

## REVIEW ARTICLE

# Medical Emergencies In Dental Practice A Review Article

Dr. Altaf Hussain Chalkoo<sup>1</sup>, Dr. Bazila Illahi<sup>2</sup>

<sup>1</sup>Professor, Head of the Department, <sup>2</sup>Postgraduate Student, Department of Oral Medicine and Radiology, Govt. Dental College, Srinagar, Kashmir, India

### Corresponding Author

Dr. Altaf Hussain Chalkoo

Professor, Head of the Department, Department of Oral Medicine and Radiology, Govt. Dental College, Srinagar, Kashmir, India

Received date: 21 February, 2024

Acceptance date: 15 March, 2024

### ABSTRACT

Medical emergencies in dentistry are any unfavourable medical occurrences that may occur during dental treatment. For each of those incidents to be effectively and safely managed, a proper diagnosis is necessary. In many emergency cases, only basic life support is needed; in others, specific pharmacological therapy may be added. Priorities for preventing medical emergencies in dentistry include recognition, prevention, planning, basic life support, cardiopulmonary resuscitation, and particular medical emergencies. This review gives the idea of common medical emergencies, which may occur in dental office and their management protocol.

**Keywords:** Medical emergencies, Basic life support, Cardiopulmonary Resuscitation, .

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution- Non Commercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

### INTRODUCTION

Emergency is a condition that requires immediate attention and effective management. These situations are life-threatening and must be known to all practitioners so that unnecessary mortality can be avoided.(1) Emergency situations can be prevented to a certain extent by recording detailed medical history, performing complete physical examinations, and monitoring patients thoroughly during procedures. Preparation for emergency preparation and sound knowledge of the management of all emergency situations are generally of great concern to dental professionals, these are life-threatening situations that each doctor must be aware of in order to avoid unnecessary morbidity (2) Today's dental patient - young, old and medically compromised - has a rather complex medical history, increasing the possibility of a dental chair medical crisis. Combining age profiles, multiple diseases and drug dependency results in a clinically complex patient group. Ultimately, dentists face the challenge of knowing and utilizing clinical skills to anticipate and address potential medical emergencies in dental offices. Some diseases and their treatments can increase the likelihood of medical emergencies during clinical treatment, so dentists should have clinical expertise to handle various medical emergencies. The use of local anesthesia and other drugs, dental materials used, and the fear of routine and surgical treatment in dentistry elicits new

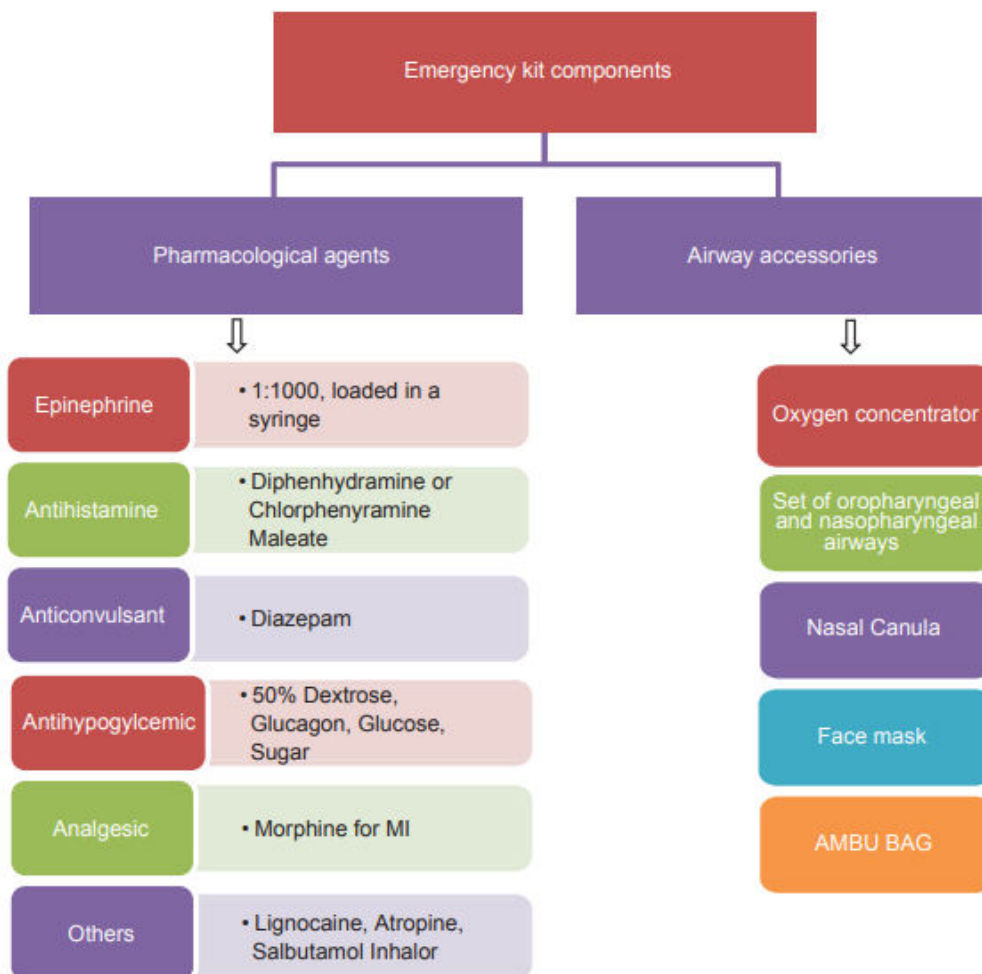
medical conditions, such as syncope, hyperventilation and cardiac arrest. Such situations are more likely within the limits of dental practice due to the increased stress levels that most patients in dental offices encounter. (3) In situations of emergency, it is not uncommon that first responders are affected by panic and inaction, potentially affecting the response time of critical care, thereby increasing patient morbidity and mortality. In the event of such a situation in the clinic, dentists and their teams must have confidence and current medical emergency management skills to provide quality emergency treatment in the first instance.(4)

