



UNIVERSITATEA DE STAT DE MEDICINĂ ȘI FARMACIE
“NICOLAE TESTEMIȚANU” DIN REPUBLICA MOLDOVA

PEDIATRIC EMERGENCIES IN DENTAL PRACTICE

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OBJECTIVES

- Identify common pediatric emergencies in dental practice
- Identification of appropriate evaluation and management of these common pediatric emergencies
- Discussion of pertinent pitfalls and pearls in common pediatric problems seen within the dental practice



Introduction

- A medical emergency is defined as an **unforeseen difficulty experienced by the patient.**
- To prevent or reduce complications, it is necessary to take a detailed medical history, document all of the child's previous and current diseases, and, if necessary, consult with the referring general practitioner or pediatrician.
- If a child suffers from a serious illness, which could lead to life-threatening complications during the procedure, the surgery should be postponed and performed in a hospital setting



Introduction

- Emergencies may due to a variety of causes, including a child's pre-existing medical condition, an airway obstruction caused by dental material or problems related to a sedation procedure.
- Prompt and organized therapy can usually save a life. It is the responsibility of the pediatric dental surgeon to be prepared to recognize a medical emergency & render appropriate care.
- **Many medical emergencies** that occur in a dental office **are fear-related**, therefore, if fear and apprehension are reduced, the chances of having a medical emergency are also reduced.



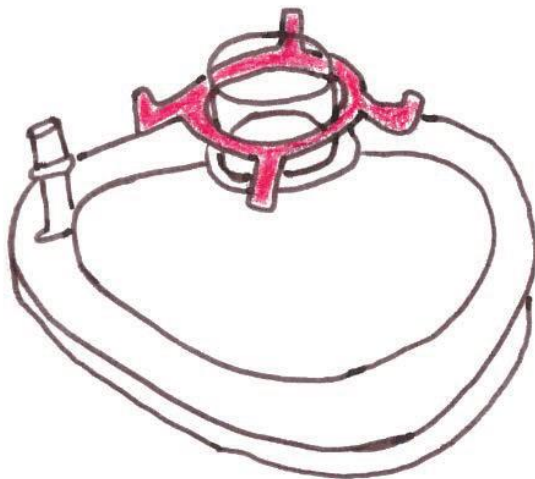
Introduction

- Differences between children and adults are reflected in the size and shape of the body along with emotional and cognitive maturity, but differences in physiology, such as the respiratory, cardiovascular, and immune systems, are also important.
- The pharmacokinetics of drugs in the body of the child must also be taken into account. The dosage of medication to be used in emergency situations, as well as the application techniques, are different from those of an adult patient.

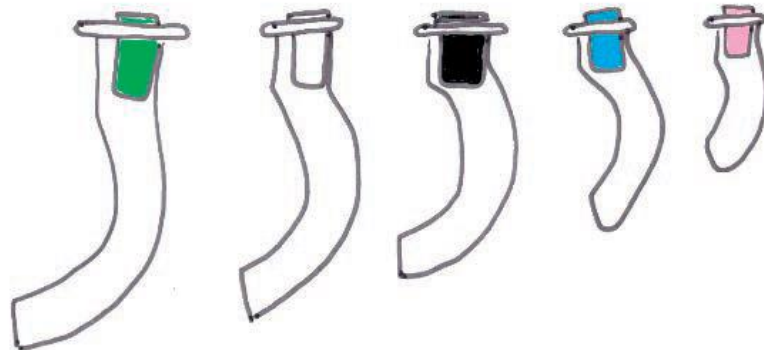


Introduction

- The equipment used must be adapted to the patient's age, for example there are different sizes of **breathing masks** and **oropharyngeal** or **endotracheal tubes**, which must be properly selected because if the size is not adequate, the efficiency is not adequate.



Breathing mask

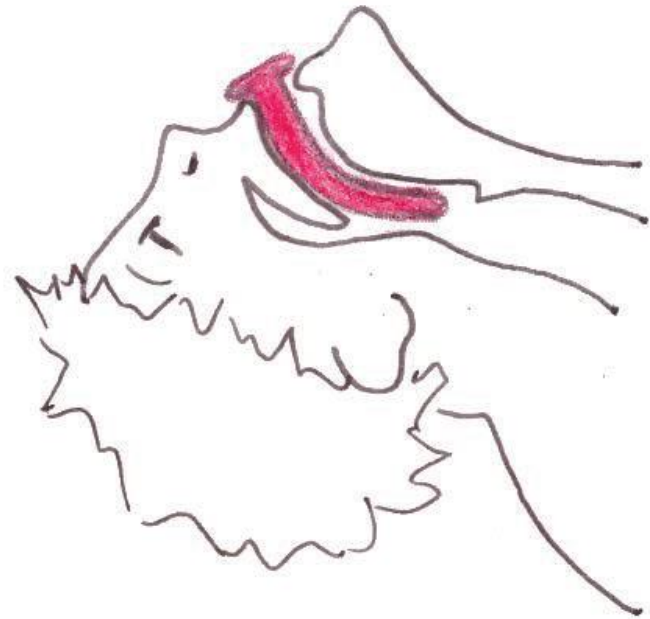


Oropharyngeal Guedel tubes,
sizes marked by colors



Introduction

- An oropharyngeal tube should be introduced directly in children, as opposed to the way of applying the tube in adults in which the tube is concavely applied to the palate to reach the soft palate and then rotated by 180° to put it into position.
- Rotation is not recommended for children because of the delicate structure of their airway, and because of the size of the tongue in relation to the oral cavity.



**Location of
oropharyngeal tube**



Rationale in Emergency Management

- Recognize that a problem exists.
- Diagnose the problem correctly.
- Activate the emergency medical service (EMS) system immediately.
- Keep the patient alive until better trained personnel arrives .
- Remain calm and act swiftly and definitely.
- Never administer drugs without definite indication.



Medico legal aspects

- For medico legal aspects, a written record of the following should be kept:
- **Time** of onset
- **Vital signs** elicited during the emergency
- **Time, Name, Dose and Route** of drugs administered
- Effects of drugs and therapy provided
- Time of initiation of **Cardiopulmonary**
- **Resuscitation**
- Status of the patient at the time of transfer to **Emergency Medical Services** system



Steps in the preparation of the emergency in dental office

- The ability to perform **Basic Life Support**
- A functioning **dental office emergency team**
- Ready access to emergency assistance
- The **availability of emergency drugs** and other equipments.



Emergency plan

- All **staff members** should have **specific assigned duties**
- **Contingency plans** should be in **place** in case a staff member is absent
- All **staff members** should receive **appropriated training** in the management of medical emergencies.
- All **clinical staff** members should be **trained** in **Basic Life Support** system for health care providers.
- The dental **office** should be **Equipped** with **emergency equipment** and the supplies should be appropriate for that practice
- **Emergency drills** should be conducted at least quarterly.

