STONEY HEALTH SERVICES POLICY AND PROCEDURES		ALLERGIC REACTIONS & ANAPHYLAXIS MANAGEMENT	
Effective: March 16, 2015	**CODE**: PP + TITLE	**Applies To**:	☐ Leadership & Operations ✓ Programs & Services ☐ Client, Family & Community
Review: March 16, 2016	**Sheet:** 1 of 32		
Next Review: July 21,2018	**Approval:**		

Related Policies & Procedures: SHS Safety Incident Reporting, Analysis & Resolution Policy; SHS Medication Management Policy

1. **STANDARD:** Stoney Health Services personnel shall monitor for and identify as well as provide immediate identification and intervention to promptly address, minimize the consequences of anaphylaxis and ensure effective efficient follow-up as needed.

2. **RATIONALE:** Anaphylaxis is a serious, life-threatening allergic reaction; an emergency that can be treated effectively with prompt recognition and use of appropriate medication.

3. **POLICY:** Stoney Health Services (SHS) will follow the directives of the First Nations and Inuit Health Branch Alberta (FNIHB-AB) Region Guidelines for the Management of Anaphylaxis Related to Immunizations in order to consistently identify and manage anaphylaxis following immunization, medication administration and/or other severe allergic reactions (i.e. to foods, insect sting, latex, etc.) in a community health setting. All physicians and personnel will comply with the following procedures : https://www2.onehealth.ca/LinkClick.aspx?fileticket=KrkA5eV1Iu0%3d&tabid=790

4. **PROCEDURE(S):**

5. **APPENDICES:**

A. ANAPHYLAXIS IDENTIFICATION AND MANAGEMENT

a. Signs and Symptoms of Anaphylaxis: Signs and symptoms of anaphylaxis develop over several minutes and by definition involve at least two body systems (e.g. the skin, respiratory, gastrointestinal and/or circulatory systems).

- The cardinal features of anaphylaxis are:
  - Itchy, urticarial rash.
  - Progressive, painless swelling (angioedema) about the face and mouth, which may be preceded by itchiness, tearing, nasal congestion or facial flushing.
  - Gastrointestinal symptoms, including cramps/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.

- Other Symptoms:
  - Skin and mucosal symptoms are reported to occur in 80% to 90% of anaphylaxis cases and respiratory symptoms occur in up to 70%.
  - Cardiovascular system symptoms (i.e. chest pain, palpitations, or tachycardia occur in up to 45%.
  - Central nervous system symptoms of uneasiness, altered mental status, dizziness, or confusion occur in up to 15%.
  - Gastrointestinal symptoms (i.e. nausea, vomiting and diarrhea) may occur in up to 45% of cases.

Note: The rate of progression or the severity of the anaphylactic episode can be difficult to predict at the start of anaphylaxis; however, rapid development of anaphylaxis following vaccination indicates that a more severe reaction is likely.

Symptoms vary from one person to another and only a few symptoms may be present. Features of severe anaphylaxis include obstructive swelling of the upper airway, marked bronchospasm and hypotension. Hypotension can progress to cause shock and collapse.

Unconsciousness is rarely the sole manifestation of anaphylaxis; it occurs only as a late event in severe cases**. Death can occur within minutes.**

b. General Considerations for Management of Allergic Reactions/Anaphylaxis : All SHS physicians and personnel responsible for administration of medication(s) and/or immunization(s) ....

- Will follow the FNIHB-AB Guidelines for the Management of Anaphylaxis. See Appendix A: Guidelines for the Management of Anaphylaxis Related to Immunizations.
- Refer to page 7 of the FNIHB-AB Guidelines for Anaphylaxis Management for the Medications Used for Treatment of Anaphylaxis and Mechanism of Action.
- Have the **Anaphylaxis Kit** with the guidelines for anaphylaxis management readily available and review the anaphylaxis management guidelines prior to administration of medication(s) or immunization(s).

c. Immediate Anaphylaxis Management: Note: STEPS 1 TO 4 SHOULD BE DONE RAPIDLY OR SIMULTANEOUSLY. The priority is prompt administration of epinephrine which should not be delayed. Failure to use epinephrine promptly is more dangerous than using it inappropriately.

- **STEP I :** Promptly administer Aqueous Epinephrine (1:1000) uisng Table 1, below:
  (calculation: 0.01 mL/kg to maximum of 0.5 mL)

Table 1: Epinephrine Dosages by Age and Weight

Age	Weight	Dose
Premies	3 kg (6.6 lb)	0.03 mL
Less than 12 Months	7 kg (15.4 lb)	0.07 mL
12 to 17 months	10 kg (22 lb)	0.1 mL
18 months to 4 years	15 kg (33 lb)	0.15 mL
5 years	20 kg (44 lb)	0.2 mL
6 to 9 years	30 kg (66 lb)	0.3 mL
10 to 13 years	40 kg (88 lb)	0.4 mL
14 years and older	50 kg (110 lb)	0.5 mL

- **STEP 2:** Call for HELP. Helper to ensure 911/EMS is called.
- **STEP 3** : Place the client in a RECUMBENT position, with *feet elevated* if possible.
- **STEP 4** : Establish adequate airway.
- **STEP 5** : As an adjunct to epinephrine, a single dose of diphenhydramine hydrochloride (Benadryl®) 50 mg/mL should be given IM when the person is not responding well to epinephrine or persons who have responded to epinephrine (a short acting agent) but ***cannot be transferred to an acute care facility within 30 to 60 minutes.*** See Table 2 **:** Benadryl Dosages by Age, Weight & Route on next page.

  ☐ **Note**: Bendryl dosing calculations as follows: *(calculation: 1 mg/kg to maximum of 50 mg)*

  ☐ **Note:** Benadryl® can be given in same limb as epinephrine or vaccine, using a different injection site on the muscle.

Table 2 : Benadryl® Dosages by Age, Weight & Route

Age (years)	Weight	IM Dosage (50 mg/mL)	* PO Dosage (1.25 mg/mL)
Less than 2	7 kg (15.4 lb)	0.14 mL (7 mg)	1 to 2 tsp (5 to 10 mL) (6 to 12.5 mg)
Less than 2	15 kg (33 lb)	0.25 mL (12.5 mg)	2 to 5 tsp (10 to 20 mL) (12.5 to 31.25 mg)
2 to 4	20 kg (44 lb)	0.5 mL (23.0 mg)	1 to 2 tbsp (15 to 30 mL) (19 to 37.5 mg)
5 to 8	30 kg (66 lb)	0.5 mL (25.0 mg)	2 to 4 tbsp (30 to 60 mL) (37.5 to 75 mg)
9 to 11	40 kg (88 lb)	1.0 mL (50.0 mg)	2 to 4 tbsp (30 to 60 mL) (37.5 to 75 mg)
≥ 12 years	≥50 kg (110 lb)	1.0 mL (50.0 mg)	5 tbsp (75 mL) (93.75 mg)

