DENTAL EMERGENCIES

EDITED BY

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WILEY-BLACKWELL

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Preface

The dental emergency clinic is an important area for any dental service. Such departments are usually staffed by clinicians with a variety of backgrounds and levels of experience. This book does not attempt to be exhaustive but is a guide to help clinicians with the management of the wide variety of patients that may present. An attempt is made, where appropriate, to place patient management in an academic context.

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Chapter 1
Introduction, Infection Control and Prescribing

M. Greenwood

Introduction to the dental emergency clinic

The dental emergency clinic (DEC) is an important part of the service provided to patients. It is a demanding environment in which to work for main two reasons. First, many patients who attend such departments have a general tendency to avoid dental treatment and view attending such a department as a last resort. Second, from the point of view of the clinicians who work in such clinics, the clinical spectrum is wide, and although there is no remit to provide a specialist service, the boundaries of knowledge and experience for clinicians in certain areas are approaching this. Clinical staff working in these departments need a wide skill mix.

This textbook aims to summarise important areas of knowledge with which practitioners working in the DEC should be familiar. Modern clinical working often requires adherence to protocols, and a summary of some of the more important current management protocols, together with supporting evidence, is provided in the appendices.

For maximum efficiency in any department that deals with emergencies, a system of triage is immensely valuable. Triage is essentially the process of determining the priority of patients' treatment on the basis of severity of their condition. Triage should result in determining the order and priority of a patient's emergency treatment and occasionally their onward transport. In the DEC, emergency situations include those where the airway may be compromised due to infection or trauma. Such patients must be assessed promptly and referred quickly for onward management. Other patients, who may have sustained trauma, need to be assessed expeditiously, particularly from the point of view of airway and vital signs, and also possible head injury and concomitant injuries, which in some cases may take priority over the facial

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or dental injuries. More detail in relation to the assessment of trauma patients is given in Chapter 7.

Clearly, it is important that the wide variety and, sometimes, the large number of patients that pass through these departments are handled in an appropriate and a safe manner. In no area does this apply more than the area of infection control, the principles of which are discussed in the following sections.

Infection and infection control

Hand care

The most simple and effective method of preventing healthcare-acquired infections is to undertake effective hand hygiene. The World Health Organisation has produced guidelines that have been widely adapted into the '5 moments for hand hygiene'. These are summarised in Box 1.1.

Box 1.1 The 5 moments for hand hygiene at the point of care

- Before patient contact
- Before aseptic task
- After body fluid exposure risk
- After patient contact
- After contact with patient surroundings

Source: Adapted from WHO Alliance for Patient Safety (2006).

Handwashing is clearly important in the prevention of spread of infection in general and has received significant media attention in recent years. This is largely due to the prevalence of methicillin-resistant *Staphylococcus aureus* (MRSA). *S. aureus* is a bacterium that lives on the skin and in the nose of approximately one in three of the population. Usually, people who carry MRSA do not require treatment and it is no more likely to cause infection than 'ordinary' *S. aureus*, but different antibiotics are used to treat these patients. Screening for MRSA is carried out for new appointees to healthcare posts and hospital inpatients – but not for outpatients. Effective handwashing is critical in the prevention of spread of MRSA.

The other bacterium that has received significant attention, particularly in recent years, is *Clostridium difficile*. This is a bacterium living in the bowel of less than 5% of the healthy adult population. Patients can develop problems if they are brought into contact with contaminated surfaces (which include hands). Unlike MRSA, alcohol gels are not effective against *C. difficile* spores, and therefore, effective handwashing is mandatory.

It is important that healthcare workers remove all hand jewellery (with the exception of wedding bands), are bare below the elbows and do not wear a wristwatch. All cuts and abrasions should be covered with a waterproof adhesive dressing. It is important that, after handwashing, gloves are worn, and these should be changed between each patient and the hands washed again after removing the gloves. Non-sterile medical gloves can be used for examination purposes, but sterile gloves should be worn for operative procedures.

There is significant individual variation in requirements, but the regular use of an emollient hand cream is important to prevent drying of the skin after frequent handwashing. Contact dermatitis can be significant enough in some practitioners to cause real practical problems with clinical practice. Most organisations now routinely use latex-free gloves as standard.