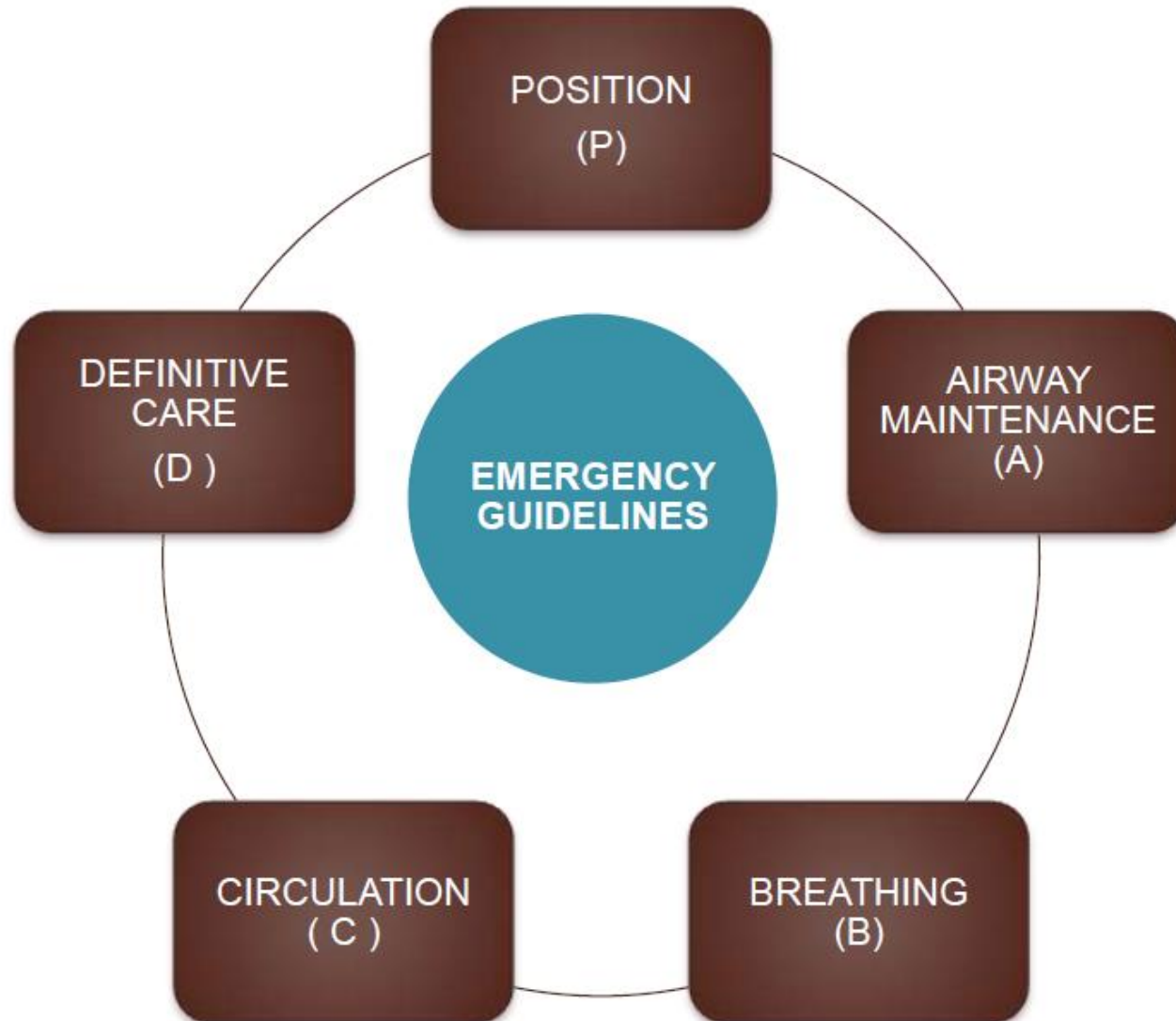


Emergency plan

- **Emergency telephone numbers** should be placed prominently near each telephone.
- **Oxygen tanks** and **oxygen** delivery system should be **checked regularly**; other emergency respiratory support equipment should be present; in **a good working order** and located according to the emergency plan.
- All medical **emergency medications** should be **checked** and **replacements** should be ordered for specific drugs **before** their **expiratory dates**.
- **One staff member** should be **assigned** the task of ensuring that the above procedures are completed or not.



TREATMENT PROTOCOLS IN PEDIATRIC EMERGENCY





EMERGENCY GUIDELINES

POSITION (P)

- **For a conscious patient:** whatever position is comfortable for the patient.
- **For an unconscious patient:** all unconscious patients are placed in a position to increase cerebral flow with minimal interference with ventilation.
 - Place the patient in a supine position
 - Head at the same level as the body
 - Feet slightly elevated (10-15 angle)



EMERGENCY GUIDELINES

Airway maintenance (A)

The anatomical factors that increases the risk of airway obstruction in infants are:

- **Smaller** infant mouth, nose and air passages
- Larger infant tongues relative to oral cavity
- **Narrow trachea**, glottis opening
- Narrowest cricoid cartilage ring
- Non palpable cricothyroid membrane



EMERGENCY GUIDELINES

Breathing (B)

During the immediate assessment of breathing, it is vital to diagnose and treat life threatening breathing problems immediately

- I. Clinical signs include **Sweating, Central Cyanosis**, use of the accessory muscles of respiratory and abdominal breathing.
- II. Seeing the victim's chest moving does not always mean that the victim is breathing, but means that an attempt to breathe is made. "**LOOK-LISTEN-and-FEEL**" technique is used.



EMERGENCY GUIDELINES

Breathing (B)

- III. Count the respiratory rate, normal rate is 12-20 breath/min and a child's resp. rate is 20-30 breath/min. increase in the breathing rate denotes illness, a warning that a patient may deteriorate and may need medical help
- IV. Listen to the patients breath sounds a short distance from their face.
- V. If the patient's depth or rate of breathing is inadequate, use bag and mask or pocket mask ventilation with sufficient oxygen.
- VI. Hyperventilation and panic attacks are relatively common in general dental practice that will be resolved with simple reassurance.



EMERGENCY GUIDELINES

Circulation (C)

Simple faints or vasovagal episodes are the most **likely cause of circulation problems** in general dental practice.

- I. Look at the **color** of the **hands** and **fingers**: Are they blue, pink, pale or mottled?
- II. Assess the **limb temp.** by feeling the patient's hand: Are they cool or warm?
- III. **Measure the capillary refill time**, apply cutaneous pressure for **5 seconds** on a fingertip held at heart level with enough pressure to cause **blanching**, check the time how long it takes for the skin to return to the color of the surrounding skin after releasing the pressure.