*** Tsp = teaspoon (5 mL); tbsp – tablespoon (15 mL)**

- **Step 6:** Monitor vital signs and reassess the situation frequently to guide medication use.
- **Step 7**: Arrange for rapid transport to an emergency department. ***Note:*** *If the EMS personnel is not qualified to give epinephrine, a nurse may need to accompany the individual to continue management of the anaphylaxis.*

- **Always give Epinephrine first.**
- Be sure to note time of administration of Epinephrine.
- **Epinephrine dosing can be repeated twice at 5-minute intervals as necessary, for a total of three doses using different limbs for each dose.**
- Epinephrine can be given in the same muscle as vaccine(s) using a different injection site if there are no remaining suitable muscles.

d. <u>Guidelines and Posters for the Management of Anaphylaxis</u>:

- <u>FNIHB-AB Guidelines</u> : A copy of the FNIHB-AB Guidelines for the Management of Anaphylaxis Related to Immunizations document can be found on the Alberta/NWT First Nations Health Portal or in the Annual Influenza Program binder in the Well-Baby Room of SHS.
- <u>Posters</u>: Anaphylaxis management posters have been placed in visible areas in rooms where medication and immunization(s) are administered including but not limited to; Well-Baby Room, Triage Room, and Nursing Office at the Morley Schools. Pocket size Anaphylaxis Management Guidelines are available in all kits.
- <u>Epinephrine Auto-Injectors</u>: Epinephrine auto-injectors are available at SHS. All personnel receive mandatory training on how to properly administer an epinephrine auto-injector to a client displaying signs/symptoms of Anaphylaxis (see above for signs/symptoms of Anaphylaxis. *(Note: To be implemented in April 2015).*
- <u>Restrictions:</u> In isolated areas with no landline access and/or with poor or no cell phone service, immunizations or **new medication** will not be administered. Administration of a new medication or any immunization will be deferred and alternate arrangements made with client(s) to come to the Health Centre, as proper Anaphylaxis Management Guidelines cannot be met.

B. ANAPHYLAXIS KITS, MEDICATION AND SUPPLIES:

a. **Anaphylaxis kits** are immediately available in all areas of SHS where immunization and medication are administered including; well-baby clinic, triage room, lab, treatment room, all Home Care home visit bags and in all portable red blood collection boxes.

b. **Verification of Anaphylaxis Kit Readiness:** There are two levels of verification in place at SHS to ensure safety and integrity of anaphylaxis medication(s) and supplies, as follows:

- **All SHS personnel administering medication(s)/immunization(s) shall check the Anaphylaxis Kits prior to administering medication(s)/immunizations** (i.e. at start of immunization clinic, school, or other off-site setting etc.) for the following: expiry date of medication, completeness and integrity of supplies and equipment (See Appendix B: Required Contents of Anaphylaxis Kits).
- **Monthly checks of the Emergency Cart and All Anaphylaxis Kits** , are carried by SHS Nursing Staff will be on a monthly rotation to verify all medications, supplies and expiry dates. In the event that an item needs to be replaced, SHS personnel shall notify the Manager of Administrative Services in writing on the white board in the lab. The individual that requested the replacement medication will then be notified by the Manager of Administrative Services/Manager of Nursing when it is available. He/she shall then replace the medication/supplies in the Anaphylaxis Kit(s). NB: SHS will collaborate with Morley Pharmacy in attempt to have the same expiry dates.

C. STAFF TRAINING: All SHS staff responsible for administration of medication and/or immunization(s) will complete anaphylaxis training as follows:

a. Annually by the FNIHB-AB, Communicable Disease Control (CDC) Nurse during the mandatory Annual Influenza Program training.
b. Every three years with completion of the FNIHB-AB Innoculist Re-certification online modules and exam.
c. As needed-opportunities for anaphylaxis review will include but not be limited to self-initiated further training, changes in protocol or as education opportunities present.
d. All SHS staff responsible for administration of medication and/or immunization(s) will complete Basic Cardiac Life Support/Cardiac Pulmonary Resuscitation (BCLS/CPR) recertification every year from a reputable trainer.
e. Basic First Aid training for other SHS personnel will include interventions in the event of allergic reactions .

D. CLIENT TEACHING

a. Client teaching concerning Epinephine Auto-Injector is the responsibility of the physician ordering an Epinephine Auto-Injector to a client with known allergies/anaphylaxis. The pharmacist dispensing the Epinephrine Auto-Injector is also responsible for client teaching on use of Epinephrine Auto-Injector and ensuring that clients understand and are comfortable with this procedure.

b. All clients receiving new medication(s) for the first and second dose are instructed to remain in the Health Centre under the supervision of SHS personnel will remain present for 15 minutes after the administration for monitoring of signs and symptoms of anaphylaxis. All SHS personnel responsible for administration of medication will provide client teaching on the common signs and symptoms associated with anaphylaxis for early client recognition of same.

c. Clients with previous/known history of anaphylaxis to medication, food, and/or allergens are instructed to remain in the Health Centre under the supervision of SHS personnel for 30 minutes to monitor client for signs and symptoms of anaphylaxis.

5. INDICATORS AND FORMULAE

Indicators /Measures	Calculation
Rate of authorized personnel passing Innoculist Examination	Number of authorized personnel passing the Innoculist Examination x 100% Number of authorized personnel taking the Innoculist Examination
Completion of Annual Influenza/Anaphylaxis Review	Number of authorized SHS personnel completing Annual Influenza/Anaphylaxis Review Number of authorized personnel taking the Annual Influenza/Anaphylaxis Review x 100%
BCLS/CPR Recertification	Number of authorized personnel completing the BCLS/CPR Recertification Number of authorized personnel taking the BCLS/CPR Recertification x 100%
Rate of documented anaphylaxis cases per allergen	Number of documented anaphylaxis cases per allergen x 100% Total Number of documented anaphylaxis cases

6. DEFINITIONS

- **Anaphylaxis:** Anaphylaxis is a life-threatening emergency that requires immediate medical treatment, including an injection of epinephrine and an assessment in a hospital emergency room. Anaphylaxis can be treated effectively with prompt recognition and use of appropriate medication. If a person is allergic to a substance, his or her immune system overreacts to this allergen by releasing chemicals that cause allergy symptoms. Typically, these bothersome symptoms occur in one location of the body. However, some people are susceptible to a much more serious anaphylactic reaction which typically affects more than one part of the body at the same time.

  Certain people are more at risk for anaphylaxis. People with allergies or asthma and/or who have a family history of anaphylaxis, are at higher risk. And, if a person has experienced anaphylaxis, his/her risk of having another anaphylactic reaction is increased. Symptoms of anaphylaxis typically start within 5 to 30 minutes of coming into contact with the allergen to which you are allergic. In some cases it may take more than an hour for you to notice anaphylactic symptoms. Warning signs typically affect more than one part of the body and may include:

  a. Red rash, with hives/welts, that is usually itchy
  b. Swollen throat or swollen areas of the body
  c. Wheezing
  d. Passing out
  e. Chest tightness
  f. Trouble breathing
  g. Hoarse voice
  h. Trouble swallowing
  i. Vomiting
  j. Diarrhea
  k. Stomach cramping
  l. Pale or red color to the face and body
  m. Feeling of impending doom

  ** American Academy of Allergy, Asthma and Immunology; website, June 2014*

- **Immunization:** The process by which a person becomes protected against a disease. This term is often used interchangeably with vaccination and inoculation.