Sterilisation and disinfection

Sterilisation is defined as the killing or removal of all viable organisms. Concern about the transmissible spongiform encephalopathies such as Creutzfeldt–Jakob disease (CJD) and particularly variant-CJD has improved the level of understanding of prion disease. This has led to a necessary redefinition of sterilisation as the inactivation or removal of all self-propagating biological entities.

Disinfection is the reduction in viable organisms to the point where risk of infection is acceptable.

Antisepsis is a related term, defined as the disinfection of skin or wounds. It is not practically possible or even necessary to sterilise absolutely everything in a dental surgery. Clearly, all surgical instruments must be sterile and anything coming into direct contact with the surgical site should also be sterile. Everything else should be disinfected.

Sterilisation and disinfection methods

Before any attempt is made to sterilise or disinfect an instrument, macroscopically evident contamination should be removed. If this is not done, physical access of the sterilising or disinfecting agent to the object being sterilised may be prevented. Therefore, instruments should be pre-cleaned and, if they have been in contact with infectious material, pre-cleaning should include adequate disinfection as a first step.

Methods of sterilisation and disinfection include dry or moist heat, a wide variety of gaseous or liquid chemicals, filtration and ionising radiation. The choice depends largely on the nature of the material being treated, the degree of inactivation required and the organisms involved.

In contemporary practice, procedures are followed that are known to result in sterility for different batch sizes and materials. The performance of equipment in terms of the temperature and duration is carefully monitored. The Bowie–Dick tape is one method of ensuring that an autoclave has been functioning effectively. The cross-hatchings turn brown when sterilisation has

Figure 1.1 A surgical pack after autoclaving. The cross-hatchings on the Bowie–Dick tape have turned brown indicating that the pack has been successfully sterilised.

been achieved (Figure 1.1). Figure 1.2 shows that the sterilisation has been effective within the packaging itself as the coloured area has changed from yellow to blue.

