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کزین برتر اندیشه بر نگذرد
خداوند روزی ده رهنمای
خداوند کیهان و گردون سپر
فروزنده ماه و ناپسید و مهر

TREATMENT OF ANAPHYLAXIS

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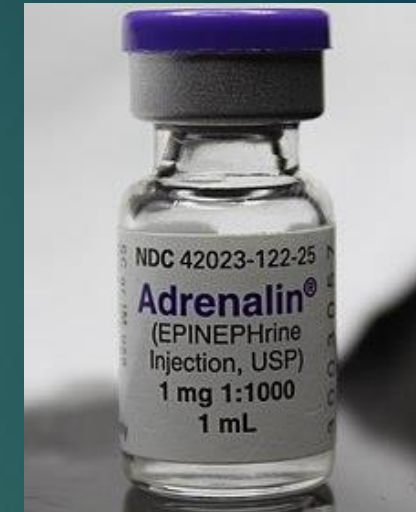
Introduction

- ▶ Anaphylaxis is a serious allergic reaction that is rapid in onset and may cause death.
- ▶ Anaphylaxis thus lies along a spectrum of severity, ranging from mild objective breathing problems (such as mild wheezing) to circulatory “shock” and/or collapse (“anaphylactic shock”).
- ▶ Early recognition of anaphylaxis facilitates removal of the cause and prompt institution of treatment.

Initial management

- ▶ **Removal** of the inciting cause, if possible (eg, stop infusion of a suspect medication).
- ▶ **Basic life support** (airway support, oxygen, ventilation support and external chest compressions if cardiac arrest occurs) and **Call for help**
- ▶ **Supine** posture to prevent a deleterious reduction in venous return to the heart

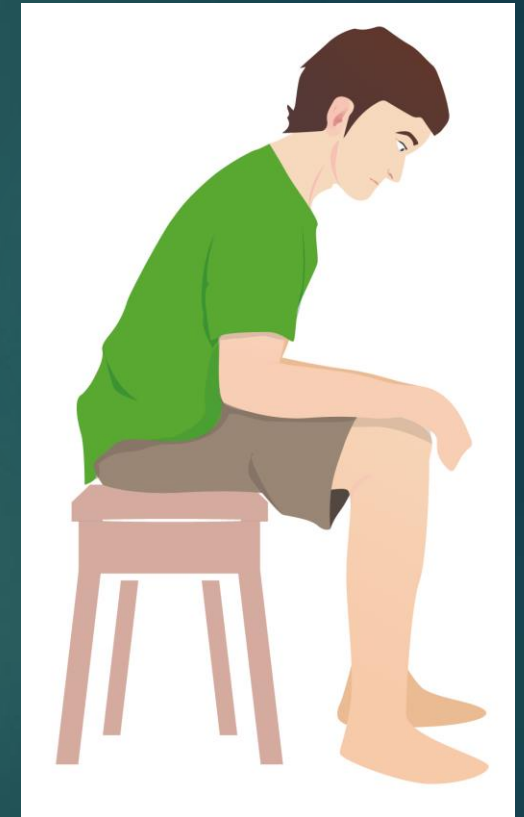
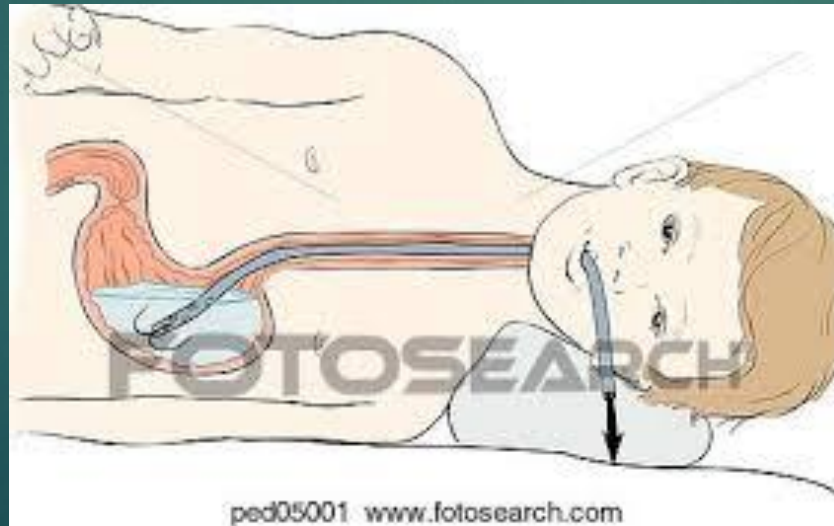
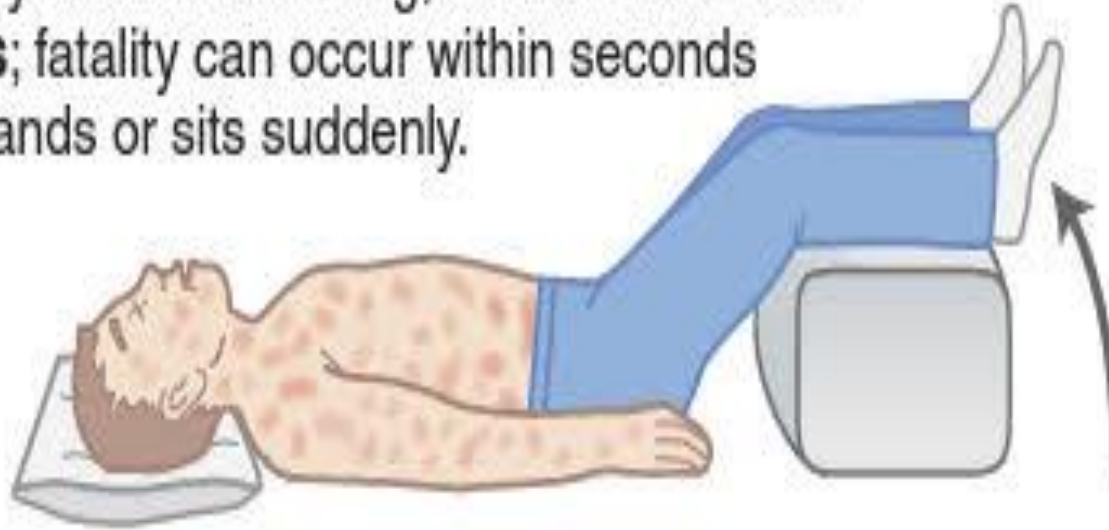
- ▶ **Early administration of epinephrine**, which physiologically antagonizes most of the pathophysiologic manifestations of anaphylaxis
- ▶ If the blood pressure is low, **intravenous fluid** (volume) resuscitation to improve venous return to the heart