- **New medication:** First and second time a client will receive a medication. This does not include immunizations.

7. REFERENCES

- Alberta Health Services (2012), "Standard on the Management of Anaphylaxis Related to Public Health Services". Standard #12.100, Version 1. Immunization Program Standards Manual. October 1, 2012.
- Alberta/NWT First Nations, Health Portal. (2014). *One Health.* https://www2.onehealth.ca/ab/CommunityHealth/HealthProtection/CommunicableDiseasecontrol.aspx
- American Academy of Allergy, Asthma and Immunology; website, June 2014.
- First Nations and Inuit Health Branch (FNIHB) - Alberta Region. (2012, November). *Anaphylaxis Management Guidelines.*
- Health Canada (2016) Anaphylaxis Guidelines & Management
- Public Health Agency of Canada. (2008, December*). Immunization Competencies for Health Professionals.* http://www.phac-aspc.gc.ca/im/ic-ci/index-eng.php - Date Modified: 2013-12-04

8. RESPONSIBILITIES:

- The Executive Director shall ensure the approval of this policy by the Medical Director.
- The Medical Director and Manager of Nursing are responsible for the application and monitoring of this policy.
- All authorized SHS Personnel and Consultants (Physicians, Registered Nurses, Licensed Practical Nurses and Pharmacists) shall comply with this policy**.**

9. DEVELOPED BY:

M. Evans, R.N. & D. Richter, Manager of Nursing — March 3, 2015

Name and Title — Date:

10. APPROVALS:

_____ _____

Medical Director — Date:

APPENDIX I

Guidelines for the Management of Anaphylaxis Related to Immunizations

Adapted with permission from Alberta Health Services "Standard on the Management of Anaphylaxis Related to Public Health Services". Standard #12.100, Version 1. Immunization Program Standards Manual. October 1, 2012.

Background

Anaphylaxis is a life-threatening emergency that can be treated effectively with prompt recognition and use of appropriate medication. It is a relatively rare event[i] in immunization settings, however, as anaphylaxis can and ***will*** occur with immunizations, each person who immunizes must have the knowledge and tools required to recognize and to manage it.

This guide has been developed to provide a consistent procedure to identify and manage anaphylaxis following immunization or medication administration in a community health setting.

In November 2008 the Public Health Agency of Canada published the Immunization Competencies for Health Professionals with a goal of promoting safe and competent practices for immunization providers.[2] The following competency applies to this document:

- ***Adverse Events Following Immunization***: Anticipates, identifies, and manages adverse events following immunization, as appropriate to the practice setting.

[i] Anaphylaxis is a rare post vaccine reaction. The estimated annual reported rate of anaphylaxis ranges from 0.4 to 1.8 reports per 1,000,000 doses of vaccine distributed in Canada.[1]

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Section 1 – Anaphylaxis Identification

Anaphylaxis: an acute hypersensitivity reaction with multi-organ-system involvement that can present as, or rapidly progress to, a severe life-threatening reaction. Anaphylaxis is triggered by the binding of an allergen to a specific immunoglobulin E (IgE). It implies previous exposure and sensitization to the triggering substance or a cross reactive allergen.[3]

The antigen-antibody reaction triggers the release of histamine and other mediators. This causes increased capillary permeability and widespread dilation of arterioles and capillaries, smooth muscle contraction and over-secretion by mucous glands. The vasodilation and escape of plasma into tissues may produce dyspnea, angioedema, choking, pruritus, urticaria and erythema. The smooth muscle contraction may produce wheezing, nausea, vomiting, abdominal cramps and diarrhea.[4]

Recognition of Anaphylaxis [1,12,13,14,15]

Signs and Symptoms of Anaphylaxis

In anaphylaxis, changes develop over several minutes and usually involve at least two body systems (e.g. skin, respiration, circulation). Unconsciousness is rarely the sole manifestation of anaphylaxis and occurs only as a late event in severe cases.

The cardinal features of anaphylaxis are:

- Itchy, urticarial rash in over 80 to 90% of cases;[1,7,13,14]
- 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;
- Hypotension, which generally develops later in the reaction and can progress to cause shock and collapse.

Gastrointestinal symptoms like nausea, vomiting and diarrhea may occur with anaphylaxis.[1]

Swelling and urticarial rash 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 the reaction remains localized. If the swelling or hives disappear, or if there is no progression to other parts of the body or any other symptoms, no further observation is necessary. If any other symptoms arise, even if considered mild (e.g. sneezing, congestion, tearing, coughing) or if there is progression of hives or swelling to other parts of the body, epinephrine should be given[1].

When one or more of the following symptoms occur, the situation should be managed as anaphylaxis:

- Progressive painless swelling about the face or mouth
- New onset of hoarseness/stridor (signs of laryngeal edema)
- Hypotension/collapse ***if*** accompanied by one or more of the symptoms outlined under "**High Alert**"
- Two or more "**High Alert**" symptoms are present

High Alert Symptoms:

- Rash, hives at the injection site
- Facial flushing
- Sneezing/nasal congestion/tearing
- "lump" in throat (can be a sign of anxiety or laryngeal edema)
- Coughing without shortness of breath
- Vomiting/diarrhea

Anaphylaxis must be distinguished from **vasovagal syncope** (fainting), **anxiety** and **breath holding** spells, which are more common and benign reactions. During **fainting**, the individual suddenly becomes pale, loses consciousness and collapses to the ground. Fainting is sometimes accompanied by brief clonic seizure activity (i.e. rhythmic jerking of the limbs), but this generally requires no specific treatment or investigation. Recovery of consciousness occurs within a minute or two, but clients may remain pale, diaphoretic and mildly hypotensive for several more minutes.

Persons experiencing **anxiety** may appear fearful, pale and diaphoretic and complain of light-headedness, dizziness and numbness, as well as complain of tingling of the face and extremities. Hyperventilation is usually evident.

Breath holding spells occur in some young children when they are upset and crying hard. The child is suddenly silent but obviously agitated. Facial flushing and peri-oral cyanosis deepen as breath holding continues. Some spells end with resumption of crying but others end with a brief period of unconsciousness during which breathing resumes. Similar spells may have been evident in other circumstances.

