University of Basrah

College of Dentistry

EMERGENCY In Dental practice

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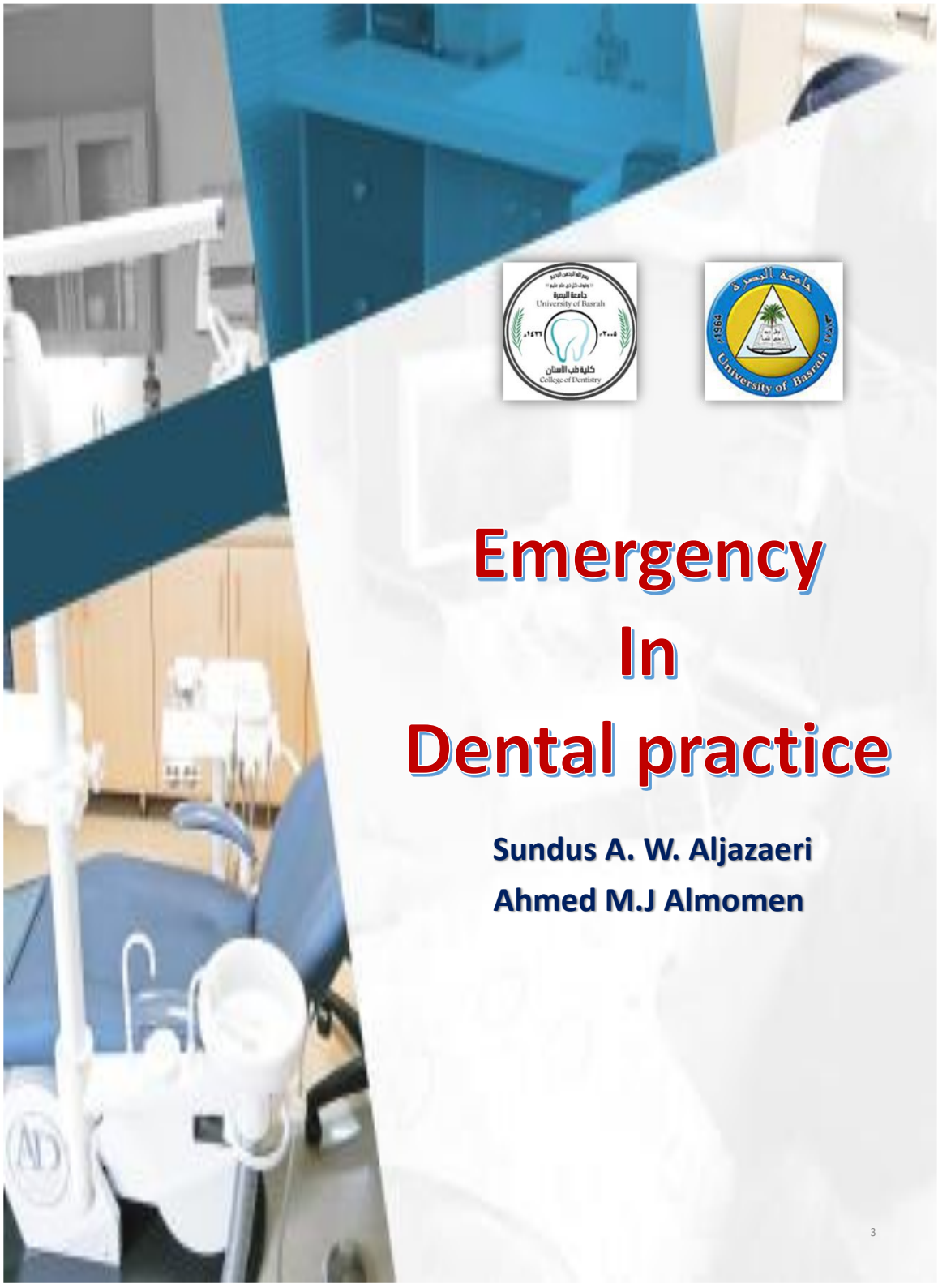

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Dedication

We express our profound appreciation to our family for their continuous support and encouragement during this hard work.

Dear colleagues at the Basrah College of Dentistry, we express my gratitude for your unwavering support and commitment.

We express our sincere gratitude to all the educators and mentors who have provided guidance in my academic endeavours, particularly acknowledging the tremendous impact of Professor Ali Abbas Al-Shawi, whose profound influence has moulded both our academic and professional trajectory.

Contents

Introduction

- **The skill of identifying emergency cases and how to deal with them is very important for a dentist. Although, these cases are rare, because the dentist already writes down everything related to the patient's health condition before starting treatment.**

- **We mention here that the dentist under Iraqi law is not allowed to do the doctor's competence, such as intravenous or intramuscular injections. This is because he is not professionally prepared for that, and as Iraqi legislation, regarding the stipulated Dental Association law in the fortuneteller No. 46 of 1984, in Article 23, it states that "Every member who violates the duties of the profession or performs one of the prohibited acts or acts in a manner that degrades the profession or refrains from implementing the decisions of the Association following the provisions of this law shall be subject to the penalties contained therein, without prejudice to the measures that may be taken against him according to other laws".**

- **In the other countries, "The dentist is not allowed to perform any interventions outside of his profession to save any patient unless he is certified in Advanced Cardiac Life Support (ACLS) (especially concerning intravenous or intramuscular administration) to ensure that they are adequately trained to manage emergencies effectively".**

  This does not mean that the dentist is not trying to save the patient, but he must learn the basics of rescue to help the patient who suffers from an emergency in the clinic, but as permitted by law and not overcome by emotion to help the patient, the dentist violates the law, and the error in such a case will expose the dentist to legal accountability and may result in penalties such as closing the clinic or withdrawing the license to practice the profession or other social consequences.

- **This book is specifically designed to prepare dental students in their third, fourth, and fifth years for potential emergencies they may encounter in their professional careers. It aims to provide them with the knowledge and confidence needed to manage these situations effectively.**

Patient Management

A description of the interaction from intake to discharge between the patient and the healthcare team.

1. **Communication,**
1. **Understanding,**
2. **Examination,**
3. **Assessment,**
4. **Diagnosis,**
5. **Prognosis,**
6. **Intervention.**
7. **Treatment.**

Incorporation of relationship management skills in dentistry is an important part correlate patient-dentist relationship.

Incorporation of relationship management skills in dentistry

Studies have shown that 75% of patients feel anxious before an appointment with a dentist, and 5-10% are so anxious that they are afraid to go altogether. It is therefore essential that the dentist seeks to develop his relationship with the patient to reduce this anxiety to some extent (figure 1).

Figure 1: important elements that be present to get the best treatment in a dental clinic.

ACCORDING TO A PATIENT

A GOOD DENTIST can identify and treat the patient's anxiety, so it is necessary to develop and maintain support, providing information and explanations about many possible actions and problems.

A BAD DENTIST does not have enough ability to communicate, in addition to the untidy and unhealthy workplace, long waiting times, lack of appropriate equipment and technology. In addition, an incompetent dentist may display unethical conduct, such as excessive billing or suggesting unneeded procedures.

COMMON MEDICAL EMERGENCIES IN DENTAL PRACTICE

BLEEDING AFTER TOOTH EXTRACTION

How much bleeding is normal after extraction?

- **It is normal for bleeding to exist for up to 24 hours after the tooth extraction. However, the bleeding should be minimal and tolerable, and excessive bleeding that causes a major distraction or that causes major discomfort that is not tolerable is a concern.**

How much bleeding is normal after multiple tooth extraction?

- **It is rare to experience bleeding for 24-48 hours following surgery. It is important to note that oral bleeding consists of a little amount of blood and a large amount of saliva. Applying a gauze pack and exerting pressure will effectively manage bleeding. However, repeated use of the pack may result in a secondary infection, which can further worsen the bleeding.**

BLEEDING AFTER TOOTH EXTRACTION

Types of bleeding after multiple tooth extraction ?

1. **During a surgical procedure- Called Primary haemorrhage.**
2. **If within 2-3 hours following surgery - Called Reactionary haemorrhage.**
3. **If within 14 days following surgery - Called Secondary haemorrhage (most likely as a result of an infection).**

How do you classify a haemorrhage?

Table 1: Classification of the bleeding.

Classes	per cent of blood lost	Amount of the blood loss
I	Volume depletion of up to 15% of the whole blood volume	750 ml
II	The volume loss increases from 15% to 30% of the total blood volume	750ml-1500ml
III	The volume loss increases from 30% to 40% of the total blood volume	1500ml-2000ml
IV	Haemorrhage resulting in a reduction of more than 40% of the total blood volume	

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BLEEDING AFTER TOOTH EXTRACTION

Level of bleeding after extraction in healthy patients

- **low-level oozing occurs for 12-24 hours After a tooth extraction, it is usual for a while a clot develops in the socket.**

- **The patient may have faintly bloodstained saliva, which will gradually diminish.**

- **Any continuous bleeding after this stage typically suggests a problem with blood clotting and needs further evaluation and treatment (figure 2).**

Figure 2: Bleeding after extraction.

BLEEDING AFTER TOOTH EXTRACTION

Causes- **mainly after extraction. Other causes include:**

Disorder related to systemic disease.

- ✓ **leukaemia, multiple myeloma, Aplastic anaemias**
- ✓ **Platelet disorders: Thrombocytopenia**
- ✓ **Coagulation defects: Hemophilia**
- ✓ **hemorrhagic disorders (haemophilia A, Christmas disease, Vit. K deficiency,**
- ✓ **liver disease,**
- ✓ **congenital cyanotic heart disease,**
- ✓ **renal failure**

Structural malformation:

- ✓ **Hereditary hemorrhagic telangiectasia**
- ✓ **Vascular malformation**
- ✓ **Hemangioma**

Drug therapy:

- ✓ **Aspirin,**
- ✓ **Anti-coagulant therapy**

BLEEDING AFTER TOOTH EXTRACTION

Management:

Local Physical methods

- ✓ **Pressure packs: A firm gauze roll should be placed upon the socket & patient should be asked to bite upon it.**
- ✓ **Socket suturing: Horizontal mattress suture or figure 8 suture.**
- ✓ **Use Hemostatic forceps. If there is an active bleeder.**
- ✓ **Thermal measures- cautery, LASER or hot saline packs**
- ✓ **Use hemostatic agents like Surgicel, Gel foam, Botroclot (hem-coagulase solution), HemCon (Hemorrhage control pack) etc.**

If local measures are not beneficial, you need:

- ✓ **Investigations: Send the patient for a hematological investigation**
- ✓ **Consultation: Seek assistance if the patient exhibits bleeding disorders or experiences persistent bleeding.**

Figure 3: emergency numbers in Iraq.

Syncope

Syncope is a transient state of unconsciousness frequently associated with inadequate cerebral blood flow (figure 4). It is alternatively referred to as syncope or loss of consciousness. It often happens when there is low blood pressure (hypotension) and insufficient oxygen is pumped to the brain by the heart. It might either be harmless or indicative of an underlying medical ailment.

1. Predisposing factors

1. **Fear, Anxiety, Pain**
2. **Fatigue**
3. **Fasting**
4. **Hot & Humid weather**
5. **Neurocardiogenic**

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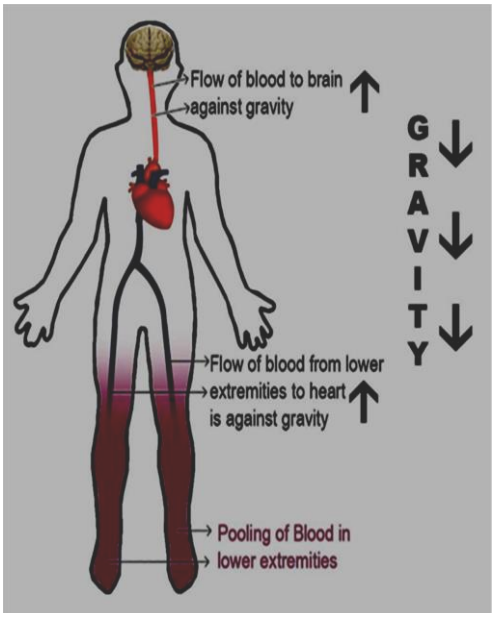
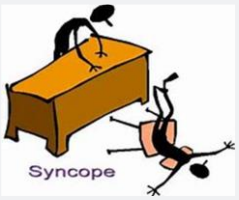


Figure 4: postural hypotension.

Syncope

2) Signs & symptoms

1. Cold & moist skin
2. Slow pulse initially followed by rapid pulse.
3. Pale skin
4. Dizziness
5. Weakness
6. Nausea
7. Loss of consciousness



3) Management of Syncope

1. Lowering head to improve cerebellar circulation (figure 5).
2. Monitoring pulse, Blood pressure (BP) & fasting or Random Blood sugar (FBS or RBS).
3. Loosening of tight cloths at neck.
4. Smelling of aromatic ammonia
5. Gentle tabbing on the patient or shack
6. Reassurance of patient
7. If not recovered other causes of collapse should be considered

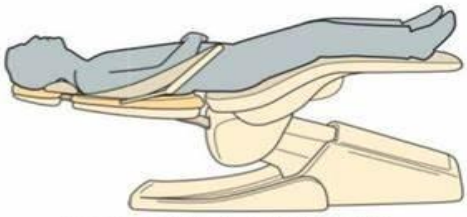


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Figure 5: position of the chair for syncope patient.

Hypoglycemia vs Hyperglycemia

Hypoglycemia vs. Hyperglycemia

Low blood glucose
(less than 60 mg/ml)
Sign and symptoms include:

- Shakiness
- Dizziness
- Sweating
- Hunger
- Pale skin colour
- Mental or behaviour changes
- Lethargy
- Clumsy or jerky movements
- Seizure
- Difficulty concentrating
- Tingling sensations around the mouth

High blood glucose
(greater than 200 mg/ml)
Sign and symptoms include:
Classic symptoms:

- Polyphagia (excessive hunger)
- Polyuria (excessive urine/ urination)
- Polydipsia (excessive thirst)

Other symptoms might include:

- Blurred vision
- Fatigue
- Weight loss
- Slow-healing cuts and sores
- Headaches
- Difficulty concentrating
- Vaginal and skin infections

Blood glucose test: Blood sugar levels at least 8 hours after eating are important data points for people with and without diabetes, while A1C test measures the average amount of sugar in your blood over the past few months (figure 6).