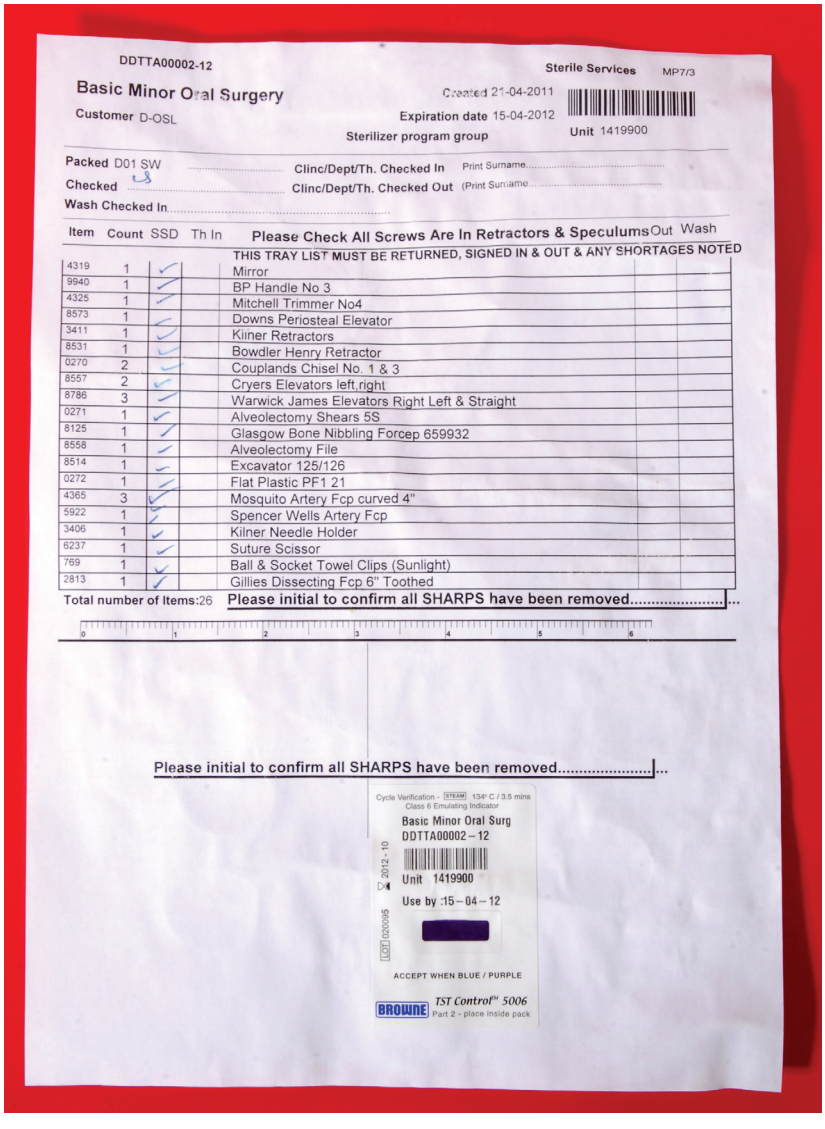
Autoclaves

The most common method of sterilisation used in dentistry is by moist heat in an autoclave. The method depends on the use of steam under pressure at temperatures between 121°C and 134°C. It is critical that the autoclave is fully saturated with water vapour and that all other gases are excluded. This method of sterilisation is more efficient than dry heat as it takes less heat to denature fully hydrated proteins and moist heat releases latent heat of vapourisation, which transfers more energy than dry heat.

In some cases, particularly in individuals at high risk from, or those who have known, prion disease, single-use (disposable) equipment should be used wherever possible. Such items include local anaesthetic syringes (Figure 1.3), scalpels, saliva ejectors and impression trays. There is an ever-increasing array of disposable equipment being manufactured.

It is important when dealing with the cleaning of handpieces that the manufacturer's instructions are followed closely. Such equipment should never be completely immersed in disinfectant. It is important to lubricate handpieces appropriately.

Impressions should be rinsed under running cold water to remove macroscopic debris. It is important that further disinfection is carried out according to manufacturer's instructions. The request form to the laboratory that accompanies the impression should highlight known infections or high-risk groups. The same is true of blood samples that are sent for analysis.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Sterile Services MP7/3

Basic Minor Oral Surgery

Created 21-04-2011

Customer D-OSL

Expiration date 15-04-2012

Sterilizer program group

Unit 1419900

Packed D01 SW

Clinc/Dept/Th. Checked In Print Surname

Checked

Clinc/Dept/Th. Checked Out (Print Surname

Wash Checked In

Item	Count	SSD	Th In	Please Check All Screws Are In Retractors & Speculums Out Wash THIS TRAY LIST MUST BE RETURNED, SIGNED IN & OUT & ANY SHORTAGES NOTED
4319	1	✓		Mirror
9940	1	✓		BP Handle No 3
4325	1	✓		Mitchell Trimmer No4
8573	1	✓		Downs Periosteal Elevator
3411	1	✓		Kilner Retractors
8531	1	✓		Bowdler Henry Retractor
0270	2	✓		Couplands Chisel No. 1 & 3
8557	2	✓		Cryers Elevators left,right
8786	3	✓		Warwick James Elevators Right Left & Straight
0271	1	✓		Alveolectomy Shears 5S
8125	1	✓		Glasgow Bone Nibbling Forcep 659932
8558	1	✓		Alveolectomy File
8514	1	✓		Excavator 125/126
0272	1	✓		Flat Plastic PF1 21
4365	3	✓		Mosquito Artery Fcp curved 4"
5922	1	✓		Spencer Wells Artery Fcp
3406	1	✓		Kilner Needle Holder
6237	1	✓		Suture Scissor
769	1	✓		Ball & Socket Towel Clips (Sunlight)
2813	1	✓		Gillies Dissecting Fcp 6" Toothed

Total number of Items:26 Please initial to confirm all SHARPS have been removed.....

Please initial to confirm all SHARPS have been removed.....

Cycle Verification - STEAM 134° C / 3.5 mins Class 6 Emulating Indicator

Basic Minor Oral Surg

DDTTA00002 – 12

Unit 1419900

Use by :15 – 04 – 12

LOT 0200095

2012 - 10

ACCEPT WHEN BLUE / PURPLE

BROWNE TST Control™ 5006 Part 2 - place inside pack

Figure 1.2 The sticker at the bottom of the paper has changed from yellow to blue, indicating that sterilisation has been effective within the pack (which is where this form should be placed prior to sterilisation).