position

- ▶ **Elevation of the legs** may help with improving venous return
- ▶ but the patient **should not be placed head-down**, because this may impair ventilation by increasing pressure on the diaphragm.
- ▶ **Modification of this position** may be necessary if the patient has extreme respiratory distress (and then may insist on **sitting**) or vomiting (**left lateral** position used to keep upper airway clear of vomit).

Place patient on the **back** or in a position of comfort if there is respiratory distress/vomiting; **elevate the lower extremities**; fatality can occur within seconds if patient stands or sits suddenly.



Initial assessment and management

- ▶ The most important drug in the acute treatment of anaphylaxis is **adrenaline (epinephrine)**
- ▶ By activating **alpha- and beta-receptors**, adrenaline functionally antagonizes all relevant pathomechanisms of anaphylaxis via **vasoconstriction, reduction of vascular permeability, bronchodilatation, reduction of edema, and positive inotropy of the heart.**



► In patients not requiring resuscitation, **immediate intramuscular** administration of adrenaline at a dose of **0.15-0.5mg** to the **outside of the upper thigh** is the pharmacological treatment of first choice.

► The risk of severe cardiac side effects is considerably **lower** compared to intravenous administration.

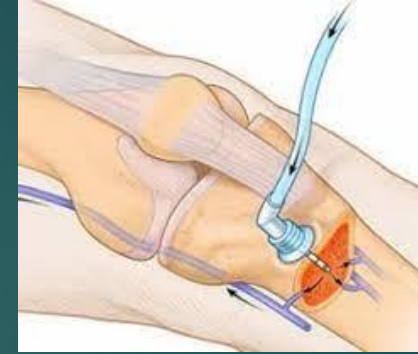
► In the absence of an effect, and depending on adverse events, the injection can be **repeated every 5-10min** subject to clinical symptoms.



