

Medical Emergencies In Dental Office

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ABSTRACT

Background: Dental practitioners have a duty of care to ensure that an effective and safe service is provided for their patients. The satisfactory performance in a medical emergency or in a resuscitation attempt in the dental practice has wide- ranging implications in terms of resuscitation equipment, resuscitation training, standards of care, clinical governance, risk management and clinical audit. This article reviews the management of medical emergencies and resuscitation and its equipments for dental practitioners and dental care professionals in general dental practice.

Keywords: Emergency, ABCDE assessment, Resuscitation, Myocardial infarction, Syncope, Stroke.

INTRODUCTION

Dental practitioners have a duty of care to ensure that an effective and safe service is provided for their patients. The satisfactory performance in a medical emergency or in a resuscitation attempt in the dental practice has wide- ranging implications in terms of resuscitation equipment, resuscitation training, standards of care, clinical governance, risk management and clinical audit¹. The concept of the original chain of survival emphasized that each time-sensitive intervention must be optimized in order to maximize the chance of survival: a chain is only as strong as its weakest link². The incidence of medical emergencies in dental practice is very low. Medical emergencies occur in hospital dental practice more frequently, but in similar proportions to that found in general dental practice³. With the elderly population in dental practices increasing,

medical emergencies in the dental practice will undoubtedly occur⁴. A survey of 4000 dental surgeons conducted by Fast and others revealed an incidence of 7.5% emergencies per dental surgeon over a 10 year period in India⁵.

ABCDE ASSESSMENT OF THE SICK PATIENT

Many people who suffer an out-of-hospital cardiac arrest display warning symptoms for a significant duration before collapse⁶. These symptoms could include: Chest Pain; Dyspnoea (Breathlessness); Nausea/Vomiting; Dizziness/Syncope. The logical and systematic ABCDE approach to assessing the sick patient incorporates: Airway; Breathing; Circulation; Disability; Exposure. When assessing the patient, a complete initial assessment should be undertaken, identifying and treating life-threatening problems first, before moving on to the

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next part of assessment. The effectiveness of treatment/intervention should be evaluated, and regular reassessment undertaken. The need to call for an ambulance should be recognized and other members of the multidisciplinary team should be utilized as appropriate so that patient assessment, instigation of appropriate monitoring and interventions can be undertaken.

RESUSCITATION IN DENTISTRY

Successful resuscitation partly relies on the availability and correct functioning of resuscitation equipment⁷. The Resuscitation Council (UK) (2006) has made recommendations on the provision and use of resuscitation equipment in the dental practice⁸. Procedures must therefore be in place to ensure that the recommended resuscitation equipment is immediately available and in working order. In addition, dental staff must know where it is stored within their working area and how to use it safely and effectively⁹.

RECOMMENDED MINIMUM RESUSCITATION EQUIPMENT IN THE DENTAL PRACTICE

Airway equipment

- Set of oropharyngeal airways sizes 1, 2, 3 and 4
- Portable suction device with appropriate suction catheters and tubing, e.g. Yankauer Sucker.

Breathing equipment

- Pocket mask with oxygen port.
- Self-inflating resuscitation bag with oxygen reservoir and tubing (if local staff have been trained to use it).
- Selection of well-fitting adult and child face masks for attaching to the self inflating bag.
- Oxygen face mask with tubing.
- Portable oxygen cylinder (D size) with pressure reduction valve and flowmeter.
- Oxygen cylinder key (if appropriate).
- 'Spacer device' for inhaled bronchodilator.

Circulation equipment

- Automated external defibrillator (AED)(with defibrillation electrodes, pair of heavy duty scissors and a razor).

- Sterile syringes and needles.

Drugs

- Glyceryl trinitrate (GTN) spray (400µg/dose).
- Salbutamol aerosol inhaler (100µg/actuation).
- Adrenaline injection (1:1,000, 1mg/ml).
- Aspirin 300mg dispersable.
- Glucagon injection 1mg.
- Oral glucose solution/tablets/gel/powder.
- Midazolam 5mg/ml or 10mg/ml (buccal or intranasal).