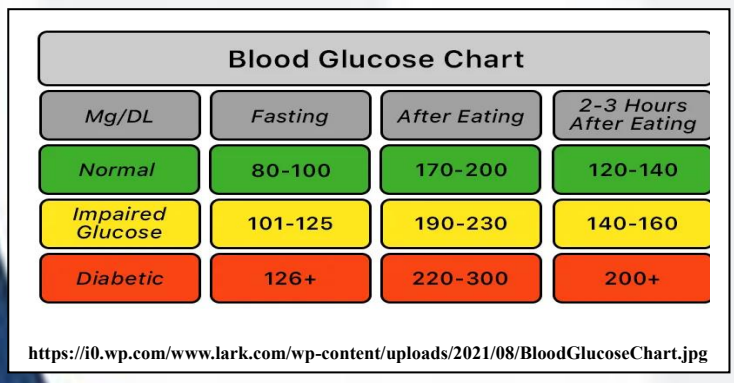

Figure 6: level of the fasting blood glucose and the

Management of Hypoglycaemia & Hyperglycaemia

- **Management (hypoglycemia)**
- Measuring the blood sugar FBS or RBS (figure 7).
- If patient can take orally – 15g oral carbohydrate.
- If the patient is unable to take orally, Intravenous (IV) 25-50ml of 50% hypertonic dextrose or 1 mg glucagon. If IV line is not available, Subcutaneous SC or Intramuscular (IM) 1mg glucagon (if the dentist has Advanced Cardiac Life Support ACLS training)
- Patient is observed for 30-60 min.

- **Management (hyperglycemia)**
- Maintenance of airway & circulation, monitoring vital signs
- Transfers to hospital

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Figure 7: blood glucose testing

Hypotension & hypertension

Hypotension is a condition in which the force of the blood pushing against the artery walls is too low. Blood pressure is measured in millimeters of mercury (mm Hg). In general, low blood pressure is a reading lower than 90/60 mm Hg (Table 2).

Causes of hypotension:

- **Dehydration.**
- **Low blood volume.**
- **Heart problems.**
- **Endocrine disorders, such as an underactive thyroid.**
- **Certain medications, such as (blood pressure medications, antidepressants, and medications used to treat Parkinson's disease).**
- **Pregnancy.**
- **Sudden blood loss.**
- **Severe infection.**

It is important to note that in some cases, the cause of high or low blood pressure may be unknown.

hypertension In adults, a sustained systolic blood pressure of 140 mm Hg or greater and/or a sustained diastolic blood pressure of 90 mm Hg or greater (figure 8).

Causes of hypertension:

- **Overweight or obese**
- **lack of physical activity**
- **Excessive alcohol consumption**
- **Stress**
- **Ageing**
- **Family history**
- **Chronic conditions such as diabetes, kidney disease, and sleep apnea, and certain medications like birth control pills and decongestants.**

Sign & Symptoms
Hypotension & hypertension

Hypotension sign & symptoms:

- Dizziness or lightheadedness
- Fainting or feeling faint.
- Nausea
- Fatigue
- Lack of concentration
- Blurred vision
- Paleness
- Rapid, shallow breathing

Hypertension, known as the "silent killer," hypertension usually presents no symptoms, but in some cases, individuals may experience the following signs and symptoms:

- Headaches
- Dizziness
- Shortness of breath
- Chest pain
- Nosebleeds
- Blood in the urine

Range of Hypotension & hypertension

Table 2: Hypotension Rang.

Comment	systolic	Diastolic
Dangerous low blood pressure	50 mmHg	33 mmHg
Too low blood pressure	60mmHg	40 mmHg
low blood pressure	90 mmHg	60 mmHg
Normal blood pressure	120mmHg	80 mmHg

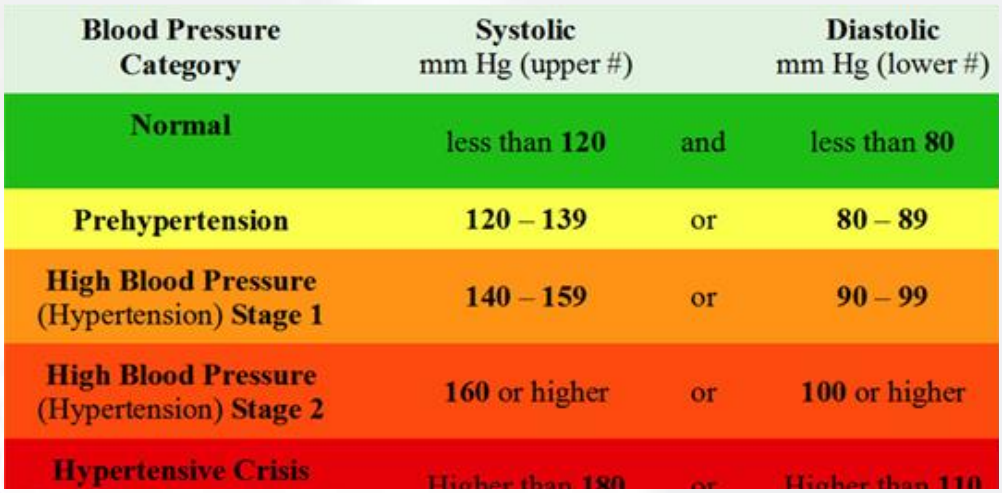

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Figure 8: Hypertention range.

Emergency Treatments for Hypertension

1. **Typically, routine dental treatment poses minimal risk for people with high blood pressure. The next table (table 3) presents dental care guidelines for individuals with varying blood pressure levels. Patients whose blood pressure is lower than 180/110 can safely get any required dental treatment, including both surgical and nonsurgical procedures, with minimal danger of experiencing negative consequences.**
2. **Patients who have been diagnosed with asymptomatic high blood pressure (≥180/110 mm Hg) should have their elective dental care postponed. Instead, they should be quickly sent to a physician for examination and treatment. Individuals experiencing increased blood pressure together with symptoms such as headache, dyspnea, angina, epistaxis, or acute anxiety may necessitate immediate medical intervention.**
3. **Patients who have uncontrolled or severe hypertension may require immediate dental treatment if they are experiencing discomfort, infection, or bleeding. In such instances, it is advisable to seek guidance from a medical professional while dealing with the patient. Techniques such as monitoring blood pressure during surgery, monitoring electrocardiogram (ECG) readings, inserting an intravenous line, and administering sedative may be employed. When making a choice, it is important to carefully evaluate if the advantages of the suggested therapy are more than the possible drawbacks.**

Table 3: Dental management to patient with hypertension.

Blood Pressure	Dental Treatment Recommendation	Referral to Physician
⩽120/80	Any required	No
⩾120/80 but <140/90	Any required	Encourage patient to see physician
⩾140/90 but <160/100	Any required	Encourage patient to see physician
⩾160/100 but <180/110	Any required; consider intraoperative monitoring of blood pressure for upper level stage 2	Refer patient to physician promptly (within 1 month)
⩾180/110	Defer elective treatment	Refer to physician as soon as possible; if patient is symptomatic, refer immediately

Dental Management of the Medically Compromised Patient-7th edition by James W. Little, Donald A. Falace, Craig S. Miller, Nelson L. Rhodus

Emergency Treatments for Hypotension

- Hypotension is defined as a blood pressure that falls below the accepted normal range of 120/80 mmHg, according to the American Heart Association.
- To promptly address symptomatic hypotension, place the hypotensive patient in a supine posture (figure 9) and raise their legs above the level of their heart.
- If the patient additionally feels nausea or vomiting, it may be important to position the patient's head to either side to prevent aspiration.
- If low blood pressure does not improve with changing position and a reversible cause cannot be promptly determined, the administration of intravenous (IV) fluids may be the suggested first-line treatment **(if the dentist has ACLS training)**. Administering normal saline can frequently restore or, at the very least, stabilise low blood pressure until physicians can identify another underlying reason.
- It is crucial to bear in mind that long-lasting low blood pressure can lead to insufficient blood circulation throughout the body, which can result in illnesses such as heart attacks, strokes, kidney failure, and other forms of shock.

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Figure 9: Supine position to hypotensive patient.

Hypersensitivity

Hypersensitivity, also known as a hypersensitivity reaction or intolerance, refers to undesirable reactions produced by the standard immune system, including allergies and autoimmunity. It is often described as an overreaction of the immune system, which can cause damage and discomfort. It's important to note that hypersensitivity, in an immunologic context, should not be confused with the psychiatric term "hypersensitive," which refers to individuals who may be overly sensitive to physical (e.g., sound, touch, light) and emotional stimuli. Hypersensitivity reactions can be classified into four types.

Type I: IgE mediated immediate reaction.

Type II: Antibody-mediated reaction (IgG or IgM antibodies)

Type III: Immune complex-mediated reaction

Type IV: Cytotoxic, cell-mediated, delayed hypersensitivity reaction

Hypersensitivity

- **Hypersensitivity, an immunological reaction, refers to undesirable immune reactions produced by the standard immune system.**
- **Hypersensitivity or allergic reactions result in exaggerated or appropriate immune responses that are harmful to the host.**

Dental materials or tools causing hypersensitivity

Injectable dental local anaesthesia, topical aesthetic agents, dental amalgam, acrylic, composite resin, nickel, palladium, chromium, cobalt, eugenol, rubber products, talcum powder, mouthwashes, and toothpaste.

Allergen causing hypersensitivity showed in (figure 10).

Figure 10: Types of allergens

Hypersensitivity

Types of hypersensitivity

- **Type I : IgE Immediate hypersensitivity**
- **Type II: Antibody- mediated cytotoxic hypersensitivity**
- **Type III: Immune complex mediated hypersensitivity**
- **Type IV: Cell mediated hypersensitivity**

- **Type I : Allergy, Atopy and Anaphylactic**
- **Type II: AntiBody- mediated**
- **Type III: Immune Complex**
- **Type IV: Delayed**

- **Type I, II & III** → **Antibody Mediated**
- **Type IV** → **Cell Mediated**

Management of hypersensitivity or allergic reaction depend on its types.

Mild Allergic Reaction

Symptoms:

1. **Mild itching (pruritus) - appears slowly**
2. **Mild rash (urticaria) - appears slowly**

Treatment:

- **Administer diphenhydramine (Benadryl) 25-50mg orally, intravenously, or intramuscularly (if the dentist has ACLS training)**
- **Repeat the dose of up to 50mg every 6 hours orally for 2 days**
- **If there is a suspicion of an allergy to the medication, discontinue its administration.**

Management of hypersensitivity or allergic reaction

Severe Allergic Reaction

Symptoms:

1. **Skin reactions with rapid appearance:**
   a. **Severe itching (pruritus)**
   b. **Severe rash (urticaria)**
2. **Swelling of lips (figure 11), eyelids, cheeks, pharynx, and larynx (angioneurotic edema)**
3. **Anaphylactic shock:**

a) **Cardiovascular symptoms include a fall in blood pressure.**
b) **Respiratory symptoms include wheezing, choking, cyanosis, and hoarseness.**
c) **Central nervous system symptoms include loss of consciousness and dilation of pupils (figure 12) .**

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Figure 11: Angioneurotic oedema

Sign and Symptom of Anaphylactic Shock

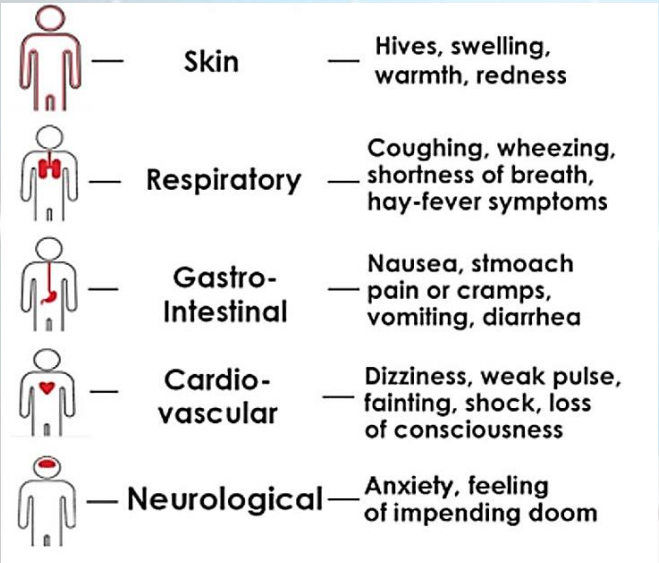

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Figure 12: ***Sign and Symptom of Anaphylactic Shock***

Management of Anaphylactic shock

1. Reassurance of the patient, remove from contact with allergen.
2. Lie the patient on the ground with elevation of the leg.
3. Check the vital signs of the patient.
4. Call for help 122.
5. Administer epinephrine 0.3-0.5 mg 1:1000 Subcutaneous (SC) or Intramuscular (IM) (avoid if severe hypertension); if the dentist has ACLS training, it can also be given Intravenous (IV). Repeat every 5-10 minutes as needed. If the dentist has ACLS training, administer theophylline ethylenediamine (aminophylline) 250-500 mg Intravenous over 10 minutes (avoid if hypotensive). Dispense steroids—hydrocortisone sodium succinate 100 mg SC, IM, or IV if the dentist has ACLS training.
6. Support birthing, administer oxygen and monitor and record vital signs.
7. Conduct cardiopulmonary resuscitation (CPR) if necessary, which may involve utilising an Automated External Defibrillator (AED).
8. Facilitate expeditious transportation of the patient to the hospital (figure 13).

Caution should be exercised while administering aminophylline to asthmatic patients who are also experiencing low blood pressure, since it may further lower their blood pressure.