### PREPARING THE DENTAL OFFICE FOR EMERGENCIES

The clinic should have a resuscitation facility for emergencies and adverse reactions to any kind of treatment provided (e.g. adrenaline, hydrocortisone, pheniramine or its equivalent). The clinic should also have the means to administer through the veins and maintain clear airways in the patient. All medications must be checked to ensure that they do not exceed expiry dates. (5) Emergency kits include various pharmacological agents and airway accessories, as shown in Figure 1. (1) These include intravenous pumping devices, intravenous cannulas, intravenous injection solutions, circulating air viva and different sizes of airways (Figure 2-4). The regulations are

stricter if the clinic performs procedures under sedation. Other requirements are essential, such as advanced cardiac life support (ACLS) trained

sedationists, suitable anaesthetic charts, non-invasive blood pressure monitors, oxygen supply, pulse oximeters and reverse drugs.



**Fig.1 Emergency kit components**



**Fig.2 IV drip set**



**Fig.3 Ambu bag/Air viva**



**Fig.4 Emergency trolley with defibrillator**

In most cases, the dentist performs the resuscitation and the dentist assistant or receptionist activates the Emergency Medical Service (EMS). When the dentist recognizes the emergency, he immediately stops the treatment and shouts to activate the other office employees present. The dental operating chair must be adjusted to comfortable positioning of the patient. Standard basic cardiac survival support protocols for airway, breathing and circulation assessment should be initiated immediately. This is the standard initial management of any emergency. During patient waiting times, the patient's vital signs should be monitored. Dental teams must know how to perform simple measures to maintain the airways with jaw thrust procedures, oral airways insertion, and the use of Ambu bags or Air-Viva to reduce the need for oral to mouth rescue breathing.(5)

#### **THE PRIMARY SURVEY IN MEDICAL EMERGENCIES**

- Keep your composure in mind.
- Ensure the safety of the patient, your team, and yourself. For instance, be sure there are no sharp objects nearby that could endanger yourself even more.
- Check the patient to see if they appear sick.
- Ask the patient whether they are conscious, "Are you okay?" If the person is unconscious or doesn't respond to your questions, give them another gentle shaking.
- If the patient answers normally, you can presume that their airways are clear, they are breathing normally, and their brain perfusion is being maintained.
- Short-sentence answers and the presence of stridor are indicators that an airway issue is occurring.

#### **ABCDE PROTOCOL**

##### **AIRWAY**

- Examine airway patency (fig.5)
- Gurgling is a sign of a foreign body obstruction that is liquid or semi-solid.
- Partial blockage: Inhalatory 'stridor' (laryngeal level or above), expiratory 'wheeze' signals lower airway obstruction.
- Total obstruction: Quiet chest and no breath sounds.

##### **BREATHING**

- Check for respiratory distress symptoms:
- Sweating, abdominal breathing, use of accessory muscles of respiration (neck muscles), and central cyanosis (tongue, mucosal membranes).
- Put your ear above the mouth to hear the sounds of the breath. (fig.6)
- Keep track of your respiratory rate (RR): A healthy adult's RR is 12–20; a child's is 20–30.
- Examine the symmetry and depth of inspiration through chest expansion.

##### **CIRCULATION**

- Check the carotid or radial pulse.(fig.7)
- Take a close look at the hands and fingers to see if they are blue, pink, or speckled in colour. Feel the patient's hand to determine the limb temperature:
- To measure the capillary refill time, blanch the fingertip for five seconds at heart level. An average refill takes three seconds.(fig.8)
- Check your blood pressure if your skills and equipment allow. (6)

##### **DISABILITY**

Using the ACVPU score, determine the degree of consciousness:

- Alert?
- Delirium or confusion?
- Reacts to vocal stimulation?
- Responds to Pain?
- Unresponsive?
- Examine pupils for size, equality and light reflex.

A standard scoring system for assessing a person's level of consciousness following traumatic brain injury is called the Glasgow Coma Scale.(7)

**EXPOSURE**

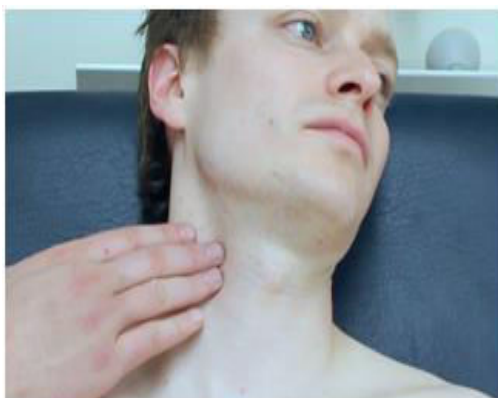
If necessary, loosen or take off some of the patient's clothing to facilitate a complete examination. Reduce heat loss while maintaining the patient's dignity.(6)



