



Barts and The London
Queen Mary's School of Medicine and Dentistry

Institute of Dentistry

Thread

Pain, pain control , therapeutics

Stage: Throughout the Course

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Subject Convenors: *from all modules*

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1. INTRODUCTION

a. DEFINITIONS

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage.

Pharmacology – the science which deals with the study of the action of drugs on the living systems

Therapeutics – the application of drugs to the treatment of diseases

Psychology the study of the mind and mental processes especially in relation to human behaviour

Neurosciences structure and function of the brain and nervous system

Conscious Sedation: A technique in which the use of a drug or drugs produces a state of depression of the central nervous system enabling treatment to be carried out, but during which verbal contact with the patient is maintained throughout the period of sedation. The drugs and techniques used to provide conscious sedation for dental treatment should carry a margin of safety wide enough to render loss of consciousness unlikely. The level of sedation must be such that the patient remains conscious, retains protective reflexes, and is able to respond to verbal commands

b. COURSE OUTLINE

Pain and Pain Control

I. Overview of pain and its epidemiology

II. Definitions of pain

III. Peripheral and central mechanisms of pain transmission, and pain modulation - part of neurosciences sub-module

IV. Pain assessment

V. Pre-operative, operative and post-operative pain and apprehension

1. Patient evaluation

2. Nonpharmacologic methods

3. Pharmacological methods - analgesics

4. Pharmacological methods - local anaesthesia

5. Pharmacological methods - conscious sedation (anti-anxiety treatments)

6. Overview of general anaesthesia and deep sedation

7. Interaction of pharmacological and psychological methods

B. Control of post-operative pain and apprehension

VI. Acute and chronic orofacial pain

A. Taxonomy of orofacial pain

- B. Clinical evaluation
- C. Diagnostic features, aetiology, mechanisms and management of orofacial pain

Therapeutics

1. General principles of drug action
2. Administration of drugs, routes of administration
3. Drug interactions, adverse reactions
4. Prescribing and the Law
5. Drugs used for the control of pain
6. Management including drug therapy of orofacial pain
7. Sedation and resuscitation
8. Antiseptics and disinfectants
9. Antimicrobials
10. Drugs used in endodontics , periodontal disease, prevention of dental disease
11. Haemostasis and haemostatic agents
12. Management of patients with complex drugs
11. Effects drugs can have on the oral cavity

c. ABSENCE AND PUNCTUALITY

Regular attendance at the timetabled sessions is essential

Your attendance and punctuality will be logged by your Clinical lecturer for that clinical session, as seen in your Grading Criteria in your log book. It is your responsibility to ensure that you sign the attendance list when arriving for lecture sessions.

If you are unable to attend a clinical session through sickness or unforeseen circumstances it is your responsibility to:

- Cancel patients, but if this is not possible please contact the Centre Administrator.
- Contact the Centre or Clinical lecturer whose session you will be missing.

If you are too unwell to call in yourself please arrange for someone else to do so.

On your return to college please complete a self-certificate and return it to the Dental UG Administrator (Ms JA Walker).

If you feel that you are going to be absent for more than a week through sickness, you must contact Dental UG Administrator (Ms JA Walker), who will inform your Tutors.

Absences for more than seven days through sickness must be supported by a medical certificate, which should be given to the administration office on your return.

Please remember that absence will put you behind. The same goes for lateness. If you start a session late you are more likely to go over your clinical session, reducing the amount of time you get to spend with patients. If you are persistently late it could result in you not passing your unit, under the assessment area of Professionalism.

d. CLINICAL ATTENDANCE

Guidelines

- Dress & Conduct
 1. Appropriate professional dress and footwear must be worn AT ALL TIMES in patient areas. Men should wear a shirt and tie/bowtie. For women, low cut tops and bare midriffs are not acceptable. Denim, canvas, cord jeans, tennis shoes, trainers, open sandals are NOT considered appropriate, professional dress. Any open shoes are not accepted in clinical areas, for health and safety reasons.
 2. A clean white coat must be worn unless otherwise directed. *The sleeves should be neatly rolled up so that wrists can be washed and the buttons must be fastened.*
 3. Hairstyles must be tidy. Long hair should be tied back.
 4. Hands and fingernails must be scrupulously clean and tidy with no nail varnish. Large rings, bracelets and wristwatches MUST be removed.
 5. Unguarded wax knives, Le Cron carvers or any other sharp instruments must NOT be carried in pockets.
 6. Name badges MUST be worn.
 7. Masks ONLY need to be worn when aerosol is generated.
 8. Chewing gum is unacceptable.
- Patients
 1. Patients should be kept waiting as little as possible and should be dealt with courteously. This improves patient satisfaction and compliance.

2. Students must introduce themselves to patients they are clerking and explain that they will be seen by a qualified member of staff; the format of the consultation must also be explained.
3. No operative procedures must be commenced without the express permission of a supervisor and written consent must be obtained and countersigned by a qualified member of staff.
4. No critical comments must be made about general practitioners or colleagues or their work in front of patients. Any anxieties should be expressed in confidence to the supervising clinician.
5. A student should give no promises of treatment or discussion about proposed treatment until discussed with the supervisor.
6. Complaints and problems of any kind must be referred to the supervisor IMMEDIATELY. Any treatment being performed at that time must be stopped and only continued when given permission from a supervisor.
7. A patient may NOT be discharged from the clinic or hospital or referred to another person without the permission of a supervisor. Treatment performed must be completely and concisely written up in the patient's notes and signed in full by the student. A supervisor must countersign this before the patient is discharged.
8. Patient's clinical notes may NOT be removed from the department. Storage of patient's notes in lockers will incur serious disciplinary action.
9. Requests for diagnostic tests (e.g. blood test, radiography) must be made by a qualified member of staff. The same restriction applies to prescriptions and to correspondence relating to patients. The students are, however, encouraged to prepare these so as to familiarise themselves with them.
10. When observing other members of staff seeing patients please remain quiet and take an active role in contributing to the consultation, and not talk among themselves.
11. Everything that occurs during a patient consultation is confidential and must not be discussed outside the clinical environment .
12. Please ensure that you know the dates and times of the sedation teaching sessions arranged both within the Dental Institute and at St Leonard's and that you arrive in good time.
13. Please bring your course unit materials and progress files to the oral medicine clinics.

e. CLINICAL AIMS & OBJECTIVES

i) Facial Pain clinics

- Be familiar with the taking of a pain history from a biopsychosocial aspect in order to answer to answer three key questions:
 - what is the extent of the patients disease or injury?
 - what is the magnitude of the illness ? how does it affect activities?
 - does the patients behaviour reflect the nature and extent of the physical disease or is there evidence that the symptoms are amplified by psychological or social reasons?
- Be competent in examining a chronic facial pain patient , including basic examination of the cranial nerves
- Have knowledge of how to use narrative, evidence based methodology and patients preference in formulating a treatment plan
- Know what patient information is available for chronic pain patients including support groups
- Improve communication skills

Below is something you could do while observing in a clinic:

Communication skills in outpatients clinics

Patient details

Identification: Gender: Age:
Appointment: Beginning (hh:mm) End (hh:mm)

Physician's behaviour

- | | | |
|---|------------------|--|
| 1 | Yes / No | Does the doctor greet the patient? |
| 2 | Yes / No | Does the doctor introduce him/herself to the patient? |
| 3 | 1 2 3 4 5 | Does the doctor show interest in the patient's daily activities? |
| 4 | 1 2 3 4 5 | Does the doctor use open questions? |
| 5 | 1 2 3 4 5 | Does the doctor ask questions with 'yes' or 'no' replies? |
| 6 | 1 2 3 4 5 | Does the doctor allow the patient to interpret his/her/own problem? |
| 7 | 1 2 3 4 5 | Does the doctor give attention to the main concerns of the patient? |
| 8 | 1 2 3 4 5 | Does the doctor invite the patient to undergo a physical examination (PE)? |

No physical exam PE Omit questions 9-10

- 9 **1 2 3 4 5** Does the doctor keep up a dialogue with the patient during the PE?
- 10 **1 2 3 4 5** Does the doctor provide information about the findings of the PE?

No Tests Omit question 11

- 11 **1 2 3 4 5** Does the doctor explain the necessity and nature of laboratory tests?

