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**CPD**  
 PAPER

# MEDICAL EMERGENCIES

## *The role of the DCP*

Wondering where to start when it comes to training in medical emergencies?  
**M. C. Balmer**<sup>1</sup> and **L. P. Longman**<sup>2</sup> point you in the right direction.

### Introduction

The General Dental Council (GDC) is the sole competent authority which regulates dental professionals in the United Kingdom, and they have issued clear guidance on the roles and responsibilities of dental care professionals (DCPs) in the event of a medical emergency:

#### 1. Student DCPs

*'The GDC considers that at an early stage in their programme students must be given instruction in first aid, including the principles of cardio-pulmonary resuscitation and its practice under realistic conditions. It is necessary for this practice to be repeated on an annual basis throughout the programme and for students to understand the necessity for subsequent annual*

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*repetition. Students should learn how to recognise and take appropriate action in situations such as: anaphylactic reaction, hypoglycaemia, upper airway obstruction, cardiac arrest, fits, vasovagal attacks, inhalation or ingestion of foreign bodies, and haemorrhage.*<sup>1</sup>

#### 2. Qualified DCPs

*'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 practice together regularly in a simulated emergency so they know exactly what to do.'*<sup>2</sup>

There is also a mandatory requirement for all DCPs to include at least ten hours of medical emergency training as one of the core topics for each CPD cycle.

The Resuscitation Council of the UK issued a definitive document entitled 'Medical Emergencies and Resuscitation - Standards for Clinical Practice and Training for Dental Practitioners and Dental Care Professionals in

**Table 1** Specific medical emergencies

- Choking
- Asthma
- Anaphylaxis
- Hyperventilation
- Respiratory arrest
- Angina
- Myocardial infarction
- Seizures
- Faints/syncope
- Cerebro-vascular accident (stroke)
- Cardiac arrest

General Dental Practice' in 2006, and this was prefaced by the GDC. This document clearly defines and details the knowledge and skills expected of all members of the dental team, and is a useful source of reference that will be no doubt update as appropriate.<sup>3</sup>

### What is a medical emergency?

A medical emergency can be described as any situation in which a patient becomes ill, may become unconscious and ultimately their life may be at risk due to a failure of an effective oxygenated circulation to the brain and vital organs. There are certain specific emergencies that are the most commonly encountered in general dental practice and all DCPs should be familiar with their presentation and management (Table 1).

### How do you 'manage' an emergency?

The ability to effectively manage a medical emergency is dependent on three things which are all inter-related:

- Theoretical knowledge
- Practical skills
- Team work.

**'A systematic assessment of the patient is essential...'**

#### Theoretical knowledge

This includes an understanding of the basic physiology of the vital organs and systems of the body, together with detailed knowledge of the causes, effects and treatment of the more common emergencies. There are several textbooks available which are useful sources of reference and a list of useful websites is provided at the end of this article.

#### Practical skills

There are specific skills that are required to effectively assess and treat a patient who is feeling unwell, or who has collapsed. It is not always immediately obvious what the cause of the problem is, but this does not preclude effective management. A systematic assessment of the patient is essential, and the

universally accepted ABCDE approach. The only way to acquire practical skills is simulation training which allows for constant repetition of the skill until the individual develops the appropriate level of competence. The knowledge and skills are briefly described below:

#### A = AIRWAY

A person must have an open airway to allow oxygen to enter the lungs, so the first step in effective management is to assess the patency of the upper airway – the patency is obvious if the patient is talking, however, if the patient is unconscious, are there any obvious obstructions eg fluid, vomit, or the tongue?

##### Airway skills

Know the location of the emergency suction and how to use it

Deal effectively with choking-back blows; abdominal thrust

Ability to place an unconscious patient into the 'recovery position'

Jaw thrust

Head tilt chin lift

Insertion of oro-pharyngeal airways

Insertion of naso-pharyngeal airways

#### B = BREATHING

If the airway is open then a person must be breathing effectively to draw inspired oxygen into the lungs. Noisy breathing is indicative of an obstruction, and the type of noise

##### Breathing skills

Location of emergency oxygen and how to attach this to the relevant face mask

Assembly and use of a pocket mask

Assembly and use of a bag-valve mask

Ability to deliver effective ventilations

Ability to assess respiration for:

- Rate
- Depth
- Noise
- Use of accessory muscles
- Bilateral chest expansion

produced will indicate the possible cause eg bronchospasm producing an expiratory wheeze in asthma and anaphylaxis. Administration of oxygen is essential and if a person is not breathing then ventilations need to be supplied.

