Management of medical emergencies for the dental team

Update November 2006

In July 2006, the UK Resuscitation Council published a document entitled '*Medical emergencies and resuscitation – standards for clinical practice and training for dental practitioners and dental care professionals in general dental practice*'. The full text of this 41-page document can be downloaded from the Resuscitation Council's website at www.resus.org.uk.

Readers of our textbook who practise in the United Kingdom may wish to read this publication in its entirety. It has a foreword written by the UK General Dental Council (GDC) in which it points out that 'maintaining the knowledge and competence to deal with medical emergencies is an important part of all dental professionals' continuing professional development' and that it 'welcomes the guidelines'. It also reminds readers of the GDC guidance on these matters given in its document 'Principles of dental team working'. Part of the GDC's foreword states that:

> Medical emergencies can happen at any time in general dental practice. If you employ, manage or lead a team, you should make sure that:
>
> - There are arrangements for at least two people available to deal with medical emergencies when treatment is planned to take place.
> - All members of staff, not just the registered team members, know their role if a patient collapses or there is another kind of medical emergency.
> - All members of staff who might be involved in dealing with a medical emergency are trained and prepared to deal with such an emergency at any time, and practise together regularly in a simulated emergency so that they know exactly what to do.

The Resuscitation Council guidance on the emergency drugs which should be available 'in all dental surgery premises' varies from that given in the current British National Formulary (BNF No 52, September 2006, p20) and

from that given in our book. Given that the GDC has written the foreword for the Resuscitation Council's publication, it is possible that this document will become the benchmark for their expectation on how dentists and dental care professionals should prepare for and manage medical emergencies in the UK. It is in the light of this publication from the Resuscitation Council and the changes in its algorithm for cardiac compressions in cardiopulmonary resuscitation that we have produced this update. We have also taken note of the updated guidance on emergency drugs in the current BNF where appropriate.

The current Resuscitation Council guidance that is new to previous guidance on the standards expected in general dental practice in the UK are that:

- All clinical areas should have immediate access to an automated external defibrillator (AED).
- Dental practitioners and dental care professionals should all undergo training in cardiopulmonary resuscitation (CPR), basic airway management and the use of an AED.
- An audit of all medical emergencies should take place.

Specific areas of particular importance are dealt with below, on a chapter by chapter basis.

Chapter 1 – Equipment and Techniques

Prevention and Preparation (p2-3)

The Resuscitation Council document again emphasises the importance of taking an adequate medical and drug history for each patient, for both new patients and existing patients at every recall.

It suggests that dental practitioners should routinely assess patients using a risk stratification system such as the American Society of Anaesthesiologists (ASA) classification. This aims to identify patients with an increased risk of a medical emergency occurring during treatment and so indicate a referral to hospital for treatment when a certain level of risk is attained. An example of the ASA system incorporated into a specially designed medical history questionnaire is given as Appendix (viii) in the Resuscitation Council statement.

The ASA physical status classification system:

ASA 1 – A normal healthy patient
ASA 2 – A patient with mild systemic disease
ASA 3 – A patient with severe systemic disease
ASA 4 – A patient with severe systemic disease that is a constant threat to life
ASA 5 – A moribund patient who is not expected to survive without the operation
ASA 6 – A declared brain-dead patient whose organs are being removed for donor purposes

For example, patients identified as having 'unstable' angina, nocturnal angina or those with a recent history of hospital admission for angina have the highest risk of an angina attack in the dental surgery and may require some or all of their treatment to be carried out in a more medically supportive environment.

Emergency equipment (p4)

On page 4 of our book we recommend that dental practices should possess the following items of emergency equipment:

- An efficient, portable aspirator (to clear the airway);
- Oxygen supply and mask, capable of delivering 10L/min;
- Airway adjuncts:
    - A ventilation mask (e.g. Laerdal® Pocket Mask;
    - A selection of oropharyngeal (Guerdal) airways (sizes 2, 3 and 4);
    - A bag and valve manual ventilator (e.g. AMBU® bag);
- A selection of disposable syringes (1, 2, 5 and 10 mL) and needles (19, 21 23 and 25 gauge)
- Butterfly needles or IV cannulae (19 or 21 gauge)
- A tourniquet

We suggest also, if possible, an RA machine and an automated external defibrillator be available.

The Resuscitation Council suggests that in addition, every practice should also have:

- An automated external defibrillator
- An automated blood glucose measurement device
- A 'spacer' device for inhaled bronchodilators

Where possible, all medical emergency medical equipment should be single use and latex free.

