

Crunch Time

While rare, sudden cardiac arrest can and does occur in dentists' offices. If it does, saving a life is a matter of time.

Dentists used to consider buying an automated external defibrillator to be roughly equivalent to buying a potted plant – only more expensive. It was an item they felt they should buy, but one that added little value – and only added expense – to their practice. That attitude may be changing, though, particularly as the public becomes more accustomed to seeing AEDs in public places, such as airports, government buildings and restaurants, and then wonders why there isn't one in their dentist's office.

Even though incidences of sudden cardiac arrest are rare in dentists' offices, stories such as the one out of Chicago in December – in which a 46-year-old grade-school principal died of cardiac arrest while receiving a root canal – only heighten the stakes.

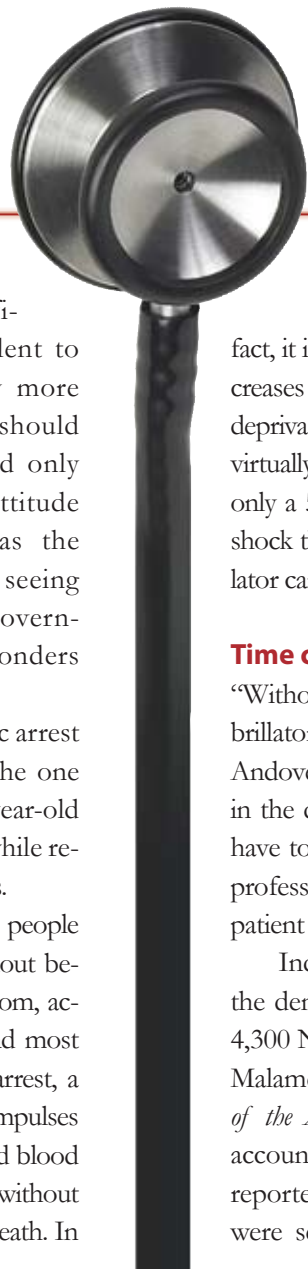
And the stakes are high. Roughly 325,000 people die every year from coronary heart disease without being hospitalized or admitted to an emergency room, according to the American Heart Association. And most of those sudden deaths are caused by cardiac arrest, a condition that occurs when the heart's electrical impulses become chaotic, stopping the flow of oxygenated blood throughout the body. The longer a person goes without oxygenated blood, the greater the likelihood of death. In

fact, it is estimated that a person's chance of survival decreases by about 10 percent for every minute of oxygen deprivation. In other words, left unattended, a patient has virtually no chance of surviving after 10 minutes, and only a 50/50 chance after five. By delivering an electric shock through the heart, an automated external defibrillator can restore the heart's normal rhythm.

Time crunch

“Without the time crunch, I wouldn't be selling defibrillators,” says Paul Asted, president, Asted Consulting, Andover, Minn., a risk management firm with expertise in the dental market. “When you talk about time, you have to ask the dentist, ‘How long will it take to get a professional rescuer to your office from the time the patient collapses?’ Then you figure from there.”

Indeed, the incidence of sudden cardiac arrest in the dentist's office is rare. In a 15-year-old survey of 4,300 North American dentists (conducted by Stanley Malamed D.D.S, and reported in 1993 in the *Journal of the American Dental Association*), syncope (fainting) accounted for over half of the 30,608 emergencies reported. Mild allergic reaction and angina pectoris were second and third, each with about 8 percent.



Sudden cardiac arrest accounted for just 331 incidents, or about 1 percent. “So it’s uncommon, but it can happen,” says Malamed, who is professor of anesthesia and medicine at the University of Southern California School of Dentistry, and an author and speaker on the topic of emergency preparedness in the dentist’s office.

In a recent survey of 244 dentists and dental hygienists in the state of Ohio (reported on in the April 1, 2007 edition of the *Journal of Dental Education*), 6 percent reported that they had administered nitroglycerin to a patient during a dental visit, 5 percent reported performing cardiopulmonary resuscitation on a patient in the dental office, and 78 percent reported that their last CPR training course included training on an AED. Eleven percent said they had an automated external defibrillator in their office.

Why AEDs?

Despite the low numbers, several factors are driving dentists toward purchasing automated external defibrillators. The first is, simply, the risk factors associated with the practice of dentistry, including sedation, patient stress, and patients’ symptoms that present as dental problems but that may in fact indicate potential cardiac problems.

“Any time you’re offering sedation, you’ll have a higher risk of cardiovascular complications,” says Asted, a certified emergency medical technician and former paramedic. “That’s why most states have specialized requirements for materials if [the dentist does] conscious or unconscious sedation.” In addition, dental patients are frequently under stress, either from pain or fear, and stress is another risk factor for sudden cardiac arrest, he points out.

Dentists also need to be careful in recognizing that a patient coming into the office complaining about pain in the jaw could actually be experiencing a heart attack, says Asted. “If the dentist isn’t able to find a dental reason for pain, he or she needs to be thinking of potential heart attack,” he says. “Such patients may also be pale, weak, sweaty or clammy-skinned It’s another reason why the dental office is a high-risk area.”