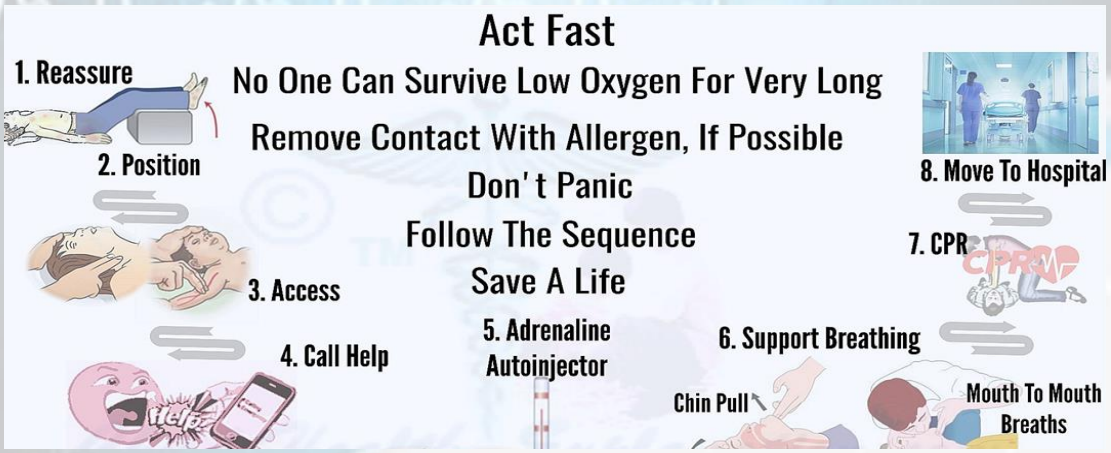

Figure 13: Management of anaphylactic shock.

Chest pain

Chest pain Many different conditions can cause chest pain, some of which are serious and require immediate medical attention. If you or someone around is experiencing chest pain, it is important to seek medical help right away. Some of the possible causes of chest pain include:

- Myocardial infarction, also known as a heart attack, is a medical emergency that happens when the blood flow to the heart is blocked. Chest pain is a common symptom of a heart attack.
- Angina is a type of chest pain that occurs when the heart does not receive enough blood and oxygen. It is typically a symptom of coronary artery disease.
- Pulmonary embolism: This is a blockage of one of the arteries in the lungs, which can cause chest pain and difficulty breathing.
- Gastrointestinal issues: Acid reflux, heartburn, or other gastrointestinal issues can cause chest pain that may be mistaken for heart-related problems.
- Panic attacks: Panic attacks can cause chest pain, shortness of breath, and other symptoms that may feel like a heart attack.

It's important to seek medical attention if someone around you is experiencing chest pain. A healthcare professional can determine the cause of the chest pain and provide appropriate treatment.

Chest pain

Angina and Myocardial Infarction are common conditions that can cause chest pain and discomfort, but they have different causes and symptoms.

Angina is triggered by a temporary decrease in blood flow to the heart muscle, usually because of narrowed or blocked arteries. It typically results in chest pain or discomfort, but the symptoms usually last for a few minutes and ease with rest or medication. Common symptoms of angina include:

- **Pressure, tightness, or squeezing sensation in the chest.**
- **Pain or discomfort in the neck, jaw, shoulder, or arm**
- **Shortness of breath**
- **Nausea or dizziness**
- **Fatigue**

Myocardial Infarction, also known as a heart attack, is caused by a complete or near-complete blockage of blood flow to the heart muscle. This blockage can lead to damage to the heart muscle and can be life-threatening. Some common symptoms of a heart attack include: Intense, prolonged chest pain or discomfort

- **Pain or discomfort in the neck, jaw, shoulder, or arm**
- **Shortness of breath**
- **Nausea or vomiting**
- **Sweating**
- **Feeling faint or lightheaded**

Chest pain

Emergency Management

- It is important to take a sublingual 0.3mg glyceryl trinitrate tablet under the tongue as soon as possible. If the pain persists after 5 minutes, a second dose can be taken by placing one more tablet under the tongue. If the pain continues after 5 minutes, a third and final dose may be taken to help alleviate the symptoms of myocardial infarction (MI). In this case the dentist must:
    1. Place patient in most comfortable position
    2. Administer oxygen at 10 L/min fl ow
    3. Call (122)
    4. Monitor and record vital signs
    5. Reassure patient
- NOTE: Maintain patient in most comfortable position; this may not be the supine position since the air hunger may be associated with orthopnea. Nitrous oxide-oxygen (N2O-30%, O2 70%), Demerol (50 mg IV), or morphine (10 mg IV) may be administered if the dentist has ACLS training.

- If someone is experiencing symptoms of a heart attack, it is important to chew and swallow a full-strength aspirin (325 mg) as soon as possible, unless there is a known allergy to aspirin. This can help to reduce the risk of further blood clotting and minimize the damage to the heart muscle.

Cardiac arrest

Cardiac arrest, also known as a heart attack or sudden cardiac arrest, is a medical emergency that occurs when the heart suddenly stops beating. It can be caused by a variety of factors, including heart disease, drug overdose, or trauma.

Sign & symptoms of cardiac arrest may include:

- **Collapse and loss of consciousness**
- **Absence of breathing or irregular breathing**
- **Absence of pulse or irregular pulse**
- **Chest pain and discomfort**
- **Nausea and vomiting**
- **Lightheadedness or dizziness**
- **Cyanosis, dilatation of the pupil**
- **Absence of pupillary response to light**
- **Absence of BP**

Cardiac arrest

- If you suspect someone is experiencing cardiac arrest, it is important to call 122 for emergency medical help immediately. Every minute counts in a cardiac arrest, and prompt treatment can increase the person's chances of survival.
- The emergency management of cardiac arrest involves performing cardiopulmonary resuscitation (CPR) (if the dentist has ACLS training) and using
  an automated external defibrillator (AED) if available. CPR involves chest compressions and rescue breaths to keep blood and oxygen flowing to the person's vital organs until medical help arrives.
- IV drugs
  1. 5% dextrose lactated ringers (with ACLS training)
  2. Hydrocortisone sodium succinate 100 mg/2 ml syringe/22 gauge, 1 needle
  3. Epinephrine: 0.5-1.0 ml 1 : 1,000, repeat every 5 minutes.
  4. Atropine sulfate: Indicated if pulse is less than 60 beats/min and systolic blood pressure is below 90. Initial dose: 0.5 mg; repeat every 5 minutes, not to exceed 2.0 mg total dose.
- An AED is a device that delivers an electric shock to the heart to help restore its normal rhythm (figure 14).
- Remember, in the case of cardiac arrest, time is of the essence. So, call for help immediately and start CPR until professional help arrives.

Figure 14: automated external defibrillator (AED)

Steps to perform Cardiopulmonary Resuscitation CPR

- **Take stock of the situation and the victim before doing CPR. Make sure it's a safe environment. Knock on their shoulder and ask, "Are you OK?" to verify if they require assistance.**
- **For assistance, dial 122. When assistance is clearly required, the patient should be placed on their back to free the airway. To elevate the chin, tilt the head back gently.**
- **Verify that the patient is breathing. Spend no more than ten seconds listening intently for the sound of breathing; intermittent gasping noises are distinct from breathing. Get the person breathing again by following the instructions outlined by the American Red Cross CPR steps.**
- **Start by pressing on the chest. The American Red Cross CPR guidelines recommend 100 to 120 chest compressions per minute, 30 at a time. Place both hands on top of each other across the chest. Work fast and powerfully, using your entire weight to ensure they are at least 2 inches deep; provide rescue breaths, close the patient's nose with your fingers put your mouth over the patient's mouth with the chin raised up to raise the chest, blow into the person's mouth. Perform two rescue breaths and keep on compressing the heart.**

Note: (If the 1st breath does not cause the chest to rise, retitle the head and ensure a proper seal before giving the 2nd breath If the 2nd breath does not make the chest rise, an object may be blocking the airway)

- **Maintain cardiopulmonary resuscitation procedures: Keep breathing and performing chest compressions until the patient shows signs of life, such breathing. (figure 15).**

Note: End the cycles if the scene becomes unsafe or if you are unable to continue performing CPR due to exhaustion. Remember, in the case of cardiac arrest, time is of the essence. So, call for help immediately and start CPR until professional help arrives.

Steps to perform
Cardiopulmonary Resuscitation CPR

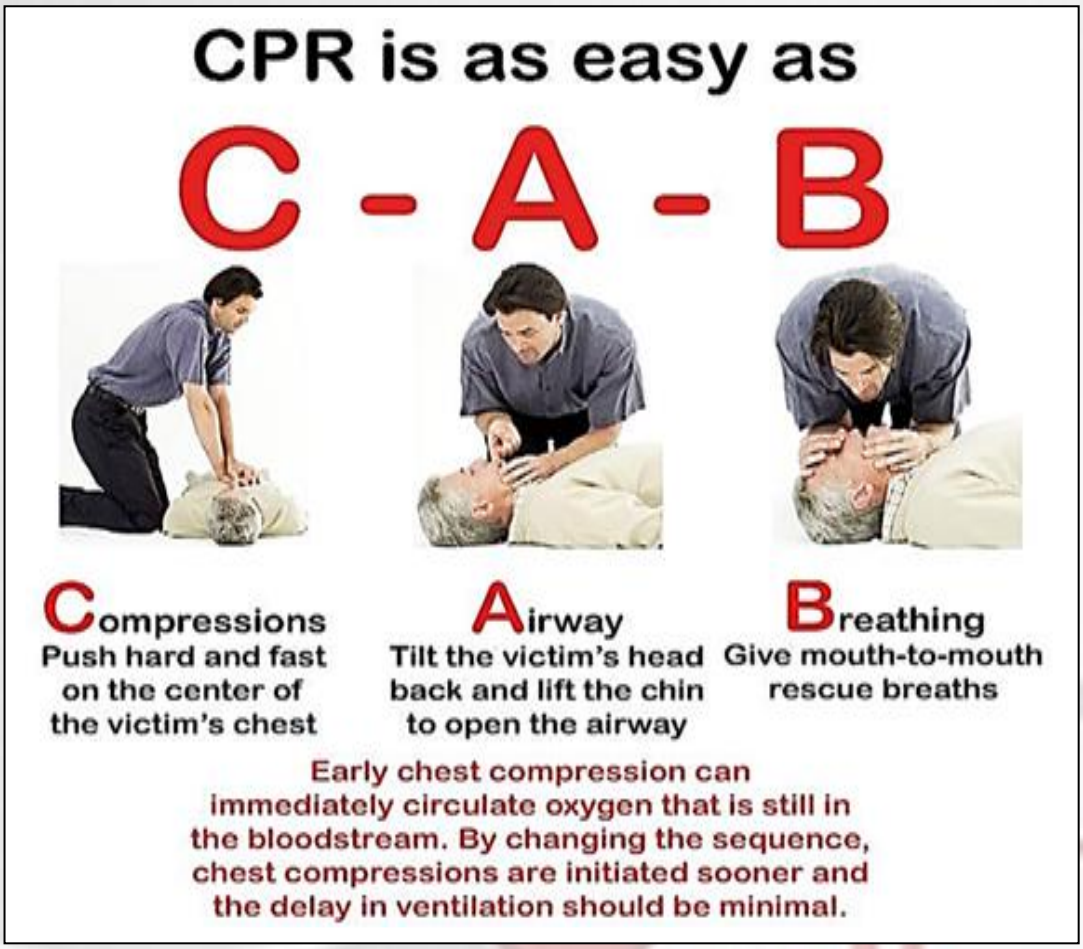

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Figure 15: Steps to perform Cardiopulmonary Resuscitation CPR

Asthmatic attacks

Asthma is a chronic respiratory disease that affects the airways, causing them to become inflamed and narrowed (figure 16). This can lead to symptoms such as wheezing, coughing, chest tightness, and difficulty breathing. It's important to note that an asthma attack can be a medical emergency and requires prompt treatment.

Signs and symptoms of an asthma attack may include:

- **Wheezing: A high-pitched whistling sound when breathing, particularly when exhaling.**
- **Coughing: A persistent cough, particularly at night or early in the morning.**
- **Shortness of breath: Difficulty breathing or a feeling of tightness in the chest.**
- **Chest tightness: A feeling of pressure or tightness in the chest.**
- **Rapid breathing: Breathing faster than normal.**
- **Bluish lips or face: A sign that the person is not getting enough oxygen.**

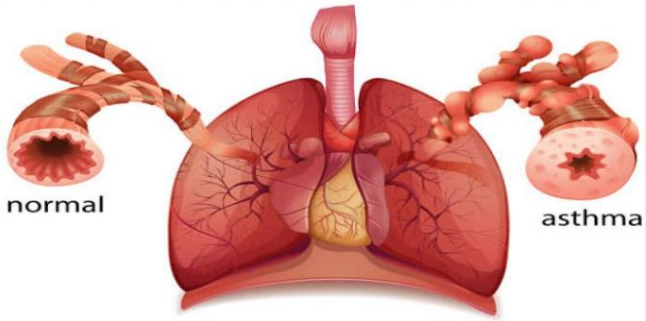

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Figure 16: Asthma diagram with normal lung and asthmatic lung

Asthmatic attacks

Emergency management

- Sit the patient up straight: This helps to open the airways.
- Use a rescue inhaler: Use Beta2-agonist inhaler (Salbutamol inhaler) 1 to 2 deep inhalations
- Call (122)
- Monitor the patient's breathing: Stay calm with the patient and monitor their breathing; give him oxygen at 10L/min flow if available until medical help arrives.
- If unresponsive, administer epinephrine (0.3-0.5 ml, 1 : 1000, SC; repeat every 20 minutes prn)
- Dispense theophylline ethylenediamine (aminophylline) 250-500 mg IV slowly over a 10- minute period (if the dentist has ACLS training)
- Administer hydrocortisone sodium succinate 100 mg IV (if the dentist has ACLS training)
- Monitor and record vital signs
- Arrange for rapid transport of patient to the hospital

NOTE:

- Because aminophylline may cause hypotension, it should be given with extreme caution to patients with asthma who are hypotensive. If the person has a prescribed inhaler, use it as directed.
- It is important to seek medical attention promptly for an asthma attack, as it can be life-threatening if left untreated.

