Preparing for Medical Emergencies in the Dental Office

A Peer-Reviewed Publication
Written by Dr. Anthony Feck

Abstract
A Medical Emergency is the unexpected guest during our busy appointment schedules. Whether or not the office has prepared for this emergency before it happens generally decides how it will turn out. It is extremely important that every member of the dental team understands and is able to perform their role when the time comes. The team must thoroughly trained and adequately equipped to treat all medical emergencies as they arise. This article will describe the commonly encountered medical emergencies, the procedures associated with the occurrence of medical emergencies, and the timing of the occurrences. The article will stress the right tools (products and equipment), the right training and practice to deal with everyday medical emergencies. Statistics tell us that medical emergencies are 5.8 times more likely to occur in dental offices than in medical offices. This should not come as a surprise, given the number of patients dentists treat who have significant medical conditions that are not under good control, with invasive procedures encountered medical emergencies. The occurrence of medical emergencies, and the timing of the occurrences.

Educational Objectives: Upon completion of this course, the clinician will be able to do the following:
1. Develop the steps to properly access a medical emergency.
2. Learn the right tools for a medical emergency.
3. Learn the commonly encountered medical emergencies.
4. Learn the procedures associated with occurrence of medical emergencies.

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Dr. Anthony Feck practices in a multidisciplinary practice in Lexington, KY. He concentrates on sedation, short-term orthodontics, and dental-occlusal cosmetics. He is the co-founder and Dean of Faculty for DOCS Education (www.DOCSEducation.com), teaching dentists and their teams from all over the world how to safely and effectively treat high-risk patients with conscious sedation. Dr. Feck is the clinical director for Six Month Smiles (www.SixMonthSmiles.com), an organization dedicated to the education and support of dentists worldwide who provide short-term, cosmetically focused orthodontics to their adult patients. He is also the founder of Sunrise Dental Solutions (www.SunriseDentalSolutions.com), a comprehensive practice solutions company. He is a personal coach to some of the most successful dentists in North America. Dr. Feck can be reached at Tony@TonyFeck.com.

Author Disclosures
Dr. Anthony Feck has no potential conflicts of interest to disclose.
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Introduction
Just another day at the office
The appointment starts out just like countless others — a late afternoon patient scheduled for routine extraction of a periodontally involved lower first molar. After you greet this long-time patient, a 49-year-old businessman whom you’ve treated many times before, you glance over the treatment plan, confirm the procedure, and review his most recent X-rays. Everything goes as usual with the administration of local anesthesia (two cartridges of 2% lidocaine with 1:100,000 epinephrine), and you excuse yourself to check a hygiene patient and leave this patient with the assistant. When you check back with the patient five minutes later he doesn’t appear to be profoundly numb, so you administer another cartridge of local anesthetic. While recapping your needle, you notice your patient grabbing his chest and grimacing. Before you can ask what’s wrong, his arm falls to the floor and he becomes unresponsive (to be continued ...).

What happens next is a series of events that can define your career. The outcome will depend on what’s going on with your patient, as well as how you and your team react. One thing’s for sure — the better prepared you are, the less likely this “just another day at the office” will become a career-defining moment. Could this happen to you?

The statistics say yes, this could happen to you.\(^1\) In fact, medical emergencies are 5.8 times more likely to occur in dental offices than in medical offices. This should not come as a surprise, given the number of patients dentists treat who have significant medical conditions that are not under good control, with invasive procedures complicated by a stressful environment where drugs are administered. Among the medical emergencies that do occur in dental offices, the “just another day at the office” scenario detailed here is one of the most common dentists are likely to face. (See Tables 1, 2, and 3)

<table>
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<tr>
<th>Commonly Encountered Medical Emergencies</th>
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<th>Procedures Associated with Occurrence of Medical Emergencies</th>
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<th>Timing of Occurrences</th>
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Importance of being prepared
Competence in handling medical emergencies is no different than proficiency in any dental procedure in that it requires three things:
1. The right tools (products and equipment)
2. The right training
3. Practice

