Recommendations

for

Medical Emergencies

RECOMMENDATIONS FOR MEDICAL EMERGENCIES

INTRODUCTION

The current vaccines and medications used by the Public Health Division rarely cause serious adverse reactions. This protocol is not intended to replace the information on contraindications, precautions or side effects contained in the appropriate informational/informed consent statements. Rather, it is directed at the reactions, which may infrequently occur within a short period of time after vaccine or drug administration or during or after performance of procedures. Each local field office has the responsibility to ensure that appropriate emergency equipment is available and accessible to all clinical staff to respond to any serious reactions to vaccine or medication administration or to procedures performed.

METHODOLOGY

- ♦ All clinical personnel must have up-to-date certification in the management of emergency reactions, including cardiopulmonary resuscitation (CPR) and other emergency procedures necessary to deal with reactions to vaccines or biologicals.
- ♦ All new nursing personnel must be trained in emergency procedures within the first quarter of employment with the agency, if at all possible, during orientation.
- ♦ Refresher courses in emergency reactions and their management must be conducted at least annually. The responsibility for coordinating and assuring adequate training rests with regional supervisory personnel, who should maintain a "tickler file" as a reminder that a review is needed.

- ♦ Emergency supplies and equipment, as outlined in the protocol on vaccine reactions and their management, must be maintained by each office. Maintenance includes renewal of medications as needed, testing of equipment and replacement of used or worn-out components. An itemized sheet to record dates of emergency equipment checks is recommended to assure proper maintenance of said equipment.
- ♦ Each office should have a written plan including designated roles for various staff members in emergent situations, location of emergency supplies and equipment, who will keep track of supplies and equipment, and who will re-order/replace when necessary, who will document emergency events. Offices must practice doing “mock codes” annually to test their plans.

MANAGEMENT OF REACTIONS:

The most important part of managing vaccine or drug-related reactions is to be prepared ahead of time for any emergency which may arise. Such preparedness includes the following essential components:

- Understanding the protocol.
- Reviewing emergency procedures.
- Thinking ahead as if "rehearsing" how to handle an emergency.
- Quality assurance that all required materials are on the emergency tray and that no materials are out of date, damaged, or broken.

1. The Emergency Tray:
   - The emergency tray must contain all of the materials listed (see Standard Emergency Tray List).
   - A nurse must be assigned responsibility for the following duties:

   a. Assurance that the emergency tray is complete and fully stocked.
   b. Monthly check and written record of materials and oxygen.
   c. Immediate replacement of broken equipment or outdated medications.
   d. Immediate availability of the emergency tray at any site where medications are being administered.
   e. The emergency tray must be present in the room where medications are being given.
   f. If several rooms are involved, the tray is to be kept in a central and immediately accessible location.
   g. All personnel involved in the operation of an immunization clinic must know where the tray is located.

2. Thinking Ahead to "Rehearse" How to Handle an Emergency:
   - It is essential to think through an emergency so that problems can be solved before an actual emergency occurs. This review should include the following components:
     - ✓ Be certain that a working telephone is always available.
     - ✓ Have emergency telephone numbers (ambulance, police, fire, rescue squad, etc.) taped to an easily accessible telephone.
     - ✓ Have a plan for how to transport a critically affected person to the nearest adequately prepared medical facility.
     - ✓ Know which medical facilities to have patient(s) transported to.
   - Periodic emergency response drills are required annually.

3. Review of Protocols:
   - It is essential that nursing and other involved personnel learn, review and understand the entire approach to drug reactions and their management.
   - Periodic refresher courses should be taken in order to assure this familiarity with the management of adverse drug reactions.

4. Availability of Protocols:
   - Laminated copies of Emergency Protocols should be kept with the Emergency Tray.

TYPES OF REACTIONS

1. Local Reactions from Vaccination/Medication Administration:

- bleeding from the injection site
- wheal and erythema caused by histamine release

2. Systemic Reactions occur in our clinical settings mostly from: a) **drawing blood**; 2) **obtaining urethral specimens**; c) **IUD insertion** in addition to the possibility of reaction to vaccinations, medications, and biologicals:

Near-Syncope (dizziness and fainting): Is usually described as light-headedness, dizziness, pre-faint during which the individual maintains consciousness. "Pre-faint," i.e., a perception that loss of consciousness is imminent, feeling weak, nauseous.

- ✓ Immediately lie the person down, and
- ✓ Elevate the legs, if possible, and
- ✓ Measure respiratory rate, pulse, and blood pressure.
- ✓ If the vital signs are within normal limits and if the person feels normal and able to stand, you may move the person to a location which will not interfere with ongoing clinic activities.
- ✓ If the client wishes to proceed with remainder of visit, i.e., giving medication, vaccination, or drawing blood, do so with person lying down.

