Chapter 4: Medical Emergencies in the Dental Office

4 CE Hours

By: Elite Staff

Learning objectives

- Identify medical emergencies that may occur in a dental practice.
- Recognize symptoms of specific medical conditions.
- Describe warning signs that can occur before a medical emergency.
- Identify situations that should cause a delay in dental care.
- Describe how to position a patient who is experiencing a medical emergency.
- Define an office emergency action plan.
- List essential equipment and medications that should be kept in an in-office emergency kit.

Introduction

Medical emergencies happen every day. They come unexpectedly and are something that health care providers never like to experience. As health care professionals, how dental team members manage emergencies in their offices is crucial.

Because most instances catch people off guard, preparing ahead of time for an emergency is important. An established plan of action, emergency kit and game plan can help the dental office operate at a higher level of efficiency and care for patients in need.

In this course, we will discuss common emergencies that one might encounter when interacting with dental patients as well as steps that should be taken to ensure that all of the bases are covered, including responsibilities, safety measures, and accident prevention. From the moment your patient begins having health troubles until the paramedics arrive, there is a crucial window of time where you as the health care provider are responsible for their care and well-being.

Common emergencies that occur in a dental practice setting

There is a wide range of emergencies that dental professionals have experienced in their offices. Falls, head trauma, foreign objects in the eye and physical accidents may occur. However, we will limit this course to cover medical emergencies that are related to underlying health conditions that predispose people to experiencing medical problems. By understanding the signs and symptoms of an emergency as it is occurring, a dental professional can identify the proper method of care, intervention, and if at all possible, prevention of the episode.

Identifying the warning signs of these medical related emergencies is essential. By being aware of precursors and risks that make patients susceptible to emergencies, you can refer them to medical services in a timely manner. Unfortunately, even with thorough patient screening, if you work in an office long enough, you will probably have a patient experience one or more of the following medical emergencies when you work in a practice setting.

Cardiovascular arrest and chest pain

Chest pain, cardiac arrest or other forms of tightness in the chest are cause for alarm. While some forms of discomfort may be nothing other than something such as GERD or anxiety, chest pain can be a sign of a serious health condition.

The discomfort may not necessarily be a sharp, painful feeling, but the person may instead feel as if his or her chest is being squeezed or under pressure. Chest pain results from the artery becoming narrow, blocking oxygenated blood from chest muscles and the heart. Quick response to heart attack symptoms is important for the life of your patient, because it’s estimated that approximately half of all heart attack patients will die in the first hours after their attack.

Classic heart attack symptoms usually include:
- Chest pain or pressure.
- Shortness of breath.
- Pain or numbness through the arms, shoulders, jaw, neck, back or upper abdomen.
- Nausea.
- Perspiration.

Women may suffer from atypical heart attack symptoms that are unlike classic symptoms of chest pain experienced by men. They may not have any chest pain at all. Because of the differences in symptoms, women may take longer to diagnose as having a heart attack. It is estimated that women have as long as a 15-minute delay in seeking care because of the differences in symptoms. [1]

Heart attack symptoms in female patients can include: [2]
- Upper body discomfort in the neck, back, jaw and shoulders.
- Fatigue and weakness due to decreased oxygen flow.
- Sleep disturbances from a partially blocked airway.
- Nausea or indigestion because the stomach and heart are sharing similar nerve supplies.
- Shortness of breath even during a period of rest because of decreased heart pumping.
- Anxiety, rapid heartbeat and perspiration.

Patients who are experiencing chest pain should be allowed to rest in any position they find comfortable, which is usually sitting upright. Based on the patient’s health history, determine whether he or she has a history of heart problems. If the patient has never experienced this type of feeling before, then EMS should be notified so the person can be taken to the hospital.
Pain that isn’t severe or elevated blood pressure may be angina pectoris instead of a myocardial infarction. If the pain continues through the left side of the body, such as the arm, or blood pressure falls sharply below what the patient’s normal baseline value is, then the patient is likely experiencing a heart attack.

If the patient is experiencing a heart attack, you should contact EMS immediately. The patient may be given a single dose of aspirin, and then a dose of nitroglycerine from an emergency kit can be administered every five minutes. Some first-time nitroglycerine users may experience low blood pressure, so placing them in a supine position can help them relax. The patient may also be placed on a 50:50 nitrous oxide and oxygen delivery. [3]

An unconscious patient experiencing a cardiovascular attack may exhibit spontaneous breathing. Check the patient’s vital signs and initiate CPR if necessary until the paramedics arrive and take over the situation.

### Loss of consciousness, fainting, syncope

Patients may faint for any number of reasons, and that may be the cause of more than half of all dental office emergencies. Drug use, seizures, anxiety or low blood pressure may be the cause. A drop in blood sugar may also be to blame, and we will address that separately. Fainting can sometimes be caught before it happens by being attentive to patients’ behaviors and vital signs. They may first feel dizzy because of a drop in blood pressure.

If anxiety is the cause of syncope, patients may need to have nitrous oxide during their procedure to help them relax. Some patients also require an anti-anxiety medication before their visit to be comfortable. Be sure to explain anything that patients have questions about so they understand the procedure and are not left with any surprises. Keeping patients comfortable is of key importance.

In some cases, patients who get up too quickly after reclining can experience syncope. It is important that all dental patients sit upright for a minute or two before excusing them from the chair. Help patients to get up slowly, and caution them to not jolt up quickly from a sitting position.

While some patients prefer to sit with their head dropped between their knees, this may cause them to hurt themselves if they actually do faint. Instead, place the patient in a supine position to help increase blood flow to the brain and leave the person in the position for several minutes.

Most people typically become alert within one minute after fainting. If not, then there is most likely a more serious underlying condition. Even after regaining consciousness, the patient should be left in the supine position before slowly being placed in an upright position. Reschedule the patient’s treatment for another day.

### Diabetic syncope/hypoglycemia

Diabetic syncope can occur when a patient experiences a drop in blood sugar levels and there is not enough glucose in the bloodstream to support metabolic cell functions. Most hypoglycemia will only occur in Type 1 diabetics (insulin dependent), but it can also occur in Type II diabetics who are taking hypoglycemic medication.

Before fainting, people may experience dizziness and confusion. They also may complain of a headache or behave strangely. It is also possible that in rare circumstances, a hypoglycemic diabetic may experience stroke- or seizure-like symptoms. All diabetic patients should be asked what their blood sugar levels were at their previous daily reading before having dental treatment performed to avoid a glycemic event during dental treatment.

The American Diabetes Association suggests the following blood sugar targets for diabetic adults who are not pregnant: [4]

- **A1C** of 7 percent or eAG 145 mg/dL.
- 70-130 mg/dl before eating a meal.
- Less than 180 mg/dl one to two hours before the next meal.

Some diabetics take insulin to lower a high level of blood sugar, and must take food at the time of their injection. This prevents their blood sugar level from becoming too low. Below 80 mg/dl is when hypoglycemia occurs, and a rapid drop can bring levels as low as 20-30 mg/dL.