But that’s where the similarity between typical dental procedures and medical emergency procedures end. An open interproximal contact can hardly compare with a myocardial
When faced with a medical emergency, the consequences can be extreme for both the patient and dentist. In 2007, two Chicago-area dentists reached a settlement of $8.5 million with the family of a 46-year-old Chicago school principal who died during an endodontic procedure. The dentists’ professional liability carrier paid $4 million of the settlement, and the dentists were personally responsible for the remaining $4.5 million. Both dentists’ licenses were suspended. One reason cited for their suspension was failure to have adequate training for dental emergencies.²

When faced with an unfamiliar challenge under the stress of severe consequences, performance even from the well-prepared can be impaired. Given this, the argument can be made that just as much, if not more, time and preparation is warranted for medical emergencies than any other treatment discipline.

The American Dental Association (ADA) has clear guidelines on emergency preparedness and response in the dental office. The ADA Commission on Dental Accreditation expresses states that dentists “must be competent in providing appropriate life support measures for medical emergencies that may be encountered in the dental practice.” Further, the ADA Council on Dental Practice states, “The entire dental office team must be prepared to handle medical emergencies.” It then goes on to say, “Every dental office must have an emergency plan that outlines the steps it takes in the event of an emergency.”²

When it comes to successfully dealing with a medical emergency, the first step is to properly assess the situation. Is the person conscious? Is the person breathing? Does the person have a pulse? Soon after determining something is an emergency, medical transport personnel must be notified, then you need the right tools.

The Right Tools

The right tools for a medical emergency should be preassembled and clearly marked and kept in a location known to all office personnel. There are many commercial emergency drug kits available for purchase, or practitioners can easily assemble their own. The advantages to assembling one’s own is a better understanding of what you have, saving money, and confirming you have the essential ingredients. The essential ingredients of any emergency armamentarium for the dental office includes seven drugs:

1. Oxygen — Supplemental or positive pressure oxygen is a nearly universal agent for any type of physical distress, and an essential part of any dentist’s emergency armamentarium. Necessary for normal metabolism, additional oxygen supplied to a patient with low levels of oxygenation can prevent or decrease tissue damage, as well as aid in the recovery of vital organs such as the heart and brain. When used for emergency procedures, it is administered in a 100% concentration through a nasal cannula or hood, nasal/oral mask, or more advanced airway. The oxygen delivery equipment should contain a dedicated oxygen tank for emergency purposes (size “E” or larger) with mobile capability, a reservoir bag, and an ambu bag for positive pressure administration. Oxygen should be administered with caution in patients who have advanced respiratory disease such as COPD.³

2. Epinephrine — Epinephrine is a sympathomimetic drug that stimulates both alpha- and beta-receptors. The drug is used in cardiopulmonary arrest to stimulate and restore cardiac rhythm. Epinephrine is also important for treatment of severe bronchospasm and stridor. Patients with severe drug reactions, hypotension, and anaphylaxis are also candidates for epinephrine. There should be an ampoule of EpiPen in the emergency kit. This can be given intramuscularly and should have its onset of action within minutes. Common side effects include hypertension and tachycardia. Epinephrine can also precipitate angina and congestive heart failure in a susceptible patient.³

3. Nitroglycerin — Nitroglycerin is used for patients with angina. It is a vasodilator for the coronary vessels and can rapidly reverse cardiac ischemia. It is important to be sure that the patient is having angina prior to giving nitroglycerin. A 0.3 mg dose of nitroglycerin should be given sublingually at the onset of angina. If a patient has their own nitroglycerin, it is reasonable to allow them to use their medication. Relief of pain is usually seen within one to five minutes after the administration of nitroglycerin. If angina is not relieved within five minutes of administration, the patient should be given a second dose. The patient should be urgently transported to an emergency room if the pain is not relieved by two nitroglycerin doses.