Cerebrovascular accidents (stroke)

Cerebrovascular accidents, also known as strokes, occur when the blood supply to the brain is interrupted or reduced, leading to the death of brain cells. This can happen due to a blockage in an artery supplying the brain, known as an ischemic stroke, or due to bleeding in the brain, known as a hemorrhagic stroke. Strokes are a serious medical emergency and require immediate medical attention (figure 17).

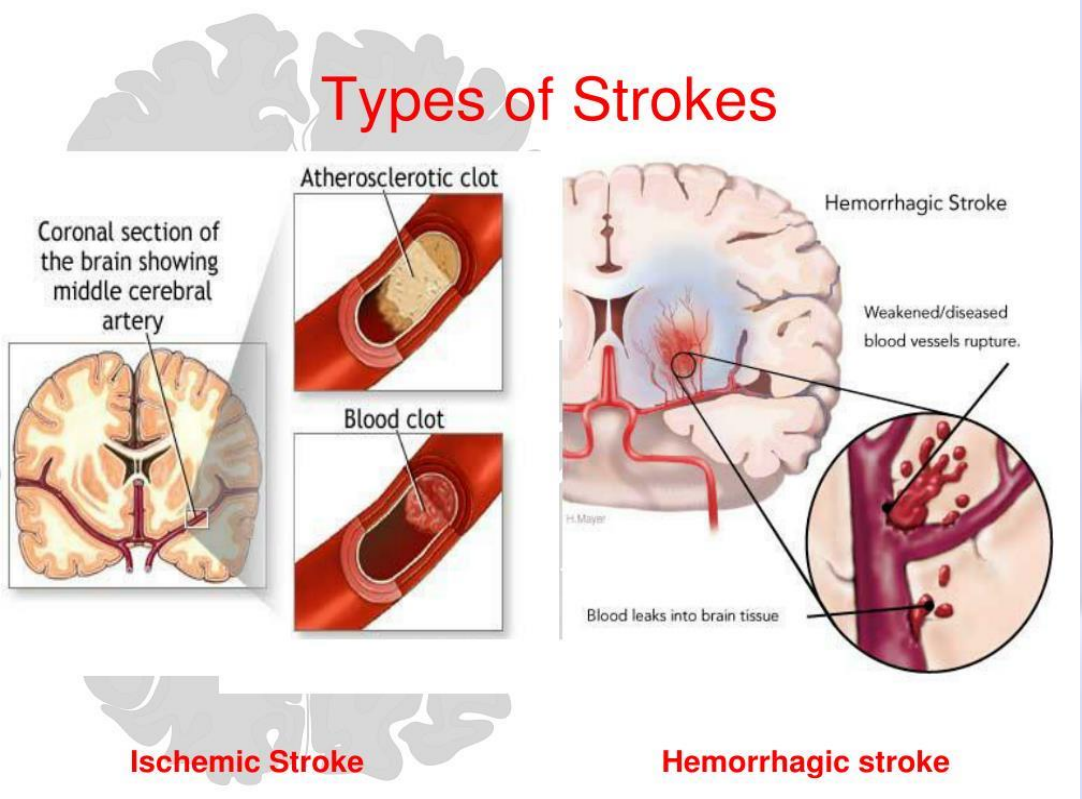

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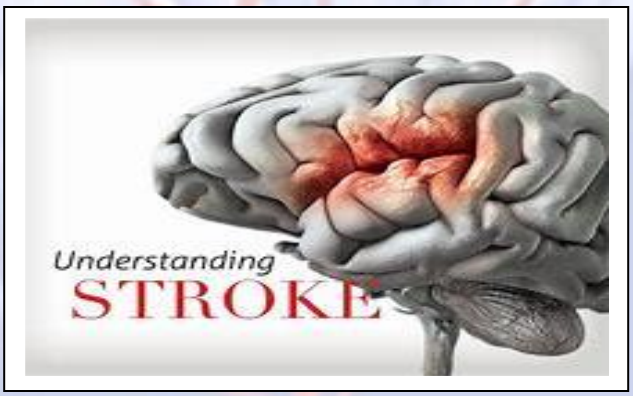
Figure 17: types of strokes

Cerebrovascular accidents (stroke)

The symptoms of a stroke can vary depending on the part of the brain that is affected. Some common sign symptoms include:

- **Sudden weakness or numbness in the face, arm, or leg, especially on one side of the body.**
- **Difficulty speaking or understanding speech**
- **sudden vision problems**
- **dizziness**
- **loss of balance or coordination**
- **severe headache.**



The risk factors for stroke include:

- **High blood pressure,**
- **Smoking, diabetes,**
- **High cholesterol,**
- **Obesity,**
- **Physical inactivity, and a family history of stroke.**

Cerebrovascular accidents (stroke)

Emergency management

Here are some key points to keep in mind when it comes of strokes:

1. **Time is critical: It is important to act quickly when dealing with a stroke. The sooner the person receives medical attention, the better their chances of recovery. If you suspect someone is having a stroke, call for emergency (122) medical services immediately.**
2. **Know the signs and symptoms: Learn to recognize the signs and symptoms of a stroke, which include sudden weakness or numbness on one side of the body, trouble speaking or understanding speech, sudden confusion, difficulty seeing in one or both eyes, and sudden severe headache.**
3. **Stay calm and supportive: If someone is having a stroke, remain calm and supportive. Reassure them that help is on the way and help them lie down in a comfortable position.**
4. **Please do not give the person anything to eat or drink: It is crucial not to give the person anything to eat or drink, as this can lead to choking or aspiration.**
5. **Follow medical advice: Once emergency medical services arrive, follow their advice and instructions. They may administer medication or recommend transport to a hospital for further treatment.**

Epileptic Seizures

Epileptic seizures are a result of abnormal electrical activity in the brain. This can be caused by various factors like genetics, head trauma, infection, or stroke. In addition, seizures can be triggered by stress, lack of sleep, alcohol, or exposure to flashing lights.

Classification of Epileptic Seizures (figure 18)

I. PARTIAL (FOCAL, LOCAL)

- **Simple partial seizures**
- **Complex partial seizures**
- **Partial seizures evolving to secondarily generalized seizures**

GENERALIZED (CONVULSIVE OR NONCONVULSIVE)

- **Absence seizures (petit mal)**
- **Myoclonic seizures**
- **Tonic-clonic seizures (grand mal)**
- **Tonic seizures**
- **Atonic seizures**

UNCATEGORIZED EPILEPTIC SEIZURES

C

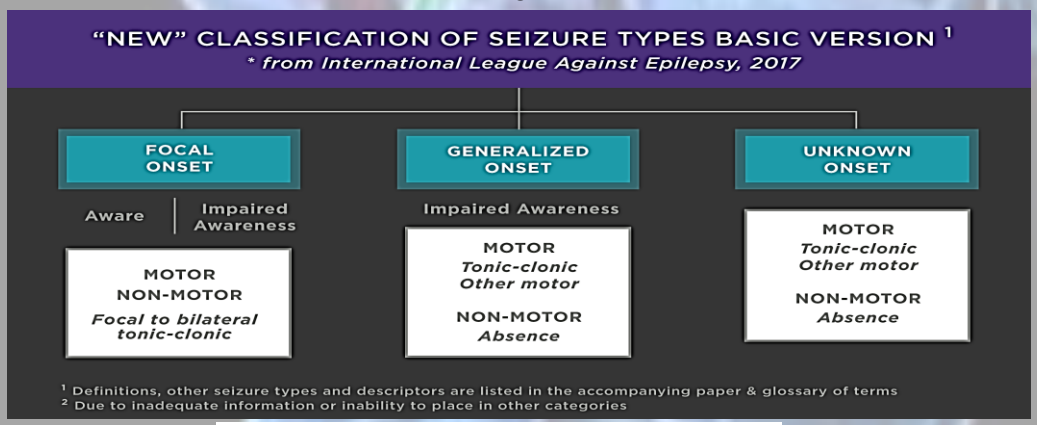


Figure 18: Classification of epileptic seizers.

Epileptic Seizures

➢ **Prevention**

1. Proper drug history before procedure
2. Use mouth prob or mouth gag during dental treatment.

➢ **Management – (figure 19)**

1. Patient is made to lie down flat.
2. Remove all objects that may harm the patients.
3. Intravenous I.V. Diazepam injection(if the dentist has ACLS training)
4. Maintenance of airway
5. Artificial ventilation if required.
6. Medical help
7. Medical assistance

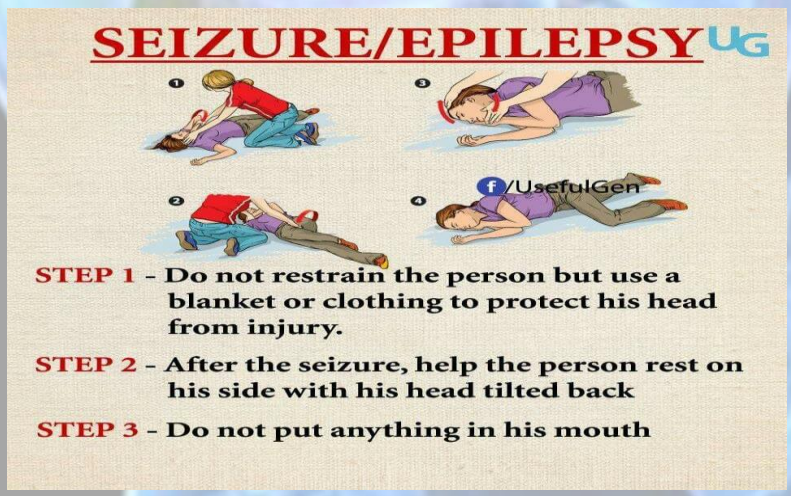


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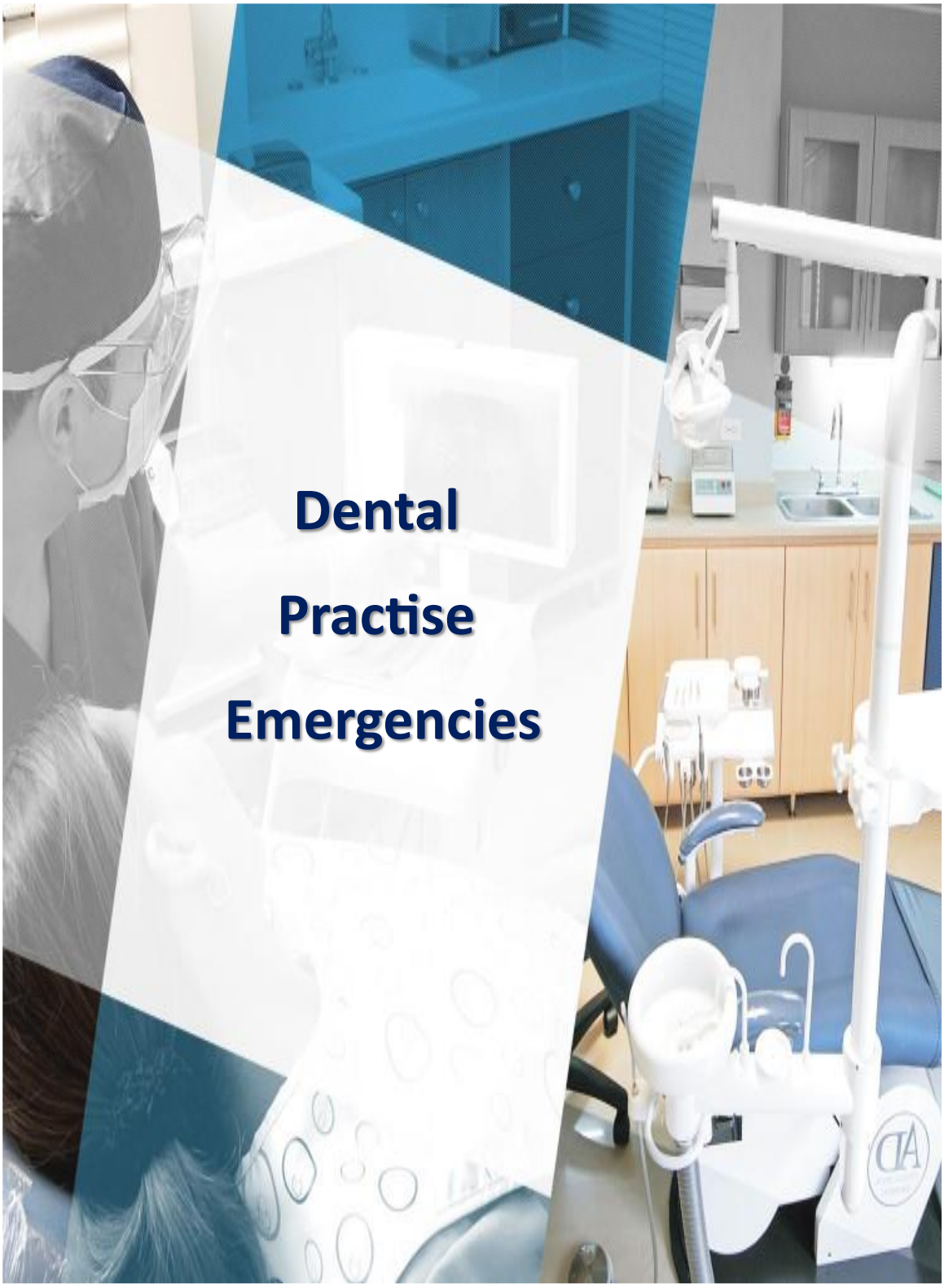
Figure 19: Management of epileptic seizure


Dental
Practise
Emergencies

Needle-stick Injuries

- Needle-stick injuries are a common occupational hazard among dental workers and can result in serious health consequences.
- The risk of transmission of blood-borne pathogens such as HIV, hepatitis B and C, and other infectious diseases is high with needle-stick injuries (figure 20).

