

# HOW PREPARED ARE YOU FOR A MEDICAL EMERGENCY?

by Catherine Goodson, DDS

In March 2011, what was supposed to be a routine wisdom tooth extraction on a 17-year-old girl from Woodstock, Maryland, went horribly wrong. Jenny Olenick had been given the standard dose of anesthesia, but it didn't sedate her adequately. The anesthesiologist administered more, and the procedure began. Then Jenny began experiencing bradycardia, or a slowing heart rate, and the oxygen saturation in her blood started dropping. Soon she went into hypoxic arrest.

Emergency responders were called and restored Jenny's pulse within four minutes of their arrival, but the damage had been done. Jenny was rushed to the hospital, where she

died after being in a coma for a week. The autopsy showed that Jenny had brain edema and acute hypoxic-ischemic encephalopathy due to lack of oxygen. The death was ruled accidental, but Jenny's parents sued the anesthesiologist and oral surgeon for medical malpractice.

No one likes to think that a dental medical emergency will happen in his or her office. But as professionals we need to realize that a single dental medical emergency can alter the course of our professional careers and the lives of our patients forever.

As a dentist, my defining emergency lived in the body of an out-of-control asthmatic with a less-than-truthful medical his-

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tory. Her dental treatment was being performed with the use of IV sedation. The first 60 minutes of the procedure were uneventful, with stable vitals and no indication of what was yet to come.

As we began the second hour of what we hoped would be a three-hour full-mouth restorative treatment, she began to experience respiratory distress that initially exhibited as slight wheezing. When I first noticed her labored breathing, I called for an inhaler, repositioned her into a more comfortable, upright breathing position and encouraged her to assist with inhaling the Albuterol. Her attack progressed from mild wheezing to a high-pitched crowing, accompanied by an obviously more occluded airway. It was apparent the inhaler was not providing any relief of the attack and this was much more severe asthma than she indicated on her medical history. She became combative due to her restricted airway and my mind began to race. What do I do next? My thoughts were disorganized and chaotic. But one thought predominated all others: How did this happen? What did I miss?

Research done at the University of Texas Health Science Center San Antonio reveals that practicing U.S. dentists will face approximately eight potentially life-threatening medical emergencies in their offices every 10 years. That means there will be approximately 150,000 dental medical emergencies in the U.S. every year.

More and more dental emergencies are due to unanticipated interactions between sedation and the medications a patient is taking. According to the AMA, in 2010 the average American between the ages of 35 and 50 was currently taking seven prescribed medications (an increase from four in 2002). These drugs are primarily used to treat hypertension, diabetes, high cholesterol and cancer-related illnesses. And since the five leading causes of death in the U.S., as released from the CDC's National Center for Health statistics, are heart disease, cancer, stroke, respiratory disease and accidental death, the average American is taking seven medications that are used to treat the five leading causes of death.

How does this affect you and your practice? Medical emergencies due to adverse drug reactions have dramatically increased. Every year in the United States, 30 million prescription-dispensing errors out of three billion prescriptions filled occur at outpatient pharmacies, according to the National Patient Safety Foundation. The number of pharmacy errors has increased due to a greater quantity of medical services being rendered outside the hospital-type setting. Most errors are minor and are recognized by the patient, but the more serious errors cause drug interactions that can be potentially fatal.

Imagine the compound effect of administering local anesthetics or providing sedation to a patient possibly taking the wrong medication, or with a potentially fatal interaction of

medications. If you're not adequately prepared, you, your patients and your practice could be in for significant problems. How confident are you that your current medical history accurately captures the medications your patients are taking? And are you (and your team) ready to deal with a life-threatening medical emergency like the one I faced?

In that emergency 10 years ago, after I administered the Albuterol, I knew time was of the essence. My reaction involved two primary responses: first, assist her respiratory efforts. Second, mobilize the staff to summon emergency assistance. The next five minutes were a technical blur. We located our emergency drug kit, but which drug should I request? The inhaler I used previously was an easy find... it was hers! Did I ask someone to phone 911 or did I just think I did? Where was the ambubag? Should I reverse the sedation? My rote learning from ACLS that accompanied my IV sedation training reminded me to use an epipen. I administered it through her pant leg, and this provided her a slight amount of relief. But she struggled so violently for breath, it was impossible for her to assist with the placement of any positive pressure oxygen supplementation measures.

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I'd like to say this story ended wonderfully, but that wouldn't be the truth. The paramedics arrived in approximately 10 minutes (ADA average is 11). She was intubated in the ambulance and remained intubated for three days in ICU, during which time it was determined that she was pregnant. While I was at the hospital with her family, they tried to console me by telling me this wasn't my fault and this kind of episode had occurred twice before! When I asked them why she didn't tell me during our pre-treatment consultation, they said she was afraid I wouldn't treat her.