In patients with frequent angina, nitroglycerin can be used prophylactically and given in anticipation of a stressful procedure. It is important for a patient to be sitting or lying down prior to the administration of the drug to help negate the effects of hypotension. There is now a nitroglycerin spray available 0.4-0.6 mg. It should be sprayed under the tongue as directed every five minutes for two doses as needed for chest pain. Call 911 when giving the first dose to transport the patient to the emergency room. It is important to store the drug correctly to avoid degradation. The expiration date must be monitored as well since an outdated drug will have no effect. Common side effects of nitroglycerin include hypotension and headaches.³

4. Glucose — Glucose is used for treatment of hypoglycemia in a diabetic or hypoglycemic-susceptible patient with low blood glucose levels. It is important to make sure that treatment planning takes into consideration patient

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² The Right Tools for a Medical Emergency, DENTALECONOMICS.com, 12.2012
³ The Right Tools for a Medical Emergency, DENTALECONOMICS.com, 12.2012
management to minimize the likelihood of hypoglycemia in such patients.

In the majority of patients with hypoglycemia, oral glucose solution should be adequate (orange juice, Gluco cola, Gluco-stat). In patients with somnolence or coma, Glucogel can be applied to the oral mucosa and reasonable absorption should be expected.

D50W can be used in instances where intravenous access can be established. It is the most reliable way of resuscitating the comatose hypoglycemic patient. D50W comes in an ampule containing 50 cc of 50% glucose (25 grams of glucose). This has to be infused very slowly since extravasation can result in significant tissue necrosis.

The only side effect of glucose administration is hyperglycemia.3

5. Diphenhydramine (Benadryl) — Benadryl is an antihistamine used to treat minor adverse drug reactions. This drug is available in oral and parenteral forms.

When a patient complains of itching or develops a maculopapular rash after the administration of a drug (local anesthetic, sedative, antibiotic, or analgesic), Benadryl 50 mg should be given orally. In instances when the cutaneous manifestation is progressing rapidly, Benadryl can be given intramuscularly. In such cases, the IM injection should be followed with a prescription for Benadryl 50 mg, q8h for three to six doses.

If there are signs of impending anaphylaxis, Epinephrine in the form of an EpiPen should be given intramuscularly, and the patient should be transported by ambulance to the nearest emergency room.5

6. Albuterol — Albuterol inhaler should be used for patients with acute flares of bronchospasm or asthma. It is a nonselective bronchodilator and works almost instantly. The patient should be instructed to inhale two puffs of the medication. If symptoms do not resolve promptly, the patient should be transported immediately to an emergency room.

Albuterol can cause tachycardia and hypertension. In addition, it can induce arrhythmia and precipitate angina and congestive heart failure in susceptible patients.3

7. Aspirin – 325 mg of aspirin (nonenteric coated) helps prevent or treat a myocardial infarction (heart attack) or cerebral vascular accident (stroke) by inhibiting platelet action, thereby discouraging clot formation and subsequent infarction of tissue supplied by the blood vessel(s). Time is of the essence once a patient has symptoms of chest pain or signs of stroke. It is best to have the patient chew the aspirin for 30 seconds before swallowing it. 4,5

The principle side effects to aspirin ingestion are sensitivity reactions and gastrointestinal irritation.

Optional ingredients of the medical emergency armamentarium include:

1. Automated External Defibrillator (AED) – More state and provincial regulating agencies are requiring an AED be maintained on-site in dental facilities. When no pulse is present, the AED will determine if the patient’s rhythm is “shockable,” then if appropriate will deliver an electrical charge to restart natural cardiac electrical activity necessary for proper circulation.

2. Nitrous Oxide – While not considered a traditional emergency drug, nitrous oxide, commonly available in dental practices, has a unique combination of three qualities that make it useful in treating signs and symptoms of an adverse cardiac event associated with coronary insufficiency. First of all, nitrous oxide delivered from medical-standard delivery units provides a higher concentration of oxygen than room air. Secondly, nitrous oxide is an effective sedative and analgesic, with a 50% nitrous oxide/oxygen mixture providing as much pain relief as 10 mg of morphine. This is an important characteristic to relieving the pain and anxiety associated with chest pain and a myocardial infarction. Finally, nitrous oxide causes vasodilation, thereby increasing blood flow to tissue depleted of oxygen due to narrowing of blood vessels.

