

# Life-threatening Situation in Dental Practice: Management Protocol (Modified from the BLS and ACLS Protocols of the American Heart Association)

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## Abstract

Implant surgery is being incorporated in our practices as a routine procedure. This increases the probability of a life-threatening situation in the dental office. This article is an attempt to create an individualized protocol for management of such a situation adapting from the American heart association (AHA). International guidelines for basic life support (BLS) and advanced life support (ACLS) protocols. This not only improves the patient's chances of survival till he can be transferred to a critical care center, it also ensures that the practitioner is not found lacking or negligent medicolegally in the management of such a situation.

**Keywords:** Life-threatening situations, modified life support protocol, respiratory and cardiac arrest, anaphylaxis, airway and circulation management, essential emergency drugs, defibrillator.

## INTRODUCTION

As we increase the number of surgeries in our practice we increase the chances of encountering a situation which may need urgent emergency medical care. In order to handle such a situation efficiently, some extra training and knowledge is needed.<sup>1</sup> The theoretical knowledge is available to us, but its application in a situation where every second counts is lacking.<sup>2</sup> The American Heart Association (AHA) has put together a protocol for handling of such situations. These guidelines help us streamline our thoughts such that our handling of the situation becomes a reflex action. The AHA divides its guidelines into a basic life support (BLS) protocol and an advanced cardiovascular life support (ACLS) protocol.<sup>7</sup> The basic protocol is not adequate for a clinical situation such as ours. The Advanced protocol at times is beyond the scope of our training.

Hence a modified protocol has been put together by incorporating the pertinent from both the basic and the

advanced. This has been designed so as to be practically applicable during an emergency. Those features that are out of the scope of the capabilities in a normal dental office have been eliminated.

## MAIN OBJECTIVES AND TREATMENT PROTOCOL

When a patient collapses our main objective is to ensure that both oxygenation and circulation are maintained till the patient is transferred to a critical care center. A combination of the Basic and the Advanced support is used to assess and manage the patient. A simple ABCD approach is used.<sup>5</sup>

## AIRWAY

Open the airway physically to ensure that the oxygen can actually enter the body. If the airway is physically blocked the air will not be able to enter. Once a patient collapses, the tongue can fall and block the airway, so in every collapsed

patient the airway has to be kept open. The airway is opened by tilting the head backwards and raising the chin. The airway can also be opened by holding the mandible in a protruded position. The oral cavity is checked for the presence of any foreign body and if present is removed.<sup>7</sup>

## **BREATHING**

Check if the patient is breathing by feeling for flow of air through the nostrils or mouth. Also check for the rise of the chest with inhalation. Oxygen support is started. When normal breathing is present the oxygen mask is placed over the nose and mouth and the patient breathes in naturally. In case the patient is not breathing then the oxygen has to be pushed in using a positive pressure. This is done using an Ambu-bag and mask which is attached to the oxygen cylinder. The bag is manually deflated to force in the oxygen. The rate should be once every 5-6 seconds or of 10-12 per minute. Each breath given should be given over a duration of one second and achieve visible chest rise.

Points A and B ensure that oxygen supply is maintained.

## **CIRCULATION**

Circulation maintenance is mandatory for the oxygen to reach the vital organs. Check for the carotid pulse. If the pulse is present then the circulatory system does not need any external support and continue only the oxygen support till the patient is transferred. If the pulse is absent, CPR has to be started immediately. A manual chest compression is given at the rate of 100 per minute with one cycle comprising of 30 compressions alternated with 2 breaths. Each compression should be to a depth of 1.5-2 inches and should be hard and fast.

## **DEFIBRILLATOR**

If the carotid pulse is not palpable an automated external defibrillator (AED) is attached. This will analyze and prompt whether the situation is shockable or nonshockable. The shock administered by this stuns the heart, and momentarily stops all electrical activity with the hope that normal electrical activity will be initiated and the heart will start beating normally. Another advantage of the AED is that once it is attached then it automatically prompts us for further subsequently steps. It prompts us to continue the compressions and when to stop for a rhythm check and another shock. This is a very valuable tool for us because we are not trained to use and read ECGs and then make decisions whether the patient needs to shocked or not.

All steps thus far a part of the basic life support protocol which can be used by us. These would increase the chances of survival till the expert medical care is provided, but these steps are not enough for as health care givers. We need to incorporate some of the steps of the advanced life support.

## **DRUGS**

Form an important part of resuscitation and a part of the advanced cardiovascular life support system. We are not trained to either recognize or treat all the life-threatening situations with the same efficiency as the critical care medical colleagues. Yet we are expected to provide more than just the basic life support protocol.

Drugs form a part of the “Advanced protocol”. There are some which are etiology specific, which are not in our realm, such as how to read a 12 lead ECG, recognize the rhythm, figure out the etiology and treat it. As a part of the modified protocol we have excluded those drugs and incorporated only those drugs which are within the scope our profession and will improve chances of survival till shifted.

The collapse of a patient on a dental chair triggers a state of panic. In such a situation there is a greater chance of a mistake. In an attempt to avoid those mistakes, we have put together a step by step protocol. It is suggested that it be displayed prominently and be readily accessible.<sup>2</sup>

The emergency drugs are clearly labeled and stored in a dedicated area. The expiry dates are routinely checked. It is very important to keep syringes of the correct size, cannulas, alcohol swabs, tegaderm, infusion sets and the ambu bag all stored together to ensure immediate availability. It has been a practical experience with us that the oxygen cylinder often leaks. Hence regular inspection is mandatory. The instruments for opening the valve of the oxygen cylinder should be stored with it, so no time is wasted at the time of need.