Contamination of surgery water supplies

Most water supplies to dental units will be lined with a biofilm, which provides a reservoir of microbial contamination. Amongst the contaminants is the bacterium *Legionella*, responsible for Legionnaire's disease. Some dental units have a bottle-fed water system, in which case disinfectants can be relatively easily supplied. It is important that manufacturer's instructions are followed. Some of the dental units that are supplied with water more remotely must be

Figure 1.3 A disposable local anaesthetic syringe for use in dentistry. The retractable sheath at the end of the syringe can be drawn over the needle and locked into place as a prevention against needlestick injury.

decontaminated in conjunction with manufacturer's instructions, and some organisations have introduced decontamination units using ethene oxide plant to perform this function. It is important that such lines are run through for the recommended length of time to reduce contamination. This is particularly important when the unit has been out of use.

Healthcare workers in the dental emergency clinic

All those who carry out exposure-prone procedures should be non-infectious or immune to hepatitis B virus, usually via appropriate immunisation. Any worker who has reason to believe that they may be infectious with a blood-borne virus has a professional and ethical duty to report this and to obtain appropriate counselling and testing where relevant. Dependent on the result to such testing, changes to the clinical practice of the individual may be required ranging from modifications of practice to ceasing clinical practice altogether.

All members of the team should have training in the principles of infection prevention and control and this should be updated on a regular (usually, annual) basis. It is important that regular reviews are made of the infection control policies and procedures and that these are updated as required.

Inoculation injuries

Inoculation injuries are defined as incidents where infected objects or substances breach the integrity of the mucous membranes or skin or where a contaminant comes into contact with the eyes.

There are local protocols in place for dealing with such incidents. Clearly, prevention is best and attention to zoning in the surgery ('clean' and 'dirty' areas), and proper disposal of contaminated equipment is vital in this respect.

If such an injury does occur, it is important that the wound is allowed or encouraged to bleed and washed thoroughly with running water. The local protocol should then be followed. Usually, such protocols involve taking blood samples from both the donor (usually, but not always, the patient) and the recipient of the injury (usually, but not always, the clinician). The blood samples should then be tested for blood-borne viruses and, depending on the result, appropriate counselling obtained. The occupational health service should be informed at the earliest opportunity.

Waste disposal

The safe disposal of waste is critically important in a clinical environment. The main subdivision is into clinical and non-clinical categories. Local protocols may vary but in general terms, clinical waste is disposed of in different coloured plastic bags depending on its nature. It is important that clinicians are familiar with local policies and procedures.

All sharps should be disposed of in a suitable container designed for the purpose. It is important when filling either waste bags or sharps containers that they are not over-filled as this significantly increases the risk of contamination or needlestick injury. Therefore, clinical waste bags must not be filled to a level more than three-quarters full and they should be tied at the neck.

Blood spillages

Prompt attention is required in the event of a blood spillage. Disposable towels should be placed over the spillage and 10,000 parts per million sodium hypochlorite applied and left for 5 minutes before disposing of the towels as clinical waste. The area should be adequately ventilated, particularly during the cleaning up process. The person clearing such waste should wear appropriate personal protective equipment. In this context, such equipment includes a plastic apron, protective eyewear and heavy-duty gloves. It is advisable to use appropriate protective footwear. Other examples of protective personal equipment are given in Box 1.2.

Box 1.2 Examples of personal protective equipment

- Gloves
- Protective eyewear (spectacles/visor)
- Masks
- For surgical procedures, clothing protection such as a surgical gown
- Appropriate footwear

Prescribing

The British National Formulary (BNF) contains excellent guidance on the principles of prescribing. Clinicians in a DEC will need to write prescriptions for some patients and it is important that basic principles are adhered to. An example of a prescription is given in Figure 1.4.