Table 1: Distinguishing Between Anaphylaxis, Syncope and Anxiety

	Anaphylaxis	Syncope	Anxiety
Onset	Typically 1-15 minutes after immunization	Within seconds after immunization	At any time, may occur prior to immunization. May precede syncope.
Symptoms (Reported by Client)			
	• Nausea • Dizziness, weakness • Throbbing ears • Headache • Difficulty swallowing • Lump in throat • Tightness in throat or chest • Tingling of tongue, mouth or face • Abdominal cramps • Uneasiness • Anxiety, restlessness • Sense of impending doom	• Nausea • Dizziness, weakness • Ringing in ears • Spots before eyes • Light-headed	• Nausea • Dizziness, weakness • Throbbing ears • Headache • Lump in throat • Tingling of tongue, mouth, face or limbs • Uneasiness • Restlessness
Signs (observed)			
Respiratory	• Dyspnea • Wheezing • Choking, drooling • Sneezing • hoarseness	• normal • yawning	• normal to mild hyper-ventilation
Skin	• flushing/cyanosis or pale/grey • sweating • itchiness (palms, soles) • hives/red rash • facial swelling	• pale/grey • sweating	• Normal to flushed or pallor • Sweating
Gastrointestinal	• Vomiting • Diarrhea	• Vomiting	• Vomiting may occur • Often normal
Cardiovascular	• Hypotension • Rapid, thready pulse • Conscious to unconscious	• Hypotension • Slow or weak pulse • Conscious to unconscious	• Normal, possible slight hypertension • Rapid pulse • Conscious
Musculoskeletal		• Muscles relaxed • Clonic jerks of limbs and face may occur	

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Section 2: Anaphylaxis Management

Preparation

Staff Education[7,10]

Public Health Nurse/Immunization Provider Competency entails the following:

- Anticipates, identifies and manages adverse events following immunization, as appropriate to the practice setting, including knowledge of the early recognition and initial management of post-immunization emergencies.
- Completes an annual review of the management of anaphylaxis following immunization which should include:
  - Physiology of anaphylaxis and allergic reactions
  - Potential causes of anaphylaxis and ways of decreasing the risks
  - Signs and symptoms of and differences between anaphylaxis, fainting and anxiety
  - Treatment of anaphylaxis, equipment and medications required including dosages and sites for administration of such medications
  - Where and how to report adverse events to immunization
  - Recording of adverse events to immunization
  - Maintenance of current basic life support certification
- Reviews ***Anaphylaxis Quick Reference poster*** prior to each immunization clinic
  - Assess anaphylaxis kit for expiring product, integrity of supplies and restock as necessary prior to immunizing.

Screening[1,11]

Screening for anaphylaxis is necessary to determine if the individual is "Fit to immunize".

- Determine if the client has experienced a previous allergic reaction to vaccines, in particular the vaccine to be administered or to any component of the vaccine.
- Determine if the client has a history of severe allergies to other agents. For individuals who have had an anaphylactic reaction to any other agent (including vaccines, other biologicals, medications/drugs, food, bee stings, etc.) the observation period should be at least 30 minutes.
- Adequate follow-up process for immunization to ensure a client is NOT recalled to receive an immunization to which they had previously had an anaphylactic reaction.

> Note: **AN ANAPHYLACTIC REACTION TO A PREVIOUS DOSE OF THE SAME VACCINE OR ANY COMPONENT IN THE VACCINE IS AN ABSOLUTE CONTRAINDICATION TO IMMUNIZATION.**

Observation Period Post Immunization[1]

- Advise vaccine recipients to remain in the waiting area for at least 15 minutes after immunization administration
- Advise vaccine recipients who have had an anaphylactic reaction to any other agent to wait for 30 minutes post immunization
- CHN/immunization provider will remain at offsite location with an anaphylaxis kit, telephone access, and address of site for at least 15 minutes following immunization of last client. Time on site should be increased to 30 minutes if last client immunized has a history of anaphylactic reaction to any agent.

Management

Equipment and Supplies

- Ensure that an Anaphylaxis Kit is immediately available whenever and wherever vaccines are administered
- Check the Anaphylaxis Kit prior to immunizing (i.e. at start of immunization clinic, school or immunizing at other off-site setting) for expiry dates of medication, for completeness and integrity of supplies and equipment. ***See Appendix B: Required Contents of Anaphylaxis Kits***

Medications Used for Treatment of Anaphylaxis and Mechanism of Action

Epinephrine

Epinephrine is the medication of choice in the first-aid treatment of anaphylaxis in the community. Epinephrine through the alpha-1 receptors causes vasoconstriction and increased vascular resistance in most body organ systems, increased blood pressure, and decreased mucosal edema. The effect o epinephrine on the beta 2 receptors is bronchodilation, decreased mediator release from mast cells and basophils, and vasodilation in the skeletal muscles.[17,18,19]

There is little risk to the unnecessary use of epinephrine, whereas delay in its administration when required may result in difficulty to treat anaphylaxis.[1]

Peak plasma concentration is achieved faster with intramuscular (IM) injection into the thigh as compared to subcutaneous (SC) or IM injection to the deltoid.[13,14,19] *However, IM administration should occur into the muscle that is most accessible*, ideally in a different muscle mass from the immunization. For an infant, this may be the vastus lateralis and for a child or an adult this may be the deltoid.

Epinephrine should not be injected into the dorsal gluteal (buttock) muscle because of the possibility of poor absorption.[20]

IF ALL IM SITES ON THE VASTUS LATERALIS AND DELTOIDS HAVE BEEN USED, THEN EPINEPHRINE CAN BE GIVEN IN THE SAME MUSCLE AS THE VACCINE(S) USING A DIFFERENT INSERTION SITE.

Dosage:

- 0.01 mL/kg to a maximum of 0.5 mL
- Where the body weight is unknown, the dose is calculated based on age – see ***Anaphylaxis Management Checklist, page 10; Appendix C: Initial Management of Anaphylaxis***.

Storage:

- Store between 20°C and 25°C.
- Protect from light, freezing and excessive heat.
- Use solution only if clear or pale yellow and contains no precipitate.[1]

Diphenhydramine hydrochloride (Benadryl®)

A single dose of diphenhydramine hydrochloride (Benadryl®) IM is used as an adjunct to epinephrine:

- when a person is not responding well to epinephrine or
- to maintain symptom control in those who have responded to epinephrine but who cannot be transported to an acute care facility within 30 to 60 minutes.

Diphenhydramine hydrochloride relieves itching, flushing, urticaria, angioedema and nasal/eye symptoms but does not prevent upper airway obstruction, hypotension or shock.[17] Use of diphenhydramine hydrochloride will not mask symptoms of anaphylaxis.[21]

When dealing with ***anaphylaxis***, diphendydramine hydrochloride is to be given IM and should not be given before epinephrine or used alone. Oral Benadryl® is only to be used during the management of ***High Alert*** situations: it is ***not*** to be used for anaphylaxis management.