For all these reasons, in 2002, the American Dental Association’s Council on Scientific Affairs suggested that dentists purchase AEDs for their offices. At least three states

have mandated the dental practices have defibrillators (in most cases, an AED) on hand, at least under circumstances. They are:

- **Florida:** Since February 2006, all dental offices must have an AED.
- **Tennessee:** Dentists performing surgery or procedures requiring either conscious sedation or deep sedation/general anesthesia must have a defibrillator on hand.
- **Oregon:** Dentists performing procedures with general anesthesia, deep sedation, conscious sedation or nitrous oxide sedation must have a defibrillator on hand.

In addition, the majority of states require dentists, hygienists and assistants to receive regular training in basic life support, including automated external defibrillation.

The public expects it

A second factor driving adoption of AEDs among dentists is public perception. “The public’s perception is that dentistry is medicine, and medicine is inclusive of everything,” says Asted. “Today, because AEDs are so prevalent, and because the dental industry expects dentists to have training in CPR and first aid, [the thinking is], there must be a reason for it. If you follow that logic, the dentist must have an automated external defibrillator.” Along those same lines, dentists who have had basic life support training know the value of an AED, continues Asted. “Imagine you as a dentist are on trial [following an incidence of sudden cardiac arrest in the office], and the opposing attorney asks, ‘Have you and your staff received training in resuscitation?’ You answer ‘yes.’ And he asks, ‘And you don’t have an AED?’”

Despite these factors, the number of dentists who have purchased AEDs – which can cost anywhere between \$1,500 and \$2,500 – is probably pretty low. Three or four years ago, when Malamed started asking about AEDs during speaking engagements at the Chicago Midwinter meeting, only a handful of the 500 or so dentists in the audience indicated they had one in their offices, he says. “Now, it’s probably about a third who raise their hands,” he says. But because dentists who show up at such presentations are more likely than others to have AEDs, he adjusts accordingly: “I doubt if it’s 25 percent” who own AEDs.

The bottom line for distributor sales reps is this: Plenty of opportunities exist to talk about AEDs. And one way to do it, according to Malamed, is talking about time. “Ask the doctor, ‘If a cardiac arrest occurred in this office and you called 911, how long would it take an ambulance to arrive, considering the time spent calling 911, the time it takes to travel from the fire station to the office, and the time it takes for the [emergency medical workers] to get from their ambulance to the office?’ In most cases, it will be at or beyond 10 minutes. Having an AED allows the

any one of whom could collapse from sudden cardiac arrest. If you have an AED, you can do something about it right away, over and above just performing CPR.”

The second approach is tailored to the dental practice, says Constantine. “If the dentist is sedating people, they are doing things ... that could potentially lead to some kind of cardiac impairment that could become sudden cardiac arrest.” A small minority of dentists go so far as to become qualified to use an advanced-life-support defibrillator, which allows them to determine for themselves, based on the rhythm of the heart,

whether to deliver a shock or not. Most, however, opt for devices that tell the caregiver when to apply the shock (which research shows is the case about 57 percent of the time, according to Constantine). The Zoll device even coaches the caregiver on cardiopulmonary resuscitation, indicating how hard the caregiver should press against the patient’s chest, and how often to do so.

Simple-to-use devices can save more lives, since anyone in the office – including the front office staff – can respond quickly to a cardiac event, adds Constantine. And, given the relatively small size of the typical dentist’s office – and hence, the proximity of any potential caregiver to the AED – the odds are good that lives will be saved. The experience of the airline industry bears this out.

American Airlines reported that in 2004, its flight crews had saved about 57 percent of passengers who needed defibrillation, says

Constantine. There are several reasons for the high save rate, not the least of which is that most airline passengers are relatively healthy. But there are other reasons for the airline’s success. “They had trained responders, and the AED was 50 feet away max, because they’re all confined on a plane,” says Constantine. “Their save rate was high because they could get there quick.

“A dentist’s office is much like an airline,” he continues. “If the dentist trains everyone [on AED use] in the office, they can get to that patient quickly, and the probability of saving him is similar to what you find in an airline A dentist who pays attention and puts the little effort into it that’s required to have a good AED program will have a high probability of saving somebody.”



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— Paul Asted, Asted Consulting

most important intervention to be administered within a minute or two of the cardiac arrest, greatly increasing the victim’s chance of survival.”

Two sales approaches

Distributor reps can approach dentists about AEDs in two ways, notes Hank Constantine, marketing director for automated external defibrillators for Zoll Medical Corp., Chelmsford, Mass. One is with the “standard” AED sales pitch, which can be applied to anyone conducting business in a public place. Says Constantine, “The rep says to the dentist, ‘You have a place of business. People are coming in all the time, and they’re bringing their children, parents, uncles and brothers. There are all kinds of people in the waiting room,

Always Prepared

Check out any article or listen to any presentation by Stanley Malamed, D.D.S., professor of anesthesia and medicine at the University of Southern California School of Dentistry. There's an excellent chance it will begin with these words: "Medical emergencies can and do happen in the practice of dentistry." It's a sobering message, but one to which your dental customers should pay attention.

