epinephrine can be administered in the deltoid muscle.
 - **If all limbs have been used for immunizations, epinephrine must still be administered to the patient intramuscularly.** Epinephrine can be administered into a muscle close to the site where the immunization agent was administered. A minimum distance of 2.5 cm (or 1 inch) must be maintained *between* the injection sites of the immunization agent and the epinephrine drug.

Epinephrine,* at the same dose as the initial one, can be **repeated** twice at 10-15 minute intervals to a maximum of 3 doses.

- iv) **Diphenhydramine (benadryl) (50 mg/mL) –** Secondary drug to administer in addition to epinephrine to treat symptoms such as pruritus, erythema, urticaria. ***Remember: never give diphenhydramine alone or before epinephrine.***
 - **Administer diphenhydramine once (maximum of 50 mg) intramuscularly (IM).** It should be given at a site other than the inoculation.
 - Diphenhydramine should **not** be repeated.
 - After administration of the drugs, oxygen should be administered and an intravenous should be established, where available.
 - After administration of epinephrine and diphenhydramine, monitor and document vital signs (pulse, respiration and blood pressure if sphygmomanometer available) and reassess the patient frequently until transport to the hospital.

Note:

- Although the current literature suggests the administration of antihistamines, including H₁ (i.e., Benadryl) and/or H₂ (i.e., ranitidine, cimetidine) as an adjunct therapy to treat anaphylaxis, research is still required about the appropriate dose, timing, route and frequency of these drugs.
- **Prompt transport is essential** as the onset of angioedema may result in complete obstruction of the patient's airway. In almost all cases, transport will be done by ambulance.

v) Follow-up of a suspected anaphylactic shock

If and when an anaphylaxis kit is used (true anaphylaxis or "false alarm"), the following steps are recommended as soon as possible after managing the incident:

1. Notify the Public Health Supervisor and Medical Officer of Health by phone for administrative and medical guidance. For non-public health settings, notify the immediate supervisor and medical director.
2. Complete the Drug Administration Record on the lid of the Anaphylaxis Kit.

3. In the case of vaccine-associated anaphylaxis, (including other immunizing agents mentioned in the previous sections of this protocol) complete a detailed incident report following existing policies and procedures set out by the immunization provider's employer/regional health authority; and complete the Public Health Agency of Canada (PHAC) form for Adverse Event Following Immunization (AEFI) (unless incident was a simple faint).
4. Ensure anaphylaxis kit is refurbished before returning to storage site. The one-way valve barrier device (used for artificial respiration) should be discarded and replaced.
5. Ensure that the patient's current and future record(s) are clearly marked with a history of a suspected anaphylactic shock following immunization(s).

While immunization is rarely associated with anaphylaxis, the appropriate routine pre-immunization screening about predisposing factors (ex: allergy to eggs, drugs such as antibiotics or vaccine ingredients, adverse reactions to previous immunizations) should minimize occurrence.

Should you have any questions or comments about anaphylaxis management, please contact your Public Health Supervisor or your local Medical Officer of Health. **Note:** Keep the contact information of these individual(s) accessible and up to date.

Drug Administration Record

Name of Patient: _____ Age: _____ Date: _____

Name and location of Clinic: _____

1. **Epinephrine (Adrenalin) 1:1000 aqueous solution:** Administer 0.01 mL/kg (maximum 0.5 mL per injection) intramuscularly (IM). Epinephrine, at the same dose as the initial one, can be **repeated** at 10-15 minute intervals to a maximum of 3 doses.

The following approximate dosages (0.01 mL/kg) may be used:

2 to 6 months	0.07 mL
6 to 12 months	0.07-0.1 mL
12 to 18 months	0.1-0.15 mL
18 months to 4 years	0.15 mL
5 years	0.20 mL
6 to 9 years	0.30 mL
10 to 13 years	0.40 mL
≥14 years	0.50 mL

Epinephrine (Adrenalin) administered:

1st dose Amount: _____ mL

(if given) Time: _____

Site: _____

2nd dose Amount: _____ mL

(if given) Time: _____

Site: _____

3rd dose Amount: _____ mL

(if given) Time: _____

Site: _____

2. **Diphenhydramine (Benadryl) (50 mg/mL).** Administer intramuscularly (IM). A *maximum* dose of 50 mg (or 1.00 mL) at site other than inoculation. See pediatric dosages below. **Do Not Repeat.**

The following approximate dosages may be used:

Under age 2 years	0.25 mL
Age 2 to 4 years	0.50 mL
Age 5 to 11 years	0.50 to 1.00 mL
≥12 years	1.00 mL

Diphenhydramine (Benadryl) administered:

Only One Dose Amount: _____

Time: _____

Site: _____

The above Drug Administration Record is to be reproduced and included in each anaphylaxis kit.