EMERGENCY GUIDELINES

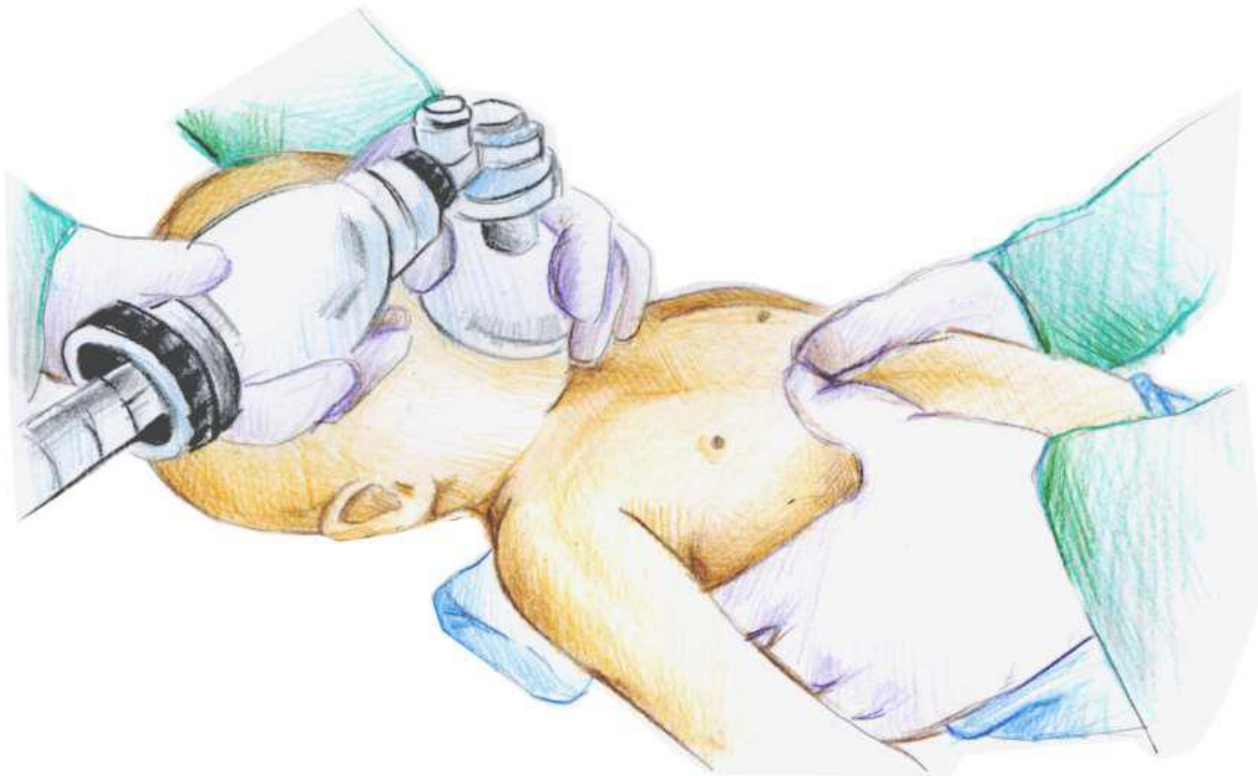
Circulation (C)

- IV. **The normal refill time is less than 2 sec**, increase in refill time indicates poor peripheral perfusion.
- V. **Counter the patient's pulse rate**
- VI. **Palpation of carotid artery preferred in children and adults, brachial pulse preferred in infants**
- VII. **Weak pulses** in a patient with a **decreased conscious level** and **slow capillary refill time** suggest a **low blood pressure**
- VIII. In absence of palpable pulse, chest compression should be started immediately.



DEFINITIVE CARE

- Definitive care involves **treating** the specific **emergency** situation, which is usually carried.





Emergency drugs and equipment

- Whenever possible, ***drugs*** in ***solution*** should be in a prefilled syringe.
- The use of **intravenous** (IV) drugs in dental practice should be **discouraged**.
- **Inhalational, sublingual buccal and intranasal** routes should be preferred.
- All drugs should be kept in an “***emergency drug***” container.
- **Oxygen cylinders** should be of ***sufficient sizes*** to be easily portable, but also allow adequate flow.



Guidelines for medications for use in pediatric patients in EDs

Resuscitation Medications

Atropine
Adenosine
Amiodarone
Antiemetic agents
Calcium chloride
Dextrose
Epinephrine (1:1000; 1:10 000 solutions)
Lidocaine
Magnesium sulfate
Naloxone hydrochloride
Procainamide
Sodium bicarbonate (4.2%, 8.4%)

Other Drug Groups

Activated charcoal
Topical, oral, and parenteral analgesics
Antimicrobial agents (parenteral and oral)
Anticonvulsant medications
Antidotes
Antipyretic drugs
Bronchodilators
Corticosteroids
Inotropic agents
Neuromuscular blockers
Sedatives
Vaccines
Vasopressor agents



Specific drugs - **OXYGEN**

- It is of primary importance in any medical emergencies in which hypoxemia might be present.
- These emergencies include CVS, Respiratory System, CNS
- In the hypoxemic patients, breathing enriched with oxygen elevates the arterial oxygen which increases the oxygen tension and alters the Hb saturation in these patients
- Hypoxemia leads to anaerobic metabolism and metabolic acidosis, that diminishes the efficacy of these emergency drugs.



Specific drugs - **Epinephrine**

- Single most important injectable drug.
- Drug of choice for CVS & respiratory systems of acute allergic reactions.
- Pharmacological actions include bronchodilation, and increased systemic vascular resistance, myocardial contractility and cerebral flow.
- For better response in case of acute allergic reaction epinephrine should be administered immediately after recognizing the condition.
 - Epinephrine should be available in preloaded syringes or auto injector to use immediately.
 - Because of its bronchodilating effects, used in case of acute asthmatic attacks that are not relieved by sprays or aerosols.





Specific drugs - **Diphenhydramine**

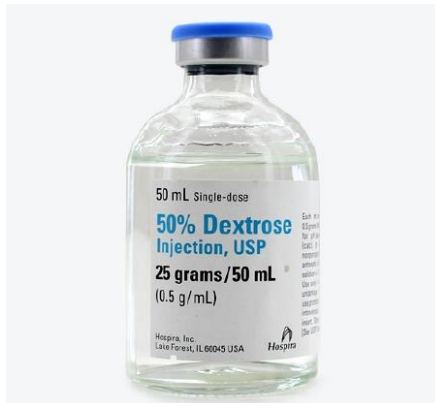
- Histamine blockers reverse the actions of histamine by occupying H1 receptor sites on the effector cell and are effective in patients with mild or delayed onset of allergic reactions.





Specific drugs - **Glucose**

- Glucose preparations are used by the clinicians to treat hypoglycemia resulting from fasting in a diabetic patient or in a non-diabetic patient with hypoglycemia.
- In a conscious patient oral carbohydrates such as orange juice, choc bar act rapidly in circulating blood sugar.
- In an unconscious patient if the dentist suspects acute hypoglycemia, oral drugs should not be administered to avoid airway obstruction.





Specific drugs - **Bronchodilator**

- Inhalation of a Beta2 adrenergic receptor agonist such as metaproterenol or albuterol are used to treat bronchospasm that is experienced during an asthmatic attack or anaphylaxis.
- Albuterol is an excellent choice because it is associated with fewer cardiovascular adverse effects than other bronchodilator.





Guidelines for equipment and supplies for use in pediatric patients in the ED

General Equipment

- Patient warming device
- Intravenous blood/fluid warmer
- Restraint device
- Weight scale, in kilograms only (not pounds), for infants and children
- Tool or chart that incorporates both weight (in kilograms) and length to assist physicians and nurses in determining equipment size and correct drug dosing (by weight and total volume), such as a length-based resuscitation tape
- Pain-scale–assessment tools appropriate for age



Guidelines for equipment and supplies for use in pediatric patients in the ED

Monitoring Equipment

- Blood pressure cuffs (neonatal, infant, child, adult-arm and thigh)
- Doppler ultrasonography devices
- Electrocardiography monitor/defibrillator with pediatric and adult capabilities including pediatric-sized pads/paddles
- Hypothermia thermometer
- Pulse oximeter with pediatric and adult probes



Guidelines for equipment and supplies for use in pediatric patients in the ED

Respiratory Equipment and Supplies

- Endotracheal tubes
 - ✓ Uncuffed: 2.5 and 3.0 mm
 - ✓ Cuffed or uncuffed: 3.5, 4.0, 4.5, 5.0, and 5.5 mm
 - ✓ Cuffed: 6.0, 6.5, 7.0, 7.5, and 8.0 mm
- Feeding tubes (5F and 8F)
- Laryngoscope blades (curved: 2 and 3; straight: 0, 1, 2, and 3)
- Laryngoscope handle
- Magill forceps (pediatric and adult)
- Nasopharyngeal airways (infant, child, and adult)