**Fig.5 Airway patency assessment**



**Fig.6 Breathing assessment (look,listen and feel)**



**Fig.7 Carotid pulse assessment**



**Fig.8 Capillary refilling test**

<b>Table 1: Classification of emergencies</b>	
<i>Non-cardiovascular</i>	<i>Cardiovascular</i>
<b>A. Stress-related</b>	<b>A. Stress-related</b>
Vasodepressor syncope	Heart failure
Hyperventilation syndrome	Cerebral ischemia and infraction
Acute adrenal insufficiency	Hypertensive crisis
<b>Asthma</b>	
<b>Hypoglycemic reactions</b>	
<b>Seizures</b>	
<b>B. Non-stress-related</b>	<b>B. Non-stress-related</b>
Orthostatic hypotension	Acute myocardial infraction
Overdose reaction	
Hyperglycemia	
<b>Anaphylactic reactions</b>	



## MEDICAL EMERGENCIES AND THEIR MANAGEMENT

Most commonly encountered medical emergencies in dental practice are as follows:

1. Vasovagal Syncope
2. Postural hypotension
3. Hypoglycemia
4. Hyperglycemic crisis
5. Anaphylaxis
6. Adrenal insufficiency
7. Hyperventilation
8. Status asthmaticus
9. Status epilepticus
10. Acute Myocardial infarction
11. Stroke
12. Foreign body Aspiration
13. Hemorrhage

## SPECIFIC RESPONSES TO EMERGENCY SITUATIONS

### SYNCOPE

Syncope is characterized as a brief, abrupt loss of consciousness followed by a spontaneous return to normal.<sup>(7)</sup> It is characterized by an abrupt drop in blood pressure and a lowering of the pulse rate and is brought on by a reduction in cerebral blood flow below a critical level. The emotional stress brought on by the dental operations typically causes a sequence of cardiovascular events to occur. The stress-induced release of more catecholamines, which results in a drop in peripheral vascular resistance, tachycardia, and perspiration, is the first event in an episode. The patient may express complaints of palpitations, nausea, and generalized warmth. A decrease in arterial blood pressure occurs as blood gathers in the periphery, which causes a decreased blood supply to the brain. The patient can then express disorientation or weakness. Even though the compensatory

mechanisms try to maintain adequate blood pressure, they soon fade, causing vagally mediated bradycardia, syncope happens once the blood pressure falls below levels required to maintain consciousness.

### CLINICAL MANIFESTATION

- Presyncope symptoms include a warm feeling in the face and neck, a loss of colour, heavy sweating, nausea, a quick heartbeat, and low blood pressure.
- Syncope: loss of consciousness, hyperpnea, hypotension, bradycardia, visual abnormalities, vertigo, convulsive movement, and twitching of the muscles.
- Pallor, nausea, weakness, perspiration, mental confusion, or disorientation are signs of post-syncope (recovery).

### MANAGEMENT

- Step 1: Stop the surgery as soon as symptoms develop. Trendelenburg posture (B.P. increases by 2 mm Hg for each inch below heart): supine with legs slightly lifted (fig.9)
- Step 2 :Airway, breathing, and circulation- An ampule of O<sub>2</sub> or ammonia placed under the nose (stimulates respiration and activity of the muscles)
- Step 3: Definitive care: Ascertain the underlying cause of syncope; modify any subsequent dental treatments to reduce the risk
- Step 4: Oxygen administration At any point in the episode
- Step 5: Vital sign monitoring
- Step 6: Additional procedures: removing equipment, removing constraining clothing, using ammonia as a respiratory stimulant, blanketing the patient if they are shivering, and administering anticholinergics for bradycardia.



Fig.9 Trendelenburg Position - 16°

### SYNCOPE IN PREGNANT PATIENTS

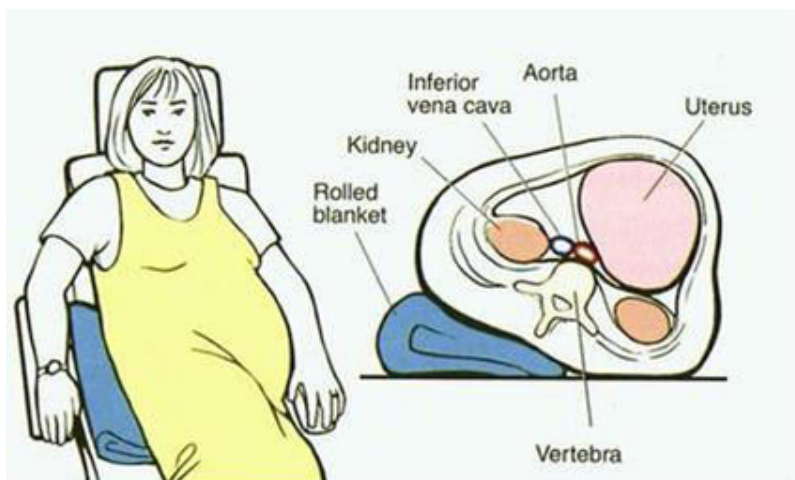
Position of Supine Supine posture reduced venous return to heart and consequently reduced blood flow to the brain. In such circumstances, lying on one's back may actually result in less venous blood

returning to the heart. A substantial volume of blood may be trapped in the legs as a result of the gravid uterus restricting or reducing blood flow through the inferior vena cava on the right side of the abdomen.