If Type 1 diabetics gives themselves an insulin injection but do not eat afterward, they may experience hypoglycemia and have a fainting episode. If the patient is still conscious, place him or her in a comfortable position and give the person something to eat that contains sugar, such as juice, soda or cake icing.

If the patient is unconscious, he or she should be placed in a supine position and be given an injection to raise the blood sugar. If unconscious, EMS should also be notified. It is important to not place anything in an unconscious patient’s mouth because choking or aspiration may occur.

Place the person in a supine position and he or she should typically regain consciousness within 60 seconds. If the patient has not regained consciousness within this window of time, then there is likely a serious underlying condition. Begin initiating basic life support steps as necessary, checking the patient’s airway, breathing and circulation. If the patient has extremely elevated blood pressure, the person may be experiencing a cardiovascular attack instead of diabetic syncope.

To avoid diabetic emergencies in the office, it is best to schedule these patients first thing in the morning, after they have eaten a full meal.

### Diabetic ketosis

Ketosis occurs in diabetics when there isn’t enough insulin to move their blood sugars into cells. Fats and protein are used instead, and the result is a buildup of waste in the blood. As a result, blood sugar levels increase over a period of time. Predispositions like cardiovascular disease may make even a controlled diabetic likely to suffer from a rise in blood sugar.

Symptoms include:

- Fruity-scented breath.
- Thirst.
- Increased urination.

Ketosis may also cause red, warm skin. Dehydration.

Because of advanced dehydration, diabetic ketosis can raise blood sugar levels to 300 mg/dL or higher, at which point the patient would become unconscious. Should this occur, EMS must be notified and basic life support initiated as needed based on vital signs.
Allergic reactions

Allergic reactions are situations that dental professionals are familiar with because many patients experience allergies to latex gloves. A patient’s reaction to allergens can range from a mild irritation to a severe, life-threatening condition.

Symptoms of an allergic reaction may include:
- Hives.
- Rash.
- Itchiness.
- Swelling.
- Intestinal distress.
- Trouble breathing.
- Redness of the skin.
- Anaphylaxis.
- Loss of consciousness.

Anaphylaxis and loss of consciousness

Severe allergic emergencies that result in anaphylaxis (constriction of the airway and reduction in air flow) can cause a patient to lose consciousness and go into distress from the lack of oxygen. Oxygen should be administered using a positive-pressure device such as a bag-valve-mask. This is a life-threatening condition; if the patient is beginning to exhibit problems breathing, then EMS should be notified and the patient should be given epinephrine immediately.

Mild allergies

A mild allergic reaction that results in minor symptoms typically only calls for the patient to be made comfortable and the delivery of an antihistamine from the emergency drug kit. The patient should be watched to ensure that more serious symptoms do not become evident, and that vital signs are appropriate.

Examples of allergens

There are several everyday allergens found in a dental office, some of which may not be obvious. Patients with severe dietary restrictions, such as abstaining from gluten, nuts and dairy, may be exposed during a typical visit.

Below is a list of some allergens and where they can be found in the office:
- **Latex** – Found in gloves and some equipment. Most people develop contact dermatitis at the area of their skin that was affected.
- **Local anesthesia** – While rare, some patients may experience a serious reaction that causes trouble breathing, irregular pulse, and syncope.
- **Egg protein** – Used for general anesthesia delivery. While nitrous oxide does not contain egg protein, it can cause a severe reaction in some patients because of a similarity in the molecular compound.
- **Fruit flavoring** – Found in topical anesthetic.
- **Gluten** – Contained in some polishing pastes, toothpastes.
- **Nuts** – Found in polishing pastes and brand-specific fluorides.
- **Milk protein** – An ingredient in polishing paste, Recaldent, some gum, and toothpastes.
- **Clove oil** – Used to make eugenol, which is found in temporary dental cements.

Quick response is important for patients experiencing a severe allergic reaction to something they are sensitive to. An antihistamine can be administered to help block milder symptoms. Patients experiencing severe reactions must be given a dose of epinephrine from the emergency kit, delivered in their thigh or upper arm. Epinephrine is extremely effective because it prevents further histamine release and helps reverse histamine-caused conditions.

EMS must be notified if the patient is experiencing a severe allergic reaction, and the patient should be placed on oxygen as you monitor vital signs.

RESPIRATORY DISTRESS

Asthma attack

All asthmatic patients should be asked about their asthma-related conditions and flare-ups:
- When was their last attack?
- What seems to bring attacks on?
- Do they use an emergency inhaler? If so, where is it located?

Asthma affects people of all ages and causes a response that tightens the airways. Aerosols in the treatment area or fear of dental treatment may trigger an attack in some people. With patients who use an inhaler, have them place it out for easy access during their appointment in case of an attack.

Symptoms of an asthma attack include coughing, wheezing and trouble breathing. Patients may also feel pressure in their chest and begin to appear cyanotic. Should your patient begin to experience these symptoms during treatment, put the person into an upright position. Examine the airway to check for swelling or obstruction and record the patient’s vitals.

Conscious patients can administer their own drugs (usually albuterol) through their inhaler, and then be given oxygen. If they recover in a timely manner, treatment can be continued.

If the patient has persistent symptoms and requires a second dose of albuterol, then treatment should be delayed until another day. Should the patient become unconscious, a bronchodilator and epinephrine should be delivered while also activating EMS.

Obstruction

From time to time, foreign objects, such as dental supplies, equipment, appliances or restorations, may find their way into the patient’s airway. If obstruction is partial, the patient will begin coughing, but if obstruction is complete, the patient can become cyanotic and clasp the hands across the throat, which is the universal sign for choking. If the patient is able to speak, then obstruction is only partial. A complete
blockage can lead to a life-threatening situation if the object is not
removed.

If a patient begins to choke, remove all foreign objects from the
person’s mouth immediately. Allow the patient to forcefully cough,
which will hopefully open the airway. If the person is unable to cough
or gasp, indicating a completely blocked airway, then abdominal
thrusts should be performed.

How to perform abdominal thrusts

The best way to dislodge an object from a patient’s airway is to
administer abdominal thrusts (also known as the Heimlich Maneuver.)
This is done when the patient has a completely blocked airway,
which prevents them from talking, gasping or coughing and helps to
forcefully remove the object.

● Stand behind the patient.
● Wrap your arms around the person, making a fist and placing your
thumb just above the navel, and grasping the fist with your other
hand.
● Slowly make forceful thrusts, moving inward and upward just
under the ribcage.

● Repeat the thrusts until the foreign object is dislodged.

If the patient is unconscious …

● Contact EMS.
● Lay the patient flat on the floor.
● Perform a finger sweep if the object can be seen.
   ○ Never perform a blind finger sweep because this can cause the
   object to become lodged deeper.
● Perform appropriate steps of CPR based on the patient’s oxygen
flow and pulse.

Hyperventilation

Severe anxiety or fear of the dentist can trigger hyperventilation, an
increased respiratory rate that can be difficult for the patient to control.
During the rapid breaths, excessive levels of carbon dioxide are released.
Symptoms such as tingling and numbness may occur, and the patient
may become apprehensive. If breaths continue to remain uncontrolled,
spasms or fainting may occur. Thankfully, hyperventilation-induced
syncope will typically result in a normal respiratory rate and the patient
can regain consciousness.