Figure 20: Needle stick

Needle-stick Injuries

Management:

- **Immediate first aid after a needle-stick injury involves washing the affected area with soap and water and applying antiseptic.**
- **Post-exposure prophylaxis (PEP) is a preventive treatment given to individuals who may have been exposed to blood-borne pathogens. PEP typically involves a combination of antiretroviral drugs and immunoglobulin, which can reduce the risk of infection if initiated promptly.**
- **Within 48 hours of exposure, health care workers (HCWs) who did not obtain a vaccination (figure 21) should get hepatitis B immunoglobulins (HBIG).**
- **The antibody titer determines the course of treatment for vaccinated HCWs.**

Figure 21: hepatitis B immunoglobulins vaccination.

Needle-stick Injuries

To prevent needle-stick injuries, it is important for d ental workers to follow a protocol that includes the following steps:

- **Use safety-engineered devices: Use safety-engineered devices, such as retractable needles, needle-free injection systems, and self-sheathing needles (figure 22), that are designed to minimize the risk of needle-stick injuries or use needle recapping device (figure 23) .**
- **Follow proper infection control procedures: Follow proper infection control procedures, such as using gloves, masks, and protective eyewear, as well as cleaning and disinfecting all equipment and surfaces in the dental office.**
- **Dispose of sharps properly: Sharps, such as needles and scalpel blades, should be disposed of properly in puncture-resistant containers that are labeled with a biohazard symbol.**
- **Never recap needles: Never recap needles by hand, as this increases the risk of a needle-stick injury. Instead, use a mechanical device, such as a one-handed scoop technique, to pick up the needles. Correct and wrong recapping and removal of the needle cap show in the (figure 24).**
- **Report all injuries: Report all needle-stick injuries to the appropriate supervisor or occupational health provider as soon as possible. Follow-up medical treatment and testing may be necessary.**

Needle-stick Injuries

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Figure 23: Self sheathing dental

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Figure 22 :Needle recapping device

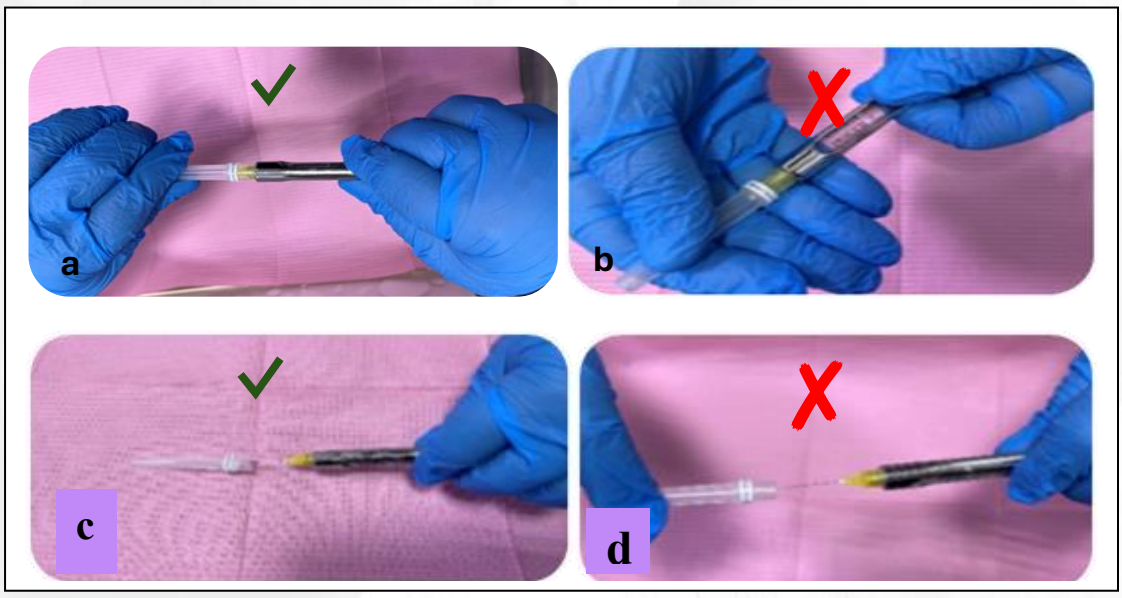
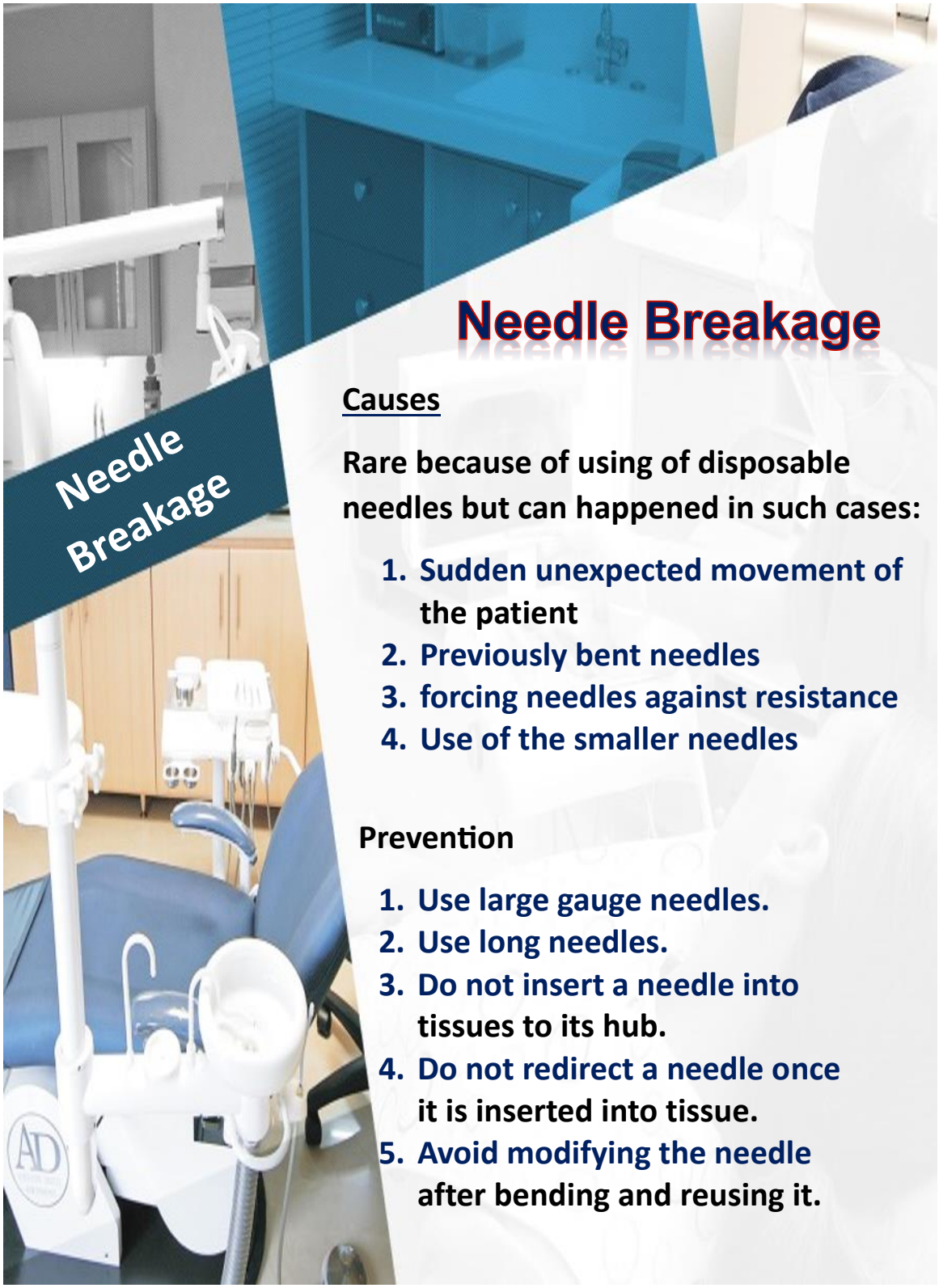


Figure 24: Removing and Recapping of the dental needle cap. a- The correct way to remove the cap, b- the wrong way, c- the correct recapping, d- wrong recapping. (picture taken in Basrah dental college)



Needle Breakage

Causes

Rare because of using of disposable needles but can happened in such cases:

1. **Sudden unexpected movement of the patient**
2. **Previously bent needles**
3. **forcing needles against resistance**
4. **Use of the smaller needles**

Prevention

1. **Use large gauge needles.**
2. **Use long needles.**
3. **Do not insert a needle into tissues to its hub.**
4. **Do not redirect a needle once it is inserted into tissue.**
5. **Avoid modifying the needle after bending and reusing it.**

Needle Breakage

Dental needle breakage is a rare but potentially serious complication that can occur during dental procedures. If a needle breaks during a procedure, it is important to follow a protocol that includes the following steps:

1. **Stop the procedure: Stop the procedure immediately and remove any remaining portion of the needle that is accessible.**
2. **Assess the patient: Assess the patient for any signs or symptoms of needle breakage, such as pain, swelling, or bleeding.**

A) When a needle breaks (visible):

- **Stay calm and instruct the patient not to move and let his/her mouth open.**
- **If the fragment visible, remove it with hemostat or a Magill intubation forceps (figure 25).**

Figure 24: Magill forceps

B) When a needle breaks (not visible):

- **No incision or probing.**
- **Calmly inform the patient.**
- **Referral Oral Surgeon, take radiograph and determine if it is superficial, remove or leave it and flow up?**

3. **Notify the patient: Notify the patient of the needle breakage and explain the steps that will be taken to address the situation.**
4. **Inform the dentist: Inform the dentist or other appropriate supervisor of the needle breakage and seek guidance on how to proceed.**
5. **Refer the patient for further evaluation: Refer the patient to a specialist or emergency department for further evaluation and management.**

Soft Tissue Injury

Definition

An oral soft tissue injury refers to damage or trauma that occurs to the soft tissues within the oral cavity. These soft tissues include the lips, cheeks, tongue, gums, and the lining of the mouth (figures 27-29).

Causes:

1. **Unskilled dentist or poor techniques** by the dentist like uncontrol force, wrong instruments, ets.
2. **Lip, tongue, and cheek injuries** caused by the patient themselves are the hallmarks of this condition. Adults with mental retardation and children often experience this.
3. **Uncooperative patient during dental** treatments.

Notes: Types of soft tissue injuries listed in figure 26.

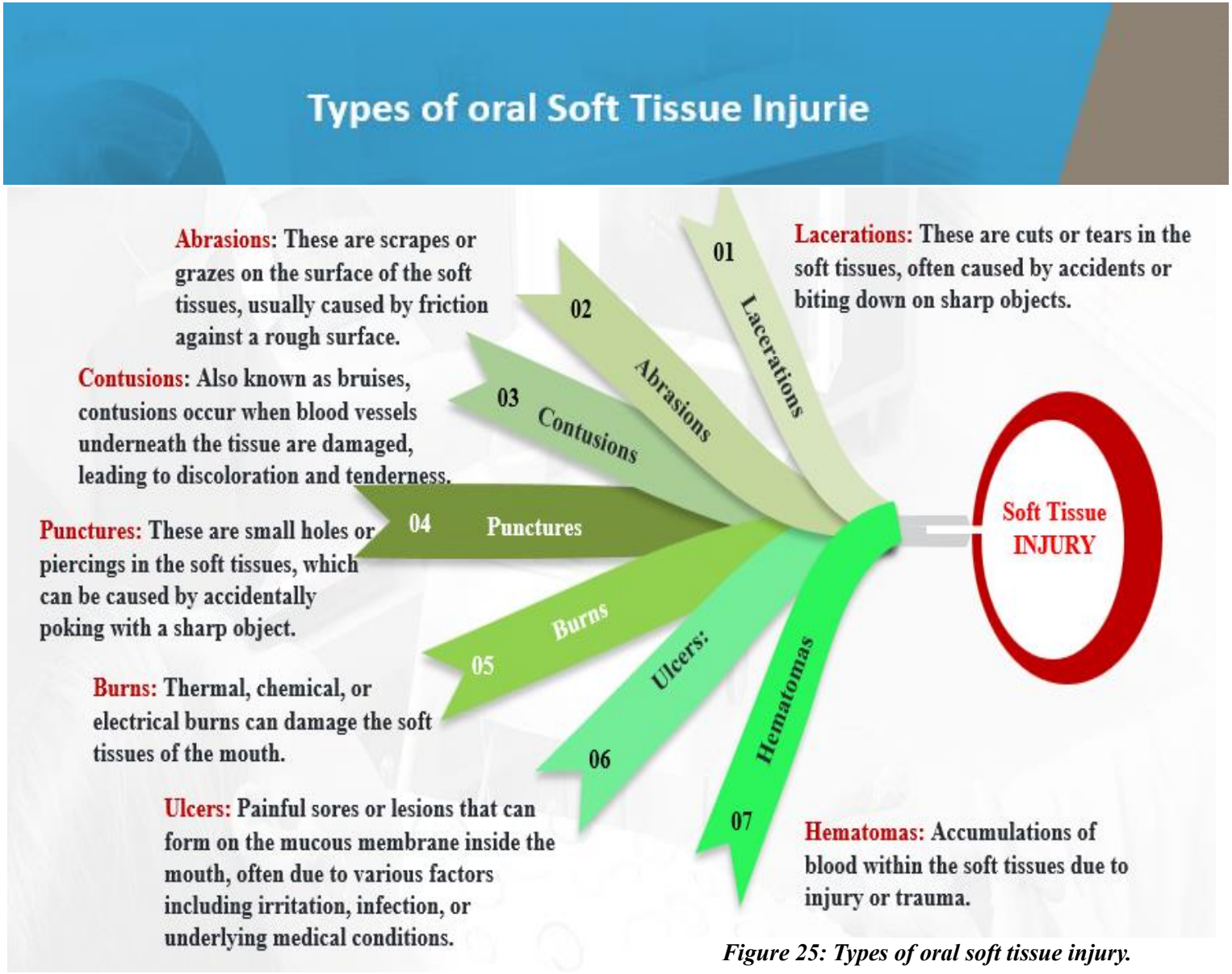


Figure 25: Types of oral soft tissue injury.