**MANAGEMENT**

When a pregnant woman has a near-term loss of consciousness, this fundamental posture must be modified. As indicated in fig. 10, turn the patient to

her right side and support her maintain that position by tucking a cushion or blanket under the left side of her back.(8)



**Fig.10 Left lateral decubitus position in pregnancy**

**POSTURAL HYPOTENSION**

A decrease in systolic blood pressure of at least 20 mm Hg or a decrease in diastolic blood pressure of at least 10 mm Hg within 3 minutes after standing up straight is referred to as postural hypotension, also known as orthostatic hypotension. Drugs including histamine blockers, opioids, and anti-hypersensitive medications are among the factors that increase the risk of postural hypotension. prolonged duration of convalescence or recumbency, insufficient postural reflex mature age, an advanced pregnancy Leg venous malformations Hunger, chronic postural hypotension (Shy-Drager syndrome), and physical weariness.

**CLINICAL FEATURES**

The patient will feel faint or dizzy, have blurry vision, be weak, confused, and have nausea. All of them finally result in dizziness after rising.(2)

**MANAGEMENT**

- Position: A non-responsive patient is positioned supine with their feet raised.

- Airway, Breathing, and Circulation: The head tilt-chin lift technique (fig. 11) is typically effective. The look, listen, and feel method should be performed to find any breathing obstructions, and the carotid pulse should be felt to assess the quality of circulation.
- Definitive care: If the patient is conscious or unconscious but breathing on their own, oxygen should be administered using a complete face mask (fig. 12), with the flow rate for most adults being between 6 and 10 liters per minute. If the patient is apneic and unconscious, a bag-valve-mask device with a flow rate of 10 to 15 liters per minute should be used.
- Checking vital signs: Later management transitions from supine to upright must be gradual. Prior to being lifted to roughly 45 degrees, the patient should be shifted 22.5 degrees, giving ample time for accommodation. After that, the patient should be lifted to around 67.5 degrees, and then 90 degrees.(9)



**Fig.11 Head tilt chin lift maneuver**



**Fig.12Oxygen mask**

**HYPOGLYCEMIA**

The most frequent diabetic emergency, hypoglycemia (measured usually by a Glucometer as shown in fig.13) is associated with high morbidity and mortality.(10) For all conscious individuals with hypoglycaemia, which is defined as blood glucose below 70 mg/dL (3.9 mmol/L), oral glucose is advised as the best course of treatment. It also mentions that people who have blood sugar levels below 54 mg/dL (3.0 mmol/L) are at risk for serious hypoglycemia.(11)

**CLINICAL FEATURES**

- Mild reaction at the beginning reduced mental acuity, mood swings, decreased spontaneity, hunger, and nausea.
- Sweating, tachycardia, piloerections, anxiety, odd behavioural patterns, poor judgement, and uncooperation are signs of a more severe stage.
- Later severe stage: Hypotension, hypothermia, seizure activity, and unconsciousness(12)



**Fig.13 Monitor glucose levels**

**MANAGEMENT**

- Oral carbohydrates, such as fruit juice or soft drinks, or 10–20 mg of glucose, may be given.(fig.14)
- Never give a cognizant patient anything by mouth that will flow down their throat or clog their airway, such as a liquid or other substance.
- A 50 ml IV infusion of a 50% dextrose solution or a 2-3 minute IM injection of glucagon is administered(fig.15)
- In the absence of glucagon or dextrose solution, 0.5 mg of a 1:1000 epinephrine concentration can be given subcutaneously or intramuscularly and repeated every 15 minutes.
- A thick paste of concentrated glucose may be used with a high degree of safety in the absence of parental route or medications. In the patient's buccal fold, a tiny amount of honey or syrup may be applied. (9)



**Fig.14 Glucose rich foods**



**Fig.15 Glucagon kit**

**HYPERGLYCAEMIC CRISIS**

Blood sugar levels of more than 125 mg/dL while fasting and more than 180 mg/dL two hours after eating are considered to be hyperglycemia. (13) In diabetic patients, serious hyperglycemic emergencies including diabetic ketoacidosis (DKA) and hyperglycemic hyperosmolar state (HHS) can happen. Absolute or nearly absolute insulin insufficiency is the

cause of DKA. It may take just a few hours or up to two days to develop.

**CLINICAL FEATURES**

Both types of hyperglycemia can cause polyuria, polydipsia, hypothermia, tachycardia, and general weakness. Patients with DKA may also experience Kussmaul breathing, fruity acetone breath, or even

consciousness loss. These are frequently the side consequences of systemic acidosis and ketosis.

**MANAGEMENT**

- A typical saline intravenous infusion can be started.
- Rapid-insulin analogues administered subcutaneously every 1-2 hours are a successful substitute for intravenous delivery.
- Patients can be managed with an initial bolus of 0.2–0.3 U/kg, followed by 0.1–0.2 U/kg every 1-2 hours, until the blood glucose level is less than 250 mg/dl. After that, until the DKA resolves, the dose can be decreased to 0.01 U/kg every hour or 0.01 U/kg every two hours.(5)
- If a patient passes out in the clinic, do the following actions: Create an IV line and provide 0.9% saline, 1 L in 30 minutes, along with 20 mmol of KCl.(8)

**ANAPHYLAXIS**

An allergic reaction, known as anaphylaxis, is a severe, acute, and perhaps fatal medical illness that is brought on by the systemic release of mediators from mast cells and basophils.(14)Anaphylaxis manifests quickly and reaches its peak severity in 5 to 30 minutes. Usually, the respiratory embarrassment makes it fatal.