Syncope: is defined as a sudden temporary loss of consciousness not caused by head trauma or a seizure and in most cases reflects a transient near-cessation of cerebral blood flow that is secondary to a fall in systemic arterial blood pressure. Premonitory symptoms such as nausea, sweatiness, tachycardia, and loss of color are usual. It is more likely to occur in patients with known heart disease, young men, and young women, who are prone to vasovagal episodes (the most frequent type of vasodepressor syncope, also called vasovagal hypotension).

- ✓ Often initiated by stressful, painful, or claustrophobic experiences.
- ✓ Typically abrupt in onset, transient, lasting for seconds to a few minutes

Treatment

1. Immediately lie the patient down and remove the inciting stimulus.
2. Call for help.
3. Nurse or other trained and capable staff should monitor and record vital signs including respiratory rate, pulse, and blood pressure.

4. If any of the vital signs are abnormal or if there is difficulty breathing, a change of skin color, or any obvious distress, staff should immediately notify MD for consultation or use other emergency protocols if MD unavailable, including activating Emergency Medical System.
5. If vital signs are stable, apply supplemental oxygen at 4-6 L/minute.
6. If the client does not regain consciousness within 1-2 minutes, causes other than assumed "vasovagal," neurally mediated, reaction to medication administration, blood draw, or procedure must be considered (e.g. transient ischemic attack or progressing stroke, hypoglycemia, other) and an ambulance and ER evaluation may be required.

Consult with MD on duty at ER or with client's physician or MD on call and notify RHO or his/her designee.

7. If the client fell during faint and has known or potential injury, complete an incident report and notify MD or RHO on call. Recommend to client that they be evaluated at hospital emergency room or by their private physician. Treat any associated traumatic injuries.
8. Record client's name, address, and phone number for follow-up if it is needed.
9. Record the events, recommendations, decisions/disposition of the case on the chart.

Carotid sinus hypersensitivity (vasomotor syncope) and postmicturition syncope: May be accompanied by vagal-induced sinus bradycardia, sinus arrest, and atrioventricular block, which may themselves be the cause of syncope. Or, it may also be due to excessive vagal tone, or impaired reflex control of the peripheral circulation.

Orthostatic (postural) hypotension: especially in the elderly, diabetics, or other people with autonomic neuropathy, blood loss or hypovolemia, and patients taking vasodilators, diuretics, and adrenergic blocking drugs.

Cardiogenic syncope can occur on a mechanical or arrhythmic basis.

Rash and/or Urticaria: "hives" and "wheals" are popular names for urticaria which are itchy red papules and plaques of variable size that arise suddenly, often within a few minutes, and may last 6-24 hours though they can stay for days. Rash and urticaria have immunopathogenic components and result from the release of histamine from mast cells in the skin usually caused by allergic hypersensitivity.

1. Measure and record respiratory rate, pulse, blood pressure. Watch for any respiratory difficulty, examine for any oropharyngeal swelling. Call staff physician or RHO, but if they are not quickly available, do not delay treatment if symptoms are severe or progressing rapidly.
2. Administer Benadryl (Diphenhydramine) 50 mg IM to adult or 1.5 mg/kg IM (maximum dose 50 mg) to child.
3. If the hives are very extensive or progressing rapidly, give Epinephrine 1:1000 at dose of 0.3 cc subcutaneously for adults. See dosage chart for children. Dosage may be repeated in 15 minutes and again 15 minutes later, if needed.

4. Loosen clothing around neck, chest and arms to assist taking of blood pressure, monitoring pulse and auscultating lungs and heart.
5. Monitor and record vital signs every 15 minutes X 4.
6. If hives persist despite Benadryl and/or Epinephrine, client should be sent to the Emergency Room.
7. If decision is made to send client home, review status and disposition with staff physician prior to release. Have plan documented for local physician to be on call for follow-up.

Advise/document that client is to report to nearest emergency room if hives recur or if any subjective respiratory difficulty arises, with or without rash and/or hives.

8. If Benadryl has been administered, that client should not operate a motor vehicle and should be assisted in reaching their destination.
9. Record all findings, treatment, and final disposition plans in the chart. Document the client's status upon leaving the clinic (include skin color and describe urticaria if still present, respiratory status, mental status, normal vital signs, instructions given).

Angioedema: In the lesions are deeper and the swelling much more extensive than in urticaria (hives) and either condition may occur independently (they are both thought to be a manifestation of the release of mast cell-related mediators). The face and tissues of the oropharynx are sometimes affected by the angioedema, which can lead to life-threatening difficulties with swallowing and breathing.