Additional items

- Automated blood glucose measurement device.
- Gloves.

Resuscitation bag

It would be helpful if the resuscitation equipment was stored in an easily accessible 'grab-bag' or similar. This bag should be spacious, sturdy, easily accessible and portable.

PERCEPTION OF THE SICK PATIENT: THE ABCDE APPROACH

The Resuscitation Council (UK) (2006a) recommends the early recognition of the sick patient by undertaking a systematic clinical assessment following the ABCDE approach: pre-empting a medical emergency would allow appropriate help, e.g. ambulance, to be called, hopefully before the patient deteriorates or collapses⁸.

Clinical Signs of Acute Illness

The clinical signs of acute illness and deterioration are usually similar regardless the underlying cause, because they reflect compromise of the respiratory, cardiovascular and neurological functions⁹. These clinical signs are commonly:

- Tachypnoea (respiratory rate >20/minute): a particularly important indicator of an at-risk patient²⁰ and is the most common abnormality found in acute illness.
- Tachycardia (heart rate >100 beats per minute);
- Hypotension (usually a systolic blood pressure <90mmHg);
- Altered consciousness level (e.g. lethargy, confusion, restlessness or falling level of consciousness)^{10,11}.

The identification of the clinical signs of acute illness (together with the patient's history, examination and appropriate investigations) is central to objectively identifying patients who are sick or deteriorating¹². However, these clinical signs of deterioration are often subtle and can go unnoticed. It is therefore important to assess the patient following the systematic ABCDE approach.

THE ABCDE APPROACH

These guidelines follow the logical and systematic ABCDE approach to patient assessment: Airway; Breathing; Circulation; Disability; Exposure.

GENERAL PRINCIPLES OF THE ABCDE APPROACH

The general principles of the ABCDE approach to assessing the sick patient are as follows:

- The ABCDE approach should be followed when both assessing and treating the patient.
- Life-threatening problems, once identified, should be treated before moving on to the next part of the assessment.
- If there is further deterioration, reassessment should be performed, starting with the airway.
- The effects of any treatment administered should be evaluated¹³.
- The need for extra help, e.g. calling 108 for an ambulance, should be considered.
- All the members of the dental team should be involved, allowing essential tasks such as collecting

emergency equipment and oxygen or calling 108 for an ambulance to be undertaken simultaneously¹⁰.

- Effective organization and communication within the dental team are paramount.
- The initial aim of treatment is to keep the patient alive, prevent deterioration and ideally achieve clinical improvement; hopefully this will buy time while awaiting expert help and more definitive treatment¹⁰.
- The ABCDE approach can be used by dental professionals irrespective of their training, expertise and experience in clinical assessment or treatment; individual experience and training will determine which aspects of assessment are undertaken and which treatments are administered¹⁰.
- Basic interventions e.g. laying the patient flat or administering oxygen, are often all that are required¹⁰.

RESPIRATORY DISORDERS

MANAGEMENT OF ACUTE ASTHMA ATTACK

There is no a standard definition of asthma, though central to all definitions is the presence of key characteristics of the disease, i.e. one or more of wheeze, breathlessness, chest tightness and cough¹⁴.

Signs and symptoms of asthma include: wheeze; shortness of breath; chest tightness; cough.¹⁴

Treatment

The British Thoracic Society has issued guidelines on the management of acute asthma.