Dosage:

Injectable: 50 mg/mL

- 1 mg/kg to a maximum of 50 mg
- Where the body weight is unknown, the dose is calculated based on age – see ***Anaphylaxis Management Checklist, page 10; Appendix C: Initial Management of Anaphylaxis.***

Oral: 1.25 mg/mL

- 1 to 2 mg/kg to maximum single dose of 100 mg
- Where the body weight is unknown, the dose is calculated based on age – see ***Anaphylaxis Management Checklist, page 10; Appendix C: Initial Management of Anaphylaxis.***

Storage:

- Store between 15°C and 30°C.
- Protect from light.[20]

Anaphylaxis Quick Reference

Anaphylaxis usually begins within a few minutes after immunization and is usually evident within 15 minutes. ***Failure to use epinephrine promptly is more dangerous than using it improperly.***

When one or more of the following symptoms occur, the situation should be managed as anaphylaxis:

- Progressive painless swelling about the face or mouth
- New onset of hoarseness/stridor (signs of laryngeal edema)
- Hypotension/collapse if accompanied by one or more of the symptoms outlined under "High Alert"
- Two or more "High Alert" symptoms

High Alert Symptoms

- Rash/hives at the injection site
- Facial flushing
- Sneezing/nasal congestion/tearing
- "lump" in throat (can be a sign of anxiety or laryngeal edema)
- Coughing without shortness of breath
- Vomiting/diarrhea

TREAT AS ANAPHYLAXIS IF TWO OR MORE "HIGH ALERT" SYMPTOMS ARE PRESENT.

	Respiratory Distress	Dermatologic Changes	Gastrointestinal	Vascular Collapse
Observed	• Dyspnea • Wheezing • Choking, drooling • Cyanosis • Angioedema • Sneezing	• Urticaria • Erythema • Pruritus • Flushing, pale/grey • Facial swelling	• Vomiting • Diarrhea	• Rapidly falling blood pressure • Sweating • Rapid, thread pulse
Reported	• Difficulty swallowing • Tightening in throat/chest	• May complain of tingling sensation around mouth or face, followed by a feeling of warmth	• Nausea/abdominal cramps	• May complain of feeling of uneasiness, restlessness, anxiety • Weakness, dizziness • Throbbing ears, headache

Note:

1. If the symptoms displayed by the client are exclusively dermatological or gastrointestinal, monitor carefully and ***be prepared to intervene.*** Begin treatment if respiratory and/or circulatory symptoms are present.
2. If an individual appears to have fainted and remains unconscious for more than 5 minutes (in the absence of any other signs or symptoms such as head trauma) an ambulance should be called.

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Anaphylaxis Procedure Checklist

STEPS 1 TO 4 SHOULD BE DONE RAPIDLY OR SIMULTANEOUSLY: THE PRIORITY IS PROMPT ADMINISTRATION OF EPINEPHRINE WHICH SHOULD NOT BE DELAYED. FAILURE TO USE EPINEPHRINE PROMPTLY IS MORE DANGEROUS THAN USING IT INAPPROPRIATELY.

Step 1 Promptly administer aqueous epinephrine (1:1000) as follows:
[calculation: 0.01 mL/kg to maximum of 0.5 mL]

Age	Weight	Dose (IM)
Premies	3 kg (6.6 lb)	0.03 mL
Less than 12 months	7 kg (15.4 lb)	0.07 mL
12 to 17 months	10 kg (22 lb)	0.1 mL
18 months to 4 years	15 kg (33 lb)	0.15 mL
5 years	20 kg (44 lb)	0.2 mL
6 to 9 years	30 kg (66 lb)	0.3 mL
10 to 13 years	40 kg (88 lb)	0.4 mL
14 years and older	50 kg (110 lb)	0.5 mL

Always give Epinephrine first.

Be sure to note time of administration of epinephrine.

Epinephrine dosing can be repeated twice at 5 minute intervals prn, for a total of three doses using different limbs for each dose.

Epinephrine can be given in the same muscle as vaccine(s) using a different injection site if there are no remaining suitable muscles.

Step 2 Call for HELP. Helper to ensure 911/EMS is called

Step 3 Place the client in a RECUMBENT position, with ***feet elevated*** if possible.

Step 4 Establish adequate airway

Step 5 As an adjunct to epinephrine, a single dose of diphenhydramine hydrochloride (Benadryl®) 50 mg/mL should be given IM when the person is not responding well to epinephrine or in those who have responded to epinephrine (a short acting agent) but ***cannot be transferred to an acute care facility within 30 to 60 minutes.***

Dosing as follows: *[calculation: 1 mg/kg to maximum of 50 mg]*

Age (years)	Weight	IM Dosage *(50 mg/mL)*	PO Dosage[ii] *(1.25 mg/mL)*
Less than 2	7 kg [15.4 lb]	0.14 mL (7 mg)	**1 to 2 tsp** [5 to 10 mL] (6 to 12.5 mg)
	15 kg [33 lb]	0.25 mL (12.5 mg)	**2 to 5 tsp** [10 to 20 mL] (12.5 to 31.25 mg)
2 to 4	20 kg [44 lb]	0.5 mL (25.0 mg)	**1 to 2 tbsp** [15 to 30 mL] (19 to 37.5 mg)
5 to 8	30 kg [66 lb]	0.5 mL (25.0 mg)	**2 to 4 tbsp** [30 to 60 mL] (37.5 to 75 mg)
9 to 11	40 kg [88 lb]	1.0 mL (50.0 mg)	**2 to 4 tbsp** [30 to 60 mL] (37.5 to 75 mg)
≥12 years	≥ 50 kg [110 lb]	1.0 mL (50.0 mg)	**5 tbsp** [75 mL] (93.75 mg)

tsp = teaspoon (5 mL); tbsp = tablespoon (15 mL)

Benadryl® can be given in same limb as epinephrine or vaccine, using a different injection site on the muscle.

Step 6 Monitor vital signs and reassess the situation frequently to guide medication use.

Step 7 Arrange for rapid transport to an emergency department.[iii]
Note: if the EMS personnel is not qualified to given epinephrine, a nurse may need to accompany the individual to continue management of the anaphylaxis.

[ii] Oral Benadryl® can be administered with conscious individuals in the high alert phase only: ORAL DOSING IS NOT TO BE USED FOR ANAPHYLAXIS MANAGEMENT.

[iii] Since 20% of anaphylaxis episodes follow a biphasic course with recurrence of the reaction after a 2 to 9 hour asymptomatic period[1,7,9] patients should be monitored for at least 12 hours following anaphylaxis.

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Anaphylaxis Follow-up

Recording

Use *"Anaphylaxis Management Record"* ***(See Appendix C: Anaphylaxis Management Record)*** to record information related to the adverse event. It is important to capture as much information as possible related to:

- Details including onset and progression of signs and symptoms
- Medications administered, including time of administration and dosage

Copies of this *Anaphylaxis Management Record* can be:

- provided to emergency services personnel
- attached to the adverse event reporting form
- attached to the incident report form
- included in the client's record/chart

Reporting

- Notify Medical Officer of Health/Regional CDC Nurse Manager as soon as possible.
  - This is to be done either in person or via phone. Do not leave a message for MOH/Reg CDC NM – use the 24 hour number: 780-218-9929.
    - *YOU MUST SPEAK WITH SOMEONE AFTER INITIAL MANAGEMENT OF SITUATION*
- Notify parents/guardian, school principal (if applicable), Zone Nurse Manager, Nurse in Charge/Supervisor as soon as possible, once situation is under control.
- Attempt to obtain all documents relating to the emergency or physician's visit – include in client's record and with Adverse Reaction report.
- Complete an "Alberta Adverse Event Following Immunization Report" and forward to First Nations and Inuit Health Branch, Alberta Regional office as soon as possible.
- Notify the client/family re recommendations for future immunization as appropriate.