Management

- 12 **1 2 3 4 5** Does the doctor explain about the medicines prescribed?
- 13 **1 2 3 4 5** Does the doctor use vocabulary compatible with the patient's understanding?
- 14 **1 2 3 4 5** Does the doctor ensure that the patient understands his/her own problem?
- 15 **1 2 3 4 5** Does the doctor ensure that the patient understands the prescription or test needed?

Yes / No Does the doctor give written information?

Patient's behaviour

- 16 **1 2 3 4 5** Is the patient apparently interested in describing his/her symptoms to the doctor?
- 17 **Yes / No** Is the patient concerned about receiving a prescription?
- 18 **Yes / No** Is the patient concerned about getting lab tests?
- 19 **1 2 3 4 5** Is the patient interested in receiving explanations regarding his/her condition?
- 20 **1 2 3 4 5** Is the patient apparently enthusiastic or happy?
- 21 **1 2 3 4 5** How does the patient appear? (shy – talkative)

Student's name
Group
Date

Scale: 1 = very poor; 5 = excellent

ii. Conscious Sedation

This teaching takes place during 6 sessions on Wednesday afternoons in the Dental Institute and on three sessions at St Leonards. Each group or part of group is specifically timetabled.

Most dental patients are able to accept dental treatment with local analgesia and sympathetic management. Some, however, require additional help from a range of techniques, including conscious sedation. Conscious sedation is an important part of pain and anxiety control. The application of conscious sedation techniques to dental procedures can greatly reduce the need for general anaesthesia.

Range of Techniques:

The following techniques will be taught during this part of the course:

- Assessment of anxious patients
- Intravenous sedation ❶ with midazolam
- Inhalation sedation ❷ with nitrous oxide and oxygen

The majority of anxious or phobic patients can be treated with these techniques or a combination of them.

❶ Intravenous Sedation Checklist

The Equipment

- | | |
|---------------------------------|--------------------------|
| Dental chair functions properly | <input type="checkbox"/> |
| Suction working | <input type="checkbox"/> |
| Portable suction unit available | <input type="checkbox"/> |
| Handpiece and 3:1 working | <input type="checkbox"/> |

Oxygen

- | | |
|----------------------------|--------------------------|
| Emergency oxygen available | <input type="checkbox"/> |
| Self-inflating 'ambu bag' | <input type="checkbox"/> |
| Guedel airways located | <input type="checkbox"/> |

Pulse Oximeter

- | | |
|---|--------------------------|
| Pulse oximeter functioning and alarms set | <input type="checkbox"/> |
|---|--------------------------|

Lay up for Intravenous Sedation

Midazolam

- | | |
|-----------------------|--------------------------|
| 10mg midazolam in 2ml | <input type="checkbox"/> |
|-----------------------|--------------------------|

Saline

- | | |
|------------------------------|--------------------------|
| 0.9% sodium chloride in 10ml | <input type="checkbox"/> |
|------------------------------|--------------------------|
-

- 5ml syringe
- 10ml syringe
- non-allergenic tape
- cannula (Y-can and /or venflon)
- wide bore needle
- drug labels
- tourniquet

Emergency Drugs

To Hand

- Atropine 600µg in 2ml
- Flumazenil (anexate) 500µg in 5ml
- Know the whereabouts of the Emergency Drug Kit

Patient Checks before Sedation

- Check medical history for changes
- Check consent form is signed for a course of treatment
- Agree the treatment for today
- Check suitable escort present

Carry out venepuncture. Check cannula is sited in a vein by administering 2 mls of saline and examining for 'tissuing' (subcutaneous/intramuscular injection). Place the pulse oximeter probe on the finger. Begin sedation. Note time of first introduction of midazolam. Give 2mg midazolam and wait 90 seconds. 1 mg of midazolam to be titrated every 30 seconds until the patient shows signs of sedation. Note time of last dose.

- Record batch number, expiry date and total dose of drugs used.
- Check patient suitable for discharge (street fit).
- Give post operative instructions

② Dental Sedation Clinic: Checklist for Inhalation Sedation

Before patient enters:

- Prepare bay in normal way (clean surfaces, cover light, chair handles etc), lay out instruments and materials trays. Check patient records.
- Connect white pipe to O₂ outlet on wall.
- Connect blue pipe to Nitrous Oxide outlet on wall.
- Adjust flow valve to deliver 7-8 L O₂ per minute.
- Check flow of Nitrous oxide.
- Set proportion to 50% - check calibration i.e. are 2 spheres at same height?
- Whilst gases flow, pull O₂ connection out of wall, check both spheres immediately fall to zero, ie both O₂ and Nitrous oxide supply cease.
- Reconnect O₂.

- Return O₂ to 100%
- Block gas outlet with palm of hand, squeeze reservoir bag to check for tears, leaks, poor seal.
- Check O₂ flush by pushing on button to ensure that O₂ is deliverable in an emergency.
- Choose appropriate mask
- Connect mask as follows O₂ + Nitrous Oxide supply from Quantiflex
→Filter→extension→MASK→one-way valve→scavenging

Escort Patient to chair and seat comfortably

- Explain what is to happen and **ensure consent has been obtained**
- Ensure appropriate 'second person' is present.

Sedation

- Open flow valve to deliver 7-8 L O₂ per minute
- Introduce and seat mask – ensure comfort and check for leaks
- Wait 1 minute (?apply topical anaesthetic at this time)
- Increase Nitrous oxide to 10% - wait 1 minute
- Increase Nitrous oxide by another 10% - wait 1 more minute
- Assess sedation of patient (?ptosis, slurred speech, tingling extremities)
- Reassess and continue if necessary by increments of 5% - wait 1 minute after each – until sedation achieved

Recovery

- At end of procedure turn off Nitrous oxide and allow the patient to breathe 100% O₂ for 2 minutes.
- Check patient is adequately recovered to leave and discharge.
- Complete notes and record full details of sedation experience as well as dental details.

iii. Resuscitation

All students must attend this practical session on resuscitation where you will:

- Be familiar with the UK Resuscitation Basic Life Support (BLS) guidelines
- Be competent in provision of BLS
- Be familiar with differential diagnoses of patient collapse
- Be familiar with evidence based guidelines for prevention of patient collapse

2. COURSE OVERVIEW

A. PHILOSOPHY

The majority of patients seek healthcare because of pain. In many instances this is acute pain and is relatively easy to manage. It is however crucial that dentists also recognise chronic pain and differentiate that due to dental disease and that of non dental origin . Dentists need to be aware that pain has an the effect not just locally and physically but also psychologically. The pain teaching section of the curriculum is based on the International Association for the Study of Pain proposed dental undergraduate curriculum. The approach is holistic using a biopsychosocial model.

Dentists must be capable of dealing with anxious patients and need to ensure that they can allay anxiety over dental treatment and provide treatment in a pain free environment through the use of local analgesia, systemic analgesics and inhalational sedation.

Over the years pharmacology and therapeutics have gradually disappeared from dental curricula as an identified area. This has resulted in dentists having poor skills in this field. With the increasing number of patients attending for dental care who are on a wide range of medications it is vital that dentists are aware of how these drugs can affect their management of their patients. Dentists must also be able to prescribe drugs safely and effectively ensuring they do not interfere with other drugs nor cause adverse side effects.

The following extracts from the General Dental Councils document on the First Five Years illustrates the areas that this Thread addresses.

General Dental Council – “First Five Years”

“Medical Emergencies”

61 The GDC considers that at an early stage in the dental programme students must be given instruction in first aid, including the principles of cardiopulmonary resuscitation and its practice under realistic conditions. It is necessary for this practice to be repeated on an annual basis throughout the programme. Students should learn how to recognise and take appropriate action in situations such as: anaphylactic reaction, hypoglycaemia, upper respiratory obstruction, cardiac arrest, fits, vasovagal attack, inhalation or ingestion of foreign bodies and haemorrhage.

62. Dental students must be aware of the relevant information concerning medical emergencies in the GDC's document *Maintaining Standards: Guidance to Dentists on Professional and Personal Conduct* or its successors. It is essential that all premises where dental treatment takes place have available and in working order: portable suction

apparatus to clear the oropharynx, oral airways to maintain the natural airway, equipment with appropriate attachments to provide intermittent positive pressure ventilation of the lungs, and a portable source of oxygen together with emergency drugs. Graduates should be able to use this equipment and administer drugs effectively

90. The student should learn to manage patients of all ages seeking emergency dental care, some of whom will be distressed and in pain. The care of such patients will involve reassurance, the diagnosis of problems and formulation of provisional treatment plans, as well as the management of dental disease conditions, sometimes by extraction of teeth and other invasive procedures. It is essential that Trusts understand their obligation to provide the patients and facilities for such an educational experience.