I returned to the office later that evening to examine the disaster I left behind that afternoon: the operatory, the emergency equipment, and the tapes from the EKG. I couldn't rest until I dissected this tragedy into its basic components. And I decided this would never happen to me again.

The incident with the asthma patient almost 10 years ago began with an inadequately designed medical history. That small

piece of paper altered my life and my practice completely. I re-defined my mission in dentistry and began a quest to design a better emergency system for dentists – an area of dentistry that has been neglected.

“Medical Emergency Mastery” was designed to take the guesswork out of emergency preparedness. It empowers general dentists and their staffs to recognize and manage medical emergencies in their office through (1) an expertly crafted medical history, (2) a targeted emergency drug kit specifically for general dentists and (3) staff emergency training that is reproducible for staffs of any size. This three-pronged approach will prepare you to proactively lead your staff, protect your patients and give you the peace of mind you have earned.

### **Component #1: A Properly Constructed Medical History**

The composition of a thorough medical history is the single-most significant diagnostic tool we possess. In my emergency, a well-crafted medical history may not have alleviated the severity of the emergency but would have helped me determine the ability of this patient to tolerate routine dental treatment.

The majority of dentists purchase pre-packaged medical questionnaires that are far too generic and ask questions in an alphabetic type order (such as asthma, allergy, angina, etc.). These questions require the practitioner to look at each question, determine if the response is acceptable and then ask an appropriate follow-up question. What if we forget the next right question? What if we don't know the next question? What if we're too busy?

The medical history should be constructed to include questions that you believe are relevant to your patient population, asked in a way that will give you maximum access to the information. I've designed the “Dental Safety” medical history to ask questions in a sequential order by systems – for example, all the questions regarding cardiac concerns are grouped together. This computer-generated system follows the patient's positive responses: he or she completes the questionnaire on the computer and a positive response generates the next series of questions. By asking the questions in a systems format, you are able to follow a logical progression of questions and answers to achieve a greater understanding of your patients' health. I've divided the questions into three sections: (1) physical systems, (2) psychological systems and (3) dental experiences.

Examples of questions that relate to a physical system would include:

Asthma-related questions:

- When was your asthma diagnosed?
- When was your last attack?
- Do you consider your asthma controlled?
- How often do you have an attack?

- When was your last medical evaluation of your asthma?
- Have you been hospitalized due to your asthma?
- Do you carry an inhaler with you?
- When was the last time you replaced your inhaler?
- What causes your asthma attacks?
- What medications do you take for asthma?
- Have you ever had an attack in the dental office?
- Do you leave your inhaler in the car?
- How often do you replace your inhaler?

Examples of questions that relate to psychological system assessment include:

- Are you under the care of a psychiatrist or psychologist?
- Does a psychiatrist prescribe medications to you?
- What medications have been prescribed to you?
- How long have you been taking medications?
- What is your diagnosis?
- Have you been hospitalized in relation to mental health issues?
- Do you drink alcohol?

Examples of questions that relate to dental experiences include:

- At what age did you have your first dental exam?
- When was the last time you were at the dentist?
- Do you have specific fears concerning dental treatment?
- Do you have a strong gag reflex?
- What did you like most about your last dentist? The least?
- Is there anything we should know about your previous dental experience that would help us understand you better?

The patient is requested to complete the form prior to the first visit, so the dentist has adequate time to review it. (If the patient doesn't have a computer or doesn't have the opportunity to complete it, the information can be obtained in the office.) The dentist or reviewing staff member is able to review the completed health history, highlight areas of concern and question the patient in greater detail prior to the initiation of dental treatment. This allows you to assess the overall health of your patients more effectively, and prevent potential medical emergencies.

### **Component #2: A Properly Constructed Emergency Drug Kit**

As a provider of in-office IV moderate conscious sedation in the practices of my colleagues, I have had the unique opportunity to examine many commercially prepared emergency drug kits. The large majority of these kits have far too many components that general dentists aren't qualified or comfortable using. And many specialists currently not providing sedation are uncomfortable using any kind of injectable emergency drug.

My goal became quite simple: construct an emergency drug kit specifically for general dentists or specialists not providing sedation. I simplified the components of this drug kit to reflect the drugs used to treat the seven most commonly occurring medical emergencies in the dental office: syncope, hypo-

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glycemia, asthma, mild allergic reaction, severe allergic reaction, angina and heart attack.