Restocking Anaphylaxis Kits

- Ensure anaphylaxis kit is restocked after every use.

ANAPHYLAXIS KITS SHOULD BE REGULARLY ASSESSED FOR EXPIRING PRODUCT, INTEGRITY OF SUPPLIES AND RESTOCKED AS NECESSARY.

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Section 3: Appendices

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Appendix A: Anaphylaxis Definitions

Brighton Collaboration Case Definition For Anaphylaxis [3]

The Brighton Collaboration was established to develop globally accepted standardized case definitions for adverse events following immunization as well as guidelines for the collection, anaphylaxis and presentation of surveillance data[25]. The Brighton Collaboration case definition for anaphylaxis provides standardized clinical criteria and glossary of terms. The intent is to improve the quality of adverse event reporting and provide a standard definition for anaphylaxis that helps with review and confirmation post anaphylaxis.

For all levels of diagnostic certainty, Anaphylaxis is a clinical syndrome characterized by:

1. Sudden onset AND
2. Rapid progression of signs and symptoms AND
3. Involving multiple ≥ 2 organ systems as follows:
   - **Level 1 of diagnostic certainty**
     - ≥ 1 major dermatological AND
     - ≥ 1 major cardiovascular AND/OR ≥ 1 major respiratory criterion
   - **Level 2 of diagnostic certainty**
     - ≥ 1 major cardiovascular AND ≥ 1 major respiratory criterion OR
     - ≥ 1 major cardiovascular OR respiratory criterion AND
     - ≥ 1 minor criterion involving ≥ 1 different system (*other than* cardiovascular or respiratory systems) OR
     - (≥ 1 major dermatologic) AND (≥ 1 minor cardiovascular AND/OR minor respiratory criterion)
   - **Level 3 of diagnostic certainty**
     - ≥ 1 minor cardiovascular OR respiratory criterion AND
     - ≥ 1 minor criterion from each of ≥ 2 different systems/categories.

This case definition should be applied when there is no clear alternative diagnosis for the reported event to account for the combination of symptoms.

Public Health Agency of Canada Case Definition for Anaphylaxis [5,6]
(Based on Brighton[3] level 2)

A clinical syndrome, characterized by sudden onset and rapid progression of signs and symptoms which include ***at least one major*** manifestation – skin/mucosal, respiratory or cardiovascular – **AND** at least one more manifestation from a different organ system.

Evidence of involvement of a second organ system can be:
- a ***major*** manifestation ***OR***
- a ***minor*** manifestation: skin/mucosal, cardiovascular, respiratory, or gastrointestinal ***OR***
- laboratory confirmation of an elevated serum mast cell tryptase [*this will not be available at the community level*].

The following table provides further detail regarding the major and minor criteria for each organ system.

Table 2: Major and Minor Criteria Used in the Case Definition of Anaphylaxis

Manifestations	Major Criteria	Minor Criteria
Skin or mucosal	• Generalized urticaria (hives) • Generalized erythema • Generalized pruritus with skin rash • Angioedema, localized or generalized	• Urticaria only at the injection site • Generalized prickle sensation • Generalized pruritus without skin rash • Red and itchy eyes
Cardiovascular	• Measured hypotension • Uncompensated shock, indicated by the combination of ***at least 3*** of the following: ○ Tachycardia ○ Reduced central pulse volume ○ Capillary refill time greater than 3 seconds ○ Decreased level of consciousness or loss of consciousness	• Uncompensated shock, indicated by the combination of ***at least 2*** of the following: ○ Tachycardia ○ Capillary refill time greater than 3 seconds ○ Decreased level of consciousness
Respiratory	• Stridor • Bilateral wheeze (bronchospasm) • Upper airway swelling (lip, tongue, throat, uvula or larynx) • Respiratory distress – ***2 or more*** of the following: ○ Tachypnea ○ Chest wall recession ○ Cyanosis ○ Grunting ○ Increased used of accessory respiratory muscles	• Persistent dry cough (new) • Hoarse voice • Sensation of throat closure • Sneezing • Rhinorrhea • Difficulty breathing without wheeze or stridor
Gastrointestinal		• Diarrhea • Abdominal pain • Nausea • Vomiting
Laboratory		• Mast cell tryptase[iv] elevation greater than upper normal limit

[iv] Tryptase reaches peak serum levels 60 to 90 minutes after the onset of anaphylaxis and remains elevated up to 5 hours.[7,8,9]

Glossary of Terms [16,25]

BRIGHTON TERM	DESCRIPTION OF TERMS
Skin and Mucosa	
Urticaria (hives)	Localized redness of superficial layers of skin that is itchy, raised, sharply demarcated and transient (usually lasting less than 12 hours)
Erythema	Abnormal redness of the skin without any raised skin lesions
Angioedema	Areas of deeper swelling of the skin and/or mucosal tissues in either single or multiple sites which may not be well circumscribed and is usually not itchy
Generalized	Involving more than one body site – that is each limb is counted separately as is the abdomen, back, head and neck
Localized	Involving one body site only
Injection site urticaria	Urticaria which is continuous with the injection site or involves other aspects of the injected limb
Pruritus or prickle sensation	An unpleasant skin sensation that provokes the desire to rub and/or scratch to obtain relief.
Red and itchy eyes	Redness of the whites of the eyes with sensation that provokes the desire to rub and/or scratch to obtain relief.
Cardiovascular	
Measured hypotension	An abnormally low blood pressure documented by appropriate measurement. *Infants and children:* age specific systolic blood pressure (BP) of less than the 3rd to 5th percentile or greater than a 30% decrease from that person's baseline *Adults:* systolic BP of less than 90 mm Hg or greater than 30% decrease from that person's baseline
Decreased central pulse volume	Absent or decreased pulse in one of the following vessels: carotid, brachial or femoral arteries
Capillary refill time of greater than 3 seconds	The capillary refill time is the time required for the normal skin colour to reappear after a blanching pressure is applied for 5 seconds. It is usually performed by pressing on the nail bed to cause blanching and then counting the time it takes for the blood to return to the tissue, indicated by a pink colour returning to the nail. Normally it is less than 3 seconds.
Tachycardia	A heart rate that is abnormally high for age and circumstance *Infants and children:* a heart rate that is above the upper limit expected for age (see table below) *Adolescents and adults:* the term is usually applied to a heart rate above 100 beats per minute
Loss of consciousness	Total suspension of conscious relationship with the outside world as demonstrated by an inability to perceive and respond to verbal, visual or painful stimulus.
Respiratory	
Sneezing	An involuntary (reflex), sudden, violent and audible expulsion of air through the mouth and nose
Rhinorrhea	Discharge of thin nasal mucous
Hoarse voice	An unnaturally harsh cry in an infant or vocalization in a child or adult
Sensation of throat closure	Feeling or perception of throat closing with a sensation of difficulty breathing
Dry cough	Rapid expulsion of air from the lungs and not accompanied by expectoration (a non-productive cough)
Wheezing	A whistling, squeaking, musical or puffing sound made on breathing out
Stridor	A harsh and continuous sound made on breathing in
Tachypnea	Abnormally rapid breathing which is abnormally high for age and circumstance *Infants and children:* a respiratory rate that is above the upper limit expected for age (see table below) *Adolescents and adults:* a respiratory rate in excess of 25 breaths per minute
In-drawing or retractions	Inward movement of the muscles between the ribs (inter-costal), in the lower part of the neck (supra-clavicular or tracheal tug) or below the chest (sub-costal). The movements are usually a sign of difficulty with breathing.
Grunting	A sudden and short noise with each breath when breathing out
Cyanosis	A dark bluish or purplish discolouration of the skin and/or mucous membranes due to a lack of oxygen in the blood
Gastrointestinal	
Diarrhea	Loose or watery stool which may occur more frequently than usual
Abdominal pain	Sensation of discomfort or pain in the abdominal region
Nausea	An unpleasant sensation vaguely referred to the upper abdominal region (upper region of the abdomen) and the abdomen, with a tendency to vomit
Vomiting	The reflex act of ejecting the contents of the stomach through the mouth