- Assess the patient following the ABCDE approach.
- Sit the patient up¹⁵.
- If available, consult the patient's individual action plan in the event of an asthma attack¹⁵.
- Encourage the patient to take two puffs of a short-acting beta-2 adrenoceptor stimulant inhaler, e.g. salbutamol (100µg/puff)¹⁶
- If the patient doesn't rapidly respond, administer further puffs¹⁶

- If the patient is unable to take his inhaler effectively, administer further puffs through a spacer device ;if one is not available, a plastic or paper cup with a hole in the bottom for

the inhaler mouthpiece will suffice¹⁶

- If the patient doesn't respond satisfactorily or if deterioration occurs, call 108 for an ambulance; while awaiting transfer to hospital, administer oxygen and also salbutamol 2.5–5mg via a nebuliser (if this is not available, administer 4–10 puffs of salbutamol 100µg/puff inhaler preferably via a large volume spacer device, repeating every 20 minutes if necessary¹⁶.
- Monitor the patient following the ABCDE approach, with particular attention to respiratory rate, heart rate and level of consciousness as tachypnoea, tachycardia and drowsiness are hallmarks of severe to life-threatening asthma¹⁴.

- Reassure the patient; an acute asthma attack is frightening and the need to be admitted to hospital can increase anxiety and exacerbate symptoms.^{14,15,16}

MANAGEMENT OF HYPERVENTILATION

Hyperventilation can be defined as a fast respiratory rate resulting in an increased loss of carbon dioxide¹⁷. It is usually anxiety induced and may accompany a panic attack¹⁸. It can occur in a susceptible person who has recently experienced emotional or psychological trauma and is not uncommon in the dental practice. It may be associated with attention-seeking behaviour.¹⁹

Treatment

- Reassure the patient; it may be necessary to be firm;
- If possible remove the cause of the distress or anxiety;
- If possible take the patient somewhere private where he can regain control of his breathing again¹⁹.

If the patient is still hyperventilating despite the above, ask him to breathe into a paper bag:

- Ensure the paper bag covers both his nose and mouth;

- Ask him to breathe in and out slowly about 10 times;
- Then ask him to breath without the paper bag for 15 seconds;
- Alternate this cycle of breathing until the hyperventilation has stopped.¹⁹

CARDIAC DISORDERS

Management of Angina

Angina pectoris is a condition marked by severe chest pain, often also spreading to the shoulders, arms and neck owing to an inadequate blood supply to the heart (from Latin pectoris meaning 'of the chest';¹⁷

Angina occurs when an increased myocardial oxygen demand cannot be met by the coronary blood supply²⁰

The patient should be managed as follows:

- Ask the patient to stop what he is doing or sit down and rest.
- Ask the patient to take his GTN spray or tablets as prescribed by his general practitioner. It is recommended that the dental practice should stock GTN, in case the patient doesn't have his own GTN with him⁸.
- If the pain has not eased within a few minutes, ask the patient to take a second dose.
- If, after the repeated dose, the pain does not ease within a few minutes, call 108 for an ambulance immediately. In addition, if the patient is not allergic to aspirin, administer 300mg (ask him to chew it); this is administered for its anti-platelet effect¹⁶.
- Even if the symptoms do not match the ones above but it is suspected that the patient is having a myocardial infarction, call 108 for an ambulance immediately and patients with known angina are usually asked to have their GTN spray easily accessible when attending for dental treatment.

MANAGEMENT OF MYOCARDIAL INFARCTION

Signs and symptoms

Common or typical symptoms include:

- Central chest pain;
- The pain can spread to the arms, neck or jaw;
- Feeling sick or sweaty as well as having central chest pain;
- Feeling short of breath as well as having central chest pain.

Symptoms vary and some people may feel any of the following:

- A dull pain, ache, or 'heavy' feeling in the chest;
- A mild discomfort in the chest making the patient feel generally unwell;
- The pain in the chest can spread to the back or stomach;
- A chest pain that feels like a bad episode of indigestion;
- Feeling a bit light-headed or dizzy as well as having chest pain.

Treatment

- If the patient displays the above symptoms and has not been diagnosed with heart disease, call 108 immediately⁸.
- Help the patient to adopt a relaxed position, which reduces the myocardial work load : he will usually prefer to sit with his head and shoulders supported and his knees bent.

Note: a supine position can sometimes provoke or worsen the pain. However, particularly if the patient is in shock, he may benefit from lying down ⁸.