Soft Tissue Injury

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Figure 27: Injure of the tongue.

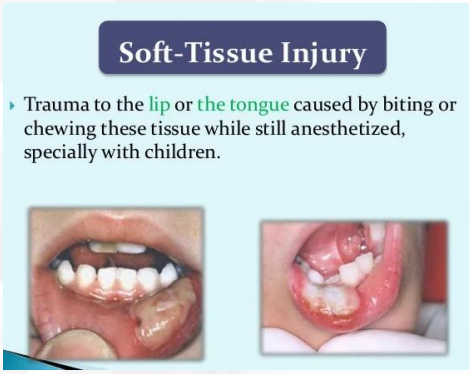

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Figure 26: Traumatised injure to the lip.

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Figure 28: Injure to the lip due to prolong anaesthesia

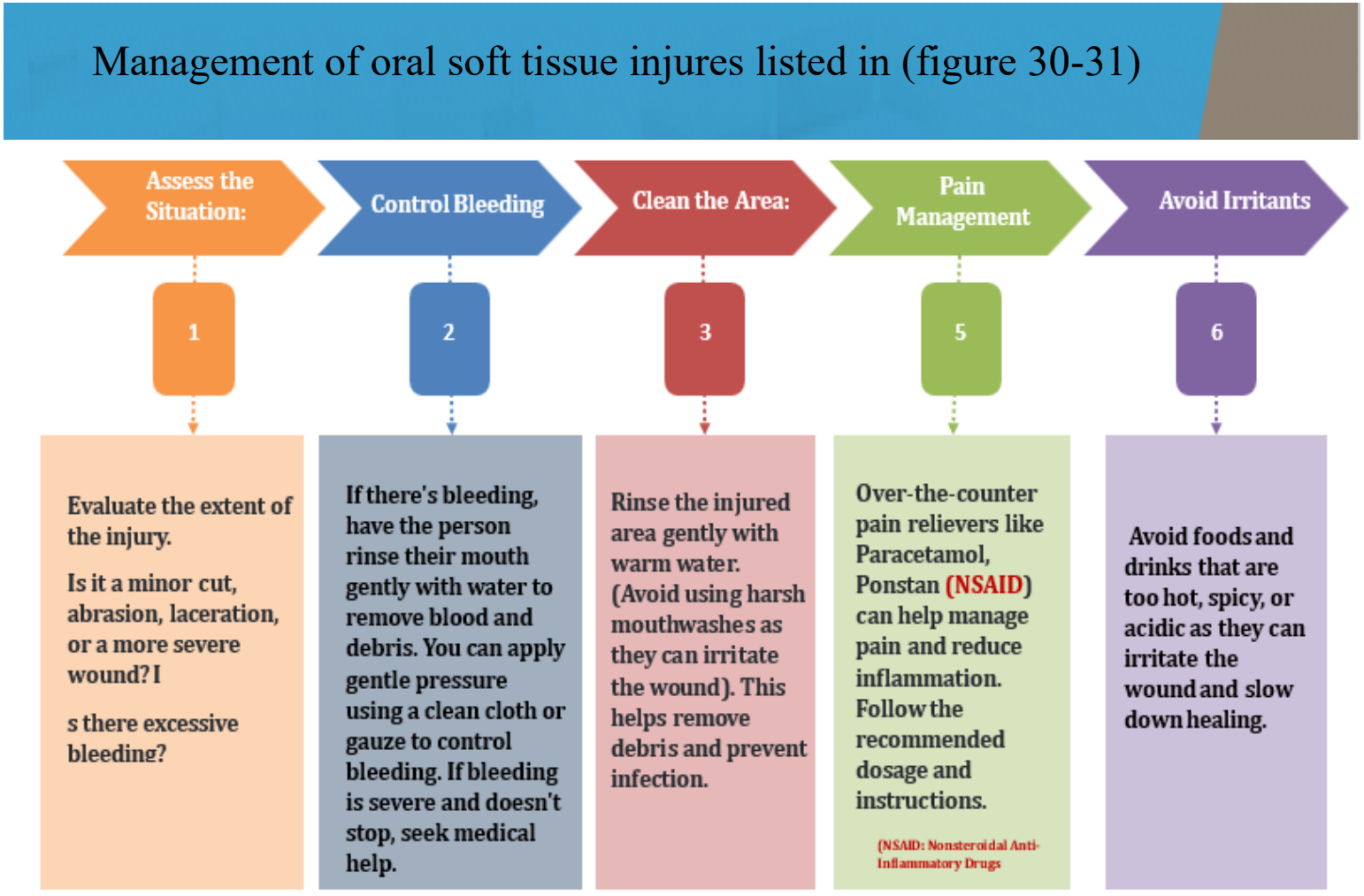

Figure 29: Management of oral soft tissue injures

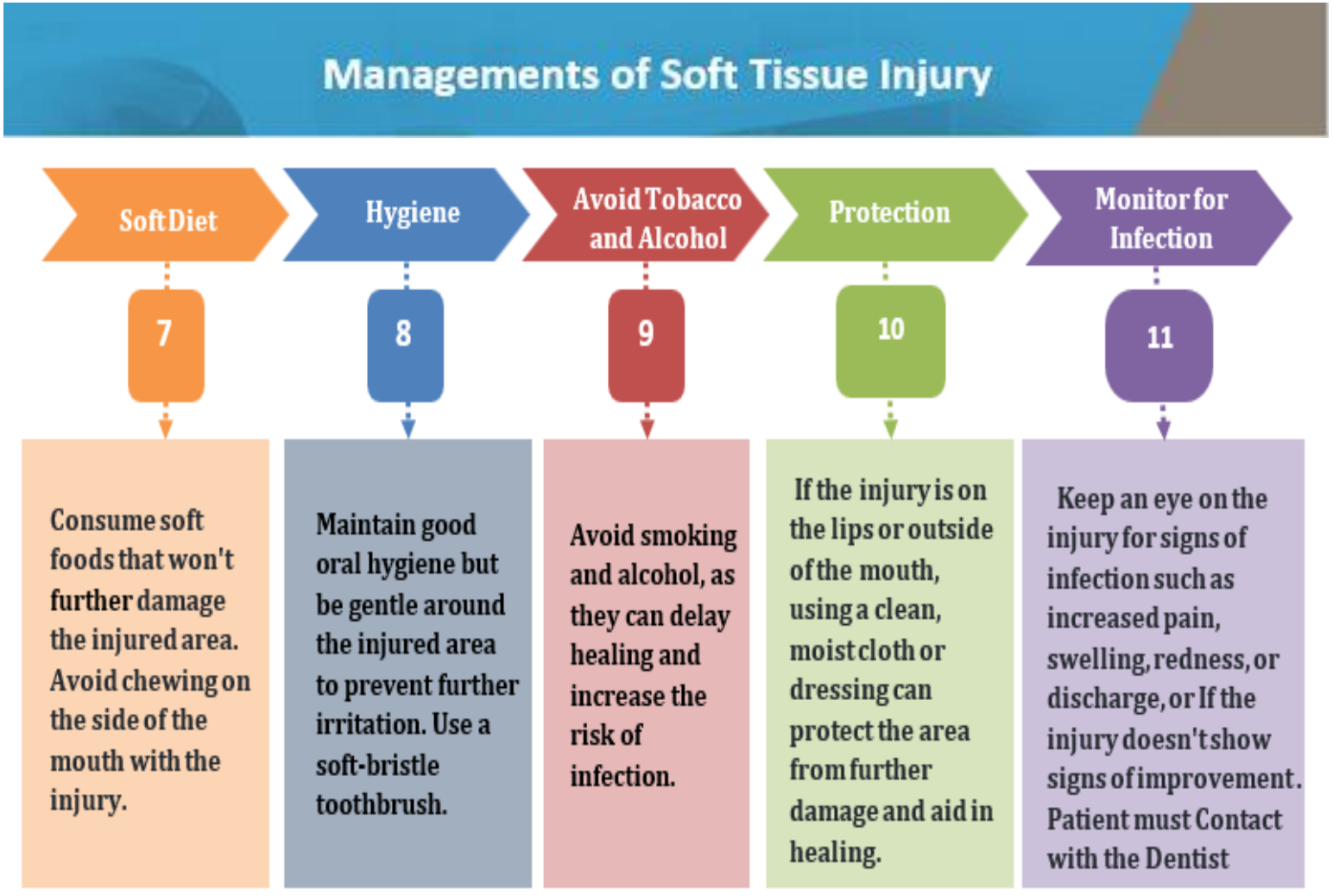

Figure 30: Management of oral soft tissue injures

Prevention of soft tissue injury

- **Dentists need to be well-versed in their field and skilled in-patient treatment and care.**
- **Employ the smallest effective dosage of local anaesthetic.**
- **Notify the patient's parents that they should not bite their lips or tongue while the anaesthetic is still working, and that they should also avoid consuming anything spicy.**
- **Patients who are not under control are sent to the hospital to undergo treatment under medication.**
- **Give the patient instructions after each treatment to avoid complications that may occur if the patient does not adhere to the instructions accurately (figure 32).**

Instructions After Wisdom Tooth Extraction - Search Images (bing.com)

Figure 31: Post extraction instructions

Soft Tissue Sloughing

Sloughing of tissue, also known as tissue necrosis, refers to the process in which a part of the body's tissue, such as skin, mucous membranes (figure 34), or internal organs, begins to die and subsequently separates or peels away from the healthy tissue. This can be the result of various factors, including infection, injury, poor blood circulation, underlying medical conditions, or the use of certain medications.

In dentistry Sloughing of Tissues occur when

External layer of tissue that loosens when

exposed to extensive topical anesthetic,

abrasive toothpaste, mouth rinses, smokeless tobacco.

Types of soft tissue sloughing listed in figure 33)

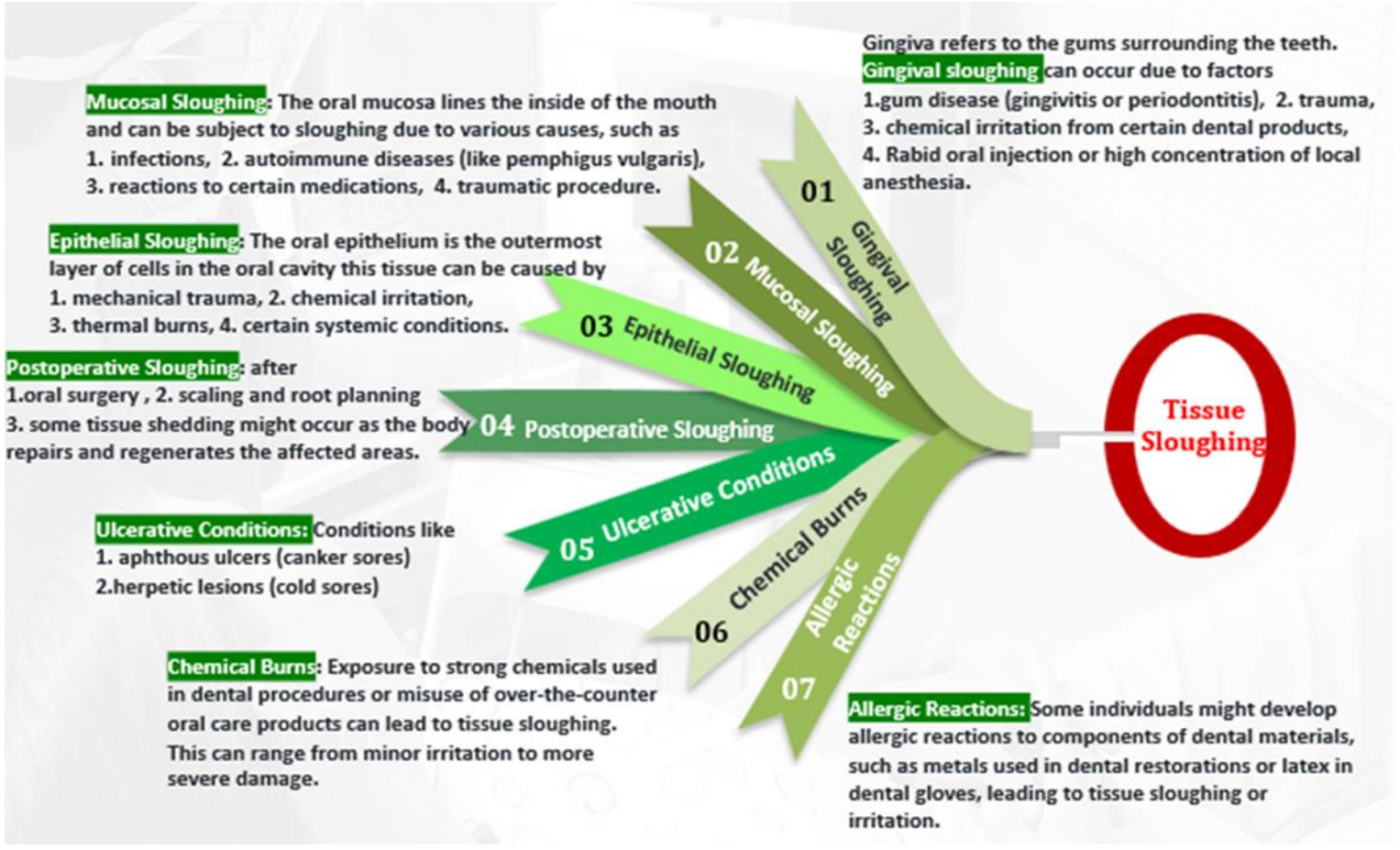

Figure 32: Types of soft tissue sloughing.