#### C = CIRCULATION

An effective circulation is essential to ensure an adequate supply of oxygenated blood reaches all vital organs. In a medical emergency this can become compromised and therefore needs to be monitored, and in a cardiac arrest external chest compressions need to be supplied.

##### Circulation skills

Ability to measure central and peripheral pulses for rate, regularity, volume

Ability to measure blood pressure

Measure and understand the significance of capillary refill time

Ability to perform effective cardiac compressions at a rate of 100 per minute

Safe use of an automated external defibrillator if the practice has one

#### D = DISABILITY

This is an assessment of the effect the emergency is having on the patient's brain and nervous system. The two things that are essential for the brain to function effectively are an adequate supply of oxygen and glucose; if these are not supplied then the patient's level of consciousness will be affected. The method of assessment of conscious level is the AVPU scale; a further useful test is the response of the pupils of the eye to light. Blood glucose level can be measured using a suitable monitor.

##### Disability skills

Use the AVPU response scale to assess consciousness (Alert; responding to Voice; responding to Pain; Unresponsive)

Assess pupil reaction and understand the significance

Ability to use a blood glucose monitor

**E = EXPOSURE**

This assessment is a physical examination of the patient which will be limited in a dental surgery setting. The main things to be considered are rashes/flushing, any signs of swelling around the mouth and face, and prevention of heat loss.

**‘All team members should know the location and content of this kit...’**

The use of this systematic assessment will provide essential information about the nature of the emergency and which body systems are being affected. It is not always necessary to have a specific diagnosis to provide effective treatment to compensate for the problem. This assessment is carried out each time something changes eg the patient becomes unconscious, and each time an intervention is done eg the respiration rate was 30 per minute but after oxygen was supplied it reduced to 20 per minute – this is reassuring and tells you that the intervention carried out was effective. It is good practice to write down the assessment results each time it is carried out and this will provide valuable documentation for the paramedics on transfer.

**Exposure skills**

Record any flushing or rashes  
Know the location of blankets within the practice

**Emergency drugs**

All dental practices carry an emergency drugs kit and all team members should know the location and content of this kit. The presentation of emergency drugs varies quite considerably and therefore practice may be required to actually prepare the appropriate drug for administration eg how to assemble

a syringe. It is good practice for all team members to train to do this, using preparations that are out of date, to avoid confusion

and delay if drug administration is required. A summary of the emergency drugs and their use is given in Table 2.

**Table 2 Summary of emergency drugs and their use in dental practice**

Drug route of administration	Indications	Dose
Oxygen <i>inhalation</i>	Most emergencies; but not beneficial in hyperventilation	Flow rate is variable Supplemental oxygen — masks - 4-6 l/min — nasal cannula - 1-2 l/min Resuscitation — 10-15 l/min
Adrenaline (epinephrine) <i>Intramuscular</i>	Anaphylactic shock	0.5 mg of 1:1000 (1 mg/ml), repeated at 5 minute intervals if required > 12 y : 500 µg (0.5 ml of 1:1000) 6 - 12 y : 300 µg (0.3 ml of 1:1000) < 6 y: 150 µg (0.15 ml of 1:1000)
Glucose <i>Oral</i>	Hypoglycaemia conscious patient	10-20 g
Glucagon <i>IM, SC or IV routes</i>	Hypoglycaemia unconscious patient	1 mg < 8y = 500 µg (0.5 mg) IM
Salbutamol <i>inhalation</i>	Asthma	200 µg (2 x puffs)
Glyceryl trinitrate <i>Sublingual</i>	Cardiac chest pain/ angina	400 µg metered dose
Aspirin <i>Oral</i>	Myocardial infarct	75-300 mg
Midazolam <i>buccal or intranasal midazolam</i>	Status epilepticus	10 mg (child dose – transmucosal midazolam 200 µg/kg) 1-5 y = 5 mg 5-10 y = 7.5 mg >10 y = 10 mg
Chlorphenamine <i>IM/ SC or slow IV</i>	Anaphylaxis 2nd line drug	10-20 mg
Hydrocortisone <i>IV or IM</i>	Anaphylaxis; 2nd line drug Status asthmaticus; 2nd line drug Adrenal shock 1st line drug	100-500 mg