Nitrous oxide’s only side effect during emergency treatment is CNS depression.1

3. Reversal Agents, ACLS Drugs, Equipment, and Products – More advanced drugs and equipment, when used appropriately by trained professionals, can increase the likelihood of successful emergency treatment outcomes. Many dental professionals have these products in their offices but do not have sufficient training and experience to use them correctly, something that may make the dentists more litigiously liable if they do not use them appropriately, or don’t use them in the emergency situation that calls for their use. A clinician should not maintain or administer any chemical agent to a patient in need unless he or she has proper working knowledge of its use, and knows method of administration, dosage amount, and side effects.

Training and Practice
When events conspire to turn “just another day at the office” into a potential career-defining moment, you will rely on the training that prepared you for just these circumstances. When it comes to appropriate actions to stressful events, good preparation will make decision making more automatic and less recall.

At the core of medical emergency training are the principles of basic life support. Not only is this likely required by your professional governing body, it is essential for you and your
entire team to know how to recognize a medical emergency, determine what vital signs are compromised, be able to alert advanced medical/transport personnel, and support the patient until such personnel arrive and take over the patient’s care. Basic Life Support (BLS) certification lasts for two years, but more frequent training can maintain skills and retention of information at a higher level.

Advanced Cardiac Life Support (ACLS) training takes your medical emergency response to a higher level, allowing for advanced treatment to be administered earlier in the sequence of care. This can increase the likelihood of the most favorable outcome. The more training the emergency response team has, the more confidence they have, and confidence is an invaluable asset during a highly stressful event when life and death hang in the balance.

There are many sources of good training in both BLS and ACLS. A good argument can be made for on-site training for the entire team. The benefits include:

1. Training in the environment where the emergency response will be delivered
2. Training with the practice's products and equipment
3. Focused training tailored to the needs of the dental practice
4. Cost savings

There are several groups available to provide such instruction. One, Life Support Services, Inc., provides on-site BLS and ACLS training tailored to the unique needs of the dental practice.6

In addition to formal training, practices should have regularly scheduled practice drills in responding to a medical emergency. A written plan such as the one mandated by the American Dental Association should be available to all team members.2 This author recommends alternating training/practice sessions every six months for the dental practice. In other words, BLS and/or ACLS training on-site, followed by medical emergency practice drills six months later. This cycle should repeat itself each year.

Continued from “Just another day at the office”....

You confirm unresponsiveness, and check for breathing. Finding none, you check the carotid artery and find the patient is absent a pulse. You command your assistant to call 911 and bring the emergency kit, oxygen, and AED. You reach into an operatory drawer and pull out a selection of oropharyngeal airways. You select the appropriate one for the patient, and through a pocket mask breathe two quick breaths into the open airway. By this time your team has sprung into their appointed, well-rehearsed roles. A hygienist is assembling and readying the positive-pressure oxygen. An assistant is opening the AED and preparing to open the patient’s shirt and apply the AED leads. A business office team member is opening the emergency kit. While you wait for the AED leads to be applied, you maintain the airway and direct CPR. Next, you have everyone stand clear while the AED reads the patient’s heart rhythm, and when signals “shock advised,” you have everyone stand clear while the shock is delivered.

There is no panic. There isn’t time to think about consequences, just what you’re doing now, and what you might have to do next. The outcome of “just another day at the office” is patient survival, thanks to the quick action of a well-trained, well-practiced team with all the right tools.

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Author Profile
Dr. Anthony Feck practices in a multidoctor practice in Lexington, KY. He concentrates on sedation, short-term orthodontics, and dental-facial cosmetics. He is the cofounder and Dean of Faculty for DOCS Education (www.DocsEducation.com), teaching dentists and their teams from all over the world how to safely and effectively treat high-fear patients with conscious sedation.