- Reassure the patient and encourage him to rest.
- Ideally, administer supplementary oxygen ¹⁶
- Ask the patient if he is allergic to aspirin. If he is not, administer aspirin 300mg: ask him to chew it. It is administered for its anti-platelet effect. Remember to send a note with the patient to hospital saying that aspirin has been administered¹⁶.
- If the patient has GTN spray or tablets, encourage him to use it as prescribed by his GP. It is

recommended that the dental practice has GTN available in its emergency drug kit – this could be administered if necessary². Do warn the patient that a side effect of GTN is a headache.

- Closely monitor the patient; there is a risk of cardiopulmonary arrest.

MANAGEMENT OF PALPITATIONS

Palpitations is when the patient has a noticeable rapid, strong or irregular heartbeat⁴⁶. Palpitations characteristically start and end abruptly.¹⁷

Treatment

- Sit the patient down and ask him if he has had palpitations previously.
- Reassure the patient.
- Try vagal stimulation: the most effective way of doing this is a Valsalva manoeuvre (the action of attempting to exhale with the nostrils or mouth or glottis closed; ¹⁷ in the supine position; ask the patient to cough or hold his nose and blow as if to pop his ears²¹; another option is to ask the patient to attempt to blow the plunger out of a syringe (impossible to do, but a safe effective vagal manoeuvre).²⁰
- If the patient is symptomatic, e.g. breathless, light-headed or has chest pain, call 108 for an ambulance; if the patient is not symptomatic, but the palpitations do not settle, seek medical advice²¹.

MANAGEMENT OF SYNCOPE

Syncope (derived from the Greek word meaning 'to cut short') can be defined as a brief loss of consciousness caused by a fall in blood pressure¹⁷. The commonest cause of syncope is a vasovagal attack or simple faint. The term vasovagal relates to or denotes a temporary fall in blood pressure with pallor, fainting, sweating and nausea caused by over activity of the vagus nerve, particularly as a result of stress¹⁷. Vasovagal syncope is the commonest medical emergency encountered in the dental practice, accounting for approximately two-thirds of all emergencies.

Signs and symptoms

Signs and symptoms that may be evident include:

- Sense of Feeling Unwell;
- Light-Headedness or Dizziness;
- Nausea and Vomiting;
- Sudden Tiredness;
- Yawning;
- Blurred or Tunnel Vision;
- Pallor;
- Sudden Collapse.

If the patient remains in an upright position, seizure-type twitching may occur (convulsive syncope)²⁰

Treatment

- If the patient feels faint, advise him to lie down; put the dental chair in a horizontal position. Raising the bottom end of the chair can be helpful.
- If the patient starts to collapse, if possible support him to the floor, taking care not to sustain an injury while doing so.
- Call out for help.
- Assess ABC to rule out cardiopulmonary arrest; as soon as the patient is horizontal he will usually start to regain consciousness.
- If the patient has collapsed on the floor, kneel down and raise the his legs above the level of his heart.
- Ensure a supply of fresh air, e.g. loosen any light clothing around the neck and chest, open a nearby window or door and ask colleagues not to crowd around the patient.
- Reassure the patient.²²

Check for any injuries; if the patient collapses during a faint, injuries e.g. bone fractures or a head injury could be sustained, particularly in the elderly.

- Note the duration of the syncope episode; if a simple faint, the patient will quickly recover, usually within 60 seconds.

- Once the patient regains consciousness, offer a drink e.g. sugar in water or a cup of sweet tea¹⁴.

- If the patient takes time to recover, place him in the recovery position . Assess the patient following the ABCDE approach. It may be necessary to call 108 for an ambulance.²²

NEUROLOGICAL DISORDERS

Neurological disorders in the dental practice require prompt effective treatment, together with close monitoring of ABCDE to detect deterioration.²³

MANAGEMENT OF A GENERALISED TONIC-CLONIC SEIZURE

A seizure is caused by a sudden burst of electrical activity in all or part of the brain²⁴.