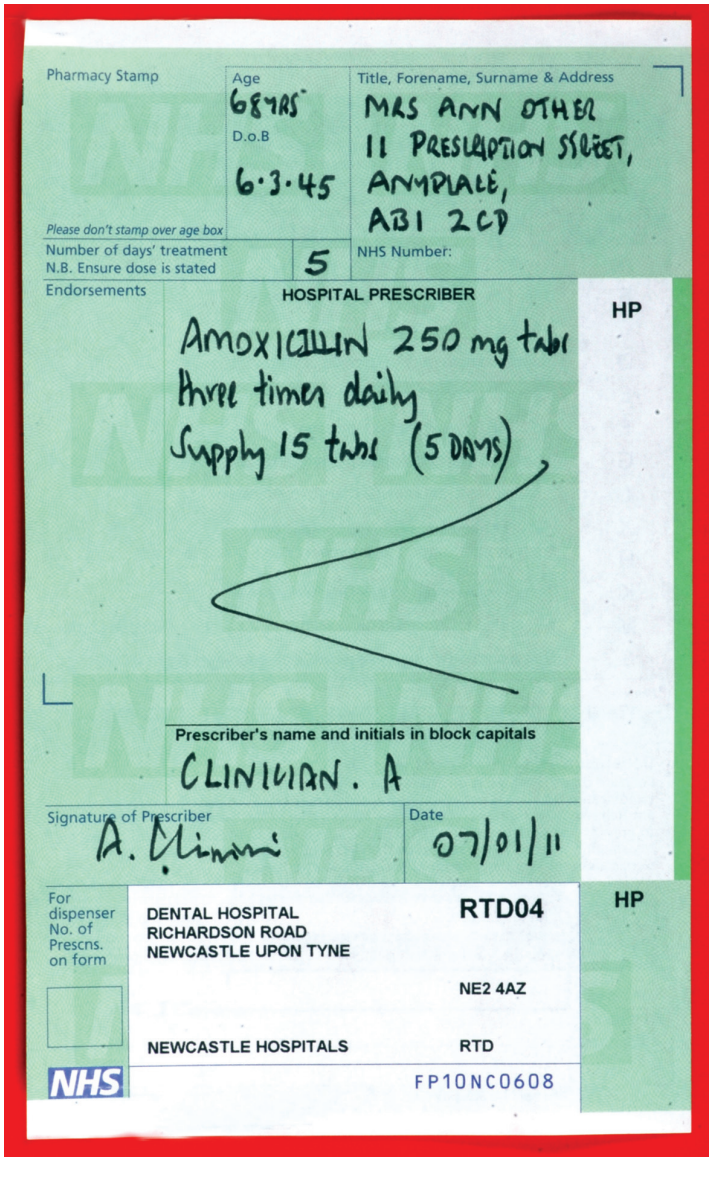

Figure 1.4 An example of a handwritten prescription. Clearly, such prescriptions should be legible and may be typed, but must be indelible.

Box 1.3 summarises some of the important principles of prescription writing.

Box 1.3 Some basic principles of prescription writing

- Prescriptions should be written or typed legibly and in indelible ink.
- All areas of the prescription should be completed and signed.
- It is a legal requirement to state the age of children less than 12 years in precise terms.
- The unnecessary use of decimal points should be avoided, e.g. 3 mg not 3.0 mg.
- Use of a decimal point is acceptable to express a range, e.g. 0.5–1 g.
- It is important that figures are placed either side of a decimal point, even if one of the figures is zero.
- Micrograms and milligrams should not be abbreviated as they can easily be misread.
- The dose and frequency should be stated.
- If medications are 'as required', a minimum dose interval must be specified.
- Names of drugs should not be abbreviated.
- Directions should be written in English but the use of well-recognised Latin terms is acceptable, e.g. tds (three times per day), bd (twice per day), qds (four times per day), prn (when required).
- Unlicensed medications (those without marketing authorisation) can be prescribed but the patient should be informed of this.

Antibiotic prescribing

Good infection control and prudent antibiotic prescribing are important in reducing the spread of antibiotic resistance. In many cases of acute oral infections, antibiotics will be required but dental surgeons should not forget important local measures such as irrigation with chlorhexidine where appropriate, together with the removal where possible of the source of infection and provision of drainage where this is possible. Where it is likely that antibiotics are required for a protracted period, or the infection is clinically significant, it is good practice to take a pus swab to send for culture and sensitivity testing. Clearly, if this is done, it is important that the result is checked to ensure that the patient has been prescribed an appropriate antimicrobial (results of culture may take 2–3 days).

In patients who have had previous recent antibiotics or who have a complex medical history that impinges on their overall management, it is important that the clinician working in a DEC discusses the case with a microbiologist, who will provide good advice regarding the best way of managing the patient, particularly from a prescribing viewpoint.