Hyperventilation is the only emergency seen in the dental office where
oxygen delivery is contraindicated. A paper bag for breathing should
be avoided because this can cause elevated carbon dioxide levels.
Communicate with the patient so that the person is aware of his or
her breathing speed, and then verbally coach the person into slower
breaths, one at a time. Under no circumstances should you deliver
oxigen to the patient.

Seizures

If a patient experiences a seizure in your office, it is most likely that
the person has a medical history of seizures or epilepsy. [5] It is highly
unlikely that someone without a history of seizures will experience one
while in your care, but you should be prepared nonetheless.

Seizures are caused by erratic electrical activity in the brain. These
electrical signals can spread over the brain and stimulate areas that
control other things, such as muscle control. Some patients can tell
when they are about to experience a seizure, which is called an “aura.”
The aura usually involves strange smells, sounds, sensations or
hallucinations and can give them a chance to prepare for the seizing
event. After seizing, patients will typically be fatigued or confused.

Types of seizures

Generalized
These seizures affect both sides of the brain and result in
unconsciousness. Types of generalized seizures include tonic-clonic,
myoclonic, absence and atonic. Tonic-clonic (also known as grand
mal) are the most common. Patients who experience this type of
seizure should be placed in a supine position and given a head-tilt,
chin-lift to open the airway.

Partial
Partial seizures are localized to a specific portion of the brain.
Consciousness may or may not be lost. They do not last long, but may
spread and cause a generalized seizure. [6]

Non-epileptic
These seizures may resemble an epileptic seizure in appearance
and symptoms. While difficult to identify, they differ from epileptic
seizures in that non-epileptic seizures are not caused by electrical
changes in the brain.

Status epilepticus
Rarely, seizures occur for a prolonged duration. This type of seizure
describes an ongoing, continuous seizure.

Seizing patients should have the immediate area freed of equipment
or foreign objects that they could come into contact with and possibly
harm themselves. Move everything back out of the way and do not
restrain the patient. All instruments and supplies must be removed
from the patient’s mouth to prevent aspiration or trauma. Do not
attempt to prop the patient’s mouth open in any way or give rescue
breaths.

If a relative or caregiver has accompanied the patient to the office, call
the person into the treatment area to find out whether the seizure is
typical. Most of the time it is only necessary to monitor the patient
and have someone drive him or her home, but if the seizure is severe, it
will be necessary to call EMS.

Drug overdose

Accidental overdose may occur from prescription, over-the-counter,
or illegal drug use. The patient’s body weight and age must be kept
in mind when administering medication as well as a history of drug
sensitivities.

Some ethnicities of people may be more susceptible to reactions
from specific drugs. For example, Ethiopian and some North African
children may experience deadly reactions to the drug codeine. [7] It
is important to understand unique sensitivities to particular drugs to
which specific groups are susceptible.
Always administer intravascular medication very slowly. Review the patient’s health history, including allergies, current medications and any recreational drug use, to avoid an adverse reaction.

- **IV injected sedation drugs** – Should always be administered slowly. Begin with only the lowest amount of drug possible to avoid accidentally delivering too high of a dose to the patient.
- **Block injections** – Use only an aspirating syringe when delivering the medication.
- **Lidocaine** – May cause central nervous system toxicity and seizures. Toxicity, unconsciousness and respiratory failure may occur. [8] There is no antidote available for Lidocaine.

**Bleeding disorder**

Blood is something that dental professionals deal with each day. When significant blood loss occurs, it can quickly become an emergency situation. Patients who hemorrhage should be positioned upright to reduce blood flow to the head. Most of the time, firm pressure and care to the local area of bleeding will be enough to control the blood flow.

Severe bleeding may be caused by:

- The patient taking blood thinners close to the time of their treatment.
- Aspirin use.
- Trauma to orofacial blood vessels during surgical procedures.

- Surgical procedures, such as sinus lifts, dental implants and extractions.

Patients who take blood thinners should have treatment needs addressed with their physician. Do not instruct the patient to discontinue medication on his or her own. The person’s medical care provider should make this decision.

If the bleeding is caused by a traumatic injury from a fall (caused by loss of consciousness or accident), quickly apply pressure to the area. It is not likely that bleeding will be severe enough to need a tourniquet in a dental setting, but should you find that it does, apply steady pressure while EMS is notified.

**Stroke**

When the brain experiences a blockage in blood flow, strokes are the result. Known as a cerebrovascular accident, strokes typically occur in adults with high blood pressure or hardening of the arteries caused by a buildup of plaque within them. Blood clots also are a common cause of stroke, and when the episode occurs, the symptoms are visible almost immediately. Most of the time these episodes are short-lived, but it is possible that they will continue for a lengthy period. Smaller strokes (transient ischemic attacks) are a sign that a more severe attack may be on its way.

Symptoms of stroke include:

- Trouble walking.
- Problems talking or understanding what others are saying.
- Partial paralysis of the face, arm or leg.
- Difficulty seeing with one or both eyes.
- Headache. [12]

Contact EMS immediately if you suspect your patient is experiencing a stroke. To determine whether that is happening, act F.A.S.T. [13]:

<table>
<thead>
<tr>
<th>F: Face</th>
<th>A: Arms</th>
<th>S: Speech</th>
<th>T: Time</th>
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<tbody>
<tr>
<td>Ask the person to smile. Does one side of the face droop?</td>
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<tr>
<td>Ask the person to raise both arms. Does one drift downward?</td>
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<tr>
<td>Ask the person to repeat a simple phrase. Is the speech slurred or strange?</td>
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<td>If you observe any of these signs, call 911 immediately.</td>
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Lay the patient on his or her side and remove all instruments or other objects from the person’s mouth to prevent aspiration. If necessary, you may utilize the suction to prevent the patient from inhaling material or large quantities of saliva and blood. It is very common for the patient to lose control of some muscles or facial control, so work to keep the person comfortable and calm while waiting for paramedics.

**Patient positions and emergency steps**

The first priority when positioning patients is to ensure their safety and comfort. Whether this is by placing them on their back so that blood flow can quickly reach their head or by relocating surrounding equipment to preventing a seizing patient from incurring accidental trauma, it’s important to act quickly. The position of patients and the environment that they are kept in will depend on what type of medical emergency is happening.

Ultimately, you should keep the patient in a safe and comfortable position until the person can be handed off to the care of emergency medical personnel when they arrive.

**Supine position**

Unconscious patients should be placed back into the supine position. This is the position in the treatment chair where the head is reclined, with the legs slightly elevated so they are higher than the head. Placing a patient in the supine position will support blood flow to vital organs in the upper body, such as the brain and heart. By supporting blood flow to the brain, the supine position helps prevent possible oxygen deficiency.

In medical emergencies, the prime concern should be that there is enough blood flow and oxygen to the brain. [14] This prevents irreversible brain damage, heart failure and other problems related to the deficiency of oxygenated blood flow.
Upright position

Some patients need to be placed in an upright position for comfort and care for their emergency. Examples include a patient who is experiencing an asthma attack and needs to have albuterol administered, or a patient who has asphyxiated something during their treatment.