### Emergency drug skills

Know the location of the emergency drug box

Know the type of drug and dose required for which emergency

Understand the different methods of drug delivery (inhalational, oral; transmucosal; intra-muscular and intra-venous)

Practice assembling the drug ready for administration

Practice intra-muscular administration using a simulator

### Paramedic transfer

The last responsibility the dental team has is to transfer the patient safely into the care of the paramedics. It is good practice to ensure that all the information required is provided as written documentation for ease of reference. The acronym SAMPLE or MAPLES provides a useful *aide memoir* to ensure all the appropriate details are included.



### Paramedic handover – essential information

Symptoms

Allergies

Medications

Past Medical History

Last oral intake

Events prior to the incident

### Team work

All members of the dental team should undertake regular scenario training within the dental practice. This will help to increase the confidence and competence of each individual team member with their individual roles and responsibilities. Each time a scenario is conducted the team members should alternate roles so all aspects of the management of the emergency are rehearsed. All scenarios should end with a practised ‘paramedic handover’ including provision of all documentation. Attendance at lectures and external courses can be very beneficial but are no substitute for regular ‘in house’ training.

### Team roles and responsibilities

Who acts as the team leader and directs the team?

Who is responsible for locating and preparing the emergency equipment and drugs?

Who is keeping a note of the time and recording the results of the assessments?

Who contacts the paramedics and waits by the entrance to lead them to the emergency?

Who is responsible for collating and photocopying the necessary documentation?

1. General Dental Council. Developing the dental team: curricula frameworks for registerable qualifications for professions complementary to dentistry. September 2004.
2. General Dental Council. Principles of dental team working. January 2006.
3. Resuscitation Council (UK). Medical emergencies and resuscitation – standards

for clinical practice and training for dental practitioners and dental care professionals in general dental practice. 2006. [www.resus.org.uk/pages/MEdental.pdf](http://www.resus.org.uk/pages/MEdental.pdf)

### Further reading

- Balmer M C, Longman LP. *The management of medical emergencies: a guide for dental care professionals*. Quay Books, June 2008.
- Robb N D, Leitch J. *Medical emergencies in dentistry*. Oxford University Press, 2006.
- Thornhill M H, Pemberton M N, Atherton G J. *Management of medical emergencies for the dental team*. Stephen Hancocks Ltd, 2005.

### Useful websites

For current and updated guidelines on all aspects of resuscitation:  
Resuscitation Council UK  
[www.resus.org.uk](http://www.resus.org.uk)

For information on CPD requirements and standards:  
General Dental Council  
[www.gdc-uk.org](http://www.gdc-uk.org)

For definitions of medical conditions and general information and references:  
[www.wikipedia.org](http://www.wikipedia.org)  
[www.nhsdirect.nhs.uk](http://www.nhsdirect.nhs.uk)

For descriptions of causes, signs and symptoms of medical conditions, together with information on presentation, management and prognosis:  
[www.patient.co.uk](http://www.patient.co.uk)  
[www.medic8.com](http://www.medic8.com)  
[www.mayoclinic.com](http://www.mayoclinic.com)

For specific information about individual conditions:  
The British Heart Foundation  
[www.bhf.org.uk](http://www.bhf.org.uk)

Asthma UK  
[www.asthma.org.uk](http://www.asthma.org.uk)

Diabetes UK  
[www.diabetes.org.uk](http://www.diabetes.org.uk)

The Stroke Association  
[www.stroke.org.uk](http://www.stroke.org.uk)

CPD questions on this article can be found on page 55.