

ANAPHYLAXIS IN GENERAL DENTAL PRACTICE

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“The prevalence of allergic diseases worldwide is rising dramatically in both developed and developing countries. These diseases include: asthma, rhinitis, anaphylaxis, eczema, urticaria (hives), angioedema, and drug/food/insect allergy.”¹

Scenario

The management team wanted to ensure a relaxed atmosphere for a new in-house CPD session based around the new GDC publication, *Standards for the Dental Team*,² so they decided to use the waiting room area for the day. Eighteen members of the team were able to attend. During the morning session, Chris, a relatively new member of the team, was animated and focused.

It was good to see all of the clinical, laboratory and support staff together at the event and all actively involved in the discussions. Tracey, the Practice Manager, had arranged for a local catering business to provide a special buffet. She had specifically ordered some vegetarian and halal options to cover all the bases as she hadn't had time to ask everyone about their preferences before the training event. At lunch, the buffet had clear labels and was met with delight by all the participants.

During lunch, Chris chatted with a number of team members, discussing the need for support during clinical sessions for CDTs. Others in the group

were discussing Principle 6.2.6 of *Standards for the Dental Team*,² and debating best practice during medical emergencies. Everyone was enjoying and trying the various dishes; unfortunately, this meant that the labels did get rather mixed up. Still, everyone seemed fine, although some food was tasted and then put immediately in the bin. After overhearing comments such as ‘What was that supposed to be?’, Chris looked concerned. She asked Fred and Aziz if there was any shellfish in the food, but Fred said he didn't think so. He remembered that Chris had mentioned not eating shellfish when someone had a crab sandwich for lunch one day last week; in fact, Chris had left the staff room immediately on that occasion.

All too soon, the lunch break was over and everyone returned to the waiting room to begin the afternoon session. Chris immediately began to look rather pale; the tone and level of her voice changed and it was evident that her breathing was becoming difficult. Approaching Tracey, she urgently enquired if there was any chance that there was some shellfish in the buffet.

Tracey replied that there was, but only in the one labelled item. She then remembered, with a sinking feeling, that the labels had been mixed up...

By this point, Chris was looking unsteady on her feet and said she felt dreadfully ill. She asked Aziz to quickly get her handbag from the staff room. When he returned, Chris fumbled in her bag, took out a yellow pen-like object from her handbag and jabbed the tip into her own outer thigh. Everyone was very concerned and Tracy wanted to phone for an ambulance, but no one seemed really sure what to do next. About 15 minutes after using the adrenaline auto-injector, Chris was much calmer and appeared to be recovering, although she did say that she now had quite a headache. ‘What was all that about?’ asked Fred. ‘I'm pretty sure that Chris had an anaphylactic shock’, said Aziz, ‘and I think we need to talk about it in our planned medical emergency training. You see, Chris probably ate something that she is allergic to and had an extreme reaction known as anaphylaxis.’ ‘I feel so guilty!’ Tracey joined in, ‘but it never even crossed my mind!’

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Figure 2 EpiPen®
(Mylan Specialty
L.P., NJ, USA)®



Personal awareness about allergies

With the introduction of universal precautions in the late 1980s, disposable gloves, often made from natural latex, were worn as part of routine dental clinical procedures. Over time, it was noted that some individuals responded adversely to wearing latex gloves, suffering a form of dermatitis or even asthmatic symptoms as part of an allergic reaction.³ Over the last thirty years, there appear to have been an increasing number of individuals who show anything from slight to severe allergic reactions to a range of items.³ Common sources include medications, nuts, wheat and shellfish.

Anaphylaxis is "a severe, potentially life-threatening allergic reaction that can develop rapidly."⁴ Individuals who know that they are extremely allergic or hypersensitive to a stimulus (eg nuts, insect stings, specific foods and even medications) may carry a disposable, automatic, pen-like device that delivers a pre-determined amount of adrenaline (epinephrine). Adrenaline auto-injectors or 'adrenaline pens' such as the EpiPen® (Mylan Specialty L.P., NJ, USA)® or Jext® (ALK-Abelló, UK) provide a simple way for the individual to deliver a measured amount of adrenaline into their own body. Adrenaline is usually produced by the adrenal glands during high-stress situations as part of the 'fight or flight' response of the sympathetic nervous system. The effect of adrenaline is to stimulate the individual's heart rate, constrict blood vessels to increase blood pressure and dilate air

passages. An injection of adrenaline into the blood stream will cause an increase of both oxygen to the lungs and blood flow throughout the body. However, this may be a temporary effect and the individual may need to be hospitalised if their anaphylactic reaction is severe or if recovery is prolonged.