Guidelines for equipment and supplies for use in pediatric patients in the ED

Respiratory Equipment and Supplies

- Oropharyngeal airways (sizes 0 –5)
- Stylets for endotracheal tubes (pediatric and adult)
- Suction catheters (infant, child, and adult)
- Tracheostomy tubes (sizes 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5 mm)
- Yankauer suction tip
- Bag-mask device (manual resuscitator), self-inflating (infant size: 450 mL; adult size: 1000 mL)



Guidelines for equipment and supplies for use in pediatric patients in the ED

Respiratory Equipment and Supplies

- Clear oxygen masks (standard and non-rebreathing) for an infant, child, and adult
- Masks to fit bag-mask device adaptor (neonatal, infant, child, and adult sizes)
- Nasal cannulas (infant, child, and adult)
- Nasogastric tubes (sump tubes): infant (8F), child (10F), and adult (14F–18F)
- Laryngeal mask airway (sizes 1, 1.5, 2, 2.5, 3, 4, and 5)



Guidelines for equipment and supplies for use in pediatric patients in the ED

Vascular Access Supplies and Equipment

- Arm boards (infant, child, and adult sizes)
- Catheter-over-the-needle device (14 –24 gauge)
- Intraosseous needles or device (pediatric and adult sizes)
- Intravenous catheter–administration sets with calibrated chambers and extension tubing and/or infusion devices with ability to regulate rate and volume of infusate
- Umbilical vein catheters (3.5F and 5.0F)‡
- Central venous catheters (4.0F–7.0F)
- Intravenous solutions to include: normal saline; dextrose 5% in normal saline; and dextrose 10% in water



Guidelines for equipment and supplies for use in pediatric patients in the ED

Specialized Pediatric Trays or Kits

- Lumbar-puncture tray including infant (22-gauge), pediatric (22-gauge), and adult (18- to 21-gauge) lumbar-puncture needles
- Supplies/kit for patients with difficult airway conditions (to include but not limited to supraglottic airways of all sizes, such as the laryngeal mask airway, needle cricothyrotomy supplies, surgical cricothyrotomy kit)
- Tube thoracostomy tray



Guidelines for equipment and supplies for use in pediatric patients in the ED

Specialized Pediatric Trays or Kits

- Chest tubes to include infant, child, and adult sizes (infant: 10F–12F; child, 16F–24F; adult, 28F– 40F)
- Newborn delivery kit (including equipment for initial resuscitation of a newborn infant: umbilical clamp, scissors, bulb syringe, and towel)
- Urinary catheterization kits and urinary (indwelling) catheters (6F–22F)



Cardiac arrest

- Cardiac arrest is the sudden stopping of the heart. It is represented by the lack of pulse, loss of consciousness and apnea.
- Cardiac arrest in children may be a consequence of respiratory or circulatory failure, although usually the problem is in the respiratory system.



Cardiac arrest

Therapy (1)

- if the child is not breathing or has agonal breathing at times, open the airway and apply five breaths of air;
- before each breath of air the rescuer should take a deep breath and supply air to the victim as soon as possible, so that oxygen in the inhaled air is not derived from his or her own lungs;



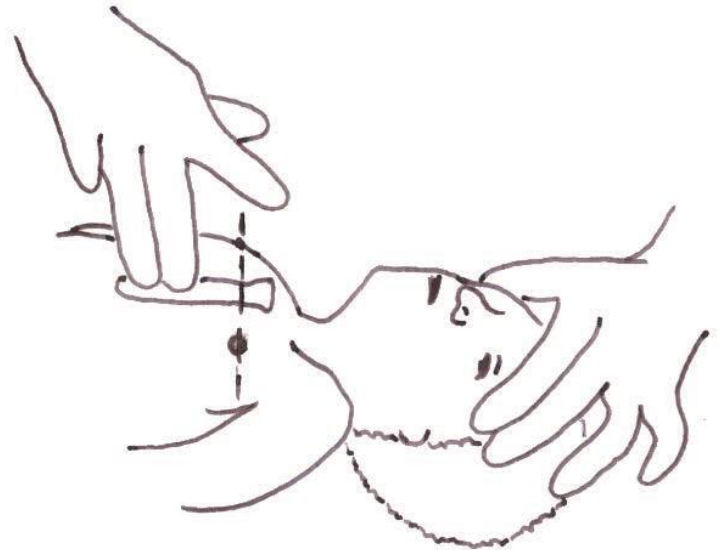
Opening of airways by tilting the head and lifting the chin



Cardiac arrest

Therapy (2)

- if the rescuer is sure that the palpable pulse frequency of the patient is greater than 60 ppm, he or she should continue with artificial ventilation until the arrival of qualified assistance;
- if there is no pulse, he or she should begin with chest compressions, which are performed in children over the lower half of the sternum, avoiding compression of the xiphoid bone.



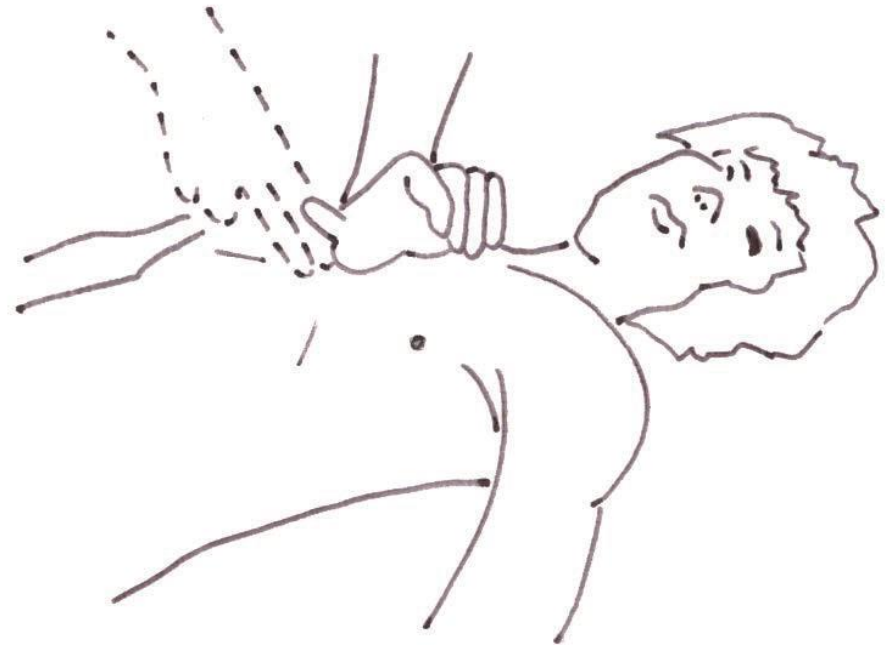
Chest compressions in a young child



Cardiac arrest

Therapy (3)

- the procedure should consist of 15 external cardiac massages and two breaths of air.
- this procedure for reviving children with a rhythm of 15:2 applies to children up to puberty, whereas older children and adolescents receive the reviving procedure similarly to adults.