Oral Medicine

93. It is important to ensure that the dental student is taught the clinical presentation, diagnosis and management of the common diseases of the oral mucosa, of other oral soft tissues, of the salivary glands, of the facial bones and joints, as well as the oral manifestations of systemic diseases. The various manifestations of facial pain of both dental and non-dental origin, its diagnosis and management must also be considered.

PAIN AND ANXIETY CONTROL

101. The control of anxiety and pain is fundamental to the practice of dentistry and requires full awareness of the social and psychological needs of the individual patient. Building on a sound knowledge of the prevalence and nature of dental phobias and anxieties in respect of dental treatment and the relevant basic sciences, students should be able to assess the suitability of the various methods of managing and controlling anxiety. They should recognise those patients requiring referral for specialist care. In addition students should be able to advise patients on the advantages, limitations and advisability of different forms of pain and anxiety control appropriate to treatment to be undertaken.

102. The value and range of behavioural non-pharmacological methods of anxiety management must be emphasised. In order to assess and manage an anxious patient, dental students should have learnt a range of methodologies that can be reasonably matched to individual circumstances.

103. By the end of the undergraduate programme students should be competent to administer all forms of local and regional analgesia for dental operations and procedures and have been trained in the management of the complications which may arise in the application of such methods of pain control.

104. All dental students must have a range of practical experience in the administration of inhalational and intravenous conscious sedation including assessment and preparation, care under treatment, and recovery and discharge of patients receiving conscious sedation. All dental students should also have practical experience of providing different forms of treatment for sedated patients and be familiar with the drugs, techniques and

equipment for the safe sedation of adults and children. Dental students should graduate with a full recognition of their limited experience in the use of conscious sedation techniques and of the necessity for postgraduate study and instruction in such forms of pain and anxiety control.

105. The theoretical principles of general anaesthesia should be taught to students and they should have this knowledge reinforced by attachment to an anaesthetist who is administering general anaesthesia to dental patients. Practical experience should be gained in operating on patients under general anaesthesia and in their care, including management of the airway. Practical experience should also be gained in the pre- and post-operative care of patients requiring treatment under general anaesthesia. All dental students should receive instruction in the referral of patients for treatment under general anaesthesia in a hospital setting.

106. Many patients are interested in, and may choose, complementary and alternative therapies. Students should be aware of the existence and range of such therapies

Some of the competencies to be achieved at the end of the first five years:

PAIN AND ANXIETY CONTROL

- be competent at infiltration and regional block analgesia in the oral cavity; be competent at when, how and where to refer a patient for general anaesthesia;
- be competent at managing fear and anxiety with behavioural techniques and empathise with patients in stressful situations:
- have knowledge of inhalational and intravenous conscious sedation techniques;
- have knowledge of conscious sedation techniques in clinical practice.

ORAL MEDICINE

- have knowledge of the drugs commonly used in oral medicine and of their side effects and drug interactions:

MEDICAL EMERGENCIES

- be competent at carrying out resuscitation techniques and immediate management of cardiac arrest, anaphylactic reaction, upper respiratory obstruction, collapse, vasovagal attack, haemorrhage, inhalation or ingestion of foreign bodies, and diabetic coma;
- have knowledge of diagnosing medical emergencies and delivering suitable emergency drugs using, where appropriate, intravenous techniques;

B. AIMS

PAIN AND PAIN CONTROL

Enable students to acquire knowledge and practical skills in the following areas :

I. Introduction

- A. Pain as a public health problem
- B. Pain as an obstacle to optimum dental care
- C. Epidemiology, social consequences
- D. Economic impact
- E. Medico-legal, ethical and compensation issues

II. Definition of pain

- A. Relationship between acute, recurrent and chronic pain
- B. Pain terms
- C. Philosophical issues
- D. Historical aspects of the study of pain
- E. Biological significance of acute pain (survival value) versus chronic pain

III. Peripheral and central mechanisms of pain transmission, and pain modulation

- A. Theories of pain
- B. Peripheral distribution of the trigeminal nerve and other nerves of the head and neck, the anatomic relations of the structures which they innervate, and their primary central connections
- C. Receptors and afferents of the trigeminal system
- D. Brainstem
- E. Thalamus and cerebral cortex

- F. Features that distinguish the trigeminal system from the spinothalamic and dorsal column lemniscal systems, e.g., the proportion of myelinated to unmyelinated fibres, the occurrence of sites (e.g., tooth pulp, cornea) predominately or exclusively innervated by nociceptive afferents, the bilateral and disproportionately large representation of the orofacial region in higher levels of the somatosensory system, the nuclear and subnuclear organization of the trigeminal brainstem complex

- G. Related motor centres and mechanisms underlying orofacial movement
- H. Segmental and brain centres modulating pain transmission
- I. Neurochemicals involved in pain transmission and control

IV. Pain assessment

- A. The measurement of pain, as well as disability, associated distress and suffering
- B. Assessment of pain relief
- C. Affective, cognitive, behavioural and developmental aspects
- D. Interpersonal and psychosocial issues; illness behaviour

V. Pre-operative, operative and post-operative pain and apprehension

- A. Control of pre-operative and operative pain and apprehension

1. Patient evaluation

- a. *Psychological status*
- b. *Physical status*
- c. *Type and extent of operative procedure*

2. Nonpharmacologic methods

- a. *Psychological and behavioral methods*
- b. *Interpersonal strategies of patient management*
- c. *Hypnosis, acupuncture, etc.*

3. Pharmacological methods - analgesics

- a. *Review of physiological and pharmacological considerations*
- b. *Selection of agents*
- c. *Techniques of administration*
- d. *Prevention, recognition and management of complications and emergencies, including principles of advanced life support*

4. Pharmacological methods - local anaesthesia

- a. *Review of anatomic and physiologic considerations*
- b. *Selection of agents*
- c. *Technique of injections*
- d. *Prevention, recognition and management of complications and emergencies, including principles of advanced life support*

5. Conscious Sedation

a) **Attitudes**

To acquire:

- a caring attitude to patients needing conscious sedation
- an appreciation of the concept of multidisciplinary care and teamwork

- an ability to liaise with personnel from other disciplines and a willingness to seek advice, consult literature and refer patients
- an ability to remain calm, decisive and purposeful whilst handling difficulties or complications
- an appreciation of the usefulness and importance of good clinical notes
- the habit of keeping up to date with the published literature on sedation
- an appreciation of the potential of the specialty
- an appreciation of the requirement for postgraduate training prior to commencing independent training sedation practice

b) Knowledge

To acquire a knowledge and understanding of:

- history of pain and anxiety control in dentistry
- causes, signs and symptoms of dental anxiety/phobia
- spectrum of patient management techniques including the distinction between conscious sedation and general anaesthesia
- behavioural/non-pharmacological management
- patient assessment techniques and criteria (e.g.. American Society of Anesthesiologists classification of physical fitness) including specific problems relating to young and elderly patients
- cardiovascular and respiratory physiology and anatomy relevant to sedation
- importance of medical disease and drug therapy in patients undergoing sedation
- management of patients with special needs
- indications and contraindications to the use of sedation and general anaesthesia
- applied pharmacology of current conscious sedation agents, including important drug interactions and potential hazards of polypharmacy
- pharmacological sedation techniques (e.g. benzodiazepines, inhaled nitrous oxide/oxygen)
- principles of monitoring basic physiological variables (e.g. heart rate, respiratory rate and depth, blood pressure, arterial oxygen saturation)

- equipment required for the administration of inhalation and intravenous sedation and for monitoring, including the principles of pulse oximetry
- importance of effective airway protection/management principles of caring for a sedated patient
- importance of effective local analgesia
- difficulties and dangers of over- and under-sedation principles of safe recovery and discharge following sedation
- role of antagonist drugs (e.g. flumazenil) drugs and methods used for the relief of acute and chronic pain, including interactions with sedative agents
- medico legal aspects of the provision of conscious sedation (e.g. GDC regulations, consent, patient instructions)
- impact of the dental procedure on the provision of sedation
- management of minor mishaps / accidents (e.g. extravascular injections, bruising)
- role of the Dental Nurse / 'second appropriate person'
- recognition and management of complications of sedation
- occupational exposure limits to nitrous oxide including methods of monitoring

c) Skills

i) Assessment and treatment planning:

To be able to:

- take a full medical, dental and social history
- assess need and suitability for sedation
- devise an appropriate treatment plan
- obtain valid consent
- evaluate effectiveness of sedation/treatment
- recognise opportunities for providing care without sedation
- write accurate, clear and concise clinical notes

ii) Intravenous sedation:

To be able to:

- assess suitability of vein(s)
- perform intravenous cannulation

- recognise signs and symptoms of extravascular injection
- titrate intravenous drug and recognise sedation end-point
- insert a mouth prop
- administer supplemental oxygen via nasal cannulae
- remove intravenous cannula and dispose safely
- assess fitness for discharge

iii) Inhalational sedation (RA):

To be able to:

- perform an RA machine check sequence
- connect breathing system and select appropriate nasal mask
- adjust RA machine (gas mixture and flow, including observation of reservoir bag)
- titrate nitrous oxide concentration and recognise the sedation end-point
- ensure correct functioning of anti-pollution measures (scavenging)
- assess fitness for discharge

iv) Monitoring:

To be able to:

- measure blood pressure using sphygmomanometer and stethoscope
- perform clinical monitoring of respiration (rate and depth), pulse (rate and rhythm) and level of consciousness. Interpret and respond appropriately to change
- use a pulse oximeter, interpret readings and respond to change.
- recognise equipment artefacts and malfunctions

v) Management of sedation-related complications:

To be able to:

- recognise and respond to over-sedation, respiratory depression, airway obstruction
- demonstrate use of airway adjuncts (ventilating bag, pocket mask, airways)
- perform oral/pharyngeal suction
- connect and adjust oxygen supply

[NB: It is assumed that Basic Life Support skills are up to date and rehearsed regularly]

6. Overview of general anaesthesia and deep sedation

7. Interaction of pharmacological and psychological methods

B. Control of post-operative pain and apprehension

1. Use of appropriate instructions and interpersonal strategies

2. Selection of appropriate pharmacological agents based on procedures and psychological background

VI. Acute and chronic orofacial pain

A. Taxonomy of orofacial pain

The classification of acute pain and chronic facial pain syndromes, the principles upon which it is based and the application to specific cases

B. Clinical evaluation

1. Pain Measurement
2. Objective tests and procedures, e.g., physical exam, tooth vitality tests, radiographs, microbiology, haematology, serology, nerve blocks etc.
3. Dental, medical, psychosocial

C. Diagnostic features, aetiology, mechanisms and management of orofacial pain associated with:

1. Specific sites, e.g., tooth, muscle, mucosa, skin, sinus, bone
2. Infections, e.g., herpes, candidiasis
3. Non-dental referral, e.g., earache, cardiac, headache
4. Orofacial pain syndromes
 - Trigeminal neuralgia
 - TMD/TMJ/ MPD syndromes
 - Burning mouth
 - Idiopathic facial pain, atypical odontalgia
 - Postherpetic neuralgia
 - Orofacial malignancy

Acute orofacial pain is commonly due to dental and periodontal disease and less commonly to diseases of the oral mucosa, bone, jaws and associated structures. Management of most pains in this category is by relatively straightforward treatment of the cause. Familiarity with standard treatment procedures is mandatory.

PHARMACOLOGY AND THERAPEUTICS

Students need to acquire knowledge and practical skills in the following areas:

1. General principles of drug action

- a. Classification of drugs
- b. Mode of action of drugs
- c. Factors governing the fate of a drug in the body
- d. Factors affecting distribution of the drug in the body
- e. Factors affecting drug metabolism
- f. Factors affecting drug elimination
- g. How do drugs produce the required effect

2. Administration of drugs, routes of administration

- a. List the major routes of administration and when and why is each type used
- b. List the advantages and disadvantages of the different routes
- c. Choice of the strengths, quantities, doses

3. Drug interactions, adverse reactions

- a. Importance of drug interactions
- b. Classification of drug interactions
- c. Preventive measures
- d. Classification of drug interactions e.g. overdose, intolerance, side effects, secondary effects, idiosyncrasy, teratogenic, hypersensitivity,
- e. Reporting of adverse reactions
- f. How to manage them

4. Prescribing and the Law

- a. use the BNF
 - b. non proprietary (generic) and proprietary titles
 - c. inform patient about drugs and driving, safe keeping of drugs, disposal of drugs
 - d. principles of writing prescriptions for PoM drugs as well as controlled drugs
 - e. prescribing for special groups e.g. children, elderly, pregnant women, medically
-

- f. compromised : liver, renal
- g. factors influence compliance with drug therapy

5. Drugs used for the control of pain

As detailed in pain thread

6. Antiseptics and disinfectants

- a. difference between an antiseptic and disinfectant
- b. examples of these agents and their use
- c. use in the mouth as a cleaning agent for teeth, for root canals
- d. used in the control of infection

7. Antimicrobials

- a. Define antimicrobials
- b. Choice of antibiotics systemic and local
- c. Dosage and route
- d. Uses prophylactic, therapeutics
- e. Antibiotics penicillin, cephalosporins, tetracyclines, , erythromycin, metronidazole, clindamycin
- f. Antifungals systemic and topical
- g. Infective endocarditis
- h. Drug resistance, hypersensitivity
- i. Antiviral agents

8. Drugs used in endodontics , periodontal disease, prevention of dental disease

- a. Fluorides different forms
- b. Dental sensitivity
- c. Drugs used in endodontics

9. Haemostasis and haemostatic agents

- a. Anticoagulants
- b. Antithrombotic agents
- c. Fibrinolytic
- d. Management of bleeding patient

10. Management of patients with complex drugs

a. importance of these groups of drugs when managing patients in the dental environment :CNS

Cardiovascular

Respiratory

Chemotherapeutic agents

Endocrine

b. Steroids –use in the orodental field, modes of administration, types precautions need to be taken when prescribing them or when a patient is taking them and the side effects of systemic steroids

c. Vitamins

d. Minerals, Calcification

11. Effects drugs can have on the oral cavity

a. effect local and systemic drugs have on the oral cavity

C. TEACHING METHODS:

I. Neurosciences submodule

There will be 6 tutorial groups. 6 tutorial sessions will be held during the period of the module based on the PBLs.

PBL Tutorials Pages 11- 14 of the neurosciences booklet contain 4 scenarios which the students are recommended to read and attempt to answer the questions set at the end of each PBL. Any problems can be raised at the class tutorials or raised directly with one of the lecturers that teach on the Neuroscience course. There are two whole class practicals to help in the understanding of the principals of neurophysiology.

II. Pain, pain control and therapeutics

- Lectures, symposia, which are often interactive are given by a wide multidisciplinary team including : adult oral health, members of clinical and diagnostic oral sciences , paediatric dentists , basic scientists, pharmacologists, psychologists, anaesthetists.
- Resuscitation practicals are held each year and co-ordinated by Dr T. Renton.
- The sedation course is co-ordinated by Dr Chris Mercer .
- Practical classes are held for the teaching of local anaesthetics both in restorative dentistry and oral surgery.
- Experience of general anaesthesia is gained in oral surgery .
- Students attend the facial pain clinics to gain practical experience in management of non dental pain.

- Students should cover other aspects of the curriculum not covered by lectures or seminars by reading the relevant books and articles
- Students may wish to do SSMs in these topics

D. ASSESSEMENT

OSCE especially communication skills,
written questions in parts 3, 4 and 5
clinicals in part 5

E. EVALUATION:

Neurosciences - Evaluation of the module by students more details in the neurosciences booklet from which the following is taken

We value students' helpful comments on the curriculum; such comments are brought to the Staff-Student Committee for discussion and may help us to improve the presentation of **Dental neuroscience** next year. You may like to write notes about the individual teaching sessions in this module handbook. In particular, you should record your opinion of the standard of each lecture. After the learning objectives for each lecture, there is an evaluation scale [**A - B - C - D - E**]. The meaning of the letters is: A, Excellent; B, Good; C, Average; D, Poor; E, Very Poor. You will be asked to complete an anonymous questionnaire on teaching at the end of the Module, when these notes may come in useful.

Please bear in mind that we have used peer evaluation of lectures for some years – staff listen to each other's lectures and give advice afterwards. A few students sometimes make personal remarks about lecturers and these are recorded but they carry no weight. If you have any queries concerning the content of **Dental Neuroscience**, you should contact your academic tutor or one of the module conveners.