Signs and symptoms

Typical characteristics of a generalized tonic-clonic seizure include:

- Sudden loss of consciousness (can be preceded by crying out) and collapse to the ground;
- Rigidity (tonic phase) – lasting for approximately 10 seconds, the body is stiff, the elbows are flexed and the legs are extended;
- Breathing stops; central cyanosis particularly noticeable around the mouth
- Clenching of the jaw – saliva may accumulate at the mouth, which could be blood-stained if the casualty has bitten his tongue or lip;
- Convulsive movements (clonic phase) – lasting for 1–2 minutes, there is violent generalized rhythmical shaking;
- Incontinence;
- Variable period of unconsciousness following the event. The casualty may feel very tired and may fall into a deep sleep; he could be dazed, confused, disorientated, frightened and may have slurred, incomprehensible speech.^{18,19,24,25}

Treatment

- If necessary, call 108 for an ambulance

- Ensure that it is safe to approach the patient.
- Protect the patient from injury. Ensure the space around him is clear and remove any objects that are potentially dangerous objects.
- Loosen any clothing around the patient's neck.
- Cushion the patient's head, e.g. place some thing soft such as a pillow , jumper or jacket under his head . Alternatively , place the palms of your hands behind his head and support it to prevent injury.
- Note the time in order to check how long the seizure lasts.
- Once the seizure has stopped check airway, breathing and circulation; if the patient is breathing place him into the recovery position (if the patient is not breathing, start resuscitation).
- Wipe away any saliva; suction may be necessary.
- Check to see whether the patient has sustained any injuries.
- Calmly reassure the patient.
- Stay with the patient until he has made a complete recovery.
- Administer oxygen to support breathing if necessary.
- Consider medication if the convulsive (jerking) movements are prolonged (5 minutes or longer) or if the seizures are repeated rapidly; midazolam 10mg (buccal liquid or injection) administered by the buccal route (unlicensed use) is recommended^{18,19,24,25}

When to call 108 for an ambulance

Call 108 for an ambulance if:

- It is the patient's first seizure; or
- The seizure continues for longer than 5 minutes; or
- One tonic-clonic seizure follows another without the casualty regaining consciousness between seizures (status epilepticus); or
- The patient incurs an injury during the seizure; or
- The patient requires urgent medical attention; or
- If there is difficulty monitoring the patient; or
- If there is a high risk of recurrence^{8,24,26}.

Action not recommended during a seizure²⁴

During a seizure it is recommended not to:

- Restrain the patient;
- Insert anything in the patient's mouth;
- Move the patient unless he is in danger;
- Give the patient anything to eat or drink until he has fully recovered;
- Attempt to arouse the patient.

MANAGEMENT OF STROKE

A stroke can be defined as a focal or global neurological deficit with symptoms lasting >24 hours²⁰ A patient suffering a stroke requires immediate treatment, which is directed towards sustaining life and preventing further brain damage. A transient ischaemic attack (TIA), sometimes called a mini-stroke, is when the brain's blood supply is interrupted for a brief time; although the symptoms are similar to a stroke they are only temporary , lasting minutes or hours but disappearing completely within 24 hours.²⁷

The symptoms will depend on the type of stroke, the area affected and the extent of the stroke. Symptoms may include:

- Sudden weakness or numbness of the face, arm or leg on one side of the body;
- Sudden severe unexplained headache;
- Sudden loss or blurring of vision, in one or both eyes;
- Sudden difficulty in speaking or understanding spoken language;
- Sudden confusion;
- Loss of balance – dizziness, unsteadiness or a sudden fall, particularly with any of the above signs²⁷

Recognition of a stroke: FAST

The Stroke Association (2009) recommends following the FAST approach when assessing whether a patient has had a stroke²⁷:

- Facial weakness: can the patient smile? Has her mouth or an eye drooped?
- Arm weakness: can the patient raise both arms?
- Speech problems: can the patient speak clearly and understand what is being said to him?
- Test all three symptoms