It’s now the emergency CAB

There are three essential steps that should be taken after ensuring the patient’s positioning and comfort. These are assessing and assisting the patient’s circulation, airway, and breathing.

Until 2010, most health care providers called a memory aid for these actions the Emergency ABC’s because the guidelines called for the sequence to be airway, breathing and circulation assessments. However, that year, American Heart Association guidelines changed this basic life support sequence by placing circulation before airway or breathing checks. So the memory aid became known as “CAB” instead of “ABC.”

Circulation

The first step in the emergency CAB is circulation. Patients’ pulses should be checked; for adults, you can check the pulse along the wrist or neck (alongside of the thyroid cartilage.) Use two fingers next to one another to palpate the areas along the radial, brachial or carotid arteries. A child’s pulse may be easier felt beneath the upper arm.

When checking patients’ pulses, not only do you want to see what their rate per minute is, you should also note whether the rate is regular or irregular, and the quality, that is, if it is weak or strong. A deep pulse may be found in someone with elevated blood pressure, while weaker pulses are found in someone suffering from hypotension.

Normal resting heart rates based on age are [17]:
- Newborns 0 to 1 month old: 70-190 beats per minute.
- Infants 1 to 11 months old: 80-160 beats per minute.
- Children 1 to 2 years old: 80-130 beats per minute.
- Children 3 to 4 years old: 80-120 beats per minute.
- Children 5 to 6 years old: 75-115 beats per minute.
- Children 7 to 9 years old: 70-110 beats per minute.
- Children 10 years and older, and adults (including seniors): 60-100 beats per minute.
- Well-trained athletes: 40-60 beats per minute.

A pulse rate that is too rapid is referred to as tachycardia. Bradycardia is a pulse rate that is too slow.

If you have checked the patient’s circulation for longer than 10 seconds and are unable to detect a pulse, then you should begin performing chest compressions as you were trained in CPR or basic life support training. Compression rates and ratios with rescue breathing continue to be revised almost on an annual basis based on the most recent guidelines of the American Heart Association, so be sure to keep your guides current.

If chest compressions are necessary, it is important to use proper hand positioning is used so that the compressions will be effective. To find the point where pressure should be administered, draw an imaginary line between the patient’s nipples and locate the lower portion of the sternum directly in the middle. Stack one hand over the other and place the heel of the lower hand over the area of compression.

Your torso should be positioned so that your arms are directly downward, straight into the patient’s chest, not at an angle. Use the heel of your hand to press straight downward approximately two inches, being careful to come back up enough for the chest to completely recoil.

Repeat chest compressions at a rate of at least 100 compressions per minute.[18] For a child, aim to compress their chest by one-third to one-half the depth of the chest, also at a rate of 100 compressions per minute. The goal of the firm compressions is to simulate a pumping heart so that oxygenated blood can flow through the circulatory system, preventing death.

Compression to breath ratios used in adult CPR are 30:2, meaning that 30 compressions are given with a short pause to administer 2 rescue breaths. For children and infants, a 15:2 ratio is used.

Because it is easy for the person administering chest compressions to become fatigued, two-person CPR can be used. This allows one person to give chest compressions and the other to deliver rescue breaths, and then the pair can switch after several cycles. CPR should be continued until rescue paramedics arrive and instruct you to allow them to take over.

Airway

Conscious patients are able to let you know if they are having trouble breathing. Patients who are choking typically know how to use the universal choking sign, which is having one hand clasped around the throat. If the patient can cough, speak and breathe, then there is not a complete airway obstruction.

However, if the patient is experiencing anaphylaxis from an allergic reaction, the person may have a compressed airway, preventing adequate oxygen intake. Patients who are choking will need to have an abdominal thrust performed to help dislodge a foreign object.

The Red Cross recommends first delivering five back blows with the heel of your hand, followed by five abdominal thrusts. [15] This is done by standing behind the patient, wrapping your arms around the person, putting the thumb side of your fist just above the belly button, grasping the other hand around it and thrusting inward quickly five times. On a pregnant or obese person, perform the same procedure, but locate your hands higher up, over the abdomen.

If a patient is experiencing any signs of obstruction, quickly remove any equipment or materials, such as bite blocks, cotton rolls or other instruments. A finger sweep should not be performed unless there is visible debris that the clinician can directly see. If debris is visible, then removal can be attempted.

Should a patient become unconscious, the dental professional must ensure that the person’s airway is open. The head-tilt, chin-lift that is used in CPR administration does this. It is extremely important to do
this carefully to avoid damage to the spinal cord if accidental trauma has occurred during the situation.

To open the airway, the practitioner should position him- or herself immediately behind the patient’s head. Gently place the thumbs on the outside of the patient’s jaw and the remaining fingers underneath, softly guiding the mandible forward and up. This opens soft tissues in the back of the mouth so that the airway can operate without anatomical blockage.

**Breathing**

As soon as the airway has been opened, breathing should be checked. A normal respiratory rate for a healthy adult is 12-20 breaths per minute. [16] Children tend to breath much faster until they reach adolescence.

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<tr>
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<tr>
<td>Elementary</td>
<td>18-30</td>
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<tr>
<td>Preschooler</td>
<td>22-34</td>
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<td>24-40</td>
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Patients with asthma or experiencing an allergic reaction may experience wheezing as they attempt to take breaths. Hyperventilating (tachypnea) elevates the respiratory rate, and oxygen intake will be too high. Bradypnea is when the rate of breathing is lower than normal, which prevents adequate oxygen from reaching vital organs and loss of consciousness.

As taught in health care provider CPR and lifesaver courses, breathing can be checked using the “look, listen and feel” method. First look at the patient’s chest to see whether it is rising and falling as it would during normal breathing. Place your ear over the patient’s face and listen for sounds of breathing, wheezing, or any airflow. Lastly, as you are bent down listening, feel for any air movement coming out of the patient’s mouth or nose.

Spend no longer than 10 seconds assessing the airway. If signs of breathing are not evident, then rescue breathing should be conducted. Always use a barrier device or a bag-valve-mask device to prevent transfer of pathogens or bodily fluids between patients and a care provider.

Administer two rescue breaths and watch to see whether the chest rises and falls with each one before repeating them. Failure of the chest to rise or fall is evidence of an obstruction. Be sure to avoid delivering too many breaths per minute. See the table above for the normal respiratory rates based on age.

**AED/defibrillator use**

The use of automatic defibrillators has increased the likelihood of survival for heart attack victims. [18] AEDs are available for purchase and can be kept in the office to use in the event of a medical emergency. They are very user-friendly and simple to use. Many newer models will audibly direct the operator on what steps to perform.

Previously, AEDs were recommended for children and adults, but their use is now appropriate on all ages, including infants.

Upon finding someone unresponsive, first check to see whether the person can be woken. Speak loudly to adults and try shaking their shoulders, or with children, pinch them on the arm or leg. If the patient fails to respond, have someone contact EMS while the other team member fetches the AED. Perform necessary CPR steps using the emergency CAB before the AED arrives.