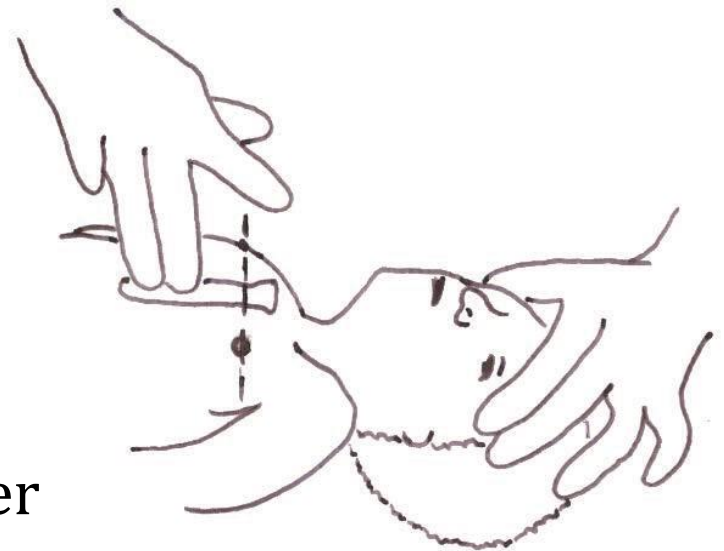
Chest compressions in an older child



Cardiac arrest

Chest compressions in a young child

- Imagine a line that connects the nipples of a child.
- Put the following three fingers on the chest: index, third and fourth finger.
- The index finger should be close to the imaginary line that joins the nipples.
- Raise the index finger in the air and start massaging by putting pressure on the sternum with the two remaining fingers.
- If the fourth fingers feel the xiphoid bone, move the little finger towards the imaginary line.





Cardiac arrest

Chest compressions in an older child

- Feel with the middle finger the xiphoid bone and place the index finger on the sternum.
- Then put hands on the sternum to the point you had touched with the index finger and start the massage.
- During the massage, the elbows are extended.

The xiphoid bone can be easily broken under direct pressure, which may cause profuse internal bleeding because of rupture of the liver and other internal organs.





Diabetic ketoacidosis

- Diabetic ketoacidosis can develop in patients with an absolute or relative insulin deficiency, resulting in high hyperglycemia, the accumulation of ketones and the development of metabolic acidosis.

Diabetic Ketoacidosis

Blood glucose
300 to 500 mg/dL



PH <7.3



Ketones
Positive



Total C O₂



Na



K



Anion gap



HCO₃ <15 meq/L





Diabetic ketoacidosis

Symptoms:

- polydipsia,
- polyphagia,
- polyuria,
- weakness,
- nausea, vomiting,
- hyperventilation,
- red face, smell of acetone,
- disorders of consciousness.

Treatment: in the first hour, administer saline at a dose of 10–20 ml/kg body weight, and after 2 h of this treatment, include intravenous insulin.



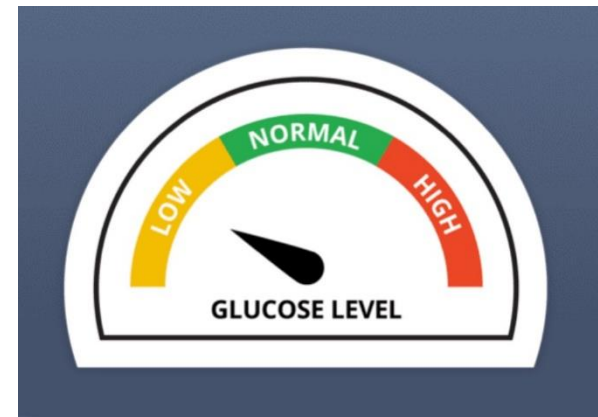


Hypoglycemia

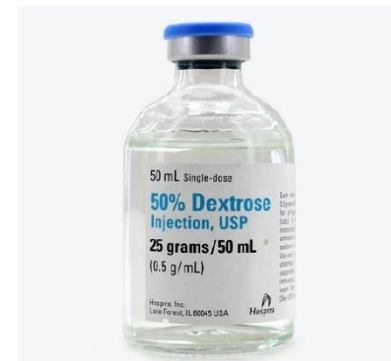
- Hypoglycemia is a condition of low blood glucose levels.
- It represents the most common acute complication of diabetes but can also develop in patients who do not have diabetes.

Symptoms:

- tremor, palpitations,
- hunger, anxiety,
- sweating,
- headache, fatigue,
- disturbances of consciousness,
- convulsions
- pallor.



- stop all procedures, place the patient in a comfortable position (usually this means to sit up straight), pay attention to breathing and circulation,
- give oral carbohydrates (sugar dissolved in water, orange juice, chocolate), with one dose containing 40 g of glucose, (repeat the dose every 10 min until symptoms disappear)
- if not effective, give **1 mg glucagon intramuscularly or 50 ml of 50% dextrose intravenously over 2–3 minutes.**





Acute respiratory insufficiency resulting from obstruction of the airways

Symptoms:

- obstruction of the upper airways
 - coughing
 - cyanosis
 - inspiratory stridor
- lower respiratory tract obstruction,
 - cough
 - shortness of breath
 - inspiratory and/or expiratory wheezing
 - cyanosis



Universal sign
of choking

**If obstruction persists it can
cause loss of consciousness**



Acute respiratory insufficiency resulting from obstruction of the airways

Treatment (1)

- If the child is coughing, encourage the child to do so, because a spontaneous cough is more effective in the treatment of obstruction than any other external process.
- Interventions are needed when coughing becomes ineffective, so when the child cannot talk, cry or breathe between coughs
- First proceed with **5 strokes on the back with an open palm**





Acute respiratory insufficiency resulting from obstruction of the airways

Treatment (2)

- If the obstruction is not resolved, apply the **Heimlich maneuver five times**
- The Heimlich maneuver is performed with the rescuer standing behind the victim and clasping his hands; one hand is made into a fist and placed on the child's abdomen above the navel while the palm of the other hand holds the fist as they strongly press against the child's belly and move upwards)





Acute respiratory insufficiency resulting from obstruction of the airways

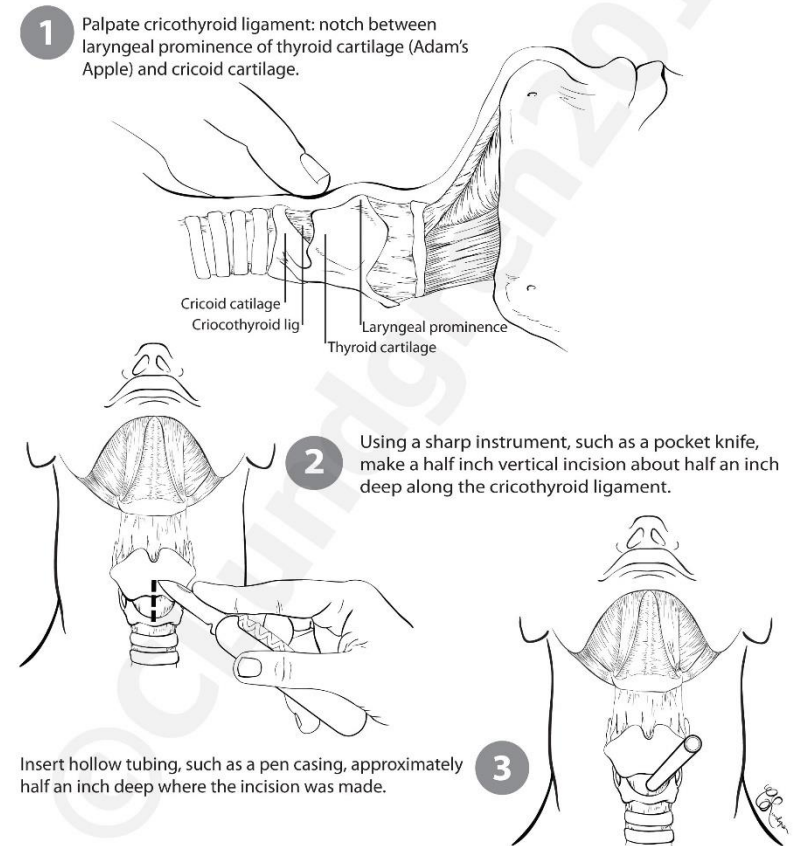
Treatment (3)

- If the child becomes unconscious and is not breathing, the child needs to be ventilated.
- If there are no signs of circulation, then chest compression is required.