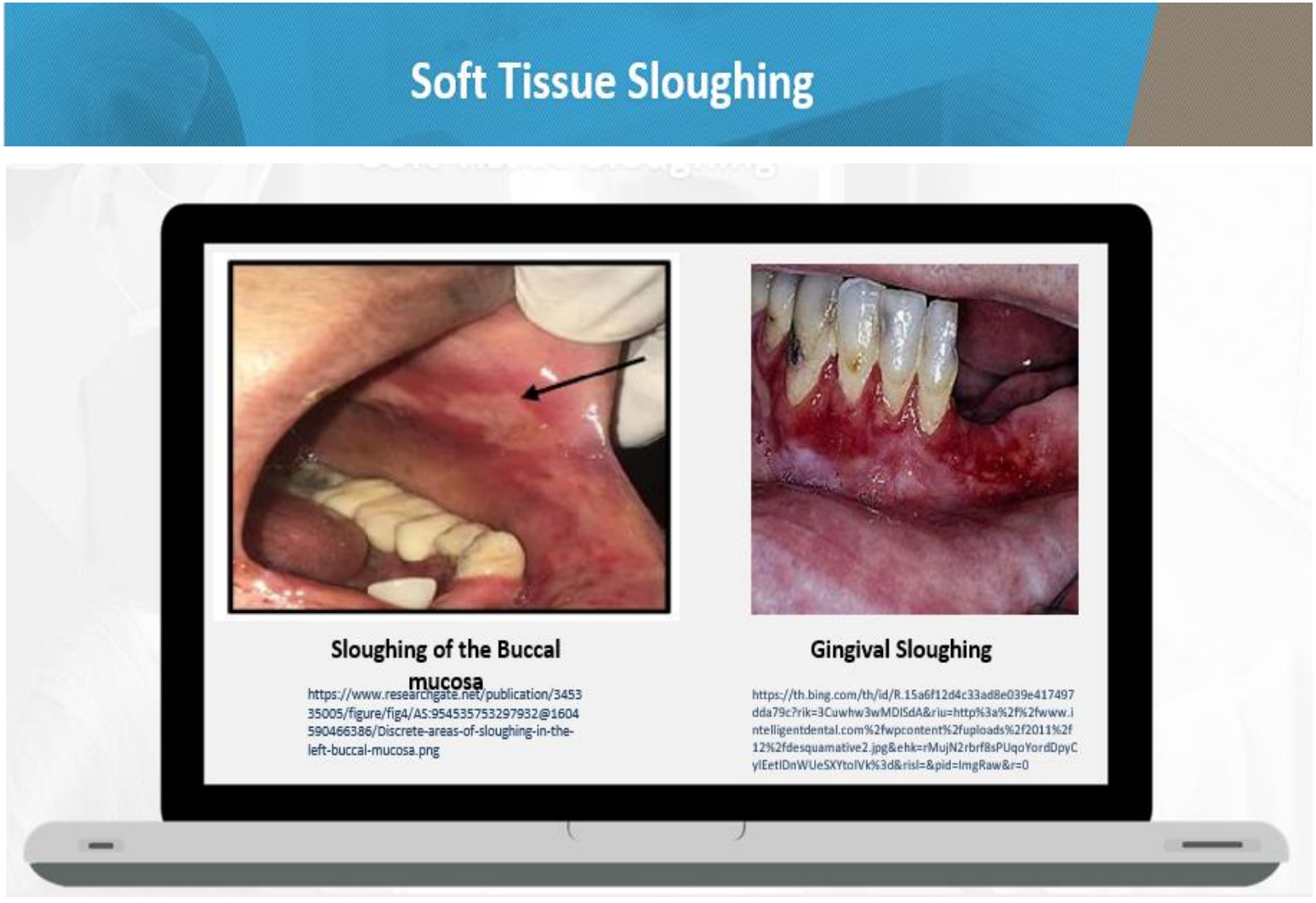

Figure 33: Sloughing of the buccal mucosa and gingiva

Managements of Soft tissue sloughing listed in figure 34

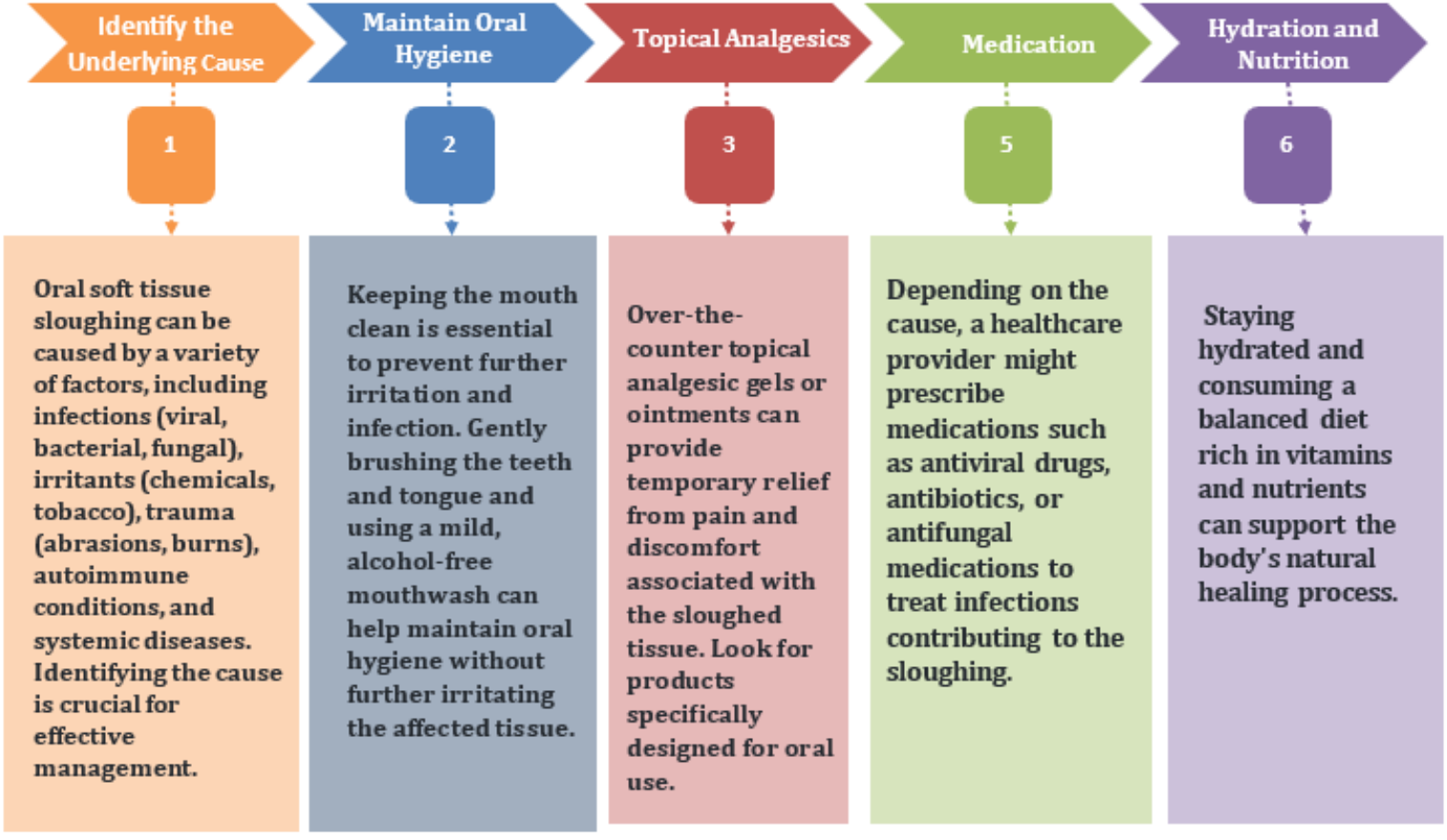

Figure 34 : Managements of Soft tissue sloughing

Facial nerve palsy

Facial palsy after a dental injection is a rare but concerning occurrence. This condition is often referred to as "dental injection facial nerve palsy" or "local anesthesia-induced facial nerve palsy." (figure 35) Here are some potential causes and factors associated with this condition:

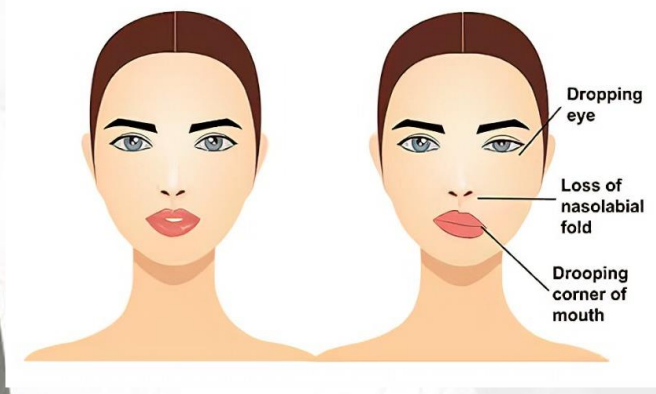

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Figure 35: Facial palsy

Facial nerve palsy

Causes

1. **Anatomical Variations: The anatomy of the patient's face and oral cavity can vary, and in some cases, the facial nerve may run in an unusual path, making it more susceptible to injury during a dental injection.**
2. **Injection Technique: Improper injection technique, such as deep or forceful injections, can increase the risk of nerve damage.**
3. **Infection or Abscess: In some cases, an underlying infection or dental abscess may lead to facial nerve inflammation or compression, resulting in facial palsy.**

Sign & Symptoms of facial palsy seen in (figure 36).

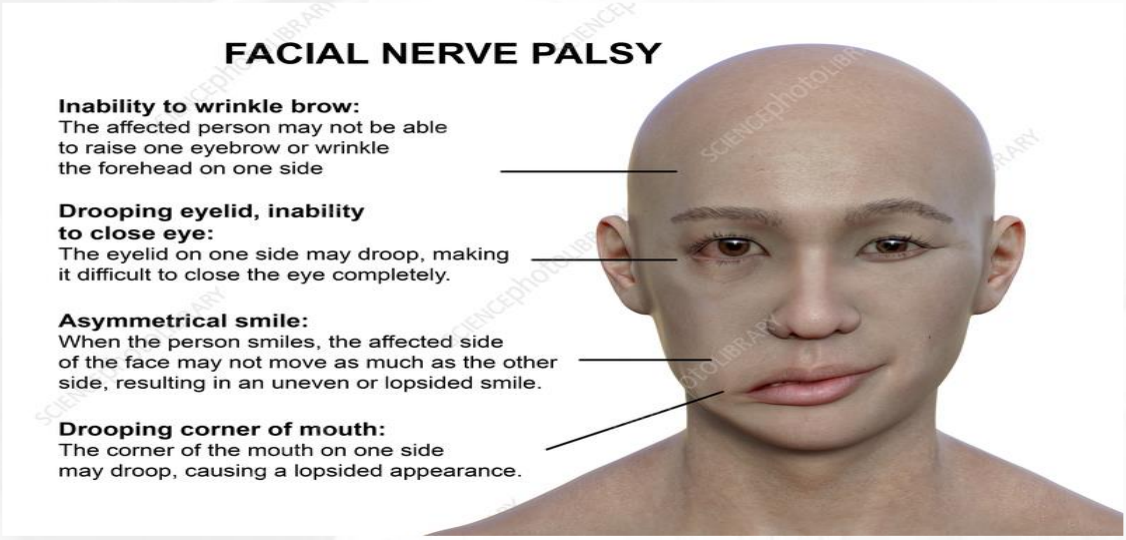

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Figure 36: Sign and Symptoms of Facial Palsy.

Management Facial nerve palsy

- **If this happens, be cool and explain what's happening. Reassure the patient that it's only temporary and that everything will be OK in three hours once the local anaesthetic wears off.**
- **Since the paralysis of the facial nerve prevents the patient's eyelids from closing, it is important to prescribe lubricating eye drops and instruct the attendant or patient to apply two drops to the affected eye every fifteen minutes. This will help to keep the eyes moist.**
- **Instruct the patient to cover their open eye with a clean towel so that dust doesn't go in.**
- **Lastly, advise the patient to remain in the clinic for at least three hours after the local anaesthetic wears off so that you can check their condition.**
- **Systematic management medical, surgical and physiotherapy seen in (figure 37).**

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Figure 37: Systematic management of facial Nerve Palsy.

Aspirating or swallowing of foreign bodies in dental clinics

- **A major risk during dental procedures is the ingestion of dental instruments and materials.**
- **It is possible to aspirate or swallow any object that is typically inserted into or extracted from the mouth during dental or surgical procedures.**
- **In this category you may find things like imprint materials, gauze packs, instruments, implant components, restorations, instruments, instruments, and rubber dam clamps.**
- **In most cases, when foreign bodies enter the digestive system, they pass through on their own. Surgery may be necessary in less than one percent of instances, while ten to twenty percent of cases can be treated nonsurgically.**

General consideration

- **Symptoms may develop later in patients who swallow foreign bodies, but they are often asymptomatic in the beginning. The gastric mucosa can be damaged, an abscess can form, the intestines can be perforated, the airway can become partially, or fully blocked, respiratory distress, pneumothorax, or haemorrhage can occur because of foreign body aspiration or ingestion (figure 38).**
- **It can be fatal if these cases are not handled appropriately, and intervention is not done promptly.**
- **So, it's important for general dentists to know how to treat patients who have aspirated dental objects or who have swallowed them.**

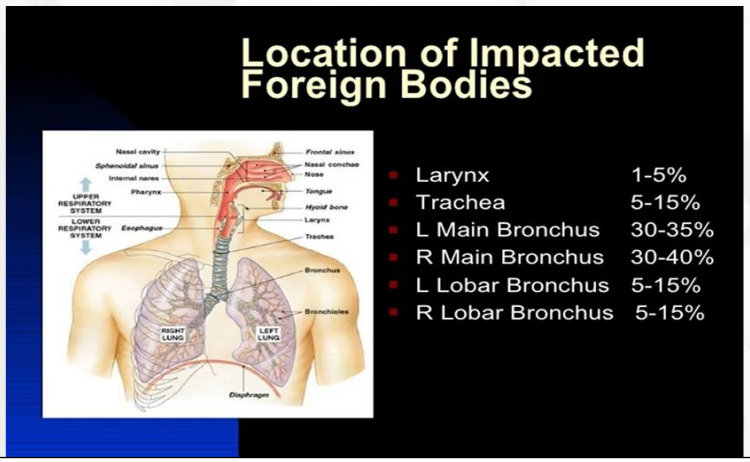

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Figure 38: Location of foreign bodies in the chest

Management

Management of Aspirating or Swallowing of foreign bodies in dental clinics by Heimlich maneuver

1. **Stand behind the person and place your one foot slightly in front of the other for increased stability and support.**
2. **Make a fist with one hand and place it over the umbilical area, Grab your fist with the other hand.**
3. **start thrusts by pulling in and upward between five and ten times until the blockage (figure 39).**

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Figure 39: Heimlich manoeuvre

Dislocation of TMJ

Types of dislocation

1. **Unilateral**
2. **Bilateral**

Causes of TMJ Dislocation

First, using too much force; **second**, not supporting the jaw during tooth extraction; and **third**, the relaxation of the mastication muscles, which is more common when the patient is under general anaesthesia.