Once the AED is available, it can be used if the patient’s heart rate is irregular or absent. To prepare to use the AED, remove any shirts, jewelry or underwire bras. Turn on the AED and place the electrode pads directly on the patient’s dry chest. Although it is highly unlikely that a patient would be in a pool of water in a dental office setting, be sure that there is no standing water that could act as a conductor and spread the shock to other areas.

The pads should be placed with one over the center right of the chest just over the nipple, while the second is placed just below the left nipple and to the left of the ribcage. If the patient has an unusually thick amount of chest hair, it may be difficult to get a close connection with the skin. In this case, use the enclosed razor to remove excess hair. If a razor is not available, place the pad on their chest and quickly rip it off before placing it back onto the same area.

Should the patient have piercing or an implanted device such as a pacemaker, move the pad at least 1 inch away. Pacemakers typically leave a scar in the skin, or are identified by a medical bracelet.

After the patient has been prepared, press the AED’s “analyze” button and follow the voice prompts. Be sure to stay clear of the patient so that the machine can check for any signs of a pulse without being disturbed. If necessary, the AED will alert you that a shock is needed.

Be sure to stay clear of the patient when the shock is given. No team members should touch the patient because of they could be shocked. If everyone is clear, press the “shock” button, wait till the shock has been delivered and then perform two minutes of CPR. After two minutes, the AED will alert you that it is time to once again analyze the patient’s heart rhythms. Repeat this cycle until EMS arrives.

In 2005, the American Heart Association guidelines suggested that the use of an AED should become a standard of care in all health care settings, including dental offices. Using an AED increases the potential for resuscitation over traditional CPR.

**PREVENTING A MEDICAL EMERGENCY**

Not every medical emergency is preventable, but some can be avoided. When it comes to treating patients in your office, it is important to conduct a thorough review of the patient’s health history and vital signs to identify precursors that may indicate a medical problem.

**Reviewing the patient’s health history**

Regardless of when you last saw a particular patient, a review of medical changes, conditions, risk factors or illnesses should be conducted at every appointment. Some offices do this by using a supplemental form attached to the primary health history form, providing space to document health updates that should be signed by the patient and dental team member who reviewed it.

Some patients may fail to identify obvious medical procedures and let you know halfway during their treatment that they had a knee or heart...
valve replacement two months before. Because these areas of the body aren’t next to the teeth, sometimes people assume it isn’t important that you know about it.

Even if a patient does not check the box, it is important to ask about drug allergies, current medications, recent hospitalizations and surgeries they may have had. Ask them when they last took their medication. Many people spread out their medication for reasons such as cost and therefore do not have adequate control over situations like blood pressure and diabetes.

**Premedication requirements**

The American Heart Association has revised its recommendations on antibiotic prophylaxis (premedication) for dental procedures. Premedication is used to prevent disrupted oral flora that travels into the blood supply to lodge itself or cause an infection in arterial walls and the heart (infective endocarditis.)

According to the American Dental Association, the two types of patients that require premedication include people who:

- Are predisposed to infective endocarditis because of specific heart conditions.
- Have had joint replacement surgery and also found at risk for developing an infection near the prosthetic device.

It is recommended that people with the following conditions receive premedication if undergoing more invasive dental procedures:

- Artificial heart valves.
- History of IE.
- Heart transplant with a history of valve problems.

**Remind patients to take or bring their medications**

Remind patients who have a specific health condition that requires medications to bring them with them during your confirmation call. For instance, an asthmatic patient should be reminded to bring an inhaler to the appointment. Patients with a history of angina attacks should also bring their nitroglycerin tablets with them. Remind all patients to take their medication as prescribed to ensure their safety during dental care.

**Recording vital signs**

Vital signs should be taken at each appointment. With routine vital sign documentation, abnormal readings that are not consistent with the patient’s history can easily be identified. If necessary, treatment can be deferred and medical referrals made.

**Blood pressure**

Patients’ blood pressures should be recorded at every dental appointment, even if the patient was seen just the day before. Traditionally, blood pressure is taken using a standard blood pressure cuff and stethoscope, but many offices now prefer to use an electronic cuff. Unfortunately, with an electronic cuff, you may find some minor discrepancies in the readings and be unable to detect irregular heartbeats.

When taking patients’ blood pressure, have them sit upright with their legs uncrossed. Place the cuff on their right arm and ask them to not speak during the reading. This time can also be useful for monitoring their respiratory rate and quality of breaths as well as pulse. Be sure to use the proper-sized cuff; a cuff that is too loose, narrow or wide can result in a false reading.

If you are taking blood pressure using a stethoscope and traditional BP cuff, you should follow the following steps:

- Place the cuff approximately 1 inch above the bend on the inside of the elbow.
- Place the diaphragm of the stethoscope above the brachial artery, just below the BP cuff, and hold it in place.
- With the other hand, use the inflating bulb to begin filling the cuff.
- Continue filling the cuff 20-30mm of mercury past the point where the patient’s pulse can no longer be heard or felt.

### Blood pressure categories:

<table>
<thead>
<tr>
<th>Category</th>
<th>Systolic</th>
<th>Diastolic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>under 120</td>
<td>and under 80</td>
</tr>
<tr>
<td>Hypertension</td>
<td>120-139</td>
<td>or 80-89</td>
</tr>
<tr>
<td>High blood pressure, stage 1</td>
<td>140-159</td>
<td>or 90-99</td>
</tr>
<tr>
<td>High blood pressure, stage 2</td>
<td>160 or over</td>
<td>or 100 or over</td>
</tr>
<tr>
<td>Hypertensive crisis</td>
<td>Over 180</td>
<td>or Over 110</td>
</tr>
</tbody>
</table>

In the event that blood pressure falls into the hypertensive crisis category, emergency care should be sought immediately. All patients whose blood pressure levels measure high enough to fall into stage 2 hypertension should have elective dental treatment delayed until after they receive medical care from their primary care physician. (20)
Blood pressure guidelines for children vary greatly, based on age as well as height and weight percentiles, with healthy systolic ranges never exceeding a reading of 120. Even a slight elevation can be cause for alarm. For example, a 10-year-old female with a systolic reading of 134 and a 10-year-old male with a systolic reading of 135 would both be categorized as having stage 2 hypertension.

Patients who are anxious may experience higher blood pressure readings while they are at a dental office. If a reading is too elevated, the practitioner should wait five minutes and take a second reading. If the patient continues to have an elevated blood pressure, proper measures should be taken for the person’s dental care, and he or she should be referred to a medical provider. When in doubt, contact a patient’s doctor to determine whether the treatment can be completed.

**Pulse and respiratory rates**

Record patients’ pulse after reviewing their health history. A good time to do this is immediately after recording their blood pressure. Use two fingers to palpate the wrist for at least 15 to 30 seconds. You can multiply the pulse by the appropriate amount of time needed for an average number of beats per minute. Document the quality of the pulse. Was it strong, weak, or normal? Regular or irregular?