The rate of allergic reactions worldwide in the 15-25 year olds has been steadily increasing over the last 30 years.⁵ Currently, legally "the rules for pre-packed foods establish a list of 14 food allergens, which have to be indicated by reference to the source allergen whenever they, or ingredients made from them, are used at any level in pre-packed foods, including alcoholic drinks."⁶ By the end of this year, that legislation will have been extended to all foods, including those sold non-packed or pre-packed for direct sale. In some cases, individuals may also have an allergic reaction to items such as latex, topical medications, food additives such as monosodium glutamate and food

colours. Therefore, all members of the dental team should have access to an in-date adrenaline auto-injector in case a patient or team member suffers an anaphylactic shock. The emphasis is not only on the individual avoid exposure to allergens but also on all health workers not to put patients at risk.

Symptoms associated with anaphylaxis include:⁷

- Urticaria (hives) anywhere on the body, skin itching or redness
- Swelling of the throat, lips and tongue
- Tightness in the throat, difficulty in swallowing or speaking
- Swelling of the airways, shortness of breath, tightness in the chest, wheezing, coughing
- Increased heart rate, chest pain
- Sudden feeling of weakness (caused by a drop in blood pressure)
- Abdominal pain, nausea, vomiting and diarrhoea
- Headache, confusion
- Collapse, unconsciousness



Urticaria, skin itching and redness can be symptoms of a severe allergic reaction

The current guidance on situations where a casualty has been found who appears to be experiencing symptoms of anaphylaxis is that **you should immediately call 999 for an ambulance.**⁴ Anaphylaxis is a medical emergency and immediate action is required. Some individuals who know that they are allergic to specific triggers may carry an adrenaline pen, but it's important to remember that individuals who have never had an allergic reaction before can still have an anaphylactic reaction – this may be their first exposure to the allergen. An adrenaline auto-injector should be injected into the sufferer's outer

thigh (into what is the vastus lateralis muscle) then held it in place for approximately ten seconds. It must not be injected into a vein or into the buttock as this may accidentally inject into a vein. Full instructions on how to use auto-injectors can be found on the side of the device.

Concern is being raised in medical circles that there has been an increase in allergic reactions within the global population. While there were eight deaths in the UK in 1998 related to a severe allergic reaction, by 2007 this had increased to twenty four deaths.⁸ Anyone who has had a severe allergic reaction and been prescribed an adrenaline pen should clearly inform their family, friends, colleagues when and how to use the device in case they become unable to self-administer.⁹

Additional Resources

Videos showing an adrenaline pen being used can be found on the EpiPen® (Mylan Specialty L.P., NJ, USA)® and Jext® (ALK-Abelló, UK) ® websites.^{10, 11} In addition, help and guidance for individuals who suffer from allergic reactions can be found on the Anaphylaxis Campaign website, supported by the Royal College of Physicians.⁶

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MANAGEMENT OF THE EMERGENCY DRUG KIT

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Medical emergencies in the dental practice are relatively uncommon but can occur at any time and within any area of the practice. It is not unusual for a medical emergency to occur in the waiting area rather than the surgery. Most importantly, it's essential to remember that a medical emergency can involve anyone in the practice; not only patients, but also visitors and members of the dental team.

As a profession we have a responsibility to ensure that a high standard of care is maintained through quality training practises and an up-to-date knowledge base.¹

Contents of the emergency drug kit

There are a variety of drug boxes available on the market for purchase. The Resuscitation Council (UK) has previously recommended that such kits should be standardised across the UK.² Following the publication of updated guidance in November 2013, the Resuscitation Council (UK) has stated that their drug and equipment lists "refer only to equipment for the management of cardiorespiratory arrest. Primary dental care facilities should also have appropriate equipment and drugs for managing other life-threatening medical emergencies (eg anaphylaxis) as recommended in the dental section in the British National Formulary."³

Guidance in the British National Formulary on medical emergencies in the dental practice refers to the following drugs:⁴

- Adrenaline Injection (epinephrine injection), adrenaline 1 in 1000, (1 mg/mL as acid tartrate), 1-mL amps
- Aspirin dispersible tablets 300mg
- Glucagon Injection, glucagon (as hydrochloride), 1-unit vial (with solvent)
- Glucose (for administration by mouth)
- Glyceryl Trinitrate Spray
- Midazolam Buccal Liquid, midazolam 10mg/mL or Midazolam Injection (for buccal administration), midazolam (as hydrochloride) 5mg/mL, 2-mL amps
- Oxygen
- Salbutamol Aerosol Inhalation, salbutamol 100 micrograms/metered inhalation