The current kits include:

- Ammonium ampules (x3)
- Benadryl (50mg) tabs x 100
- EpiPen (.3mg) single use pen or Twin Jet pen
- Glucose substitute (name brand)
- Nitro Tabs (.4mg)/nitro spray (.4mg)
- Albuterol inhaler/Proventil inhaler
- Aspirin (81mg) (aka baby aspirin)

Each drug is in a waterproof pouch and labeled individually with its name, the medical and laymen's terms for the emergency that it is used to treat and directions for its use. In my discussions with my colleagues one theme was consistent: they knew what the drugs are used for in theory, but they were afraid they wouldn't remember what and how to administer the drugs in an emergency. My packaging and directions solved that problem! The drugs are kept together along with an emergency manual that outlines the signs, symptoms and treatments for the most commonly occurring emergencies, including ones that don't require medical intervention.

For example, if your patient begins to experience chest pains (angina), the manual outlines the possible causes of the pain and which emergency drugs would be used to treat it. The directions for the nitro tab administration are clearly indicated on the label as well. This removes any guesswork from administration. You are now able to consult a chairside guide to provide your patient the best medication to treat any possible emergency.

A properly stocked drug kit is essential, no doubt. But of much greater significance is the awareness that the majority of our patients' emergency needs will be those that require knowledge of airway management. With this in mind, I developed an inventory of the necessary equipment and supplies required to provide airway maintenance. By creating spreadsheets to inventory emergency equipment and supplies, your team can methodically review the use of equipment and inventory their supply in as little as 15 minutes a month (Fig. 1).

### **Component #3: A Properly Trained and Empowered Staff**

The most integral component of the dental safety system is the staff training. We all know we have amazing staff members, so why not let them shine? Each team member has specific duties and responsibilities to assist us chairside and maintain

Fig. 1

<b>Equipment Maintenance Log</b>			
	<b>JAN</b>	<b>FEB</b>	<b>MAR...</b>
<b>AED/ Batteries</b>			
<b>Oxygen tank</b>			
<b>E-cylinders/number ___</b>			
<b>Nasal Canula</b>			
<b>Ambu Bag</b>			
<b>Face Mask</b>			
<b>Nitro Tab .4mg</b>			
<b>Nitro Spray 4mg</b>			
<b>Ammonia</b>			
<b>Benadryl (50mg ) Tabs</b>			
<b>Epi Pen (.4 mg)</b>			
<b>Albuterol</b>			
<b>Glucose Sub</b>			
<b>Aspirin (81 mg)</b>			
<b>Propanolol</b>			
<b>Ice Pack</b>			
<b>First Aid</b>			
<b>Expired Anesthetics</b>			
<b>MSDS Sheets</b>			
<b>OSHA Compliance</b>			

office equipment and supplies; why not apply that to emergency preparedness? That is exactly what I decided to do. We started our training with the premise that we would stop being afraid of what could go wrong and start being positive about what could go right. I designed specific roles for staff members that could be modified for a staff with as few as three members. Included is the exact text for a 911 call, a method for documentation of an emergency incident as well as flow sheets for staff review.

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The most simplistic system is one that requires the fewest staff members but is adaptable for large practices. This training regimen requires three team members, not including the doctor. Two of the team members will have the predominate roles and the third will primarily summon emergency assistance. (This staff member may be non-clinical if necessary.) The doctor's primary role is to remain with the patient, direct the response efforts, maintain the patient's airway, administer CPR, if necessary, and direct the administration of emergency drugs.

The primary responder will be the staff member with the most dental or emergency experience. She should have experience in recognizing the signs of an emergency and be knowledgeable in the treatment. She will know the location of the emergency drugs, equipment and their uses. This responder will follow only the doctor's direction. After receiving instructions from the doctor, she will direct a third responder to be on standby to notify 911 and prepare for emergency intervention. The call to 911 will be placed only when requested by the doctor.

The second responder remains chairside with the doctor to provide assistance with drug or equipment administration as needed. She also will communicate with any staff as necessary and complete any documentation. Her focus will remain on monitoring vitals and airway maintenance.

The third responder will actually place the 911 call. (The content of the call is scripted and the script remains at the front desk (Fig. 2). This staff member monitors treatment in adjacent rooms and surveys patients in the reception area to provide reassurance and dissipate any anxiety.

In order to facilitate this training, I implemented a flow sheet for my staff that outlined each responsibility. Written protocols ensured that emergency scenarios could be reviewed on a monthly basis: equipment maintenance sheets would only require about 15 minutes a month to monitor (Fig. 3).

Cross training was essential to prevent any lack of knowledge due to absence or staff changes. Initially, my staff felt awkward and clumsy when they spoke to each other, even slightly confused. Combining the emergency protocol with the staff responsibilities caused frustrations and self-doubt in even the most talented members of the staff, but after a few sessions, the team was relieved that we had a system in place.