Hold the area for 15 more seconds as you also monitor the respiratory rate. Many people will alter their breathing if they are consciously aware that someone is checking it. By taking the pulse and respiratory rates consecutively and without telling the patient, you can record their normal breath rate. Make a note of the quality of breaths. Are they slow, normal or fast? Normal, shallow or deep?

**Pulse oximeter use**

Pulse oximetry use during sedation services can detect conditions such as hypoxemia when no other visible signs are present. They also effectively monitor oxygen levels in dental patients of all ages. This can prevent a low oxygen uptake and possible medical emergency that might not otherwise be detected during treatment.

Using a pulse oximeter is typically optional, depending on the type of sedation services being used, but choosing to invest in this type of equipment can protect both patients’ health and the doctor from facing liabilities.

**Temperature**

Most dental offices do not record patients’ temperatures on a routine basis. However, doing so can help identify whether they are experiencing any type of underlying viral or bacterial infection. Taking a patient’s temperature can be done conjunctively with recording their blood pressure, thus not adding any additional chair time to the scheduled appointment.

The average temperature for healthy individuals is 98.6 degrees Fahrenheit (37.5 degrees Centigrade). A low-grade fever at a temperature that exceeds 99.6 degrees Fahrenheit is a sign that the patient is battling some type of infection.

Health care providers typically record temperatures using a tympanic/temporal thermometer, ear canal thermometer, or an oral thermometer. If an oral thermometer is used, you will also need to have disposable covers. Temporal thermometers are easily cleaned, making them more convenient, and they give readings that are consistent with oral thermometers. Mercury oral thermometers are now considered unsafe for use because accidental breakage of the glass could expose patients to toxic mercury inside of the thermometer.

**Nitrous oxide**

When patients are using nitrous oxide, never leave them unattended!

There are several side effects that can occur very quickly when a patient is on nitrous oxide during a routine dental procedure. Nausea may cause vomiting and a risk for the patient to aspirate some of the debris.

If a patient has a history of vomiting during a procedure using N2O, be sure that the nitrous is being administered slowly, in low concentrations. Nausea is more likely if the patient did not have a meal or consumed too heavy of a meal.

An oxygen fail-safe alarm can alert the practitioner when oxygen supply levels are depleted, eliminating the risk of a patient emergency from overexposure to nitrous oxide.

Only a dentist can administer nitrous oxide. Other staff members, such as a hygienist or dental assistant, are only legally able to monitor the patient after the dentist has administered the drug. They can, however, lower the concentration of nitrous oxide during the appointment, placing the patient on a higher volume of oxygen.

Leaving the patient and stepping out of the room or becoming so distracted that the patient is being poorly monitored (or not monitored at all) can compromise the health of the patient, risking oversedation, loss of consciousness and physical harm.

**Learn how to recognize an emergency**

The earlier a medical emergency is recognized, the more time the dental team has to respond, call for emergency medical care and begin addressing the patient’s immediate needs, such as performing basic life support.

Visible physical symptoms, such as sweating, paleness, fatigue, change in respiratory rate or vomiting, should be addressed as soon as they are evident. Some symptoms, such as nausea, chest pain, elevated blood pressure or irregular pulse, may not be evident unless the patient is asked or special equipment is used. This is why vital signs should be recorded at the beginning of the appointment, and repeated within five minutes if the readings are irregular.

**Make note of existing health conditions**

It is essential that patients’ health history is updated at every visit and checked for possible health conditions or allergies that the person has experienced in the past. If you know a patient had a heart attack 11
years ago, ask the person when was the last time he or she saw the cardiologist.

Perhaps the patient is an epileptic. When was the last seizure? How severe was it, and what kind of care is the person getting from a medical doctor? Make note of patients who are at risk for medical emergencies, because they will typically be more likely to experience one in your office than an overall healthy patient with no medical concerns.

All too often, dental practitioners fall into a repetitive habit of routine. Charts do not get checked, and patients are placed at an increased risk for problems, such as accidentally forgetting to use nitrile gloves on a patient who has a latex allergy.

HIPAA confidentiality restricts what type of information can be placed on the outside of a patient’s chart. It may be useful to put a sticker or red star on the outside of paper charts for patients who have significant allergies or medical conditions.

Electronic charting is very convenient, because most practice management software programs will send you a popup alert on medical conditions as soon as you open the patient’s file.

Consult with the patient’s physician and a drug reference book

When in doubt, ask for a medical clearance from patients’ primary care physician before beginning dental treatment. Notify the doctor if you record any abnormal vital signs, such as stage II hypertension, and get a confirmation from the doctor’s office on what treatment restrictions the patient has been placed on, if any.

Consult with a drug reference book to note medications and dosages the patient is taking and what they are being taken for. Certain medications have a contraindication for other medications, such as birth control pills or NSAIDs.

Take action

As soon as you realize a patient is experiencing an emergency, all treatment should be stopped. If the situation appears to be severe, then follow your office’s emergency action plan. We will discuss emergency action plans in more detail a little further along in this course. Make the patient comfortable, record vital signs, call EMS, and enact basic life support if necessary.

EMERGENCY KIT

Dental offices should have an emergency medical kit that contains equipment to perform basic life support (BLS), emergency drugs and a defibrillator. All team members should know the location of this emergency kit and how to use all of the included equipment or medication should an emergency arise.

Because medications expire, it is important to routinely examine the emergency kit and document the contents as well as expiration dates. A log sheet can be part of the office’s monthly checklist, and the responsible staff member should check all of the contents each month to be sure there are no leaks, damaged materials, and an ample supply of emergency drugs.

Kits can be purchased from medical supply companies or can be compiled by your office in separate pieces. Your state dental board may require specific contents, so be sure to check and ensure that you comply with local safety regulations.

Kit contents

AED/external defibrillator. This can be kept adjacent to the emergency kit location because most AEDs are large, bulky or may be mounted on the wall.

Oxygen delivery device to use during CPR. This may be a bag-mask-valve device, resuscitation pocket mask or other disposable CPR barrier. Barriers prevent practitioners from cross-contaminating bodily fluids between the patient and themselves, and valve-type devices increase the uptake of air by the patient.

A nasal cannula along with a portable E cylinder or a nitrous oxide nasal hood with 100 percent oxygen flow can provide a good source of oxygen when the patient is conscious and positive pressure is not needed. Place the patient on minimum flow rate of 6 liters per minute. Oxygen is administered in almost every medical emergency other than hyperventilation.

Sphygmomanometer and stethoscope. Although these pieces of equipment should be used routinely in the dental office, having a spare in the emergency kit that is reserved only for medical emergencies will prevent the risk or not being able to locate the device during an emergency.

Essential emergency drugs

Epinephrine – Perhaps the most important medication in your entire emergency kit, epinephrine is useful for emergencies with allergic reactions, respiratory distress and cardiovascular emergencies. This injectable drug is easily delivered through a preloaded syringe or pen-type
device. Most people with severe food allergies will keep a device such as an EpiPen with them in the event of an exposure. Epinephrine should be given to asthmatic patients who do not respond to albuterol during an attack.