There are some adjuncts which should be stocked in our dental office for use by the expert emergency health care provider who responds to our call for help. A laryngoscope and endotracheal tubes would of benefit. It is important to mention that the laryngoscope needs batteries for the bulb. The batteries should be stored alongside and should be in a working condition. Although there are only a few drugs that would be in the scope of our learning, stocking the rest of the drugs which make up a part of the advanced protocol would be helpful.

In addition to the above, two potentially life-threatening situations may arise where both the breathing and pulse are

present. These are acute coronary syndrome and severe Bronchospasm. Drugs are the mainframe of management of these situations in addition to continuous oxygen supplementation.

Realizing the need for a flow chart in the case of an emergency sample charts have been made which can be printed and displayed prominently.<sup>6</sup> These are:

1. The drugs required along with their indications and modes of administration.
2. The basic life care protocol as suggested by the AHA.
3. The modified protocol using a combination of basic and advanced protocols.

The modified protocol has been created using the information and the pertinent points from both the basic life support (BLS) and advanced cardiovascular life support

(ACLS) guidelines of the American heart association (AHA). Incorporating these into our dental office protocol would increase the chance of survival in such a situation and also protect us medicolegally.<sup>3</sup>

### Adjuncts to be Stocked on Premises for the Experts<sup>4</sup>

1. Ambu bag for positive pressure.
2. LV cannulas.
3. 10 ml syringes.
4. Tegaderm.
5. Laryngoscope with batteries.
6. Endotracheal tubes adult sizes 7.5 and 8; pediatric sizes 3.5 and 4.5.
7. Fully functional oxygen cylinder.

#### Modified Emergency Treatment Protocol

1. Patient becomes unconscious	Assess for responsiveness
2. Call for help and shift	India universal ambulance number-102
3. Put the patient in horizontal position	Again assess for responsiveness
4. Open airway	<ol style="list-style-type: none"> <li>1. Head tilt chin lift</li> <li>2. Mandible advancement</li> </ol>
5. Check breathing	<p><b>Present:</b></p> <ol style="list-style-type: none"> <li>i. Start oxygen at normal pressure</li> <li>ii. Give oxygen for 2 minutes</li> <li>iii. Every 2 minutes check for, pulse, BP and responsiveness</li> </ol> <p><b>Absent:</b></p> <ol style="list-style-type: none"> <li>i. Start positive pressure oxygen using ambu bag and mask</li> </ol>
6. Assess blood circulation	<p><b>Present:</b> Continue oxygen support.</p> <p><b>Absent: Start CPR</b></p> <p><b>CPR:</b></p> <ol style="list-style-type: none"> <li>i. Cycle is count of 30</li> <li>ii. After each cycle give two breaths</li> <li>iii. Every 2 minutes check for carotid pulse again.</li> </ol>
7. Defibrillate	<p><b>Attach AED:</b> The AED will check if a shock is needed and will prompt further actions accordingly.</p>
8. Drugs	<p><b>When extra hand is available:</b></p> <ol style="list-style-type: none"> <li>i. Start an IV line</li> </ol>
<b>Anaphylaxis</b>	
1. Adrenaline	Sub Cutaneous      1 Amp
2. Avil	IM/IV                1 Amp bolus and in IV, 10 cc flush
3. Dexamethasone	IM/IV                1 Vial
<b>Cardiac Arrest</b>	
1. Atropine	IV                    1 Amp bolus and 10 cc normal saline flush
2. Adrenaline	IV                    1 Amp bolus and 10 cc normal saline flush
3. Sodium bicarbonate	IV                    1 Amp bolus and 10 cc normal saline flush
4. Calcium gluconate	IV                    1 Amp bolus and 10 cc normal saline flush
<b>Hypoglycemia</b>	Oral/IV              25 ml Dextrose
<b>Acute Coronary Syndrome</b>	
1. Aspirin	<b>Oral Chewable:</b> 160-325 mg
2. Nitroglycerin	<b>Sublingual:</b> 3 tabs or 3 spray doses every 3-5 minutes
<b>Severe Bronchospasm</b>	
1. Bronchodilator	Salbutamol inhaler

## Emergency Drugs

S. No.	Drug	Indication	Dose	Mode of Admn.	Expiry	Stock
<b>Oxygen Cylinder</b>						
1	Sodium chloride	IV /Cannula flush	10 cc	IV		
2	Dextrose	Hypoglycemia	25 ml bottle	Oral/IV		
3	Adrenaline	Anaphylaxis/ Cardiac arrest	1 Amp	Sub. Cut./IV		
4	Dexamethasone	Anaphylaxis	1 Vial	IM/IV		
5	Avil	Anaphylaxis	1 Vial	IM/IV		
6	Sodium bicarbonate	Cardiac arrest	1 Amp (10 cc)	IV		
7	Calcium gluconate	Cardiac arrest	1 Amp (10 cc)	IV		
8	Atropine	Cardiac arrest	1 Amp 6 mg	IM/IV		

## Basic Life Support Protocol (BLS)

Assess	Action
Airway	Open airway using noninvasive techniques
Breathing	Each breath over 1 second and 5-6 seconds with visible chest rise.
Circulation	Check for carotid pulse for 5 -10 seconds. Perform high quality CPR
Defibrillation	Shock if prompted, follow immediately with CPR

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