Equipment for the management of medical emergencies

Assuming the recommended emergency drugs kit is in place within a dental practice, the practice principal or practice manager should ensure that all members of the team area aware of what is inside the kit and that the associated equipment also meets the recommendations. Below is a list of the minimum equipment for cardiopulmonary resuscitation in primary care, as suggested by the Resuscitation Council (UK):⁵

Airway and breathing

- Protective equipment - non-latex gloves, aprons, eye protection
- Pocket mask with oxygen port
- Portable suction eg Yankauer tube
- Oropharyngeal airways sizes 0,1,2,3,4
- Self-inflating bag with reservoir (adult)
- Self-inflating bag with reservoir (child)
- Clear face masks for self-inflating bag (sizes 0,1,2,3,4)
- Oxygen cylinder (CD size)
- Oxygen masks with reservoir
- Oxygen tubing

Circulation

- Automated external defibrillator (AED) (Type of AED and location determined by a local risk assessment. Consider facilities for paediatric use, especially for practices that treat children)
- Adhesive defibrillator pads (spare set of pads also recommended)
- Razor
- Scissors

Based on the recommendations of the British National Formulary for medical emergencies in dental practice,⁴ the following equipment is also suggested

- Single use sterile syringes and needles
- blood glucose monitor
- Large-volume spacer device

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Familiarity with the contents of the drug box and equipment is fundamental to the dental team prior to an event of an emergency. A number of things could go wrong if the equipment is not checked regularly. Examples include:

- Drug/dosage error in an emergency
- Faulty/dangerous equipment (eg leaking oxygen tank)
- Insufficient supply of equipment in an emergency

The emergency drug kit is a box of tricks that should never hold any surprises

The name of the drugs

Every member of the team should be familiar with the descriptive and common names for drugs in the emergency kit to avoid confusion when one person asks another to get a certain drug.

The dose

Knowing the correct dosage of each drug prior to an emergency will give the team a time advantage, which could be crucial to the eventual outcome.

What, when and how it is used

Knowledge of the drugs, their uses and when and how they should be administered is a fundamental skill that should not be taken for granted. Familiarising yourself with the drug box is not something that should place during an emergency!

Amount of each drug in the emergency box

The amount of each drug remaining should regularly be assessed. The Resuscitation Council (UK) has previously suggested enforcing weekly checks on the drug kit; not only to alert the practice if there are missing drugs, but to also identify if they have been tampered with.²

Location, location, location

Ideally, all drugs should be stored together in a purpose-built container. Where this is not possible, due the size of the equipment or measures required to store the drug correctly (eg oxygen, glucagon), a single location for all the equipment and drugs should be identified. It is essential that the

drug kit be easily accessible during an emergency. Checking that the emergency drug kit is not locked away and accessed using a key or code is part of the routine inspection process by the CQC.

Practice guidelines and protocols

To ensure that all members of the team are working from the same page it is essential that practice guidelines and protocols are in place.

In relation to the emergency drug kit, the practice principal has an obligation to ensure that the written documentation covers everything that has been mentioned earlier in this article, in addition to the following:

- A record of practical skills and level of attainment should be kept for each member of staff
- All members of the team should have access to an outside line in their surgery in order to allow immediate communication with the emergency services
- Regular checks should be made to ensure that emergency drugs are in date and note what needs replacing, and details of these checks should be recorded and signed
- There should be a practice protocol for obtaining medical advice and organising the transfer to hospital

of a patient being resuscitated

- As a minimum, there should be training for all members of the practice team (both clinical and administrative) in the techniques of basic life support, with and without airway adjuncts, as well as a ongoing refresher training (at least once a year), enabling staff to retain these skills.⁶

Audit

The idea of auditing the emergency drug kit may seem like another unnecessary workload for practices to adhere too. However, audits can help to extensively improve performance.

In relation to the emergency drug kit, an audit should reveal:

- If team members have gone through the appropriate training
- If practice induction programmes include sufficient information regarding the location of the emergency drug kit
- If there are adequate procedures in place in the event of a medical emergency
- If team members have an adequate understanding of their roles and responsibilities regarding the management and maintenance of the emergency drug kit
- Whether the emergency drug kit is adequately accessible.

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