**Diphenhydramine/histamine-blocker** – Also for use with allergic reactions, histamine blockers may be preferred in patients with a milder reaction. Injectable antihistamines are for more serious reactions (such as when a patient is experiencing anaphylaxis); orally administered antihistamines are appropriate for mild allergic responses.

**Sugar/glucose** – This is for diabetic patients who are experiencing hypoglycemia from an insulin imbalance. This can be in the form of juice, cake icing or soda and should be given to a patient only if the person is conscious. A tube of icing can easily be kept in the emergency box; something such as juice would need to be kept in a separate refrigerator.

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**Additional emergency medications and equipment**

In addition to essential medications, if dental offices desire, they may use other emergency medications. This can come in useful if the office is rural or located in an area where EMS response times are long. Some of these drugs are optional, while others are required by state regulations. For instance, if your office performs general anesthesia or sedative services, then you may be required to keep specific reversal drugs on hand for easy access should the patient become over-sedated.

**Airway devices** – If your dentist has advanced training in the use of devices such as a laryngoscope or endotracheal tube, these devices can come in useful.

**Hydrocortisone** – A corticosteroid, hydrocortisone is used for suppressing anaphylaxis. Unfortunately, the drug has a slow onset, sometimes taking as long as an hour to become effective. This medication can also be used to manage an adrenal crisis.

**Naloxone** – This is used to reverse respiratory depression associated with opioids. When opioids are used for sedation, then naloxone is the drug of choice for emergencies because it is a specific opioid antagonist. Naloxone can also be used when there is an overdose of specific narcotics (Demerol, morphine) and help reverse any decreased consciousness associated with their use.

**Flumazenil** – This also is used for reversing respiratory sedation and used to counteract effects from benzodiazepine because it is a specific benzodiazepine antagonist. This medicine is also used for overdose situations when other narcotics, such as Valium or Versed, have been used.

**Benzodiazepine** – In a water-soluble form, dentists can administer benzodiazepine (midazolam or lorazepam) intramuscularly to patients experiencing status epilepticus. Traditionally, this drug is administered through venipuncture, so an alternative form should be used if making it part of your office’s emergency kit.

**Glucagon** – Injectable glucagon may be used in the event of a hypoglycemic emergency when sugar (glucose) cannot be given orally to a patient who is unconscious. It must be delivered intravenously and is not for intramuscular use.

**Morphine** – This is used to treat patients in pain during a heart attack. Use caution when administering this medication to the elderly. Many dental offices would need to deliver this intramuscularly, but intravenous is the method of delivery.

**Ephedrine** – For management of severe hypotension, ephedrine has similar effects as epinephrine. Ephedrine has a longer duration than epinephrine and can last up to 1.5 hours.

**Atropine** – Also for the management of hypotension, atropine is appropriate for use when bradycardia is also present.

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**Team preparedness**

Formal steps must be taken to properly train the office team members on how to respond to an emergency. Doing so not only protects patients, but also helps provide legal protection for doctors and their practice when paper documentation shows training has been performed on a consistent basis.

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**Appropriate formal training of all staff members**

Comprehensive training in health care provider CPR and basic life support may be best achieved when the entire team trains together. Most health care provider CPR is typically active for two years and can be completed through Red Cross or American Heart Association certified providers. Doing this on a frequent basis will maintain all staff member’s certifications and ensure that the office is also fulfilling legal obligations. It also serves as a refresher to team members who already know how to practice life support. Proper documentation should be recorded in a central location.

No matter what a staff member’s role is in the office, all team members are obligated to receive basic life support and CPR training. Each person will play a key role in an emergency action plan and should serve as backup to team members who are not present or unable to perform emergency actions for some reason.

Formal training will enable staff members to perform one- or two-person CPR on both children and adults. The course will also include instructions on the use of an AED and other emergency equipment used during CPR.

Separate office training should also prepare all team members to know:

- The location and contents of the emergency medical kit.
- How to administer drugs from the emergency kit.
- How to use the emergency kit, such as bag-valve-mask equipment.
- How to properly record vital signs, such as pulse, blood pressure, temperature and respiratory rates.
- The emergency action plan for the office.
Establish an office emergency action plan

Perhaps the most important part of managing medical emergencies in the dental office is your office emergency action plan. This plan should be provided in writing to all employees and reviewed on a routine basis so all parties understand their roles and responsibilities when responding to an emergency. A written team plan can prevent key areas from being overlooked and help the office respond quickly and appropriately based on the circumstances that are occurring.

- **Have a code word or phrase.**
  Using a code word or phrase can help alert all of the team members to the situation without startling other patients or people in the waiting room. The word or phrase should sound like something that wouldn’t worry anyone, but instantly connects with the team members. For example, the dentist does not have any sisters, but an emergency phrase could be “Tell Dr. Smith that his sister is calling.” Hearing this phrase will alert the doctor as well as the staff that there is an emergency and their attention is needed immediately. Other words might sound silly but still be effective, such as “apple pie” or “sunburn.”

- **Act quickly.**
  The faster you respond to a medical emergency, the better. In instances where an AED needs to be used, it has been shown that every minute that passes before artificial defibrillation decreases the patient’s survival rate by as high as 10 percent. Good team communication and an emergency plan that has been enacted, practiced and known by all of the team members can help decrease response time to the patient’s needs.

- **Have a play-by-play planned ahead.**
  Written action plans for your emergency routine are essential. They ensure that the entire office knows emergency protocol, which member is responsible for what, and helps emergencies be addressed quicker. When you are preparing your emergency action plan, be sure to include these specific steps:
  - Recognize.
    - Is your patient experiencing a medical emergency? What symptoms or signs cause you to believe that is happening? At what point should the team members alert the doctor or other staff that the emergency plan needs to be enacted? A vital communication step that is taught in health care provider CPR is having one team member point to another one and say “You dial 911.” This prevents the call from being delayed and mass confusion as a result of multiple people thinking that someone has already contacted EMS.
  - Communicate.
    - What will your emergency phrase or keyword be? All team members need to stop whatever they are doing when they hear this phrase. The doctor will come to the area where the patient is located and alert the team members if it is appropriate to alert EMS in addition to already established emergency protocols. Everyone should know where emergency equipment is located and where a phone is to dial 911.
  - Act.
    - While waiting for the response of your other team members, place the patient in the proper position, including administering oxygen, if appropriate. If the patient has brought medication along, such as an inhaler or nitroglycerine, locate and administer it immediately. All team members should then complete their assigned roles in the emergency action plan, which will be explained shortly. Contact EMS and alert it of the situation as well as any family members who have accompanied the patient to the appointment. If the medical emergency is one that the patient has experienced before, the family member’s input is essential.

  One member should bring the emergency medical kit as well as an AED if available. Assess the patient’s vital signs and begin basic life support or CPR as necessary, providing backup to other team members when needed. Traditional CPR can be very strenuous to a health care provider; so two-man CPR is a good way to prevent fatigue.

