Introduction:

Any dentist who treats patients knows that sooner or later, emergencies can happen with patients in the operatory or in the reception area, with members of the patient’s family or friends, or with dental office staff.

As dentists, the public should know that we are concerned with more than just their teeth, face, neck and mouth, but with their overall body and health. The American Dental Association Council on Scientific Affairs states, “dentists must be prepared to recognize and properly manage patients who are experiencing medical emergencies in the dental office.” Therefore, emergency preparedness and knowledge are essential, and should be an ongoing endeavor in the dental office. This course should also serve as a basis for further reading and research by the dentist and their staff,

The dentist must be familiar with the use of some common emergency medications commonly found in proprietary dental emergency kits. These medications can also be ordered and assembled individually by the dentist into their own custom-made emergency kit.

Part 1 is a descriptive overview of eight very important emergency medications:

- Oxygen
- Diphenhydramine
- Atropine
- Nitroglycerin
- Aspirin
- Ephedrine
- Epinephrine
- Albuterol

We will discuss when to use each medication, the physiology of its effect, and how to administer the medication in an emergency dental situation.
An emergency is defined as an unforeseen combination of circumstances or the resulting state that calls for immediate action. Dental office emergencies (DOE) are rarely seen. While 90% of dental office emergencies are considered mild, there is a chance of a serious emergency occurring.

Malamed states the major reasons for patients experiencing emergencies in the dental office are:

1. Increasing numbers of older patients seeking dental treatment.
2. Therapeutic advances to treat complex medical conditions from the medical profession.
3. A growing trend for longer dental appointments.
4. Increasing use and administration of drugs in dentistry.

He also lists the six most commonly reported emergencies in private-practice dentistry, in order of frequency as:

- Syncope
- Mild allergic reaction
- Angina pectoris
- Postural hypotension
- Seizures
- Asthmatic attack (bronchospasm)

DOE can be stressful, tense, and panicked, which can make it difficult to think of proper emergency protocols.

Your thought processes for DOE in your office should center on emergency cardiac care as taught to healthcare providers by the American Heart Association in basic life support (BLS) courses. Healthcare providers are taught, as noted in the updated 2005 guidelines, the ABCD's of emergency cardiac care which are Airway, Breathing, Circulation, Defibrillation.

In part 1 of this series we will integrate the eight medications listed in the introduction, with the six most common DOE, with BLS as our basis.
Oxygen

One of the first emergency medications, and one of the easiest to administer is oxygen. It should be one of the first medications you should consider. Syncope is the most common DOE and angina pectoris is the third most common DOE. After an open airway is confirmed, oxygen is one of the most necessary components in resuscitation.

The brain and the heart command a large use of oxygen. Remember back to biochemistry that oxygen is an essential in both the Citric Acid Cycle, (Figure 1) and Oxidative Phosphorylation (Figure 2), which produce Adenosine Tri Phosphate (ATP), the fuel for metabolism.

Figure 1. The Citric Acid Cycle.\textsuperscript{6}
Oxygen is an essential component in the chemical reactions of the Citric Acid Cycle that produce ATP, which is used by the body for metabolism.
Figure 2. Oxidative Phosphorylation.\textsuperscript{6}

Oxygen is an essential component in the chemical reactions of Oxidative Phosphorylation that produce ATP, which is used by the body for metabolism.

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\text{Glucose + 36 Adenosine Diphosphate (ADP) + 36 PO}_4^{3-} + 36 H^+ + 6 O_2 \rightarrow 6 CO_2 + 36 ATP + 42 H_2O
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Oxygen is easy to administer and is rapidly effective. There are various ways that oxygen can be administered to patients during DOE.

1. Nasal Cannula (Figure 3), which delivers a fraction of inspired oxygen (FIO\textsubscript{2}) concentration of < 30\% at a flow rate of 3 liters per minute (lpm).
2. Simple Oxygen Facemask, which delivers a FIO\textsubscript{2} of 50\% at a flow rate of 6 lpm.
3. Bag-Mask-Valve, which delivers a FIO\textsubscript{2} of 100\% at a flow rate of 8 lpm.

Figure 3. Oxygen Administration Devices.

Nasal Cannula Simple O\textsubscript{2} Face Mask Bag-Mask-Valve
Diphenhydramine