If the object causing the obstruction is not ejected with the above treatment procedures, it is necessary to perform a **tracheotomy**.

EMERGENCY PROCEDURE

How to Perform an Emergency Tracheotomy



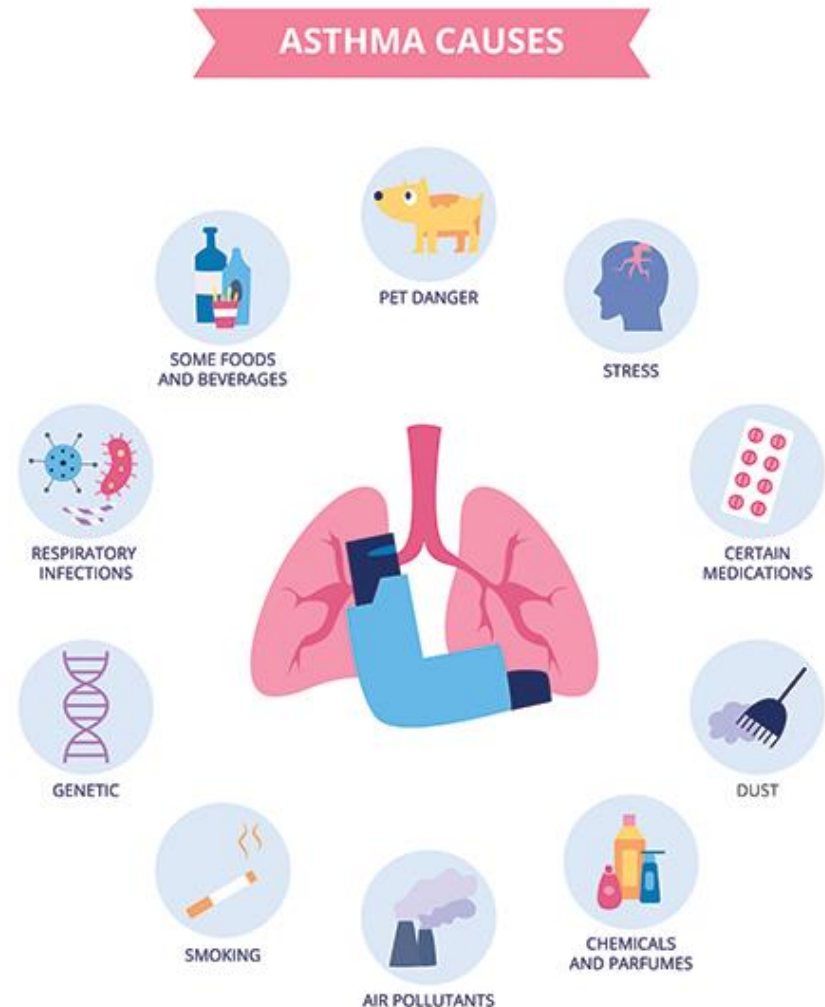


Acute asthma attack

Asthma is a chronic inflammatory disease of the entire respiratory system in patients with allergic diseases.

Symptoms:

- dyspnea,
 - chest tightness,
 - audible wheezing
 - problematic breathing.
- For physical status, the most significant findings are extended and difficult-expiration, with a marked expiratory whistle.





Acute asthma attack

Treatment:

- immediate treatment begins with the inhalation of beta-agonists (**salbutamol**), which will be sufficient if the problem is a mild attack;
- in severe attacks, administration of epinephrine is indicated at a dose of 0.01 to 0.03 ml/kg of a 1:1000 solution, administered intramuscularly or subcutaneously.





Syncope

- Syncope is a short-term reversible loss of consciousness and postural tonus, which results from a sudden, transient and diffuse disorder of brain function resulting from a sharp reduction in the delivery of blood to the brain.

Symptoms:

- the patient shows signs of confusion, has cold sweat,
- turns pale and usually says that he or she is not well.
- later, pupillary dilation appears, along with increased respiration, disorientation and loss of consciousness;
- breathing becomes irregular, shallow and may be absent;
- bradycardia occurs; the blood pressure drops and the pulse is weak



Syncope

Therapy (1)

- if the patient is placed in the Trendelenburg position, the duration of syncope is short and lasts from a few seconds to a few minutes;
- when the patient is conscious and can be given a sweet drink to prevent hypoglycemia.



Patient in the Trendelenburg position



Syncope

Therapy (2)

- In patients who are unconscious, it is indicated to give 36–50% glucose solution intravenously or intramuscular glucagon

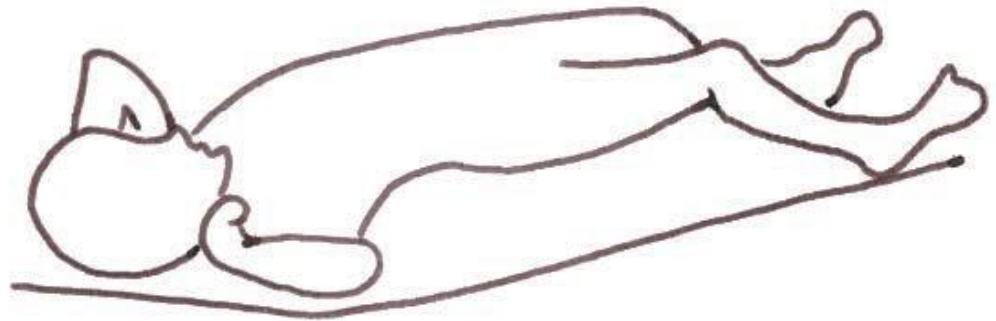


If the staff is not trained to inject drugs or there are not any medications available, it is possible to rub honey or a sweet drink in the buccal fold taking care to avoid aspiration



Epileptic seizure (grand mal)

- The attack may be preceded by aura (postictal phase), which is manifested as a change in one of the senses.
- Aura mainly occurs in the same way in a given patient before each attack and lasts a few seconds.
- The next phase is termed the ictal phase, which leads to loss of consciousness, followed by tonic contraction of muscles, which takes 10 to 20 sec.