- ▶ The **subcutaneous** injection of adrenaline is **no** longer recommended due to its **insufficient absorption** and resulting delayed action.



► If symptoms **fail** to stabilize and circulatory or respiratory decompensation is imminent, adrenaline should be given **intravenously**. (if IV access is not available obtain **intraosseous** or **endotracheal** access)



► IV: **0.01 ml/kg** dose of **1:10000** slow IV **push**



► **IV** bolus dosing of epinephrine is **less safe** and, in inexperienced hands, incorrect dosing has been associated with serious adverse events, including **acute pulmonary edema, ventricular arrhythmias, intracerebral hemorrhage, and death**.

► reserve **bolus IV** dosing of epinephrine for **cardiac arrest**, in which case standard cardiac arrest dosing (1 mg IV bolus approximately every 3 min) is appropriate.



- ▶ In addition to its IM administration, adrenaline can also be given by **inhalation** in the case of **laryngeal edema** and is also effective in **bronchospasm**.
- ▶ Here, the administration of adrenaline, undiluted (e.g., 3-5ml at a concentration of 1mg/ml) via a **nebulizer** using a **breathing mask/mouthpiece** together with **oxygen** is recommended.
- ▶ The inhaled administration of adrenaline **does not replace parenteral** administration and should only be used in an **additive** capacity.



► If bronchial obstruction is the major symptom, the additional administration of **inhaled beta-adrenoceptor agonists** is effective, e.g., **salbutamol**, at an initial dose of two puffs—if ineffective, between four and eight puffs, and/or subcutaneous terbutaline.

► In the case of young children, the efficacy of inhaling a dosed aerosol can be increased by using a "**spacer**," together with a mask if required.



- ▶ Epinephrine should always be administered first, but
- ▶ If epinephrine is ineffective in treating anaphylaxis in patients **taking β -blockers** (These patients can experience **refractory hypotension, bradycardia, and relapsing manifestations.**), **GLOAGON** administration may be necessary.

Glucagon: positive inotropic and chronotropic effects on the heart.

Glucagon can reverse refractory bronchospasm and hypotension during anaphylaxis in patients on β -blockers by activating adenyl cyclase directly bypassing the β -adrenergic receptor.



- ▶ The dose of glucagon is 1 to 5 mg intravenously as a bolus, followed by an infusion of 5 to 15 $\mu\text{g}/\text{min}$ titrated against the clinical response.
- ▶ Nausea and vomiting are the major limiting factors of Glucagon therapy, so intubation should be considered for Protection of the airway.



Oxygen

- ▶ In manifest cardiovascular or pulmonary reactions, the administration of oxygen via a breathing mask is recommended, in particular a non-rebreather mask.
- ▶ The administration of **high-flow oxygen (100%)** is recommended.
- ▶ A laryngeal mask or tube may be helpful.



Volume replacement

- ▶ It is clear that **volume therapy** can only be used in **addition** to the crucial mast cell-stabilizing and Vasoconstrictor effect of adrenaline therapy.
- ▶ **CRYSTALLOIDS (N/S or Ringer lactate): 30 cc/kg in 1st hour.**
- ▶ Adult: **1000-2000 mL** rapidly (i.e. **5-10 mL/kg** in **first 5-10 min**), with large bore (14 to 16 gauge adults)
- ▶ Child: **10-20 mL/kg** in **first 5-10 min**