**CLINICAL FEATURES**

The feeling of warmth, itchiness, especially in the groin and axilla, and worry. Early signs of angioedema of the tongue and lip are observed. Later on, these could develop into a bronchospasm, laryngeal edema, erythematous rash (urticaria), edema of the face and neck, and other symptoms. (fig.16) (2)



**Fig.16 Clinical manifestations of Anaphylaxis**



**Fig.17 Epi pen**



## MANAGEMENT

- Stop administering any substances that could result in anaphylaxis.
- The patient should be positioned flat with their legs raised.
- Airway, breathing, and circulation, or A-B-C.
- The anterolateral side of the thigh should receive 0.3–0.5 mg of epinephrine intramuscularly (IM) in a dilution of 1:1000. It should be given out ten times in a row.
- If the patient is conscious or unconscious but breathing on their own, oxygen should be administered using a full face mask. For most adults, a flow rate of 6 to 10 liters per minute is suitable.
- A bag-valve mask with a flow rate of 10 to 15 liters per minute should be used if the patient is unconscious and apneic.
- Keep tabs on vital signs.
- Histamine-blocking medication: diphenhydramine (50 mg for adults, 25 mg for children) IM/IV or Chlorpheniramine 10–20 mg by gradual IV infusion is recommended for youngsters.
- Corticosteroid - Hydrocortisone 100–500 mg slowly administered intravenously.

**Epi pen** (epinephrine auto injector 0.3 mg)-An "Epipen," which contains 300 micrograms of epinephrine, is sometimes carried by individuals with a history of anaphylactic responses. If a patient experiences an anaphylactic response during dental surgery, this could be employed.(9)

## ACUTE ADRENAL INSUFFICIENCY

'Adrenal crisis' is the term for an acute worsening of chronic cortisol insufficiency that is most frequently brought on by surgical stress or sepsis. Adrenal gland loss causes the uncommon condition known as primary adrenal insufficiency. The condition known as secondary adrenal insufficiency is rather typical. It may happen as a result of hypothalamic-pituitary disease or, more frequently, as a result of exogenous steroid medication that suppresses the hypothalamic-pituitary axis. In reaction to stress, the body produces more cortisol; but, if the adrenal cortex is unable to produce enough of the hormone to keep up with the demand, a crisis may occur and a potentially fatal medical emergency may arise. It is now recognized that routine non-surgical dental treatment presents a negligible risk for the development of an adrenal crisis, and steroid cover is no longer necessary. Salivary cortisol studies have demonstrated that non-surgical dental procedures do not stimulate cortisol production at levels comparable to those of oral surgery. For patients who need surgical dental care, the situation is less clear, therefore it makes sense to make sure they are covered until further information is made available.

In general, risk reduction in at-risk patients can be accomplished by scheduling their appointments early in the day (endogenous cortisol levels are higher in the morning), making sure that they have taken their usual steroid dose before the procedure, and giving them enough analgesia and anxiety medications, as needed.(6) Patients who take at least 20 mg of cortisol (or its equivalent) daily for at least 2 weeks at any point in the year before to the anticipated major oral surgical treatment are often those who are at risk of developing acute adrenal insufficiency as a result of adrenal suppression.(8)

## CLINICAL FEATURES

The patient may appear pale, confused, frail, or even collapse. Hypotension, bradycardia, and hypoglycemia may also be present. Also, cardiac arrest may result from severe situations.

## MANAGEMENT

- To assist offset the hypotension, try to lay the patient flat with the legs raised. Those patients who are unconscious should pay particular attention to this.
- The administration of additional oxygen and intravenous fluids should also begin.
- As part of emergency management, a 100mg bolus of hydrocortisone can be injected intravenously or intramuscularly.
- While awaiting emergency assistance, an IV infusion of 1 litre of normal saline or 5% dextrose solution should be given over the course of an hour. (5,9)

## HYPERVENTILATION

Hyperventilation occurs when you breathe more quickly and deeply than usual. Adults typically breathe at a rate of 11 to 18 breaths per minute, although fear can cause hyperventilation. As a result of CO<sub>2</sub> being "blown off," arterial pCO<sub>2</sub> falls. Respiratory alkalosis and cerebral vasoconstriction are the results of the resulting drop in arterial CO<sub>2</sub> concentration. There are organic reasons for hyperventilation, including as pain, metabolic acidosis, drug intoxication, hypercapnia, cirrhosis, and organic abnormalities of the central nervous system. The anxiety of getting a local anaesthetic injection in a dentist clinic frequently triggers the onset of hyperventilation.

## CLINICAL FEATURES

Tingling in the fingers or lips, vertigo, and tetanic spasm in the periphery. Relative cerebral hypoxia can cause unconsciousness to set in.