Treatment

- Assess the patient following the ABCDE approach described. Also assess the patient following the FAST approach; if a stroke is suspected call 108 for an ambulance²⁷.
- Ensure the patient has a clear airway. Following a stroke the airway can become compromised by the tongue and/or secretions in the mouth. Ensure the patient's airway remains patent: aspiration of gastric contents or secretions is a serious complication of a stroke, which is associated with considerable morbidity and mortality²⁸.
- If the patient is unconscious (but breathing), place him in the recovery position; inserting an oropharyngeal airway may be helpful.²⁸
- If the patient is conscious, ensure his head and shoulders are supported in a slightly raised position, thus helping to protect the airway; tilting the head towards the affected side allows secretions to drain out; wipe the mouth with a flannel or similar. It may be necessary to suction the mouth.²⁸
- Regularly monitor the patient's airway and do not give him anything to eat or drink²⁰.
- Administer high flow oxygen using a non-rebreather mask. If available, establish oxygen saturation monitoring using a pulse oximeter. Closely monitor the patient's breathing as ventilatory support may be required.
- Closely monitor the patient's vital signs.

- Closely monitor the patient's level of consciousness, using the AVPU scale.

- Reassure the patient. Once the patient regains consciousness the patient may be disorientated and may have a headache requiring analgesia.²⁸

ENDOCRINE DISORDERS

In the dental practice, hypoglycaemia is by far the most likely endocrine disorder to be encountered. Adrenal insufficiency may also occur.²⁹

MANAGEMENT OF HYPOGLYCAEMIA

Hypoglycaemia is normally defined as a blood glucose level <3mmols/l and is usually associated with diabetes (particularly patients taking insulin)⁸. When attending for dental treatment, diabetic patients should eat as normal and should take their medication, e.g. insulin or oral hypoglycaemic agent, as prescribed.

Clinical features of hypoglycaemia can be classified as either autonomic (usually present first when the blood glucose is 3.3–3.6 mmol/l) or related to neuroglycopenia (usually present when the blood glucose is <2.6mmol/l):

- Autonomic: sweating, hunger, hot sensation, anxiety, nausea and vomiting;
- Neuroglycopenia: fatigue, visual disturbance, uncoordinated and altered behaviour, drowsiness, confusion and if untreated convulsions and coma.²⁹

Treatment

- Assess the patient following the ABCDE approach. Treatment will depend upon the patient's level of consciousness and degree of co-operation.²¹
- If the patient's consciousness level allows him to safely eat and drink, offer him the simplest available and quickly absorbed food or drink that contains carbohydrate, e.g. milk with added sugar, a glass of Lucozade or cola (not diet drinks), a glass of fruit juice, or three or more glucose tablets. Repeat this after 10–15 minutes if necessary.²⁹

In more severe cases, where the patient's level of consciousness deteriorates:

- Ensure his airway is clear and maintained ; place him in the lateral position. If he is unconscious consider inserting a basic airway device, e.g. Oropharyngeal airway.
- Administer high flow oxygen using a non-rebreathe mask. If available, attach pulse oximetry to monitor oxygen saturation.
- Administer glucagon 1mg IM/SC (hormone produced by the A-cells of the islets in the pancreas); it increases the blood glucose level by mobilizing glycogen stores in the liver.³⁰ The majority of people with type 1 diabetes lose their glucagon response to hypoglycaemia within five years of diagnosis. The recommended dose for glucagon is 1mg subcutaneously or intramuscularly.³¹
- Monitor the patient's response and level of consciousness; 90% of patients will fully recover in 20 minutes.²⁰
- If able, recheck the blood glucose after 10 minutes to ensure that it has improved (5mmol/l or more), in conjunction with an improvement in the patient's level of consciousness and AVPU scale.⁸
- Try to establish the possible cause of the hypoglycaemia. To prevent a repeat hypoglycaemic episode, offer the patient food that contains starchy carbohydrates (absorbed more slowly), e.g. a sandwich, fruit or biscuits and milk.²⁹
- Educate the patient. Education is the key to preventing recurrent or severe hypoglycaemia. It may be necessary to advise the patient to make an appointment to go to see his GP or practice nurse for assessment and advice.^{31,32,33,34}
- Reassure the patient. Repeated episodes of hypoglycaemia may cause extreme emotional distress, even when the episodes are relatively mild.³⁵
- If it was necessary to administer glucagon to the patient, he may go home once fully recovered, but should be accompanied; he should not drive and his GP should be informed.