At the end of this submodule you will find a list of questions concerning the running of the course. You are requested to note each response while the memory of the event is fresh. Towards the end of the course we will ask you to transfer your scores to an MCQ form and to hand this in, together with your written comments prior to the summative essay examination.

Evaluation of teaching

Please use this form to evaluate the teaching at the end of the thread. We will ask you to complete an evaluation of this thread, and these evaluations can be used to remind you of the teaching (more can be found at the back of this booklet: SECTION 9: APPENDICES).

Date: _____

Lecture/ symposium / seminar title:

The best thing about this session was.....

The worst thing was.....

The one outstanding thing I learned was.....

This session could be improved to better meet my needs by.....

Overall score: [**A - B - C - D - E**]. The meaning of the letters is: A, Excellent; B, Good; C, Average; D, Poor; E, Very Poor.

The thread convenor attends many of the didactic teaching sessions or at the least has received copies of the handouts or PowerPoint presentations given in conjunction with this thread to ensure the contents are covered .

3. ASSESSMENT

Neurosciences

In Course Assessment

The '**In Course Assessment**' for the Dental Neuroscience module will consist of two sessions of 15 MCQs plus 5 or 4 MCQs in Oral Cavity to be completed in 60 minutes under examination conditions. This assessment will be **SUMMATIVE**.

Assessment in conscious sedation

No student will be 'signed up' unless at least 80% of the sessions have been attended. All sessions will be recorded in their progress files using the following guidelines:

A. Attitudes

The candidate's performance in such areas as attendance, punctuality and communication with patients should provide sufficient evidence.

B. Knowledge

In addition to passing the requisite examinations in anatomy, physiology and pharmacology, the undergraduate should demonstrate knowledge of the clinically relevant basic sciences prior to a clinical attachment on a sedation unit.

Teachers, examiners and students should be reminded that sedation is within the remit of the final BDS examination.

C. Skills

The ability to site an intravenous cannula, check and set up a Relative Analgesia machine, record the patient's blood pressure using a sphygmomanometer and stethoscope, and to use and interpret pulse oximeter readings will be assessed during the clinical sessions.

The ability to manage a sedation patient may be assessed by observation of a case being treated.

Clinical sessions

The undergraduates will have their clinical sessions graded in their progress files. The clinical grading should reflect the three areas of underpinning knowledge, skills and attitudes. The grading should be based on appropriate criteria that reflect both the undergraduate's attitude to patients and the skill with which sedation and clinical dentistry are carried out.

Experience

A) Patient assessment and treatment planning

Recommended minimum number of cases: 2

B) Intravenous sedation

Recommended minimum number of satisfactorily managed cases: 3

C) Inhalational sedation (relative analgesia)

Recommended minimum number of satisfactorily managed cases: 3

Attendance at yearly resuscitation sessions

4. MANAGEMENT STRUCTURE

THREAD & SUBJECT CONVENORS

Name	Role	E-mail Address
Prof Joanna Zakrzewska	Professor of Pain in Relation to Oral Medicine, thread convenor	j.m.zakrzewska@qmul.ac.uk
Dr Tara Renton	Clinical Senior Lecturer/ Oral & Maxillofacial Surgery – lead on resuscitation teaching and selection of anaesthesia.	t.f.renton@qmul.ac.uk
Dr Chris Mercer	Clinical Senior Lecturer – lead on sedation teaching	c.e.mercer@qmul.ac.uk
Dr Walter Wieczorek	Lecturer - Neurosciences teaching co-ordinator	w.wieczorek@qmw.ac.uk
Dr David Murphy	Psychology teaching	d.j.murphy@imperial.ac.uk

Who should I contact for help in the first instance?

If you wish to communicate with staff in writing you may do this by e-mail or via our pigeon- holes (5th floor). You may also contact staff by phone on the number using the telephone extension shown below. E-mail addresses are also shown below:

STAFF LIST

Name	Telephone Extension	e-mail address
Prof Joanna Zakrzewska	(14) 7053	j.m.zakrzewska@qmul.ac.uk
Dr Chris Mercer	(14) 2112	c.e.mercer@qmul.ac.uk
Dr Tara Renton	(14) 7050	t.f.renton@qmul.ac.uk
Name	Room Numbers	e-mail address
Dr. W. Wieczorek	Room 4.37	w.wieczorek@qmw.ac.uk
Dr. M. Carroll	Room 1	m.carroll@qmul.ac.uk
Dr. J. Millar	Room 2.37	j.millar@qmul.ac.uk
Dr. P. Shortland	Room OE23 (ICMS)	p.j.shortland@qmul.ac.uk
Dr David Murphy	Imperial	d.j.murphy@imperial.ac.uk

5. LECTURE/SEMINAR AIMS & OBJECTIVES

AIMS OF NEUROSCIENCE TERMS 2-3

The aims of the course are for students to have a general understanding of the structure and function of the brain. Special emphasis to be placed on orofacial region, pain transmission and modulation.

Objectives

1. The Brain: Overview

JM

The objective of this lecture is to provide a very basic account of the main areas of the brain, and to discuss the main functions that are associated with these areas.

2. Blood supply to the brain and spinal cord

PS

1. Describe the principal arteries to the brain and spinal cord.
2. Explain the possibilities of co-lateral circulation through arterial anastomoses.
3. Describe the venous drainage of the brain and spinal cord.
4. Describe major vascular disorders.

3. Blood-brain barrier and Cerebrospinal fluid

MC

1. Explain the significance of the blood-brain barrier to the homeostasis of the CNS.
2. Account for the operation of the blood-brain barrier, in terms of **(a)** its morphological basis and **(b)** the selective uptake of solutes from the blood supply to the CNS.
3. Describe, with relevant examples, how the blood-brain barrier may affect clinical treatment of neurological diseases.
Discuss the formation, composition and circulation of cerebrospinal fluid.

4. Transmission in the CNS

WW

1. Describe the morphology of synapses in the central nervous system.
2. List the major transmitters that are believed to act in the CNS, and the criteria for a neurotransmitter
3. Describe the methods for the inactivation (**removal, reuptake, or enzymic breakdown**) of the different kinds of transmitters.
4. Describe the importance of excitatory and inhibitory post- synaptic potentials emphasising the importance of spatial and temporal summation..

5. General anaesthetics

WW

1. State the properties of an ideal anaesthetic, emphasising effects on consciousness, nociception and muscle tone.

2. Describe, in outline, theories of the sites of action of inhalational anaesthetics.
3. Describe in detail the physical properties and pharmacology of halothane, nitrous oxide and fentanyl.
4. Describe in detail the pharmacology of thiopentone
5. Identify the types of adjuvant drugs that are used peri-operatively as premedicants,

6. Somatosensory pathways

PS

1. Briefly describe the gross anatomy of the spinal cord.
2. Draw a cross-section of the spinal cord to show the principal location of ascending tracts within the white matter.
3. Describe the pathways to the brain for touch receptors (DCML).
4. Describe the pathways to the brain for proprioceptive receptors (SCBT)
5. Describe the pathways to the brain for pain receptors (STT).
6. Draw a cross-section of the spinal cord to show the principal location of descending tracts within the white matter.
7. Describe the functions of the main descending pathways from the brain (CST/RST)

7. Pain and nociception

WW

1. Give reasons why C and A sensory fibres, are believed to signal nociception.
2. Define the differences between nociception and pain.
3. Draw a diagram of the terminations and connections of C fibres in the dorsal horn.
4. Describe the loci and receptive fields of cells that project into the spinothalamic tract.
5. Describe the role of the cells in the substantia gelatinosa in the gating of nociceptive transmission.
6. List as many as possible of the mechanisms whereby nociceptive transmission can be blocked at the spinal level.
7. Describe the possible roles of enkephalin, serotonin and noradrenaline in antinociception.
8. State the role of the thalamus and cortex in pain perception.

8. Opiate analgesics

WW

1. Define the terms, opioid, opiate, opium, and classify opioid drugs.
2. Classify opioid receptors and state the effects of morphine mediated by the different receptors.
3. State the effects of morphine on nociception and pain, mood, the respiratory centre, the cough reflex, nausea and vomiting, the pupil and the gastrointestinal tract.
4. By means of a "box and arrow" diagram, linking the cerebral cortex to the dorsal horn, illustrate the sites of action of endogenous opioids and morphine in modulating nociception.
5. Define the terms, tolerance, dependence and withdrawal syndrome and explain the modern theories, which account for tolerance to and dependence on morphine.