Bronchospasm: is a spasmodic contraction of the smooth muscle of the bronchi, as occurs in asthma, which causes difficulty breathing and may be manifest by cough, wheezing, and/or dyspnea.

For both **Angioedema** and **Bronchospasm**:

- Administer Epinephrine immediately. (1:1000) solution at dose of 0.3 cc subcutaneously for adults and also 1:1000 solution at dose determined by dosage chart for children. Dose can be repeated at 15 minute intervals X 2 for total of 3 doses if needed.
- Call for help (staff physician or RHO) and have someone access 911.
- Administer oxygen, 4-6 liters by facemask.
- Remove clothing from trunk and arms to facilitate taking blood pressure, monitoring pulse, determining respiratory rate, and auscultating lungs and heart.
- Monitor vital signs every 5 minutes (respiratory rate, blood pressure, pulse) and document.
- Client should be transferred to Emergency Room. If clinically indicated, PHN or clinician may accompany client in ambulance and administer treatment if required en route.
- All findings, treatment, consultations, plans should be recorded with original for chart and copy for Emergency Room.

Anaphylaxis is a complex manifestation of immediate hypersensitivity and potentially life threatening signs and symptoms which are secondary to exposure to a foreign substance resulting in life-threatening respiratory distress, usually followed by vascular collapse and shock.

Anaphylactic reactions are rare but one of the most common life threatening emergencies that may occur. They are the most severe manifestation of a systemic allergic reaction and usually occur within 30 minutes of being exposed to the antigen to which the sensitized person is allergic. The quicker the reaction to the antigen, the more severe the reaction is likely to be. Early recognition is critical to prevent full blown anaphylaxis and possible death.

The symptoms of anaphylaxis are:

- urticaria (hives, generalized itching),
- angioedema (lip, facial, tongue and/or uvula swelling),
- upper airway obstruction (laryngeal swelling, hoarseness, lump in throat, difficulty swallowing and breathing),
- bronchospasm (wheezing, cough), and
- hypotension (faint, weak, pale, feeling of impending doom).

In an anaphylactic reaction one, several, or all these symptoms may be present. Sometimes, an anaphylactic reaction may present as shock or upper airway obstruction. Anyone who suddenly develops hives needs to be closely observed for the development of other signs of systemic anaphylaxis.

Some of the most common sensitizing agents that may be encountered are:

- foods (such as, nuts, legumes, shellfish, eggs),
- stinging insects (such as wasps, bees), and
- antibiotics (such as penicillin, cephalosporins, sulfa).

Most people who are sensitized don't know it and therefore reactions are unexpected. A careful history of the preceding 3-4 hours should be obtained and documented.

It may involve any organ, but it is a true emergency when the respiratory and cardiovascular systems are affected. Patients who develop anaphylaxis may have pruritus, rash, urticaria, or angioedema before manifestations of anaphylaxis such as hypotension, life-threatening or irreversible bronchospasm, or impending airway obstruction due to laryngeal edema, and shock. Typically, there is vasodilatation that causes hypotension, often accompanied by stridor and bronchospasm. The client may appear extremely anxious because of airway obstruction and hypoxia. The patient may also have vomiting, diarrhea, tachyarrhythmias, and chest pain. There may be no prior history of allergy or exposure to the offending substance, i.e., antibiotics where the initial exposure is in utero or through ingestion of food from treated animals. Anaphylaxis is a **medical emergency** and requires **immediate** attention. In general, the sooner the symptoms develop, the more severe the reaction will be.

1. Obtain staff assistance and call a physician to the room.
2. Access 911.
3. The patency of the airway is the first priority. Allow the patient to assume a position of comfort and if pulse oximetry is available and documents adequate ventilation and oxygenation do not change the patient's position but give 100% oxygen.
4. If assisted ventilation is necessary, place the airway in a neutral position using either the head tilt, chin lift or jaw thrust maneuvers and ventilate with a bag-valve-mask.
5. In the early stages of anaphylaxis if there are no signs of shock, immediately give epinephrine 1:1000 at dose of 0.3 cc IM to adults. The standard dose of epinephrine for children is a minimum of .01 mg per kilogram of body weight (see chart). Repeat dose, if needed, at 15 minute intervals X 2 for total of 3 doses.
6. For severe anaphylaxis, give 0.01 mg/kg (0.1 mL/kg, max 10 mL) of a 1:10,000 solution of epinephrine intravenously if trained staff and equipment are available.

7. Remove clothing from trunk and arms to facilitate starting IV's, taking blood pressure, monitoring pulse and respiratory rate, and auscultating lungs and heart.
8. If clinically indicated, PHN or clinician may accompany client in ambulance and administer treatment en route, unless ALS personnel are on ambulance.
9. All findings, treatment, consultation, and plans should be recorded with one copy remaining in local health office and one copy sent to hospital facility.