UPPER LIMIT OF HEART AND RESPIRATORY RATE IN ORDER TO DEFINE TACHYCARDIA AND TACHYNPNOEA

Age in years	Heart Rate *Upper limit of beats per minute*	Respiratory Rate *Upper limit of breaths per minute*
< 1 year	160	60
1 - 2 years	150	40
2 – 5 years	140	35
5 – 12 years	120	30
>12 years	100	16

Appendix B: Required Contents of Anaphylaxis Kits[1]

- ☐ Anaphylaxis Quick Reference
- ☐ Emergency Contact numbers
- ☐ Anaphylaxis Management Record (Appendix C)
- ☐ Healthcare Provider Summary of Steps of CPR for Adults, Children and Infants (Appendix D)
- ☐ 2 ampoules/vials of epinephrine 1:1000 (note expiry date)
- ☐ 2 vials of diphenhydramine hydrochloride (Benadryl®); 50 mg/mL solution
- ☐ 1 bottle of diphenhydramine hydrochloride (Benadryl®); 1.25 mg/mL solution
- ☐ 4 – 1 cc syringes
  4 – 25 g, 5/8" needle
  4 – 25 g, 1" needle
- ☐ 2 – 3 cc syringes
  2 – 25 g, 5/8" needle
  2 – 25 g, 1" needle
  2 – 22 g, 1 ½ " needle
- ☐ 10 alcohol swabs (optional)
- ☐ Pen
- ☐ Gloves
- ☐ Disposable resuscitation mask or Laerdal Pocket Mask®

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Appendix C: Initial Management of Anaphylaxis

ANAPHYLAXIS USUALLY BEGINS WITHIN A FEW MINUTES AFTER INJECTION AND IS USUALLY EVIDENT WITHIN 15 MINUTES.

Always treat as anaphylaxis:
- Progressive painless swelling about face or mouth
- New onset of hoarseness/stridor
- Hypotension/collapse if accompanied by one or more "high alert symptoms"
- Two or more "high alert symptoms"

"High Alert Symptoms"
- rash/hives at injection site
- facial flushing
- sneezing/nasal congestion/tearing
- "lump in throat"
- Coughing without shortness of breath
- Vomiting/diarrhea

Cardiovascular collapse can occur without respiratory symptoms

Early recognition and treatment is vital!

SPEEDY INTERVENTION IS OF PARAMOUNT IMPORTANCE: FAILURE TO USE EPINEPHRINE PROMPTLY IS MORE DANGEROUS THAN USING IT IMPROPERLY.

1. Promptly administer epinephrine (1:1000) in any easily accessible IM site – preferably away from immunization site.
   - If all muscles have been used, epinephrine can be administered into the same muscle as immunization with appropriate spacing
2. Call for HELP; including EMS.
3. Place the client in a recumbent position (elevating feet if possible).
4. Establish adequate airway.
5. As an adjunct to epinephrine, a dose of Benadryl® can be given.
   - Give IM when the person is not responding well to epinephrine, or in those who cannot be transported to the next level of care within 30 to 60 minutes.
     - Dose: see table, or use 1 mg/kg to maximum of 50 mg
   - Oral product is not to be used for anaphylaxis management.
     - Can be used where there is one "High Alert" symptom identified.
6. Arrange for rapid transport to an emergency department/next level of care.
7. Monitor vital signs and reassess situation frequently.

To save time, these tables should be used for the 1st dose. For children outside normal weight range, dosage should be calculated for second or subsequent doses.

AQUEOUS EPINEPHRINE 1:1000 REFERENCE TABLE: ***dosage calculation: 0.01 mL/kg to maximum of 0.5 mL.***

Age	Dose (IM)	Weight
Premies	0.03 mL	3 kg (6.6 lb)
Less than 12 months	0.07 mL	7 kg (15.4 lb)
12 to 17 months	0.2 mL	10 kg (22 lb)
18 months to 4 years	0.15 mL	15 kg (33 lb)
5 years	0.2 mL	20 kg (44 lb)
6 to 9 years	0.3 mL	30 kg (66 lb)
10 to 13 years	0.4 mL	40 kg (88 lb)
14 years and older	0.5 mL	50 kg (110 lb)

Always give Epinephrine first.

Be sure to note time of administration of epinephrine.

Epinephrine dosing can be repeated twice at 5 minute intervals prn for a total of three doses, using different limbs for each dose.

Epinephrine can be given in the same muscle as vaccine(s) using a different injection site if there are no remaining suitable muscles.

BENADRYL® REFERENCE TABLE:

Benadryl® dosage calculation:
IM: 1 mg/kg to maximum of 50 mg;
oral: 1 to 2 mg/kg to maximum single dose of 100 mg.

Age (years)	IM Dosage *(50 mg/mL)*	PO Dosage *(1.25 mg/mL)*	Weight
Less than 2	0.14 mL (7 mg)	**1 to 2 tsp** [5 to 10 mL] (6 to 12.5 mg)	7 kg [15.4 lb]
	0.25 mL (12.5 mg)	**2 to 5 tsp** [10 to 20 mL] (12.5 – 31.25 mg)	15 kg [33 lb]
2 to 4	0.5 mL (25.0 mg)	**1 to 2 tbsp** [15 to 30 mL] (19 – 37.5 mg)	20 kg [44 lb]
5 to 8	0.5 mL (25.0 mg)	**2 to 4 tbsp** [30 to 60 mL] (37.5 – 75 mg)	30 kg [66 lb]
9 to 11	1.0 mL (50.0 mg)	**2 to 4 tbsp** [30 to 60 mL] (37.5 – 75 mg)	40 kg [88 lb]
≥12	1.0 mL (50.0 mg)	**5 tbsp** [75 mL] (93.75 mg)	≥ 50 kg [110 lb]

Benadryl® should be given deep IM. It can be given in the same limb as epinephrine or vaccine, using a different injection site on the muscle.