The main worry is respiratory alterations, which can reach 25–30 breaths per minute and increased depth of breathing.(6,9)

## MANAGEMENT

- An upright position is typically advised for patients who are hyperventilating. Such patients typically find the supine position uncomfortable due to the reduced ventilator volume brought on by the abdominal viscera's pressure on the diaphragm.
- The patient should be relaxed by reassuring and should be helped to restore control of breathing by speaking calmly and breathing gently and regularly at a rate of 4 to 6 breaths per minute.
- All foreign objects, such as rubber dam, clamps, and partial dentures, should be removed.
- The most practical way to treat respirator alkalosis is to tell the patient who is hyperventilating to cup their hands in front of

their mouth and nose and take breaths in and out of the reservoir of carbon dioxide-enriched exhaled air.(fig.18)

- Parenteral medications such as benzodiazepines, diazepam, and midazolam 2-4 mg intravenously are administered to treat anxiety. In the absence of an intravenous route, 10 mg of diazepam or 3-5 mg of midazolam may be injected intramuscularly.
- The dentist must identify the reason of hyperventilation once the episode of hyperventilation has stopped and all clinical symptoms have disappeared. If both the doctor and the patient are comfortable, dental treatment may continue at this point.(9)



**Fig.18 Paper bag breathing**

## STATUS ASTHMATICUS

Status asthmaticus, a severe asthma exacerbation characterized by hypoxemia, hypercarbia, and secondary respiratory failure, is a medical emergency. (15) Extrinsic or intrinsic causes can cause an asthma attack. Due to immunoglobulin E antibodies' response to allergens, Type 1 hypersensitivity reactions are tied to extrinsic stimuli. Non-immune triggers are intrinsic factors. This includes exposure to cold or irritants breathed while exercise.

- Verify that the patient has taken their most recent scheduled dose of medicine before administering any treatment for their asthma.
- A metered-dose inhaler bronchodilator should be available for the patient.
- The procedure should be completed in the late morning or early afternoon.
- A bronchodilator and oxygen should be included in an emergency kit.
- Avoid L.A. containing sodium metabisulphite and dental products that could cause an asthma attack. Avoid products including dentifrices, fissure sealants, methyl methacrylate, fluoride trays, and cotton rolls that might cause asthmatic episodes.(2)

## CLINICAL FEATURES

Coughing, wheezing, shortness of breath, or pressure in the chest are common symptoms of asthmatic attacks in patients [27]. The patient may become irritated and be unable to talk in full phrases. Typically, respiratory rates increase, and it may be possible to see the employment of accessory muscles. Tachycardia and tachypnea point to a mild to severe exacerbation, but bradycardia can indicate an impending respiratory arrest.(5)

## MANAGEMENT

- Airway, breathing, circulation should be assessed. Sit patient up and loosen tight clothing.
- A nasal canula, hood, or full face mask should be used to provide oxygen. A flow of 5-7 L per minute is sufficient if a nasal canula is utilised.
- Hydrocortisone hemisuccinate 100mg IV (or similar amount of another glucocorticoid); may take up to 6 hours to take effect.
- Intermittent oxygen-driven nebulized salbutamol (2.5–5 mg) and ipatropium bromide (0.5 mg) inhalations.(fig.19,20).
- Since inhaled medication may not reach smaller bronchi due to severe constriction or plugging, salbutamol/terbutaline 0.4 mg i.m./s.c. may be added.

- For individuals who cannot use a nebulizer, 0.3 to 0.5 mL of epinephrine can be injected intramuscularly three times every 20 minutes.
- Intubation / mechanical ventilation should be done if needed.
- Dehydration and acidosis can be corrected with saline + sodium bicarbonate /lactate infusion.(9)



Fig.19 Nebulizer



Fig.20 Asthma Inhaler

### STATUS EPILEPTICUS

Continuous clinical or electrical seizure activity, or repeated episodes with incomplete neurologic recovery intermittently, lasting at least 30 minutes, are considered to be seizures. The Academy of Orthopaedic Surgeons' definition of status epilepticus—a seizure that lasts longer than five minutes or a recurring seizure that starts before the person recovers from the initial episode—might be more applicable in a dental office setting.

Failure of the epileptic patient to take antiepileptic medications is the most frequent cause of status epilepticus.

### CLINICAL FEATURES

The patient might get a "aura" or premonition that a seizure is about to start. An aura might happen right before a fit. This is a characteristic of a seizure and has been referred to as a "strange feeling in the gut," a déjà vu sense, a strange smell, or flashing lights. Tonic phase: Patient loses consciousness, gets rigid, falls, and turns cyanosed during the tonic phase; Clonic phase: jerky limb movements, possible tongue biting; drooling, incontinence, and urinary symptoms.

### MANAGEMENT

- Remove potentially harmful items from the patient's mouth and immediate area, such as a mouth prop.
- Loosen any restrictive clothing (fig. 21), refrain from holding the patient down or prying their lips open, and never put anything in their mouth.
- As soon as the seizure stops, turn the patient into a stable side position (recovery position - fig. 22), maintain a clean airway, and prevent aspiration.(16)
- If seizures are persistent (active convulsions lasting 5 minutes or longer; status epilepticus) or occur quickly one after the other, medication should be administered. High flow oxygen should be used whenever possible.
- A 10 mg i.v. bolus injection of midazolam or a 7.5 mg dosage of diazepam, administered buccally or intranasally and followed with fractional doses every 10 minutes for adults and children older than 10 years or slow infusion titrated to control the fits.
- Phenytoin (25–50 mg/min in a flowing saline IV line) or phenobarbitone (100–200 mg i.m./i.v.).
- To rule out hypoglycemia, a 25–50 ml i.v. dextrose solution admission is advised.(9)