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1. What are commonly encountered Medical Emergencies?
   a. Seizures
   b. Chest pains
   c. Shortness of breath
   d. All of the above

2. What procedures are associated Occurrence of Medical Emergencies?
   a. Teeth extractions
   b. Pulpal extraction
   c. Preparation or filing
   d. All of the above

3. When do most Occurrence of Medical Emergencies happen:
   a. Just before treatment
   b. During local anesthesia
   c. After treatment
   d. After leaving the office

4. What is the first step in dealing successfully with a medical emergency
   a. Check to see if the patient is numb
   b. Call 911
   c. Properly assess the situation
   d. All of the above

5. If your patient has symptoms of chest pain or stroke you
   a. Should you tell the patient to lower their head and breathe deeply
   b. Should you tell the patient to chew an aspirin for 30 seconds before swallowing it.
   c. Wait 30 minutes for the symptoms to go away.
   d. None of the above

6. At the core of medical emergency training is Basic Life Support training and certification.
   a. Basic Life Support certification lasts for 1 years
   b. Basic Life Support certification lasts for 2 years
   c. Basic Life Support certification lasts for 3 years
   d. Basic Life Support certification lasts for 4 years

7. What is an indication that the patient is experiencing a problem?
   a. When the patient is unresponsive
   b. When the patient is having difficulty breathing
   c. When the patient has no pulse
   d. All of the above.

8. In addition to formal training each dental office should
   a. Have regularly scheduled practice drills in responding to a medical emergency.
   b. Think about writing a plan such as mandated by the American Dental Association.
   c. Should rehearse with one team member at a time, but never as a group.
   d. Think about getting an emergency kit.

9. How does the dental team prepare for Medical Emergencies in the Dental Office?
   a. By constant training
   b. By having a written plan and reviewing it often.
   c. By having practice drills every 6 months.
   d. All of the above.

10. What will an Automated External Defibrillator (AED) do?
    a. This will determine if a pulse is present
    b. This will determine if the patient’s rhythm is “shock-able”.
    c. This will deliver an electrical charge to restart natural cardiac electrical activity.
    d. All of the above.

11. Why are medical emergencies more likely to occur in a dental office than in a medical office?
    a. Because more dental patients are women
    b. Because dentists have a smaller amount of time with their patients.
    c. Because the patient is so nervous in the dental office.
    d. None of the above.

12. Competence in handling medical emergencies with proficiency requires
    a. The right tools (products and equipment)
    b. The right training
    c. Practice
    d. All of the above.

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**Questions**

**Notes**
Preparing for Medical Emergencies in the Dental Office

Name: ____________________________  Title: ____________________________  Specialty: ____________________________

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City: ____________________________  State: ____________________________  ZIP: ____________________________  Country: ____________________________

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Requirements for successful completion of the course and to obtain dental continuing education credits: 1) Read the entire course. 2) Complete all information above. 3) Complete answer sheets in either pen or pencil. 4) Mark only one answer for each question. 5) A score of 70% on this test will earn you 1 CE credit. 6) Complete the Course Evaluation below. 7) Make check payable to PennWell Corp. For Questions Call 216.398.7822

Educational Objectives

1. Develop the steps to properly access a medical emergency.
2. Learn the right tools for a medical emergency.
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Course Evaluation

1. Were the individual course objectives met?  Objective #1: Yes  No  N/A

2. To what extent were the course objectives accomplished overall?  5  4  3  2  1  0

3. Please rate your personal mastery of the course objectives.  5  4  3  2  1  0

4. How would you rate the objectives and educational methods?  5  4  3  2  1  0

5. How do you rate the author's grasp of the topic?  5  4  3  2  1  0

6. Please rate the instructor's effectiveness.  5  4  3  2  1  0

7. Was the overall administration of the course effective?  5  4  3  2  1  0

8. Please rate the usefulness and clinical applicability of this course.  5  4  3  2  1  0

9. Please rate the usefulness of the supplemental webliography.  5  4  3  2  1  0

10. Do you feel that the references were adequate?  Yes  No

11. Would you participate in a similar program on a different topic?  Yes  No

12. If any of the continuing education questions were unclear or ambiguous, please list them.

13. Was there any subject matter you found confusing? Please describe.

14. How long did it take you to complete this course?

15. What additional continuing dental education topics would you like to see?

Please Evaluate This Course by Responding to the Following Statements, Using a Scale of Excellent = 5 to Poor = 0.

1. Were the individual course objectives met?  Objective #1: Yes  No

2. To what extent were the course objectives accomplished overall?  5  4  3  2  1  0

3. Please rate your personal mastery of the course objectives.  5  4  3  2  1  0

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