Signs & Symptoms of TMJ dislocation

Unilateral condylar dislocation

1. Lateral displacement of the chine.
2. Difficulty in closing of the mouth (figure 40).
3. Pain and tenderness

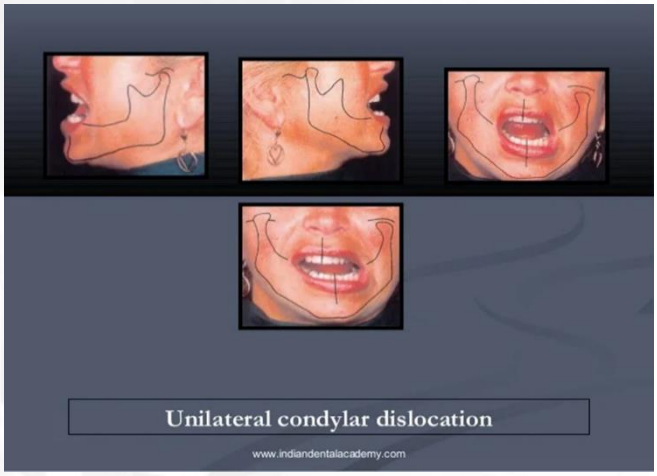

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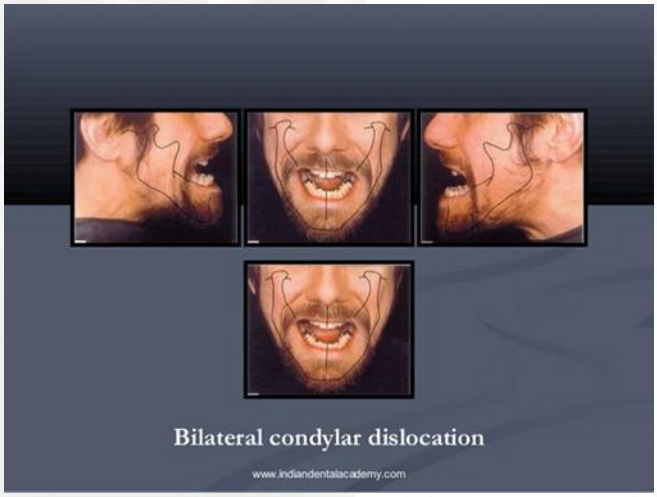
Figure 40: ***Unilateral condylar dislocation.***



Bilateral condylar dislocation

1. Anterior open bite.
2. Difficulty in closing of the mouth (figure 41).
3. Pain and tenderness

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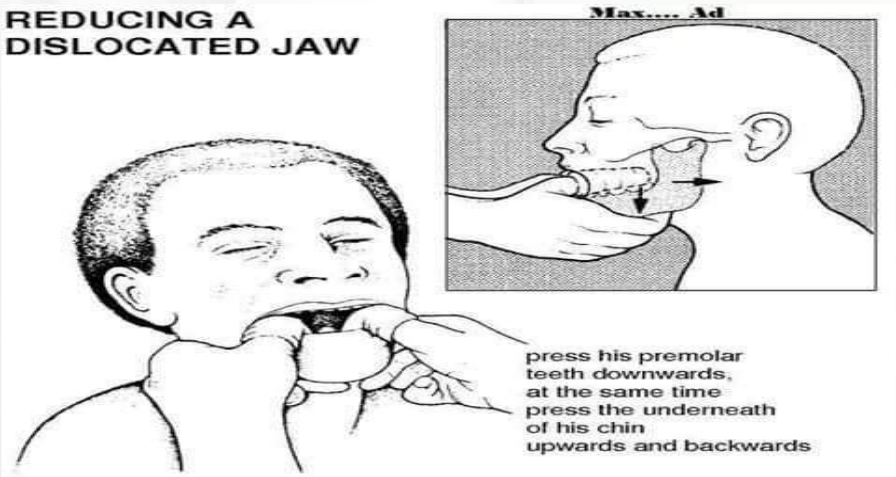
Figure 41: Bilateral condylar dislocation.

Management of TMJ dislocation

Reduction by thumb:

1. To do reduction, one must **protect the thumb from tooth damage by wrapping it in gauze or a bandage**. The thumb should then be put on the occlusal surfaces of the back teeth of the jaw, while the finger should be placed beneath the lower border of the mandible.
2. **Mandible is then pushed downward backward rotating the chin upwards. with this manpower the condyles are moved downwards and backwards over the articular eminences of temporal bone (figure 42).**
3. **Stabilizing the mandible by using chin band for 24 hours to avoid dislocation.**
4. **Reassurance of the patient.**



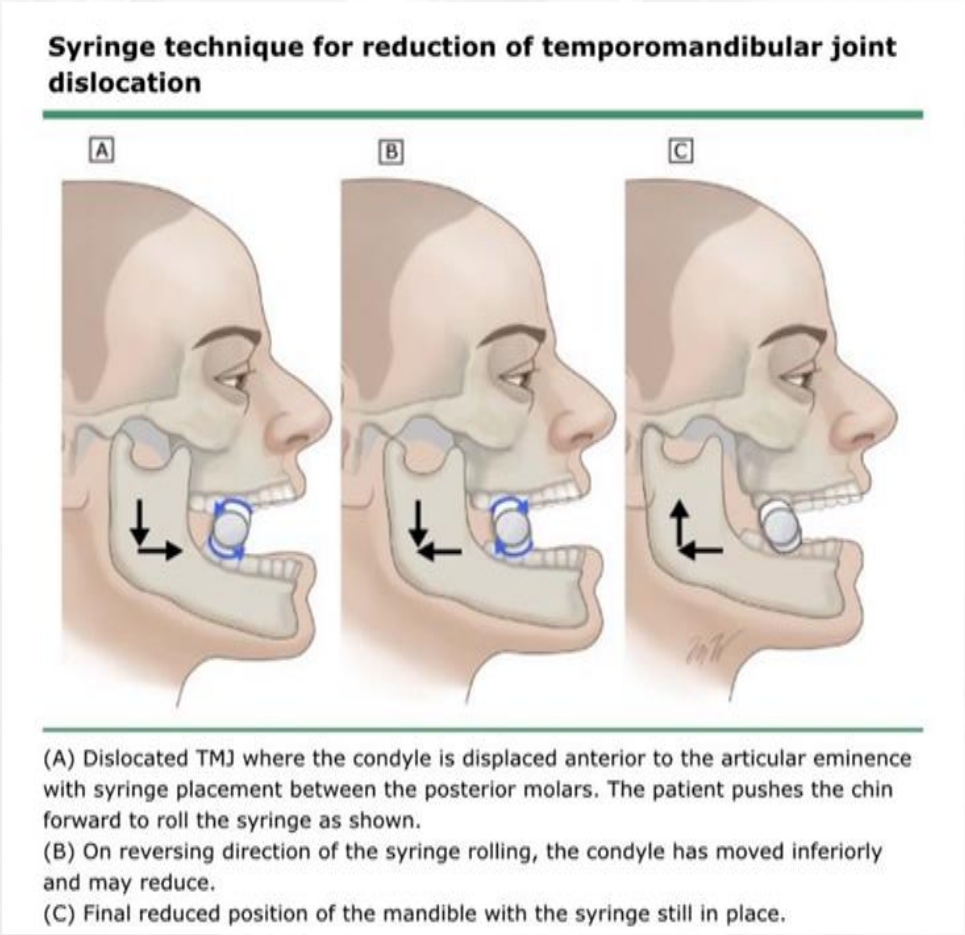
https://images.saymedia-content.com/.image/c_limit%2Ccs_srgb%2Cfl_progressive%2Cq_auto:good%2Cw_700/MTc0NDU5NTY4NzY3MDUxMTEy/tmj-temporomandibular-joint-disorder-tmj-dislocated-jaw.jpg

Figure 42: Reduction of dislocated TMJ.

Management of TMJ dislocation

Reduction by syringe:

Syringe inserted horizontally in between the upper and lower molar teeth and ask the patient to close his mouth, syringe will play a role like that with thumb reduction (figure 43).



https://th.bing.com/th/id/OIP.UeMNH3Vr7pYF6PJxaecc4gHaG7?w=162&h=180&c=7&r=0&o=5&pid=1.7

Figure 43: Redaction of displace condyle by syringe rolling.

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Clinical Laboratory Tests and Normal Values

Test	Range of Normal Values
COMPLETE BLOOD COUNT	
White blood cells	4400-11,000/mL
Red blood cells (male)	4.5-5.9 10^6/μL
Red blood cells (female)	4.5-5.1 10^6/μL
Platelets	150,000-450,000/μL
Hematocrit (male)	41.5%-50.4%
Hematocrit (female)	35.9%-44.6%
Hemoglobin (male)	13.5-17.5 g/dL
Hemoglobin (female)	12.3-15.3 g/dL
Mean corpuscular volume (MCV)	80-96 μm^3
Mean corpuscular hemoglobin (MCH)	27.5-33.2 pg
Mean corpuscular hemoglobin concentration (MCHC)	33.4%-35.5%
DIFFERENTIAL WHITE BLOOD CELL COUNT	MEAN %
Segmented neutrophils	56
Bands	3
Eosinophils	2.7
Basophils	0.3
Lymphocytes	34
Monocytes	4
HEMOSTASIS	
Bleeding time (BT)	2-8 minutes
Platelet function analyzer (PFA) 100	Closure time <175 seconds
Prothrombin time (PT)	10-13 seconds
Activated partial thromboplastin time (aPTT)	25-35 seconds
SERUM CHEMISTRY	
Glucose, fasting	70-110 mg/dL
Blood urea nitrogen (BUN)	8-23 mg/dL
Creatinine	0.6-1.2 mg/dL
Bilirubin, indirect (unconjugated)	0.1-1.0 mg/dL
Bilirubin, direct (conjugated)	<0.3 mg/dL
Calcium, total	9.2-11 mg/dL
Magnesium	1.8-3.0 mg/dL
Phosphorus, inorganic	2.3-4.7 mg/dL
SERUM ELECTROLYTES	
Sodium	136-142 mEq/L
Potassium	3.8-5.0 mEq/L
Chloride	95-103 mEq/L
Bicarbonate	21-28 mmol/L
SERUM ENZYMES	
Alkaline phosphatase	20-130 IU/L
Alanine aminotransferase	4-36 μ/L
Aspartate aminotransferase	8-33 μ/L
Amylase	16-120 Somogyi units/dL
Creatine kinase (male)	55-170 U/L
Creatine kinase (female)	30-135 U/L

Data compiled from McPherson RA, Pincus MR. Henry's Clinical Diagnosis and Management by Laboratory Methods, ed 21. Philadelphia, Saunders Elsevier, 2007, pp 1404-1418.

Emergency Kit

NOTE:

- **The dentist has (ACLS training) can perform IV, IM injections only.**
- **Dentist must periodically review contents, expiration date, and clarity of all drugs periodically (at least monthly). Ensure kit contains the following:**

1. **Oxygen setup**
2. **Blood pressure cuff**
3. **Stethoscope**
4. **Syringes (1, 5, 10, and 20 ml)**
5. **Lacrimal pocket mask**
6. **Disposable airway No. 2, 3, and 4**
7. **Butterflies No. 3, 21 gauge**
8. **22-gauge needles**
9. **IV tubing set, Long No. 880-35**
10. **250 ml dextrose, lactated ringers' solution**
11. **Paper tape roll**
12. **Alcohol sponges**
13. **Curved cricothyrotomy cannula**
14. **Padded tongue blade**
15. **Pulse oximeter/ECG (medical resources)**
16. **Automated external defibrillator (AEB)**
17. **Drugs**
    a) **Atropine 0.4 mg ampule, 1 ml**
    b) **Benadryl (diphenhydramine) 50 mg tablets or 50 mg/ l ml syringe/22 gauge, 1-inch needle**
    c) **Aminophylline (theophylline ethylenediamine) 250 mg/IO ml syringe/22 gauge, 1-inch needle**
    d) **Hydrocortisone sodium succinate 100 mg/2 ml syringe/22 gauge, 1 needle**
    e) **Epinephrine 1 : 1000 1.0 ml ampule**
    f) **Amyl nitrate 0.18 ml bud) For acute relief of angina pectoris)**
    g) **Nitro-glycerine (glyceryl trinitrate (GTN) 0.3 mg tabs (packed as 30/bottle)**
    h) **Two ammonia inhalant buds, orange juice, oral glycose, glucose paste, or**
    a. **dextrose 50% 100 ml**
    i) **Sodium bicarbonate: 50 ml of 7.5% solution (44.6 mEq)—two bottles**
    j) **Ventolin inhaler**
    k) **Diazepam (Valium) 5 mg/ml**
    l) **Lidocaine 2%, 2 ml ampules**

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Graduated from Baghdad College of Dentistry in 1989 and obtained a master's degree in oral and maxillofacial surgery in 1997 from Baghdad University. Worked at Basrah General Hospital in the maxillofacial hall.

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