Assign roles to specific staff members

- **Team member No. 1.**
  - Recognize whether the patient is experiencing an emergency.
  - If you suspect a possible emergency, use the code word or phrase to alert the doctor and other staff.
  - Turn off all nitrous oxide and give the patient oxygen unless the person is hyperventilating.
  - Administer the patient’s medicine if there is one available, such as an inhaler.
  - Place the patient in the appropriate position, supine or upright, depending on symptoms. Check vitals.
  - Ask the patient whether he or she is OK, using a loud voice. If the patient appears unconscious, attempt to wake the person by shaking him or her firmly by the shoulders. Children can be pinched or slapped on the arm.
  - Inform team member No. 2 to dial 911 by looking at the person directly and saying, “You – call 911!”
  - Inform a team member to bring an emergency medical kit and AED.
  - Administer CPR and basic life support as needed until an emergency medical service team arrives.

- **Team member No. 2.**
  - Respond to team member No. 1’s alarm.
  - Determine along with team member No. 1 whether it is appropriate to contact EMS. If so, verbally confirm that you are going to call 911 and then go directly to the phone and dial 911. If possible, dial from a phone that is not at the reception desk.

  Be sure to include your office address and the situation you suspect the patient is experiencing. It can help to keep a business card taped to your phone or desk, because the confusion during an emergency could cause a lapse in memory for the office address.

  - Stay on the phone with 911 until EMS arrives. Relay any information to 911 that other team members present to you.

- **Team member No. 3.**
  - Respond to team member No. 1’s alarm by immediately fetching the emergency medical kit and AED. Bring these supplies to the area where the patient is located.
  - Assist team member No. 1 in recording vitals.
  - Prepare AED, if necessary.
  - Prepare and administer emergency drugs as appropriate.
  - Practice two-rescuer CPR as appropriate until EMS arrives. Switch periodically with team member No. 1 to prevent rescuer fatigue.
Practice makes perfect

Practice your emergency plan on a regular basis. Twice per year may be adequate. Always have the entire team practice the plan together any time a new team member is added to the staff.

All team members should have current health care provider CPR certification and know their roles in the office emergency plan. This plan should be reviewed on a regular basis, especially when new staff members join the office or job roles change.

Allowing input and questions can allow for necessary alterations or clarification when needed so that all are confident in their role. When you practice an emergency, have team members rotate roles and identify areas that may have been missed or done differently.

Being overly prepared by multiple mock situations can prevent confusion and improve the team member’s comfort level should an actual emergency take place. Panic by team members during an emergency does not help the patient.

Cross-train

It is important that more than one person be trained for each rescuer role. In addition, a team member should be cross-trained so he or she can fulfill two or three different roles if needed. As a result, the office team can be more efficient and remind other members if a step is being missed.

Cross-training also is important when a specific team member is out or unavailable. This is yet another reason why all team members should be CPR certified, even if they are never in the actual treatment area with the patient.

DOCUMENTATION OF A PATIENT EMERGENCY

Detailed record keeping is essential when a patient has experienced a medical emergency in your office. From the moment the emergency symptoms are observed to when the patient is transferred to EMS personnel, each step of the way should be carefully outlined in your treatment notes.

Assess your team’s response

Within a day or two of an emergency in the dental office, conduct a team assessment of the emergency action plan. In this assessment you should document all involved team members and their roles in the situation. Ask for the team’s input on each person’s roles in the care of the patient, allowing an opportunity to determine what changes may be needed if another medical emergency should arise.

Key points to evaluate should include:

- What signs pointed to an emergency?
- Who first recognized those signs?
- Did the patient’s health history indicate an increased likelihood to experience a medical problem?
- What alerts put in place helped detect the emergency, such as notes or electronic record warnings?
- Were there any signals that were missed that could have been avoided?
- Were the patient’s vital signs recorded? Were they normal?
- What was the initial reaction to the situation by the involved team members?
- Could other preventive steps have been taken that could have avoided the emergency?
- Did the team follow the emergency action plan as roles were assigned?
- Do these roles need to be altered?
- When was the emergency kit accessed and were the contents appropriate for the situation?
- At what point was EMS notified, and how did you decide it was time to call 911?

A team assessment is not an opportunity for judgment or badgering of other team members. It is a serious step that should be taken for the office to efficiently respond to any situations that may arise in the future.

Team members should be given a chance to assess the experience and provide input on ways to be more efficient in the future with their personal responsibilities.

Because dental care providers are licensed health care workers, there is some legal liability in the way they respond to medical emergencies. All team members should have current health care provider CPR certification and know their roles in the office emergency plan. This plan should be reviewed on a regular basis, especially when new staff members join the office or job roles change.

Ultimately, all liability rests on the shoulders of the supervising dentist. However, licenses and certifications to other staff members, such as the hygienist and assistant, are also at risk, placing an added responsibility on those team members.

Emergency care that is reasonable and prudent is at the dentist’s discretion. All team members should know what the dentist’s plan of action involve, so the office can act as effectively and quickly as possible. Simply being ignorant of the law, responsibilities, or a lack of training are a liability for all dental professionals, no matter what their role. Until the emergency response team arrives, the sole responsibility of the patient’s condition lies under the supervision of the dental team.

Your patients and their families expect that you will provide expert medical care that ensures their safety and personal interests. While it can be a scary situation to help a patient during an emergency, remaining calm throughout the entire situation and thinking through the proper steps can help you make good choices that improve the safety of your patient.

Proper precautions should be taken to eliminate medical episodes while the patient is under your care. Up-to-date medical records, health history screenings and vital signs should be recorded at every single appointment. Neglecting to ask patients about medications they are taking, recording their blood pressure, pulse or documenting blood sugar levels can place both patients and dental team members in a dangerous situation.

The best way to prepare for a medical emergency is to make emergency training part of your annual continuing education for the entire office. Many times we remember essential parts of our responsibilities and emergency plan, but annual refreshers can bring to mind key components that are easy to forget.

Undergoing emergency training as a complete office is an effective way to make sure that all staff members are on the same page and understand the weight of their personal responsibilities.
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## MEDICAL EMERGENCIES IN THE DENTAL OFFICE

### Final Examination Questions

Select the best answer for each question and mark your answers on the Final Examination Answer Sheet found on page 136, or for faster service complete your test online at Dental.EliteCME.com.

1. Nausea is not a common sign of a heart attack.
   - True
   - False

2. Hypoglycemia occurs when blood sugar levels are below 80 mg/dl.
   - True
   - False

3. To avoid accidental overdose, intravascular medications should be administered slowly.
   - True
   - False

4. To determine whether a patient is likely experiencing a stroke, follow the acronym SIGN: Speed, indicators, gloves, non-mobile.
   - True
   - False

5. A healthy adult has an average respiration rate of 12-20 breaths per minute.
   - True
   - False

6. Do not spend longer than 10 seconds assessing a patient’s airway in an emergency.
   - True
   - False

7. Systolic blood pressure that is 160 or over or diastolic blood pressure that is higher than 100 is indicative of high blood pressure stage 1.
   - True
   - False

8. Most health care provider CPR certifications are active for 5 years.
   - True
   - False

9. A code word or phrase should be used to alert team members that a medical emergency has occurred in the office.
   - True
   - False

10. The best way to prepare for a medical emergency is to make emergency training part of your annual continuing education for the entire office.
    - True
    - False