Malamed is the author of three textbooks: the *Handbook of Local Anesthesia*, *Medical Emergencies in the Dental Office*, and *Sedation: A Guide to Patient Management*. He has published close to 100 scientific papers and is a Diplomate of the American Dental Board of Anesthesiology. He's got his own Web site, www.drimalamed.com, on which is posted several of his articles on emergency preparedness for the dental practice.

Surveys have demonstrated that over the course of a 20-year dental career, a dentist will encounter six to seven medical emergencies in the office, says Malamed. The likelihood is that the victim will be a patient, but in 10 percent of emergencies, the victim is the doctor or member of the office staff.

Sudden cardiac arrest is always a concern, but the fact is, the most common medical emergency in the dentist's office is far less dramatic. "More than 50 percent of medical emergencies are caused by fainting," says Malamed. "It most often occurs in young, macho males while receiving a local anesthetic injection." Sitting upright, nervous about the shot but unwilling to admit it, these young men's bodies release adrenalin – the "fight or flight" response. Blood is directed to the arms and legs, but fails to return upstream to the heart and brain. When the brain is deprived of blood, the person loses consciousness.

Stress (usually caused by fear or pain) is the culprit of other common emergencies, including angina, seizures, asthma and hyperventilation, says Malamed. Along with fainting, these stress-induced incidences account for about 75 percent of

all emergencies. "That means that we can prevent 75 percent of all emergencies by taking care of our patients' fear and practicing good pain control."

It may not be possible to prevent all medical emergencies, but it is possible to be prepared for them, says Malamed, who recommends that dentists implement a simple four-pronged emergency preparedness program, which includes:

- Training in basic life support for all members of the office staff, not just the doctor or hygienist. And such training should be repeated periodically, to make sure all staff members remember what to do should an emergency arise.
- Development of a simple in-office emergency team.
- Emphasizing the need to call 911 as soon as a situation arises.
- Maintaining a supply of basic emergency drugs and equipment.

Malamed recommends that dental practices keep on-hand:

- Two injectables — epinephrine, or adrenalin, for anaphylaxis, or acute allergic reactions; and an antihistamine, for allergic reactions.
- Oxygen, for all emergencies.
- Some form of sugar (orange juice, etc.), for patients with hypoglycemia.
- Nitroglycerin, for angina pectoris, or chest pain.
- A bronchodilator, for patients with asthma.
- Chewable aspirin, for patients with suspected myocardial infarction.

In addition, dentists should consider buying an automated external defibrillator for patients experiencing sudden cardiac arrest, recommends Malamed. They should also have masks on hand to facilitate ventilation of victims, either mouth-to-mask, with bag-valve mask devices, or with positive pressure oxygen.

The dental office emergency team should be trained to respond rapidly and efficiently should an emergency arise, says Malamed. A team can include:

- **Team leader:** The dentist remains the team leader, and is legally responsible for the well-being of his or her patients.
- **Team member 1:** That is, the first person at the scene of the emergency, whether that is the doctor, hygienist or assistant, or some of the front office people.
- **Team member 2:** This person is assigned to immediately bring equipment – including oxygen cylinder, emergency drug kit and the automated external defibrillator — to the site of the emergency. (All equipment should be stored in an easily accessible location.)
- **Team member 3:** Actually, this is the remaining office staff. Possible duties include waiting for the arrival of the emergency medical team, holding the lobby elevator for them, preparing emergency drugs for administration, and keeping a written record of the event.

To view the American Dental Association's 2002 report, "Office emergencies and emergency kits," visit the following URL: www.ada.org/prof/resources/pubs/jada/reports/report_emergency.pdf.

A sound program

The distributor rep must let his or her dental customers know that a good AED program, such as the type that Constantine speaks about, involves far more than buying a high-quality defibrillator, according to those with whom *First Impressions* spoke. Intermittent training of office staff is a must, according to Malamed. Maintaining the AED – that is, making sure batteries work and pads are in good condition – is another component of a good program.

"There isn't a single piece of advanced equipment that doesn't call for some form of medical oversight," says Asted. "A doctor would lose his license if he didn't have a radiology program that included maintaining the equipment, having protocols in place, and conducting training in the proper use

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— Asted

of that equipment." AEDs are no different. Yet sometimes dentists can place AEDs on the wall and virtually forget about them. "I've walked into a number of offices where either the pads or the batteries were expired," says Asted.

Dentists can contract with firms that remind the office via e-mail or by phone to check batteries and pads. Some AEDs do self-diagnostics, indicating with a green light that the batteries are OK. But the distributor can play a role too, says Constantine. "What I find is that some distributors have very good relationships with the dentist. They'll come around and inspect [the AED] every three months. It's just another reason to stop in, say hello, check out the AED and make sure the unit is OK."

Finally, distributor reps should encourage their dental customers to place their AEDs in a prominent place in the office. "I tell dentists that I would put that AED where the patient can see it," says Asted. "It's along the lines of, 'I'm doing my best for you; I'm making your environment safer.' If they have [an AED], why not take advantage of all the benefits of it?" **[FI]**