Antihistamines

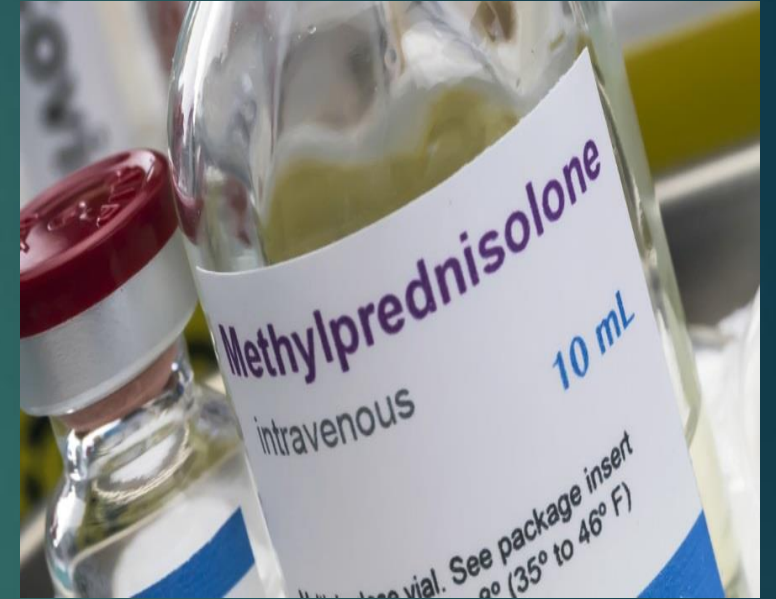
► Although antihistamines are not life-saving, they can offer dramatic relief of **itching** and **urticaria**. One clinical study found a combination H1 and H2 antagonists to be superior to an H1 antagonist alone.

- **Cetirizine**: 0.25 mg/kg up to 10 mg po,
Diphenhydramine: 1.25 mg/kg up to 50 mg po, IM, IV,
Cimetidine: 4 mg/kg up to 200 mg IV.



Corticosteroids

- ▶ Corticosteroids and Antihistamines have a **secondary** role in the management of anaphylaxis.
- ▶ However, patients recently completing **a course of corticosteroids** and those with **known adrenal insufficiency** should be treated.
- ▶ **Methylprednisolone**: Adult: **50-100 mg IV**
Child: **1 mg/kg**, maximum 50 mg IV





► **Biphasic anaphylaxis**: a second wave reaction after the First wave improved.

Estimated 15% of pediatric anaphylaxis.

► does not appear to be affected by the administration of corticosteroids during the initial therapy.

► but it appears to be more common when **therapy is initiated late** and symptoms at presentation are more **severe**.

- 
- ▶ **Immunotherapy**: is very effective for prophylaxis of **bee - and wasp venom- induced anaphylaxis** in sensitized patients and can be lifesaving.
 - ▶ **Drug-induced anaphylaxis** can be prevented by **avoidance** of culprit drugs and cross reacting agents,
 - ▶ by **premedication** (for radiocontrast media), and, in some cases, by **drug desensitization** for antibiotics, chemotherapeutic agents, insulin, vaccines, biological agents, and so on.
 - ▶ For **food-induced anaphylaxis**, **avoidance** of the culprit food is essential; **oral immunotherapy** is available in some allergy centers.

Observation Period

- ▶ current recommendations:
- ▶ that patients should be monitored for 4 hours with relatively mild anaphylaxis.
- ▶ 6 to 8 hours for those with respiratory Compromise.
- ▶ for selected patients with hypotension for 8 to 24 hours after resolution of symptoms. →

- Moderate to severe reaction
- Need for multiple doses of epinephrine
 - Episode in an asthmatic patient with wheezing
 - Ingested antigen with possibility of continued absorption
- Previous history of biphasic response

POSTEMERGENCY MANAGEMENT

- ▶ **Antihistamine** **Cetirizine** (5-10 mg qd) or **loratadine** (5-10 mg qd) for 3 days
- ▶ **Corticosteroids** Optional: **Oral prednisone** (1 mg/kg up to 75 mg) daily for 3 days
- ▶ Prescription for **epinephrine autoinjector**
- ▶ Provide **written plan** outlining patient emergency management



1

Form fist around **EpiPen®** and **PULL OFF BLUE SAFETY CAP.**



2

POSITION ORANGE END about 10cm away from outer mid-thigh*.

* Either clothed, or unclothed, avoiding seams and pocket areas.



3

SWING AND JAB ORANGE TIP into thigh at 90° angle and hold in place for 10 seconds.



4

REMOVE EpiPen®
Massage injection site for 10 seconds*.

*After use the orange needle cover automatically extends to cover the injection needle.