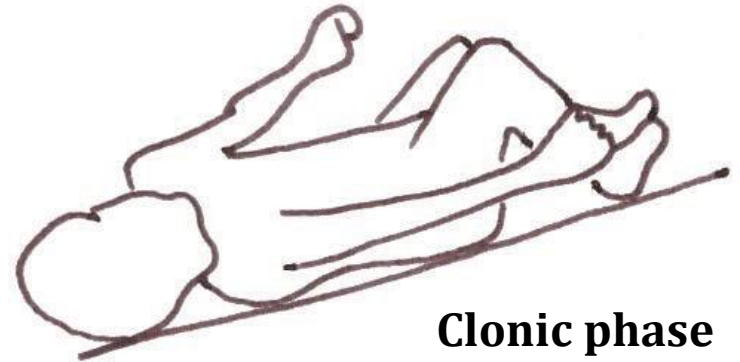


Tonic phase



Epileptic seizure (grand mal)

- Then, the clonic phase occurs, which is characterized by contraction of the whole musculature.



Clonic phase

- Foaming at the mouth can occur because of mixing of air and saliva, the patient may bite themselves during the clonic contractions and injure soft tissue intraorally, and blood may be visible; this phase lasts for 2–5 min.
- In the last stage, breathing becomes normal and the patient gradually returns to consciousness.
- Urinary or fecal incontinence may occur because of relaxation of the sphincter.



Epileptic seizure (grand mal)

Treatment (1)

- move all of the instruments away from the patient and remove everything from the mouth that is there at the moment;
- lower the seat as close to the floor as possible;
- the patient should lie on their side to reduce the possibility of aspiration of secretions or dental materials in the mouth;



Patient in the lateral position



Epileptic seizure (grand mal)

Treatment (2)

- do not restrain the patient or put your fingers into the patient's mouth;
- measure the duration of the seizure;
- if the seizure lasts more than 3 minutes, call an ambulance;
- if a seizure lasts longer than 5 minutes or frequent seizures occur, administer 0.25 mg/kg of diazepam IV;





Epileptic seizure (grand mal)

Treatment (3)

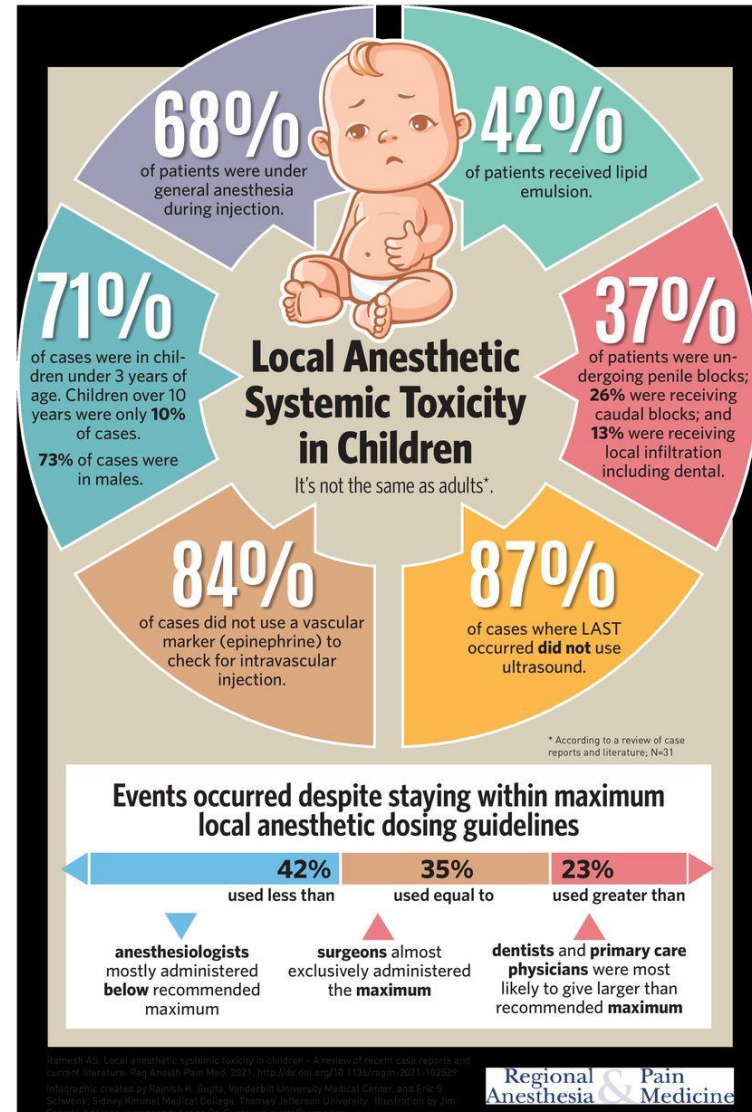
- do not allow the patient to leave the clinic until the level of consciousness is fully restored;
- perform a brief examination of the oral cavity to establish the existence of new injuries;
- the patient is required to go home accompanied by his or her parents





Toxic reactions

- The most common cause of toxic reactions is local anesthetics.
- Toxic reactions occur because of **rapid absorption** of the drug into the blood stream, **overdosing** and **intravascular injection**.





Toxic reactions

Symptoms:

- confusion,
- slurred speech,
- tremors of the face and limbs,
- high blood pressure,
- rapid heartbeat and breathing,
- dizziness,
- nystagmus,
- headache,
- tinnitus,
- disorientation,
- loss of consciousness,
- tonic-clonic seizures.
- Following the first phase of excitation, the patient subsequently passes through a depression of the nervous system and experiences a reduction in blood pressure, heart rate and respiratory rate.



Toxic reactions

Treatment

- place the patient in a supine position,
- check circulation, breathing and air flow;
- if the patient exhibits tonic-clonic convulsions, it is necessary to ensure the supply of oxygen; then the clonic phase lasts less than one minute.
- if the supply of oxygen is not secured, the patient enters acidosis because of CO₂ retention;
- be sure to secure the airway and allow for normal breathing;
- if any phase lasts longer than two minutes and the patient is not breathing, call an ambulance

Local Anesthetic Systemic Toxicity Checklist



- Call for help
- Get LAST rescue kit
- Consider cardiopulmonary bypass team



Consider administering
LIPID EMULSION
early

LIPID EMULSION 20%
The order of administration (bolus or infusion)
and method of infusion (manually, iv roller clamp, or pump) are not critical

over 70 kg

- Bolus ~100 mL over 2-3 min
- Infuse ~250 mL over 15-20 min

IF PATIENT REMAINS UNSTABLE:

- Repeat bolus
- Double infusion

under 70 kg

- Bolus ~1.5 mL/kg over 2-3 min
- Infuse ~0.25 mL/kg/min (consider using a pump if <40 kg)

IF PATIENT REMAINS UNSTABLE:

- Repeat bolus
- Double infusion

Seizure?

- Ensure adequate airway
- Benzodiazepine preferred
- If only propofol available, use low dose, e.g., 20 mg increments

Arrhythmia or Hypotension?

BEWARE
LAST Resuscitation
is DIFFERENT from
Standard ACLS

Stable?

- Continue lipid emulsion ≥ 15 min once hemodynamically stable
- Maximum lipid dose: 12 mL/kg



EPINEPHRINE

- Smaller than normal dose preferred
- Start with ≤ 1 mcg/kg

AVOID

- Local anesthetics
- Beta-blockers
- Calcium channel blockers
- Vasopressin

Once Stable, OBSERVE

- 2 hrs after seizure
- 4-6 hrs after cardiovascular instability
- As appropriate after cardiac arrest



Local anesthetic reaction: vasoconstrictor

Symptoms:

- anxiety;
- tachycardia/ palpitations;
- restlessness;
- headache;
- tachypnea;
- chest pain;
- cardiac arrest





Local anesthetic reaction: vasoconstrictor

Treatment

- Reassure patient
- Assess and support airway, breathing, and circulation (CPR if warranted)
- Administer oxygen
- Monitor vital signs

Call for emergency medical services with transportation for advanced care if indicated



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Anaphylactic reaction

- Anaphylactic reactions occur because of antigen – antibody interaction.
- For the development of acute anaphylactic reactions, antigen is required to stimulate the immune system and form IgE antibodies.
- Then, a latent period occurs after exposure to the antigen, during which the mast cells and basophils are sensitized and exposure to the antigen takes place.
- When the mast cells react with antigen during re-exposure, a release of histamine and vasoactive amines occurs.
- Such a reaction can develop **between a few seconds and several hours** (or if it is a delayed reaction, at a few hours to several days) after exposure to an allergen.