6. Explain the pharmacological strategies used to manage (a) overdose of an opiate and (b) addiction to an opiate.

9 Somatic reflexes JM

1. Define the term motor unit. Describe how the force of muscle contraction is controlled by impulse frequency and by recruitment of motor units.
2. Draw a reflex arc for control of muscle contraction including tendon organs and muscle spindles.
3. Describe the control of muscle length and tension involving muscle spindles and tendon organs.
4. Define muscle tone, spasticity and flaccidity.
5. Describe the effects on muscles and reflexes of upper and of lower motorneuron damage.

10 The Brainstem PS

1. Define the main sub-regions of the brainstem.
2. Describe the main functions of each sub-region and state which cranial nerves project to each region.
3. Briefly describe the organisation of the sensory and motor nuclei and the main ascending and descending pathways in the brainstem
4. Briefly explain the main functions of the reticular formation.
5. Explain the consequences of vascular or physical lesions to the different areas of the brainstem in terms of clinical signs.
6. List the symptoms associated with damage to cranial nerves

11 Cranial nerves PS

1. Explain the categories of cranial nerve based on their functional components
2. Describe the principal components and the central connections of the trigeminal nerve.
3. Describe the principal components of the facial nerve.
4. Describe the principal components of the glossopharyngeal & vagus nerves.
5. Explain the reflexes used to test for cranial nerve dysfunction of CN V & VII.

12 The control of movement JM

1. Draw a lateral view of the cerebral cortex to show the pre-and post-central gyri and the premotor and supplementary motor areas.
2. Describe the representation of the body on the pre-central gyrus (the motor homunculus), and explain the significance of this.
3. Describe the route of the corticospinal tract, and state the effects of damaging this (upper motorneuron syndrome). Briefly state the major indirect pathways involved with voluntary movement, and some of the main conditions resulting from damage to these.
4. State the role of the semicircular canals and otolith organs in maintaining balance. Briefly state the other major pathways involved with the involuntary control of movement.

5. Describe the flexor reflex to painful stimulation. Briefly describe the major postural reflexes.

13 Nausea, motion sickness and migraine WW

1. By means of an annotated diagram, illustrate the major physiological and anatomical pathways to the "vomiting centre", indicating the location of the chemoreceptor trigger zone and the chemoreceptors in other parts of the body.
2. List drugs that commonly cause nausea and vomiting; list other stimuli and common conditions (e.g. pregnancy, infection, motion sickness) which may cause nausea and vomiting.
3. List four drugs that are commonly used to treat nausea and vomiting. State their other uses, and mechanisms of action.
4. Discuss briefly the received wisdom on the pathophysiology of migraine especially in relation to release of 5HT. Discuss the use of analgesics in the treatment of migraine.
5. Distinguish between named drugs used for treatment of acute migraine and in the prophylaxis of migraine.

14 Anxiolytics WW

1. Describe the principal types of epilepsy.
2. Describe the basic mechanism of action of drugs
3. Describe briefly the pharmacology of phenytoin, phenobarbitone, sodium valproate, carbamazepine, ethosuximide, diazepam and flumazenil.
4. Discuss the problem of anxiety and insomnia and identify the need for its pharmacological treatment.
5. Describe the hazards and side effects associated with the use of barbiturates.
6. Give a clinically useful classification of benzodiazepines.

15 Anticonvulsants WW

1. Discuss the problem of anxiety and insomnia and identify the need for its pharmacological treatment.
2. Describe the hazards and side effects associated with the use of barbiturates.
3. Give a clinically useful classification of benzodiazepines.
4. Describe the pharmacology of diazepam

16 Functional anatomy of the cortex JM

1. Draw a diagram of the brain from the side, to show the central and lateral sulci, and the major lobes, with the primary and secondary somatosensory, visual and auditory projection areas.
2. Describe the principal intra-, inter- and sub-cortical connections.
3. State the major behavioral deficits associated with damage to regions of the parietal lobes, such as astereognosis, optic ataxia, contralateral neglect, apraxias and failures of spatial appreciation.
4. Describe the principal non-language effects of damage to the temporal lobes,

such as failure to recognise objects and faces, and the role of the temporal lobes/hippocampus in anterograde and retrograde amnesia.

5. Describe the principal effects of damage to the frontal lobes, such as abnormalities of eye movement, failure to compensate for changes in visio-motor relations, and changes in preservation, selection and working memory.

17 Visual and auditory pathways WW

1. Describe the anatomy of the retina.
2. Describe the visual pathways.
3. Explain visual field defects caused by lesions interrupting the visual pathways.
4. Explain the pupillary light reflex and the accommodation reflex.
5. Describe the organ of corti.
6. Describe the auditory pathways.

18 Antidepressants WW

1. Define bipolar and unipolar affective disorders.
2. Describe in outline neurotransmitter theories of depression.
3. Describe the pharmacology of tricyclic antidepressants, 5-HT reuptake inhibitors, MAOIs and Li²⁺ including drug interactions. Also some of the newer antidepressants
4. A brief understanding of the theories of schizophrenia
5. Classification of neuroleptic drugs and their mechanism of action. (Chlorpromazine, Haloperidol, Clozapine as main examples)
6. Pharmacological effects and unwanted effects of neuroleptic drugs

19 Neuroleptics WW

1. A brief understanding of the theories of schizophrenia
2. Classification of neuroleptic drugs and their mechanism of action. (Chlorpromazine, Haloperidol, Clozapine as main examples)
3. Pharmacological effects and unwanted effects of neuroleptic drugs

20 Hemispheric specialization JM

1. Draw a diagram of a lateral view of the left side of the brain, showing the Broca and Wernicke areas, the angular gyrus, the arcuate fasciculus and the auditory and visual cortices.
2. With reference to these areas, explain the terms expressive, receptive and conduction aphasia.
3. Describe clinical tests for cerebral lateralisation of function. State the relation between handedness and brain side dominance.
4. Describe the lateralised functions of the non-dominant hemisphere, including spatial, musical and emotional function, and the contralateral neglect seen in cases of right parietal lobe damage.
5. Describe how visual input from left and right visual fields is lateralised.
6. With reference to 5. above, discuss the effects of cutting the major cerebral commissure, the corpus callosum.

PRACTICAL CLASS DNP1

SENSORY DISCRIMINATION

Objectives

1. Describe the difference in two-point discrimination thresholds on different parts of the body surface in the normal adult. Discuss the reason for these differences.
2. Discuss the concept of somatosensory receptive fields on the body surface, how the density and size of these fields may affect the localization of touch stimuli.
3. Describe the sensitivity of different types of sensory nerve fibres to a) pressure block and b) local anaesthetic

REFLEXES

Objectives

1. Define a monosynaptic reflex, state where in the body it can be found.
2. Discuss the function of one monosynaptic reflex, with a full description of the afferent and efferent pathway involved.
3. Define a polysynaptic reflex; describe the anatomical pathways involved in three polysynaptic reflexes, including at least one from the eye.
4. Discuss the difference between the contraction in a muscle during a monosynaptic reflex and that elicited by normal voluntary activity.
5. Comment on the **Jendrassick maneuvers** and its possible mechanism of action.

PSYCHOLOGY & PAIN: DR. MURPHY

- Definition and measurement of pain
- Psychological factors in the experience of pain
- Relationship between Anxiety and Pain
- Psychological Pain Management Strategies:
- The Placebo Effect

Coping with Treatment: Dr Murphy

- What makes treatment stressful?
- Why is patient distress such a bad thing?
- How can distress be reduced?
- Increasing Predictability
- Does information reduce distress?
- Increasing Control
- Problem- Focused vs Emotion- Focused Coping
- Helping children cope with treatment

Anxiety: Dr Murphy

- Why is the study of anxiety relevant to dental practice?
- What is anxiety?
- How can each of the components of anxiety be measured?