### The Dental Safety System in Action

To put my system to the test, I phoned a friend and requested she masquerade as a new patient with a complex medical history. We decided she would feign syncope. After two sessions of "verbal drills" and one "play date" of a reenactment with a non-clinical staff member, I thought surely syncope could be managed without any difficulty. That proved to be incorrect. After the initial examination, diagnosis of a restoration and initiation of treatment, our "new patient" indicated she felt faint.

Fig. 2

## The 911 Call

**When notified by the team leader, the responder will phone 911 and state the following:**

- 01** State your name, the name of the doctor, practice location and cross streets.
- 02** State the patient's symptoms, status and whether conscious or unconscious, stable or unstable, alert, etc.
- 03** State the entrance into the practice. State whether the entrance is blocked, obstructed, etc.
- 04** State that someone will greet them.
- 05** Remember to stay on the phone until told to hang up!
- 06** Communicate to your team leader that EMS has been summoned and wait...

The ensuing few minutes found my staff primarily startled. After the initial "shock" wore off, they first looked at each other and seemed to forget the patient. I remained by the patient and initiated my chairside responsibilities.

Once I began to instruct the first responder in her duties, a calm rhythm began. Ever so slowly the staff began to move, like inexperienced athletes beginning their first race. I prompted, waited, praised and assisted them in their efforts. When the emergency drug kit arrived with the ammonia, the patient recovered spontaneously.

My feelings of pride in a staff that just a month before had cried at the end of an asthma attack were beaming with pride. Syncope obviously paled in comparison to the more severe asthma attack, but nonetheless, the crisis had been averted by teamwork, knowledge and application of simple principles. It wasn't necessary to tell the team that this was "only a test." They had passed!

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Fig. 3

## Monthly Emergency Simulation Practice

	JAN Date	FEB Date	MAR Date...
Update Emergency Kit Contents			
Update First Aid Kit Contents			
Blood Pressure Technique, Pulse			
Airway Obstruction			
Syncope			
Hypoglycemia			
Anaphylactic Shock or Severe Allergic Rx			
Mild Allergic Reaction Asthma Attack			
Seizure			
Angina			
Cardiac Arrest			
Hypotension			
Hyperventilation			
Adverse Drug Reaction			
Staff Duties			
AED Use			
Eye Injury			
Needle Sticks			
911 Call			
Fire Drill			

I shared my system with my colleagues, and this kit of simple tools worked incredibly well in practices of every size and composition. I constructed kit after kit, improving upon each with recommendations from my friends. I began to share my experiences with doctors in their offices, training their staffs and empowering their teams. The greatest satisfaction came in the feedback I received; the office managers who phoned to report how they had handled an emergency without incident; the doctors who remained calm as they requested the appropriate drug from their kits and their staff responded instantly.

It is impossible to predict what will occur in our practices on a daily basis. What I have learned to predict is that medical emergencies will happen to each one of us. The shape, form and fashion will be unique to your patient population, but no matter what, you are responsible for your reaction to them. I reacted to a horrific occurrence and moved toward a solution. And I want to encourage you to be ready to respond long before you face a severe medical emergency with one of your patients.

When evaluating the three integral components necessary for a well-established emergency preparedness protocol, ask yourself the following questions:

- When did I last objectively review my medical history questionnaire?
- Do I know what question to ask next in response to a positive answer from a patient?
- Do I know how to effectively and correctly use all the drugs in my emergency drug kit?
- When was the last time I trained my staff in emergency scenarios?

Do not delude yourself into thinking a medical emergency will never happen to you in some form or fashion. Whether it's a patient's reaction to anti-hypertensives and local anesthesia, a hypoglycemic reaction or an anaphylactic shock, do you want to take the chance that your staff will forget their roles in an unfolding emergency? Don't wonder what the answer will be for one moment longer. Assess and evaluate your present systems of emergency preparedness. With a modest effort, a well-structured framework and an enthusiastic staff, your training protocol can reflect a comprehensive vision of patient care that has left no stone unturned. ■

### Author's Bio

Dr. Catharine Goodson has proudly served the dental profession since 1985. As a group practice owner, she soon realized her purpose in dentistry to aid patients in decreasing the anxiety associated with dental treatment. She founded Portable Anesthesia Services in 2005 to provide in-office moderate IV sedation for the general dentist and specialist. To provide ongoing support for her colleagues, *Medical Emergency Mastery* was developed to provide customized training in the management of medical emergencies in the dental office. Goodson also practices as an associate of The Heartland Dental group in Katy, Texas. For additional information regarding training programs for your staff, contact Dr. Goodson by e-mail at [catharine@catharinegoodsondds.com](mailto:catharine@catharinegoodsondds.com) or visit her website, [www.catharinegoodsondds.com](http://www.catharinegoodsondds.com).