Emergency drugs (p8)

The Resuscitation Council now recommends fewer emergency drugs than both our book and the BNF (no 52, September 2006, page 20), on the grounds that 'the use of intravenous drugs for medical emergencies in general dental practice is to be discouraged'. The emergency drugs it recommends are:

- Glyceryl trinitrate (GTN) spray (400micrograms/dose)
- Salbutamol aerosol inhaler (100micrograms/actuation)
- Adrenaline injection (1:1000, 1mg/mL)
- Aspirin dispersible (300mg)
- Glucagon injection (1mg/mL)
- Oral glucose solution or tablets or gel or powder
- Midazolam 5mg/mL or 10mg/mL (buccal or intranasal)
- Oxygen

- In the Resuscitation Council's guidelines, there is no requirement to keep chlorphenamine, hydrocortisone or salbutamol for injection. The BNF (no 52, September 2006) continues to recommend the inclusion of these three items for intravenous injection. The only change in the BNF recommendations from the drugs listed on page 8 of our book is the substitution of midazolam injection (2mg/5mL, 5mL ampoules or 5mg/mL, 2mL ampoules) in place of diazepam injection (5mg/mL, 2mL ampoules); see chapter 3 of our book, the section on epilepsy.

Chapter 2 – Management of the collapsed patient

Management of collapse of unknown cause (p22-23)

The Resuscitation Council's statement recommends that all dental practitioners and dental care professionals should adopt the 'ABCDE' approach to assessing the acutely sick patient. It encourages early recognition of the 'sick' patient to pre-empt a medical emergency by recognising an abnormal breathing pattern, skin colour or pulse rate and suggests that appropriate action be taken or help summoned, prior to a patient actually collapsing.

The general principles of the **A**irway, **B**reathing, **C**irculation, **D**isability and **E**xposure (ABCDE) approach to the sick patient are as follows:

- Treat life-threatening problems as they are identified before moving to the next part of the assessment.
- Continually re-assess, returning to the airway if there is further deterioration.
- Assess the effects of any treatment given.
- Recognise when you need extra help and call for it early. This may mean summoning an ambulance.
- Use all members of your dental team. This will allow you to do several things at once, e.g. collect emergency drugs and equipment, and call the emergency services.
- The aims of initial treatment are to keep the patient alive, achieve some clinical improvement and buy time for further treatment whilst awaiting help.

Particular points relevant to each of the ABCDE subsections are as follows:

Airway (A):
On assessing the airway

- Look and listen
- If an obstruction is present, clear the airway – remove foreign bodies, debris or blood with a hand- or foot-pump aspirator
- Open the airway – head tilt, chin lift
- Give oxygen at a high inspired concentration (up to 10L/min).

- Use a pulse oximeter if available. Aim for a normal oxygen saturation (97 - 100%).

Breathing (B):
On assessing breathing

- Look, listen and feel for signs of respiratory distress
- Count the respiratory rate (normally 12-20 breaths per minute for an adult – higher in children)
- Assess the depth of breathing
- If depth and rate of breathing is inadequate, consider pocket mask or bag and mask ventilation with supplemental oxygen.

Circulation (C):
On assessing circulation

- Look at the colour of the hands, especially the fingers and face, especially the lips
- Assess the limb temperature – is the hand cool or warm?
- Measure the capillary refill time by pressing on a fingertip held at the level of the heart with enough pressure to cause blanching and see how long the skin takes to revert to the colour of the surrounding skin (should be less than two seconds)
- Count the patient's pulse rate
- In patients who do not respond to simple measures an ambulance should be summoned.

Disability (D):
To help exclude common causes of unconsciousness

- Review and treat the ABCs – exclude hypoxia and low blood pressure
- Check the patient's drug record for reversible drug-induced causes of depressed consciousness
- Make a rapid initial assessment of the patient's conscious level using the AVPU method: **A**lert, responds to **V**ocal stimuli, responds to **P**ainful stimuli or **U**nresponsive to all stimuli.
- Measure the blood glucose to exclude hypoglycaemia, using a glucose meter if available.
- Monitor unconscious patients in the recovery position if their airway is not protected.

Exposure (E):
To assess and treat the patient properly, loosening or removal of some of the patient's clothes may be necessary, such as around the neck and chest.

Chapter 3 – Management of the causes of collapse

Epilepsy (p35-36)

In the treatment of status epilepticus there is increasing recognition of the practical value of the administering midazolam by an intraoral or intranasal route, rather than attempting to give diazepam by intravenous injection. As such, midazolam by the oral route (buccal sulcus), in a single dose of 10mg, or nasal route, in a dose of 200 micrograms/kg, can be considered a reasonable alternative treatment in this situation (see page 252 of the BNF no 52, September 2006). Midazolam is rapidly absorbed across the oral and nasal mucosa into the venous blood. This can produce a rapid effect on stopping the epileptic fits. In the mouth it is relatively easy to insert a bolus of the liquid between the teeth and cheeks (i.e. by the 'buccal' route as opposed to the 'sublingual' route commonly used for glyceryl trinitrate in the treatment of angina). If the nasal route is used, the liquid needs to be dripped into both nostrils which can take a little longer to give. Its use in this way remains unlicensed but the BNF has changed its emergency drug recommendations to reflect this alternative choice in the treatment of status epilepticus in a dental setting (see chapter 1, emergency drugs).

Chapter 4 – Medical emergencies in the conscious patient

Inhaled foreign body (p43-45)

Additional figure. Algorithm for choking