- What are anxious patients afraid of?
- Why do anxious patients expect more pain than non-anxious patients?
- How is fear acquired?
- Interventions to extinguish fears

PAIN & THERAPEUTICS

Introduction to Pain term 5: Prof Zakrzewska

The student should:

- Be able to define pain, understand the difference between acute and chronic
- Appreciate the value of epidemiology when dealing with facial pain
- Know how to assess a patient with facial pain
- Know how to measure pain and quantifying its impact
- Know the key characteristics of non dental pain
- Understand the need for a holistic approach to facial pain based on a psychosocial model

Infections and prescription term 5: Dr Allaker and Prof Zakrzewska

The student should:

- Recognise common bacterial, viral and fungal causes of oral infection
- Understand the differences between endogenous and exogenous oral infections
- Know the principles of management of these infections
- Know how to write a prescription

Principles of pharmacology term 5: pharmacology department Dr Hug

The student should know :

- what drugs do to the body
- what the body does to drugs
- how drugs interact
- what an adverse drug reaction is
- how drugs are discovered, trialed, marketed

Adverse drug reactions term 5: pharmacology department Dr Hug

The student should :

- Understand the importance of adverse drug reactions (ADR)
- know how to prevent ADR
- be able to diagnosis & treatment an ADR
- be able to identify patients at increased risk of developing ADR
- know how to monitor ADR
- understand why it is important to report an ADR and how to do this

Introduction to LA - lecture 1 term 5: Prof Hughes

The student should:

- Know what local anaesthetics (LA) are available
- Know what equipment is needed for a LA

- Know how to perform an dental infiltration and a mental or inferior dental block
- Appreciate complication that can occur

LA – lecture 2 term 5: Dr. Renton

The student should:

- Know how to define a LA and compare it to GA
- Know the ways in which LA can be administered and give some examples
- Name the properties of the ideal LA
- Be familiar with the mode of action and pharmacological properties of LA
- Know the constituents of LA

Physiology of Anxiety Term 5: Prof Hector

The student should:

- Define the terms 'anxiety' and 'stress'
- Give examples of common stressors
- Recall how the body systems respond to physical and emotional stress
- Outline the role of Cortisol in the physiological responses to stress
- Comment on the timescale for recover from emotional and physical stressors

An introduction to Anxiety Management Term 5: Dr Mercer

The student should:

- Understand the extent of dental anxiety in the population
- Define and distinguish nervousness, anxiety, fear and phobia
- Understand how anxiety of dentistry comes about, and the dentist's role in minimising it
- Have an overview of the range of methods used to deal with anxiety from behavioural management to general anaesthesia
- Describe the general principles of anxiety management

Assesment of patients for conscious sedation Term 11: Dr Mercer

The student should:

- List the reasons why assessment is important
- Describe the principles on which assessment is based
- Understand how to use an anxiety questionnaire
- Discuss the particular features of the past dental history which are of interest and importance
- Discuss the particular features of the medical history which are of interest and their relevance to any proposed treatment
- Discuss the relevance of social circumstances on the planning of care for anxious patients
- Describe the ASA classification criteria for the assessment of fitness
- Discuss the particular requirements of treatment planning for these patients
- Understand the need to prepare patients for their sedation treatment, and how to chose the most appropriate method of sedation for them.

Conscious Sedation techniques for Adults Term 11: Dr R McGeoch

The student should:

- Have the acquisition and understanding of core knowledge relevant to the practice of conscious sedation in dentistry
- Have the theory to carry out clinical practice in the administration of sedation, dental care of the sedated patient and appropriate discharge of patients who have received conscious sedation
- Promote an awareness and understanding of the importance of sedation in the management of pain and anxiety and communication skills in the management of patients requiring conscious sedation
- Appreciate the limitations of the undergraduate experience and understand the benefit of continuing professional education
- Promote a critical and caring approach to the management of anxious patients

Taking a pain history Term 7: Prof Zakrzewska

The student should:

- List the main characteristics of pain
- List questions required to elicit physical symptoms of facial pain
- Understand the difference between pain illness and pain disease
- Appreciate how to take a psychosocial history in the context of a dental environment
- Appreciate how pain affects not only the patient but also impacts on the patient's environment

Use of Pharmacological Techniques as part of Behaviour Management in Paediatric Dentistry Term 9: Dr Henderson

The student should :

- understand the pharmacological techniques available to assist in management of paediatric patients during operative dentistry.
- Know the pharmacological techniques, their limitations and the guidelines and regulations regarding use of these techniques.
- be able to link theoretical use of these techniques to practical cases.

Use of Relative Analgesia (Nitrous oxide) sedation in Anxiety Management

Term 9: Dr Henderson

The student should:

- understand the pharmacological techniques available to assist in management of patients during operative dentistry.
- be aware techniques, limitations, Guidelines and Regulations regarding use of these techniques.
- be able to link theoretical use of these techniques to practical cases as part of discussion.

Pain Management Term 11: Prof Zakrzewska

The student should:

- be able to classify orofacial pain
- be able to list the key characteristics of TMJ pain, chronic idiopathic pain, burning mouth syndrome, trigeminal neuralgia
- be familiar with the biosychosocial model of care
- be familiar with the key principles of cognitive behaviour therapy
- know how to manage TMJ pain, chronic idiopathic pain, burning mouth syndrome, trigeminal neuralgia
- be familiar with the concept and value of the expert patient

Pain post op , pre-emptive analgesia, analgesics sedation in oral surgery Term 12:

Dr Renton

- be able to define analgesia / anxiolysis
- be able to define methods for management of pain and anxiety
- be able to classify analgesics used for acute pain
- be able to list the key characteristics of Local analgesia / Systemic analgesia (oral NSAIDS / Paracetamol / opiate/ opioid)
- be familiar with the indications and contraindications for all analgesics
- be familiar with the mode of action of analgesics
- be familiar with the key principles of perioperative pain management

Temporomandibular Joint Term 12: Dr Barsby





- To create a diagnostic awareness and some knowledge of treatment options for a condition which the student may encounter and should be able to treat in general practice

Drugs and the dentist Term 12: Prof Zakrzewska
























The student should :

- be competent in the legal implications of prescribing
- know the difference between the BNF and DPF
- be able to adapt prescribing for special groups of patients
- know what factors that affect compliance with drug therapy
- be competent in prescribing the major antibiotics
- know how systemic drugs used for other medical conditions can affect dental treatment
- know when steroids are used in the dental setting
- be familiar with the effects of systemic steroids
- be able to recognise the effects that drugs can have on the oral cavity

LECTURES ON THE KNOWLEDGE BASE

-  [Hands and cranial nerves](#)
-  [Neurology](#)
-  [Reflexes](#)(lecture)
-  [An overview of the brain](#) (lecture)

Introduction to Local anaesthesia:

-  [Antibiotics Prophylaxis and Therapy](#) (or 26kb [pdf](#))
-  [Use of Antibiotics in Dental Practice](#) (13kb pdf)
-  [Basic Life Support](#) (10kb pdf)
-  [Emergencies in Dental Practice](#) (33kb pdf)
-  [Emergency Equipment in the Dental Surgery](#) (10kb pdf)
-  [Burning Mouth Syndrome](#) (or 30kb [pdf](#))
-  [Endocarditis Prophylaxis](#) (or 41kb [pdf](#))
-  [Assessment for fitness for anaesthesia](#) (or 124kb [pdf](#))
-  [General Anaesthesia Checklist I](#) (18kb pdf)
-  [General Anaesthesia Checklist II](#) (17kb pdf)
-  [General Anaesthesia for Dentistry](#) (19kb pdf)
-  [Dental Aspects of Local Anaesthesia](#) (25kb pdf)
-  [Post Operative Analgesia](#) (or 40kb [pdf](#))
-  [Conscious Sedation](#) (52kb pdf)
-  [Sedation](#) (or 77kb [pdf](#))
-  [Therapeutics](#) - top of the pops (or 81kb [pdf](#))
-  [Haemorrhage 1](#) (37kb [pdf](#))
-  [Haemorrhage 2](#) (or 35kb [pdf](#))
-  [Control of Dental Haemorrhage](#) Evidence Based Review or 110kb [pdf](#))
-  [Management of the Medically Compromised Patient 1](#) (49kb pdf)
-  [Management of the Medically Compromised Patient 2](#) (or 47kb [pdf](#))
-  [Resuscitation Symposium 2](#) (or 349kb [pdf](#))
-  [Tracheostomy](#) (or 404kb [pdf](#))

6. TIMETABLES & VENUES

This Module/Thread timetable is published complimentary to the Dental Curriculum Term Timetable(s).