MANAGEMENT OF ADRENAL INSUFFICIENCY

Adrenal insufficiency is a potentially fatal condition resulting from inadequate secretion of cortisol and / or aldosterone.³⁶ It can be associated with prolonged corticosteroid therapy and can persist for years after stopping.

Clinical features include:

- Shock, E.G. Hypotension, Tachycardia & Pallor;
- Anorexia;
- Nausea/ Vomiting;
- Abdominal Pain;
- Pyrexia;
- Fatigue & Lethargy.²⁹

Treatment

- Assess the patient following the ABCDE approach.
- Call 108 for an ambulance.
- Lie the patient flat in the dental chair.
- Administer high flow oxygen using a non-rebreathe mask. If available, establish oxygen saturation monitoring using a pulse oximeter.³⁷

ANAPHYLAXIS

Anaphylaxis can be defined as 'a severe, life-threatening, generalised or systemic hypersensitivity reaction'.³⁸ Basically, it is a life threatening allergic reaction – the extreme end of the allergic spectrum.³⁹ The lack of a consistent clinical picture can sometimes make an accurate diagnosis difficult.⁴⁰ The clinical presentation often includes:

- urticaria – a rash of round, red weals on the skin which itch intensely; sometimes referred to as nettlerash or hives. • Angioedema (Facial Swelling);
- Respiratory Distress;
- Wheeze/Stridor;
- Cardiovascular Shock;
- Tachycardia & Hypotension;
- Pallor.³⁹

TREATMENT

- Assess the patient following the ABCDE approach.
- Call for help from colleagues.
- If able, stop or remove the probable cause of the anaphylaxis, e.g. remove latex gloves.
- Recline the patient into a position of comfort (the supine position may be helpful in hypotension but unhelpful in respiratory distress). If the patient is in shock it will be helpful to raise his legs.
- Ensure the patient has a clear airway; if stridor is present, alert senior expert help immediately (in anaphylaxis, stridor is probably due to potentially life threatening laryngeal oedema).
- Administer high flow oxygen using a non-rebreather mask. If available, establish oxygen saturation monitoring using a pulse oximeter.
- Closely monitor the patient's vital signs.
- Assess and re-assess the patient following the ABCDE approach.
- Repeat the adrenaline after 5 minutes if there is no improvement.
- Do not sit the patient up or stand him up if he is feeling faint or dizzy – he may be in profound shock and may then have a cardiac arrest.⁴¹

Adrenaline

Adrenaline is the most important drug in anaphylaxis.⁴² To be effective, it needs to be administered promptly.⁴³

Adrenaline:

- Reverses peripheral vasodilation;
- Reduces oedema;
- Dilates airways;
- Increases myocardial contractility;
- Suppresses histamine leukotriene release.

The recommended dose of adrenaline is 500µg (0.5ml of 1:1000 solution) intramuscularly (thigh). This can be repeated after 5 minutes if there is no

clinical improvement; several doses may be required. The intramuscular route for the administration of adrenaline should be used as it is relatively safe and adverse effects are rare. The only reported severe adverse effect following intramuscular administration of adrenaline was a myocardial infarction in a patient with severe ischaemic heart disease.⁴⁴ Cautions include the following:

- Two strengths of adrenaline are available: 1:1000 solution is used for intra muscular injection, while the 1:10,000 solution, which some dental practices stock, issued for intravenous injection during cardiopulmonary resuscitation.
- The subcutaneous route for the administration of adrenaline should not be utilized because absorption is considerably slower.⁴⁵

CONCLUSION

Dental practitioners have a duty of care to ensure that an effective and safe service is provided for their patients. Here management of medical emergencies and resuscitation and its equipments for dental practitioners and dental care professionals in general dental practice has been reviewed.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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