Oral benadryl® is only to be used in High Alert situations.

tsp = teaspoon = 5mL
tbsp = tablespoon = 15mL

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Appendix D: Anaphylaxis Management Record

Client Name: _____ DOB: _____ PHN: _____

Address: _____ Phone Number: _____

Date: _____ Location: _____

Vaccine History:

Vaccine(s) given[1]	Time of Immunization	Site (LLL, LUL, RLL, RUL, LL, RL, LA, RA)[2]	Route (IM, ID, SC, NA)[3]

Incident History:

Onset of Incident (time)
Time EMS called:
EMS arrival time:
Receiving Hospital:

Notes:
1. Record Vaccine as antigen, i.e. DTaP-IPV-Hib instead of Pediacel™ or Infanrix-Hib™
2. LLL=left lower leg; LUL=left upper leg; RLL=right lower leg; RUL=right upper leg; LL=left leg; RL=right leg; LA=left arm; RA=right arm.
3. IM=intramuscular; ID=intradermal; SC=subcutaneous; NA=nasal

Assessment Details (tick all that apply)

SKIN/ MUCOSA		CARDIOVASCULAR
☐ Urticaria o Injection site o Generalized ☐ Erythema ☐ Pruritis o With skin rash o Without skin rash ☐ Red, itchy eyes	☐ Tingling/prickle sensation o Generalized o Mouth, hands/feet ☐ Angioedema o Face o Limbs o other	☐ Hypotension ☐ Tachycardia ☐ Capillary refill > 3 s ☐ Decreased level of consciousness ☐ Anxiety
RESPIRATORY		**GASTROINTESTINAL**
☐ Sneezing ☐ Rhinorrhea ☐ Hoarse voice ☐ Lump in throat ☐ Wheeze ☐ Stridor ☐ Cyanosis ☐ Tachynpoea ☐ Grunting	☐ Upper airway swelling: o Tongue o Throat o Uvula o Larynx o Lip ☐ Difficulty breathing Indrawing/retractions	☐ Diarrhea ☐ Nausea ☐ Vomiting ☐ Abdominal pain

Management Details

Epinephrine *administration Record (1:1000)*
Dose calculation: 0.01 mL/kg to maximum of 0.5 mL.

	Time	*Site*	*Amount*	*Route*
Dose 1				
Dose 2				
Dose 3				

Benadryl *administration record (50 mg/mL IM; 1.25 mg/mL PO)*
IM Dose calculation: 1 mg/kg to maximum 50 mg

	Time	*Site (IM)*	*Amount*	*Route*
Dose 1				

Time	*BP*	*Pulse*	*Resp*	*Comments*

RN *(please print)*:_____ **Recorder** *(Please Print)*_____

Signature: _____ Signature: _____

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SEE REVERSE SIDE FOR FURTHER DETAILS

Notifications:

Next of Kin Y N **Name:** _____ **Relationship:** _____
NIC Y N **Time:** _____ MOH/Designate: Y N **Time** _____
ZNM Y N **Time:** _____ Other: _____
Other _____ Other: _____

Copies of ***Anaphylaxis Management Record*** should be distributed as follows:

EMS: provide copy to accompany client

FAX ASAP to:
- MOH/Designate (780-495-8070)
- ZNM

Call MOH/Designate ASAP: 780-218-9929

Copy Distribution:
- Family physician
- Client Chart
- Attached to Incident report
- Attached to ***"Report of Adverse Reaction to Immunizing Agent"*** form

Note: there is no need to re-copy information contained on AMR onto the incident report.

Completed original should be forwarded to ZNM

FOLLOW-UP OF INCIDENT: *for recording contact with family, hospital, and any other subsequent activities or information.*

Appendix E: Healthcare Provider Summary of Steps of CPR for Adults, Children, and Infants

Component	Recommendations		
	Adults	**Children**	**Infants**
Recognition	Unresponsive (for all ages)		
	No breathing **OR** no normal breathing (i.e. only gasping)	No breathing or only gasping	
	No pulse felt within 10 seconds		
CPR Sequence	Chest compressions, Airway, Breathing (C-A-B)		
Compression Rate	At least 100/minute		
Compression Depth	At least 2 inches (5 cm)	At least 1/3 AP diameter (about 2 inches, 5 cm)	At least 1/3 AP diameter (about 1 ½ inches, 4 cm)
Chest wall recoil	Allow complete recoil between compressions; rotate compressions every 2 minutes		
Compression interruptions	Minimize interruptions in chest compressions; attempt to limit interruptions to less than 10 seconds		
Airway	Head tilt-chin lift (suspected trauma: jaw thrust)		
Compression-ventilation ratio (until advanced airway placed)	30:2 1 or 2 rescuers	30:2 – Single rescuer 15:2 – 2 rescuers	
Ventilations with advanced airway	1 breath every 6 – 8 seconds (8 – 10 breaths per minute) Asynchronous with chest compressions; about 1 second per breath; visible chest rise		
Defibrillation	Attach and use AED as soon as available Minimize interruptions in chest compressions before and after shock Resume CPR beginning with compressions immediately after each shock		

Abbreviations: CPR – Cardiopulmonary resuscitation; AP – anterior-posterior; AED – automated external defibrillator

Adapted from American Heart Association, 2011

APPENDIX II : REQUIRED CONTENTS OF ANAPHYLAXIS KITS

Appendix B: Required Contents of Anaphylaxis Kits[1]

- ☐ Anaphylaxis Quick Reference
- ☐ Emergency Contact numbers
- ☐ Anaphylaxis Management Record (Appendix C)
- ☐ Healthcare Provider Summary of Steps of CPR for Adults, Children and Infants (Appendix D)
- ☐ 2 ampoules/vials of epinephrine 1:1000 (note expiry date)
- ☐ 2 vials of diphenhydramine hydrochloride (Benadryl®); 50 mg/mL solution
- ☐ 1 bottle of diphenhydramine hydrochloride (Benadryl®); 1.25 mg/mL solution
- ☐ 4 – 1 cc syringes
4 – 25 g, 5/8" needle
4 – 25 g, 1" needle
- ☐ 2 – 3 cc syringes
2 – 25 g, 5/8" needle
2 – 25 g, 1" needle
2 – 22 g, 1 ½ " needle
- ☐ 10 alcohol swabs (optional)
- ☐ Pen
- ☐ Gloves
- ☐ Disposable resuscitation mask or Laerdal Pocket Mask®

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