Anaphylaxis Kit – Each kit should contain the following items:

- 1 Page of “Drug Management Guidelines for Management of Suspected Anaphylactic Shock in Children and Adults” (taped to the inside of the box lid)
- 3 x 1 mL ampoules of epinephrine (1:1000 aqueous solution)
- 1 x 1 mL vials of diphenhydramine (50 mg/mL)
- 3 x 1 mL syringes with safety engineered needles* (various lengths with 25G)
- 1 pocket mask
- 5 alcohol swabs
- Sphygmomanometer (optional)
- Stethoscope (optional)
- Up to date contact information for the Public Health Supervisor and Medical Officer(s) of Health.

*Length of needle to be selected appropriate to patient size and body mass. Suggest: Needle gauge: 25G, needle lengths: 3 x 1”; 3 x 5/8”; 3 x 1.5”

The kits can be stored at room temperature and should be closed with an elastic to ensure the **drugs are not exposed to light** which can cause them to deteriorate. Additionally, the kits require regular verification to replace drugs before the expiry date.

Assessment Guide and Record

Name of patient: _____ Age: _____ Date: _____

Name and location of clinic: _____

Immediate Measures for Treatment:

- Call 911
- ABCD's of resuscitation
 - Airway
 - Breathing
 - Circulation
 - Drugs

Recording Chart Guide

Called 911 at: _____ (time am/pm)

Signs and symptoms (*circle pertinent findings*)

- **Respiratory:** Dyspnea, chest tightness, wheezing, cough, stridor
- **Skin:** Urticaria, angioedema, generalized itch, flushing
- **Eye/Nasal:** runny nose, red eyes, congestion, sneezing
- **Vascular:** Hypotension, chest discomfort, dizziness, syncope, headache
- **Other:** Difficulty swallowing, abdominal pain, nausea, emesis, diarrhea, diaphoresis, apprehension
- **Other signs and symptoms:** _____

Vital Signs

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

The use of the *Assessment Guide and Record* is optional since it is expected a detailed incident report as per the existing policies and procedures set out by the immunization provider's employer/regional health authority; and the Public Health Agency of Canada (PHAC) form for Adverse Event Following Immunization (AEFI) are to be completed in the event of a suspect or actual anaphylaxis.

References:

- American Academy of Pediatrics. (2006). Red Book. 2006 Report of the Committee on Infectious Diseases. (27th ed.). Elk Grove Village, IL: Author.
- British Columbia Communicable Disease Control Immunization Manual. Anaphylaxis Section. October 2006.
- Canadian Pharmacists Association. (2007). Compendium of Pharmaceuticals and Specialties. The Canadian Drug Reference for Health Professionals. Author.
- Centers for Disease Control and Prevention. (2006). General recommendations on immunization. Recommendations of the Advisory Committee on Immunization Practices. *Morbidity and Mortality Weekly Report*, 55 (RR-15), 1-48.
- Ellis, A. K. and Day, J. H. (2003). Diagnosis and management of anaphylaxis. *Canadian Medical Association Journal*. 169 (4); 307-310.
- Heart and Stoke Foundation. Manitoba Chapter.
- Lieberman, P. (2003). Use of epinephrine in the treatment of anaphylaxis. *Current Opinion in Allergy and Clinical Immunology*, 3, 313-318.
- Lieberman, P. (2006). Anaphylaxis. *The Medical Clinics of North America*. 90 (2006), 77-95.
- National Advisory Committee on Immunization. (2006). *Canadian Immunization Guide*. (7th Ed.). Ottawa, ON: Public Health Agency of Canada
- Sampson, H. A. (2006). Second symposium on the definition and management of anaphylaxis: Summary report – Second National Institute of Allergy and Infectious Disease/Food Allergy and Anaphylaxis Network Symposium. *Annals of Emergency Medicine*. 47 (4), 373-380.
- Sampson, H. A. *et al.* (2005). Symposium on the definition and management of anaphylaxis: Summary report. *Journal of Allergy and Clinical Immunology*, 115, 584-591.
- Sampson, H. A. *et al.* (2006). Second symposium on the definition and management of anaphylaxis: Summary report—Second National Institute of Allergy and Infectious Disease/Food Allergy and Anaphylaxis Network symposium. *Journal of Allergy and Clinical Immunology*. 117, (2), 391-397.
- Simons, F. E. R., Roberts, J. R., Gu, X. and Simons, K. J. (1998). Epinephrine absorption in children with a history of anaphylaxis. *Journal of Allergy and Clinical Immunology*. 101, 33-37.