Anaphylactic reaction

Symptoms:

- respiratory (coughing, chest tightness, dyspnea and whistling sound, laryngeal edema, bronchospasm);
- cardiovascular (headaches, palpitations, syncope, tachycardia, dysrhythmia, orthostatic hypotension and shock);
- gastrointestinal (cramps, abdominal pain, nausea, vomiting and diarrhea);
- cutaneous and mucosal signs (rash, erythema and pruritus, angioedema usually occurs at periorbital, perioral and intraoral sites and on the extremities)



Anaphylactic reaction

Therapy (1)

- **Epinephrine** (vials 1:1000 in 1 mL) intramuscularly or subcutaneously
 - the dose for children is **0.01 ml/kg body weight** (ex. a 20 kg child has an epinephrine dose of 0.2 ml);
 - the dose can be repeated every 5–10 min;
 - intravenous epinephrine is administered at a dilution of 1:10,000, so 9 mL of saline is added to 1 ml of the factory dilution, and the dose for children is 0.1 ml/kg);
- **Antihistamines**





Anaphylactic reaction

Therapy (2)

- **Inhalation of β_2 -agonists**
(used when there is anaphylaxis and bronchospasm, and should be administered carefully in cases of hypotension because β_2 agonists have a vasodilatory effect; given at a dose of 2.5 mg for children up to 5 years, and at 5 mg for children over 5 years of age);



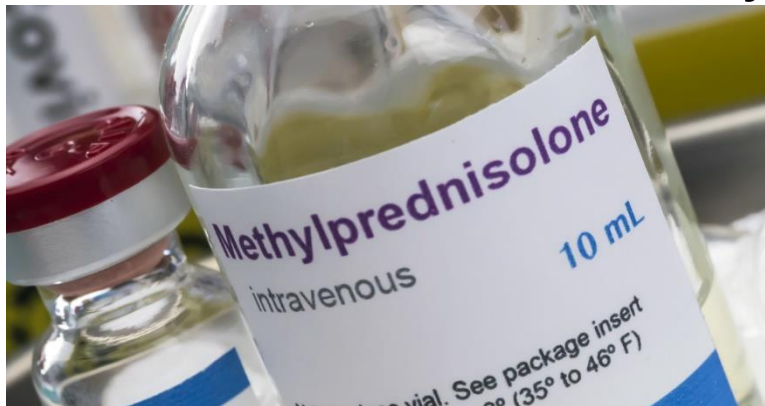
Oxygenation (oxygen is essential in cases with respiratory symptoms or hypotension)



Anaphylactic reaction

Therapy (3)

- **Corticosteroids** (corticosteroids are not the drug of first choice, but they are effective in reducing the late-phase allergic response).
 - corticosteroids may be administered, with a dose of 1–2 mg/kg methylprednisolone or 4 mg/kg hydrocortisone administered intravenously

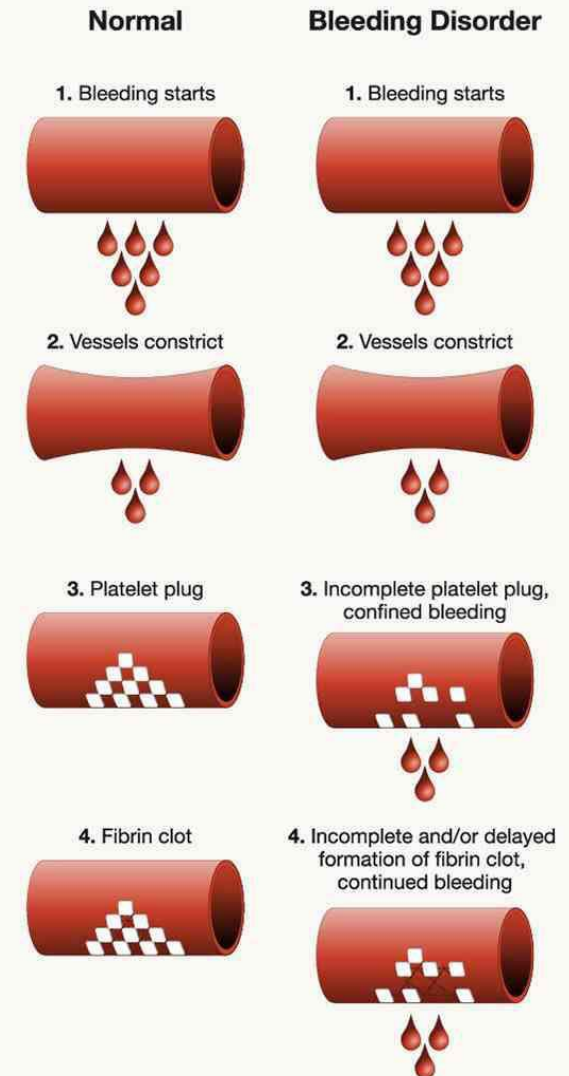


Hydrocort Inj 100mg
Hydrocortisone (100mg) 500 vials + WFI per case



Management of bleeding

- If bleeding occurs, search for bleeding or bruises, nose bleeds, spontaneous bruising and menstrual bleeding in females.
- Duration of bleeding is more important than frequency.
- Reasons of bleeding could be manifold- bleeding disorders, clotting disorders, disorders of liver and effects of drugs.
- Causes of bleeding in oral cavity includes bleeding/platelet disorders, clotting disorders, drugs and toxins and liver disorders.





Management of bleeding

- I. Pressure application for min 5 min.
 - II. If bleeds from sockets and compression is ineffective, pack the socket with gel foam for 7 days.
 - III. Suturing.
- Hemophilic patients form loose, friable clots that may be readily dislodged or quickly dissolved, antifibrinolytics prevent lysis of clots within oral cavity.
 - They are used as an adjunct to factor concentrate replacement to prevent or control oral bleeding with or without factor replacement.
 - Epsilon aminocaproic acid (EACA) administration:
 - 100mg/kg every 6 hrs for 7 days to prevent secondary hemolysis for children
 - 5g every 6hrs for 5-7 days for children greater than 30 kg.



REFERENCES:

- Textbook of Urgent Care Medicine, Resnick and Shufeldt, 2014, Pediatric Urgencies, p. 645 – 763.
- Emergency and Urgent Care, AAFP, 2014.
- Pocket book of hospital care for children, guidelines for the management of common childhood illnesses, second edition, WHO, 2013.
- Vranić DN, Jurković J, Jeličić J, Balenović A, Stipančić G, Čuković-Bagić I. Medical Emergencies in Pediatric Dentistry. Acta Stomatol Croat. 2016 Mar;50(1):72-80.
- American Academy of Pediatric Dentistry reference manual 2011-2012. Pediatr Dent. 2011;33