Fig.21 Head cushioning



Fig.22 Recovery position

### ACUTE MYOCARDIAL INFARCTION

The permanent necrosis of cardiac muscle brought on by protracted ischaemia is known as myocardial infarction (MI). An imbalance in oxygen supply and demand typically causes this. Acute thrombus obstruction of an atherosclerotic coronary artery, which results in total arterial blockage, causes about 90% of MIs.(6)

### CLINICAL FEATURES

- The initial symptom is a persistent, central chest pain that may radiate to the left or right limbs, jaw, or neck.
- Nausea or vomiting, a feeling of impending doom, restlessness, shortness of breath, pallor, and chilly sweaty skin are possible symptoms.
- Hypotension, increased venous pressure, tachycardia, and perhaps pulmonary edema are side effects of associated pump failure.(5)

### MANAGEMENT

- The greatest way to manage patients is while they are sitting down.
- Patients who experience dizziness should be lying flat.
- In addition to immediate medical assistance, the management of a patient with suspected acute myocardial infarction entails the administration of morphine, oxygen, nitroglycerine, and aspirin (MONA). The specialist can also use nitrous oxide/oxygen at a 50:50 concentration in place of morphine if it is not available.(1)
- The administration of high flow oxygen (10 liters per minute) is recommended.
- Sublingual Glyceryl trinitrate spray should be administered (0.4 mg tablets, 1 tablet every 5 minutes up to three doses).
- If there is no allergy, 300 mg of aspirin should be taken orally and chewed.
- If the patient is still unresponsive(cardiac arrest), the practitioner should check for "signs of life"(breathing and circulation) and start Cardiopulmonary Resuscitation.(9)



Fig.23 Cardiopulmonary resuscitation for cardiac arrest



Fig.24 FAST approach for stroke management

### STROKE

A stroke is defined as a clinical illness with symptoms lasting more than 24 hours and characterized by an

abrupt loss of localized cerebral or monocular function. It results from insufficient cerebral blood flow brought on by an ischemic or hemorrhagic event.



**CLINICAL FEATURES**

When evaluating a patient for a potential stroke, four criteria are commonly used.

1. Facial droop: Ask the patient to smile so you can see her teeth. When one side moves poorly or not at all, the reaction is odd.
2. Arm Drift: The patient is instructed to close both of their eyes while extending both arms for ten seconds. When one arm drifts down or stays still while the other moves, this is an unnatural reaction.
3. Hand Grip: Put a hand in each of the patient's hands and ask them to squeeze it. When one hand has reduced grip or does not grip at all, stroke may be suspected.
4. Speech: A sentence is repeated to the patient. Speaking will be slurred or difficult for someone who has had a stroke.(5) The FAST strategy (fig. 24) is advised by NICE's updated stroke management guidelines when evaluating someone who may have had a stroke outside of a hospital.

**MANAGEMENT**

- Airway ,breathing,circulation,disability and exposure should be monitored.
- Supplemental oxygen (15 litres per minute) should be given to hypoxemic patients to keep their oxygen saturation levels above 94%.(17)
- 75% of individuals with acute stroke have raised blood pressure; these patients are treated for blood pressure regulation and referred to specialists to rule out underlying causes.(5)

**FOREIGN BODY OBSTRUCTION**

Usually, inadvertent slippage, aspiration of foreign items, or laryngeal spasms result in airway obstruction.(1) Inlays, burs, mouth mirror heads, (gold) crowns, debris, rubber dam clamps, endodontic

tools, post and core that may fall into the patient's oropharynx are examples of airway blockage in dentistry offices. Aspirated into the bronchus after being swallowed and entering the GIT. Using a rubber dam, oral packing, a chair position, a dental assistant, Magill intubation forceps, and a ligature, one can prevent airway obstruction in a dentist office.

**CLINICAL FEATURES**

Patient exhibits speech impediment, throat-grabbing (a universal sign), coughing, difficulty to exchange air (despite respiratory motions), cyanosis, and loss of consciousness. These could ultimately result in cardiac arrest.

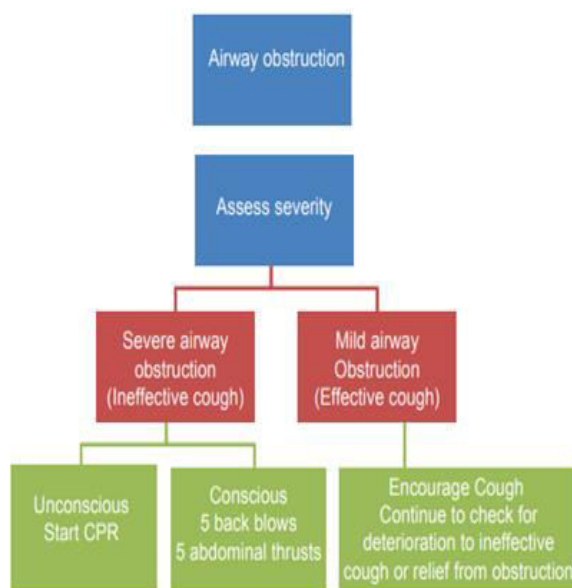
**MANAGEMENT**

The airway must be cleared first, but depending on whether the patient is conscious or unconscious, the technique will vary.