After the timetables have been published, there may be last minute amendments due to clashes: **it is therefore important that you check your emails and all notice boards regularly to see if there are any amendments that affect you.**

Overview of Pain / Therapeutics Thread Timetable

Lecture/symposium	Term	Year
Neurosciences - Pain and nociception – W. Wieczorek	2- 3	1
Psychology 6 lectures :health beliefs, pain, coping with treatment, anxiety, satisfaction and compliance, stress & health - D. Murphy	5- 7	2-3
La introduction (practical after) – F. Hughes	4	2 Autumn
Facial pain introduction - J.Zakrzewska	5	2 Spring
Principles of pharmacology - S. Huq	5	2 Spring
Adverse drug reactions –S.Huq	5	2 Spring
Therapeutics prescription writing/infection antimicrobials -- Allaker /Zakrzewska	5	2 Spring
Pain control, anxiety - LA - Mercer, Hector, Zakrzewska	5	2 Spring
Pain history psychological –Zakrzewska	7	3 Autumn
Introd Sedation and anxiety paed's - Henderson/ Davenport	8	3 Spring
Plaque treatment , perio drugs - Periodontology	8	3 Spring
Anxious pt, sedation symposium - Mercer, McGeoch	11	4 Spring
Infection control, infection - Allaker	11	4 Spring
Pain post op , pre-emptive analgesia, analgesics sedation in oral surgery – Renton	12	4 Summer
Heamorrhage – Oral Surgery	12	4 Summer
Fluoride, periodontal disease - Endodontology	12	4 Summer
Chronic Pain management –Zakrzewska	12	4 Summer
Chronic Pain management- TMJ, hypnosis - Barsby/ Zakrzewska	12	4 Summer
Collapsed patient , medcial emergencies , role play (year split 2 sessions) - Fortune	14	5 Spring
prescribing and the law, antimicrobials, complex drugs, effects drugs on the mouth – Zakrzewska	14	5 Spring

Resuscitation teaching 3 sessions needed to divide students into groups of 10

Resuscitation lecture and practical -Dr.Renton	1	1 autumn
Resuscitation lecture and practical -Dr.Renton	5	2 spring
Resuscitation lecture and practical -Dr.Renton part of HHD	8	3 spring
Resuscitation lecture and practical -Dr.Renton	12	4
Resuscitation lecture and practical -Dr.Renton	13/14	5

Resuscitation schedule for 2004/2005

Dr Tara Renton

1st years

Date: October 2004

0900 Preclinical LT: Lecture by Dr Renton

0950-1200 1st Floor clinic, Dental Institute: practical session

For BLS teaching, there will be about 20 students for each 35 minute period

09:50-10:25	Groups 1.1, 1.2
10:25-10:50	coffee
10:50-11:25	Groups 1.3, 1.4
11:25-12:00	Groups 1.5, 1.6.

2nd years (Course organisers Dr. Rob Allaker and Dr. Alan Cruchley)

3rd years (Declan organiser / Mairi Resus officer)

The resus training for BDS 3 in the induction/foundation week is:

Monday 10th Jan 2005	13.30-16.30	groups 3.5 and 3.6.
Tuesday 11th Jan 2005	09.00-12.00	groups 3.3 and 3.4.
	13.30-16.30	groups 3.2 and 3.1.

The session for each group is 1.5 hours

On Monday the session can be in the clinical skills lab or the Bainbridge room (both in the Robin Brook Center) and on Tuesday again one of the labs or seminar room 6.

4th years (Professor Liz Davenport organiser)

Seminars in Oral Surgery and practical in small groups Terms 11/12

5th years Spring Symposium

Symposium / revision session April/May

Other teaching: clinical and practical based in OM, O/S, sedation course
Topical therapeutics in restorative, paed

7. SUGGESTED READING

Essential

- British National Formulary. Current Edition. BMA and Royal Pharmaceutical Society of Great Britain.
- Oxford handbook of clinical dentistry. 2nd ed. DA Mitchell & L Mitchell. Oxford University Press, 1995. ISBN: 0192626027
- Churchill's Pocketbook of Clinical Dentistry. Chestnutt I, Gibson J, 2nd Ed ChurchillLivingstone
- Handbook of Local Anaesthesia. Malamed SF. St Louis-Mosby 1997
- Practical conscious sedation. David Craig & Meg Skelly. Quintessence Publishing Co Ltd. London 2003
- General anaesthesia and sedation in dentistry, 2nd ed CM Hill Wright 1991 ISBN 0723622191

Neurosciences

The following textbooks are recommended for background reading. Others sources may be equally good and your lecturers and tutors will advise you concerning alternatives for specific topics. It must be recognised however that none of these books represents a definitive text for the course. They must be used only in conjunction with the lectures and the prescribed learning objectives.

- ANATOMY: M.J. FITZGERALD Neuroanatomy. Basic and Clinical (3rd Edition)
- PHYSIOLOGY: BERNE, LEVY Principles of Physiology.
- PHARMACOLOGY: RANG, DALE AND RITTER & MOORE: Textbook of Pharmacology (5th edition)

Psychology

KENT, G. & CROUCHER, R. (1998) *Achieving Oral Health: the social context of dental care.*

Reference:

- WALL PD. *Pain. The science of suffering.* London: Weidenfeld and Nicolson; 1999.- lay text, easy to read book

- Lund JP, Lavigne GJ, Dubner R, Sessle BJ. *Orofacial pain, from basic science to clinical management*. Chicago: Quintessence Publishing Co.Inc; 2001:1-300 written specifically for dental undergraduates
- Merskey H, Bogduk N. *Classification of chronic pain. Descriptors of chronic pain syndromes and definitions of pain terms*. Seattle: IASP Press; 1994:1-222. diagnostic criteria for all pain conditions including oral and dental
- Wall P, Melzack R, eds. *Textbook of Pain*. London: Churchill Livingstone; chapters on dental pain, trigeminal and eye pain as well as general ones , one of the major textbooks
- Zakrzewska and Harrison *Assessment and management of orofacial pain* Elsevier 2002 – evidence based , biopsychosocial approach , read the key facts tables
- Abnormal Psychology (e.g. Davidson & Neale)
- Sarafino E P: *Health Psychology: Biopsychosocial Interactions, Fourth Edition (2002)*

8. STATEMENT ON CHEATING & PLAGIARISM

All work you submit for assessment – both in written examinations and coursework – must be your own unaided work. Cheating in written examinations and plagiarism in coursework are examination offences, and will be dealt with most severely; examples of typical penalties are as follows:

- **Cheating in written examinations:**

Includes, for example, bringing concealed notes into an examination (which includes having revision notes on your person); using prohibited materials (ie, anything that is not mentioned in the rubric of the question paper); copying from another student, etc.

- **Plagiarism in coursework:**

Is the use or presentation of the work of another person, including another student, as your own work (or as part of your own work) without acknowledging the source. This includes submitting the work of someone else as your own, and extensive copying from someone else's work without proper referencing. Copying from the Internet without acknowledging the source is also plagiarism. You may use brief quotes from the published or unpublished work of other persons, but you must **always** show that they are quotations by putting them inside quotation marks, giving the source (for example, in a footnote), and listing the work in the bibliography at the end of your own piece of work. It is also plagiarism to summarise another person's ideas or judgements without reference to the source.

When you are taking notes for an essay or piece of coursework, record all your sources carefully, and mark any quotations so that you can make the necessary references when you come to write the essay. 'Unconscious plagiarism' – using unmarked quotations in an essay because you did not identify the quotations in your notes – is as much an examination offence as deliberate plagiarism, and will be dealt with in the same way as any other examination offence.

The penalties for plagiarism and cheating are extremely severe:

- **Plagiarism** in coursework essay is usually punished by failure in the whole unit, with a ban on resitting. A second offence usually leads to failure in the whole year's work.
- **Cheating** in an examination usually leads to failure in *all* the examinations taken that year, with expulsion for a second offence.

9. APPENDICES

EVALUATION OF TEACHING

Please use these forms to evaluate the teaching at the end of each session. We will ask you to complete an evaluation of this thread, and these evaluations can be used to remind you of the teaching.

Date:					
Lecture/Seminar/Symposium Title:					
The best thing about the session was:					
The worst thing was:					
The one outstanding thing I learned was:					
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The meaning of the letters is: A, Excellent; B, Good; C, Average; D, Poor; E, Very Poor.					
RATING:	A	B	C	D	E
COMMENT:					

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