- ▶ Follow-up evaluation to determine/confirm etiology
- ▶ Immunotherapy for insect sting allergy
- ▶ **Patient Education:**
- ▶ Instruction on avoidance of causative agent
- ▶ Information on recognizing early signs of anaphylaxis
- ▶ Stress early treatment of allergic symptoms to avoid systemic anaphylaxis
- ▶ Encourage wearing medical identification jewelry



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FIRST AID PLAN FOR

Anaphylaxis

For use with EpiPen® adrenaline (epinephrine) autoinjectors

How to give EpiPen® adrenaline (epinephrine) autoinjectors

1



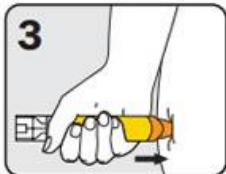
Form fist around EpiPen® and PULL OFF BLUE SAFETY RELEASE

2



Hold leg still and PLACE ORANGE END against outer mid-thigh (with or without clothing)

3



PUSH DOWN HARD until a click is heard or felt and hold in place for 3 seconds
REMOVE EpiPen®

EpiPen® is prescribed for children over 20kg and adults.
EpiPen® Jr is prescribed for children 7.5-20kg.

SIGNS OF MILD TO MODERATE ALLERGIC REACTION

• Swelling of lips, face, eyes	• Tingling mouth
• Hives or welts	• Abdominal pain, vomiting (these are signs of anaphylaxis for insect allergy)

ACTION FOR MILD TO MODERATE ALLERGIC REACTION

- For insect allergy - flick out sting if visible
- For tick allergy seek medical help or freeze tick and let it drop off
- Stay with person and call for help
- Locate adrenaline autoinjector
- Phone family/emergency contact

Mild to moderate allergic reactions (such as hives or swelling) may not always occur before anaphylaxis

WATCH FOR ANY ONE OF THE FOLLOWING SIGNS OF ANAPHYLAXIS (SEVERE ALLERGIC REACTION)

• Difficult/noisy breathing	• Difficulty talking and/or hoarse voice
• Swelling of tongue	• Persistent dizziness or collapse
• Swelling/tightness in throat	• Pale and floppy (young children)
• Wheeze or persistent cough	

ACTION FOR ANAPHYLAXIS

- 1 Lay person flat - do NOT allow them to stand or walk**
 - If unconscious, place in recovery position
 - If breathing is difficult allow them to sit
- 2 Give adrenaline autoinjector**
- 3 Phone ambulance - 000 (AU) or 111 (NZ)**
- 4 Phone family/emergency contact**
- 5 Further adrenaline doses may be given if no response after 5 minutes**
- 6 Transfer person to hospital for at least 4 hours of observation**

If in doubt give adrenaline autoinjector

Commence CPR at any time if person is unresponsive and not breathing normally

ALWAYS give adrenaline autoinjector FIRST, if someone has SEVERE AND SUDDEN BREATHING DIFFICULTY (including wheeze, persistent cough or hoarse voice), even if there are no skin symptoms. THEN SEEK MEDICAL HELP.

• If adrenaline is accidentally injected (e.g. into a thumb) phone your local poisons information centre.
• Continue to follow this plan for the person with the allergic reaction.

© ASCIA 2020 This document has been developed for use as a poster, or to be stored with general use adrenaline autoinjectors.



ASCIA Action Plans and First Aid Plans 2020



Hospital management	Dependent on evaluation	Treatment	Immediate action
*Pressor therapy *Continued therapy with listed agents and management of complications	*Peripheral intravenous fluids *Glucagon *H1 and H2 antihistamines *Vasopressors *Corticosteroids *Electrocardiographic monitoring *Transfer to hospital	*Epinephrine IM *Supine position, legs elevated *Oxygen *Tourniquet proximal to injection site (if following allergen IT)	*Perform assessment *Check airway and secure if needed *Rapidly assess level of consciousness *Assess vital signs

Equipment and Medications for Office Therapy of Anaphylaxis

Epinephrine solution (aqueous) 1:1000 (1 mL ampules and multidose vials)

Tourniquet

1-mL and 5-mL disposable syringes

Oxygen tank and mask/nasal prongs

Diphenhydramine injectable

Intravenous setup with large-bore catheter

Intravenous fluids: 2000 mL crystalloid

Aerosol β 2-bronchodilator and nebulizer

Glucagon

Defibrillator

Normal saline (10-mL vial for epinephrine dilution)

Thank you for
your attention