ANAPHYLAXIS IN INFANTS OR YOUNG CHILDREN may manifest as respiratory failure and/or shock. The clinical signs to watch for include:

- Altered levels of consciousness, i.e., inability of infant or child to recognize their family.
- Hypotonia.
- Tachycardia: heart rate >180 in <5 year old or >160 in >5 year old.
- Bradycardia: heart rate <80 in < 5 year old is most commonly a vasovagal reaction, but could be a sign of impending cardiovascular collapse in a critical child.
- Tachypnea (>60 breaths/minute).
- Increased work of breathing seen by nasal flaring, retractions, stridor, wheezing or hoarseness.
- Slow capillary refilling (>2 seconds) after blanching of the nailbed of fingers or toes.
- Mottling, pallor, and/or peripheral cyanosis, except in newborns in which cyanosis of the hands or feet may be seen normally, indicate poor skin perfusion.
- Cyanosis is a late and inconsistent sign of respiratory failure best seen in the mucous membranes of the mouth and in the nailbeds.
- Get transport to hospital facility as soon as possible.

Cardiopulmonary Arrest: Client is without respirations, neither visible nor audible signs, no pulses (no carotid pulse palpable), and no audible apical heart sounds. The factors, listed in order of importance, that most affect chances for successful resuscitation are rapid defibrillation for Ventricular Fibrillation (VF) or pulseless Ventricular Tachycardia (VT). Whatever its cause, resuscitation must occur at both the basic and advanced levels in a standardized fashion, and must be instituted as quickly as possible. Basic cardiopulmonary resuscitation focuses on the "ABCs" (airway maintenance, breathing, and circulation), and should be within the capabilities of each office.

1. Access 911 immediately
2. Initiate CPR, note time, and call for help.
3. Identify team leader to assess patient, direct and supervise other team members.
4. Place patient on cardiac board, or firm horizontal surface.
5. Continue effective CPR with establishment of a secure airway.
6. Administer 100% oxygen.
7. Establish venous access if trained personnel and equipment are available.

STANDARD EMERGENCY SUPPLIES AND EQUIPMENT

Resuscitation Equipment

1. Pocket Mask with 1-way valve 1
2. Infant Mask with 1-way valve ……………..1
3. Disposable Airways
   a. Adult size 2
   b. Child size 2
   c. Infant size 2
4. Adult and pediatric ambu bag

Evaluation Equipment

1. Blood pressure cuff – Adult 1
2. Blood pressure cuff – Pediatric 1
3. Manometer appropriate for both cuffs
4. Stethoscope 1

Treatment Equipment

1. Tourniquet 2
2. Alcohol wipes 15
3. Syringes – Disposable
   a. 3 cc with 20 g 1 ½ inch needle 5
   b. 1 cc TB with 25 g 5/8 inch needle 5
4. 4 X 4's . . . . One box
5. Band-Aids . . . . one box
6. Adhesive tape . . . . one roll

Drugs

1. Epinephrine – 1:1000 1 cc ampoule 5
2. Benadryl – 50 mg/cc 10 ml multidose vial 1
3. Oxygen equipment 1

Note: Ipecac should not be kept in emergency trays any more.
Note: Ammonia inhalants should not be kept in emergency trays any more.

Other Materials

1. Copy of updated protocols (laminated)
2. Event recording sheet (see Event Record)

EPINEPHRINE DOSE SCHEDULE FOR CHILDREN AND ADULTS

Weight in Pounds	Weight in Kg	Epinephrine Dilution (1:1000) Use tuberculin syringe
10	4.5	.05 cc
20	9.1	.10 cc
35	16.0	.15 cc
45	20.5	.20 cc
60	27.3	.25 cc
70	31.8	.30 cc
> 70		.30 cc

Note: Maximum dose (any weight over 70 pounds) is .30 cc

May give a dose every 15 minutes X 3 total doses if necessary.

Consult with emergency physician before giving more than total of 3 doses.

Dose is calculated by .01 cc (1:1000 dilution)/kg of body weight.

There are 2.2 pounds/kg so to calculate:
10 **pound** child **divided by** 2.2 **kg** = 4.5 kg
50 **kg** child **times** 2.2 **lb.** = 110 pounds

EVENT RECORD

Today's Date

Name of Local Health Office Address

Name of Patient D.O.B Age

Allergies Oxygen administered Airway (Y/N)

Action/Drugs Time RR BP HR Pt. Condition Initials

Narrative (Type of Drug Reaction, Diagnosis, Patient Status/Time of Departure):

Pt.discharged to ____
With follow-up care by ________________ When ________

Pt.Transferred to ____
Via ____

Signature ________________________

Date ________________________________