- In contrast, if the patient is choking, an attempt is made to expel the object with upward thrusts using the Heimlich thrust [Figure 25].
- If the patient is conscious, they must be made to sit straight, support the chest with one hand, and deliver five sharp back blows between the shoulder blades. It functions as an artificial cough, causing an abrupt rise in intra thoracic pressure and aiding in the expulsion of the foreign body.
- In a patient who is unconscious, the patient is placed in a supine position and given five inward and upward thrusts. Following this shove, the patient is turned to the side in order to clear the oral cavity. Try to re-ventilate the patient, start CPR, and give oxygen.(fig.26)
- If the patient's health worsens and the foreign object is still not removed, a surgical airway is made via a cricothyrotomy.(1)



**Fig.25 Heimlich thrust**



**Fig.26 Airway obstruction management**

## HEMORRHAGE

The term "haemorrhage" refers to uncontrolled or prolonged bleeding. The most frequent instances of haemorrhage in a dental setting occur after extractions and simple surgical procedures. Local causes of

haemorrhage might be arterial, venous, or capillary and can start in either soft tissue or bone. Patients with inherited diseases such haemophilia, Von Willebrand's disease, and thrombocytopenia are particularly vulnerable to bleeding after oral surgical operations.



**Fig.27 Hemostatic gauze**

## MANAGEMENT

- Blood vessel ligation, hemostatic gauze (fig. 27), pressure packs, electrocautery, and hemostatic drugs such vasoconstrictors in L.A are all used for local management .(2)
- If required, suture the area under L.A.
- The preferred medication is tranexamic acid, 500 mg in 5 ml by gradual IV administration.(1)

## PRECAUTIONS

After consulting with a haematologist, people with minor bleeding disorders can receive treatment in a primary care setting. After receiving an inferior alveolar nerve block, a hemophilic patient has an 80% risk of developing a hematoma.

## REFERENCES

1. Alva H, Hegde C, Prasad K, Shetty M. Medical and dental emergencies and complications in dental practice and its management. *J Educ Ethics Dent.* 2012;2(1):13.
2. Gopal S. Medical Emergencies In Dentistry – A Guide To A Successful Practise. *Int J Dent Oral Sci.* 2021 Nov 12;4991–6.
3. Hashim R, Mathew LS, Rustom S, Amer F, Odeh R. Emergency medical care in dentistry: A cross sectional analysis of competencies for undergraduate students. *Int J Crit Illn Inj Sci.* 2021 Mar;11(1):33.
4. Vaughan M, Park A, Sholapurkar A, Esterman A. Medical emergencies in dental practice – management requirements and international practitioner proficiency. A scoping review. *Aust Dent J.* 2018;63(4):455–66.
5. Weng YC, Wong RCW. Medical emergencies in Dentistry: Practical tips in Implementation. *Ann Dent.* 2019 Apr 4;26:42–52.
6. Wilson M, Mcardle N, Fitzpatrick J, Stassen L. Medical emergencies in dental practice. *J Ir Dent Assoc.* 2008 Jan 1;55:134–43.
7. Peate I, Brent D. Using the ABCDE approach for all critically unwell patients. *Br J Healthc Assist.* 2021 Mar 2;15(2):84–9.
8. Kalra G, Suri N, Dhindsa A, Kaur K, Jangra D, Kaur R. Different types of medical emergencies in dental practice: A review. *IP Int J Maxillofac Imaging.* 2022 Jul 15;8(2):59–62.
9. Zingade J, Kumar G, Gujjar PK. Medical Emergencies in Dentistry: A Review. *J Health Sci Res.* 2021 Jul 21;12(1):11–6.
10. Tevatia S, Mukund V, Agarwal S, Shah V. MEDICAL EMERGENCIES IN DENTAL PRACTICE: A REVIEW.
11. Brackenridge A, Wallbank H, Lawrenson RA, Russell-Jones D. Emergency management of diabetes and hypoglycaemia. *Emerg Med J EMJ.* 2006 Mar;23(3):183–5.
12. Lowe RN, Williams B, Claus LW. Diabetes: how to manage patients experiencing hypoglycaemia. *Drugs Context.* 2022 Jun 14;11:2021–9–11.
13. Sharma A. Medical Emergencies in Dental Office - A Review. *J Dent Oral Sci [Internet].* 2021 Sep 1 [cited 2023 Aug 29]; Available from: <https://maplespub.com/article/Medical-Emergencies-in-Dental-Office-A-Review>
14. Mouri Mi, Badireddy M. Hyperglycemia. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 [cited 2023 Sep 3]. Available from: <http://www.ncbi.nlm.nih.gov/books/NBK430900/>
15. Cheng A. Emergency treatment of anaphylaxis in infants and children. *Paediatr Child Health.* 2011 Jan;16(1):35–40.
16. Chakraborty RK, Basnet S. Status Asthmaticus. In: StatPearls [Internet]. Treasure Island (FL): StatPearls

- Publishing; 2023 [cited 2023 Sep 3]. Available from: <http://www.ncbi.nlm.nih.gov/books/NBK526070/>
17. Sharma DA, Neha D, Gupta DR, Sharma DI, Sahi DS, Sharma DS. A brief review on medical emergencies in dental practise. *Int J Appl Dent Sci.* 2020;6(3):679–83.
18. Jevon P. Medical emergencies in the dental practice poster: revised and updated. *Br Dent J.* 2020 Jul;229(2):97–104.