**MINISTRY OF HIGHER AND SECONDARY SPECIAL EDUCATION**
**MINISTRY OF HEALTH OF THE REPUBLIC OF UZBEKISTAN**
**BUKHARA MEDICAL INSTITUT**
**DEPARTMENT OF SURGICAL DENTISTRY**

**"Approved by"**
**Vice-rector for**
**educational and educational affairs**
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**"_____" _____ 2020.**

# O R A L S U R G E R Y

Educational-methodical complex in a subject

FACULTY OF DENTISTRY

III course

(2020-2021 academic year)

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This is discussed and approved in the department
Protocol №_____ of "_____" _____ 2020

Head of the chair, PhD: M.Q. Kamalova _____
(signature)

Chairman of the council, dean of _____
Faculty_____ _____
(signature)

The working educational program for anatomy is compiled on the basis of working educational curriculum and educational program in directions of 5510400- Dentistry.

This is discussed and approved by the scientific- methodological Council of BSMI
Protocol №_____ of "_____" _____ 2020

Methodist of the Institute: _____
(signature)

# ANNOTATION

The educational and methodological complex includes theoretical and practical knowledge of the main sections of the subject "Oral surgery", for the introduction of modern pedagogical technologies in the educational process, it allows for self-diagnosis of patients by combining acquired skills with theoretical knowledge in clinical practice using modern medical technologies.

A dentist may be interested in performing surgery for the removal of impacted teeth; however, without adequate surgical training and experience and the ability to deliver advanced forms of anesthesia, it would be unwise to do so. The third factor defining the scope of a dentist's surgical practice is the level of skill of the dentist.

Even with a high interest level and with extensive training, a dentist has little or no skill in the surgical arena, or has let those skills go unused for a period in time should not perform complex surgical procedures. On the other hand, with a high level of interest, extensive training, and sufficient skill, the general practitioner can seriously consider performing more complex surgical procedures.

The educational and methodical complex is intended for assistants, researchers, researchers and students of the 3-4th year of the dental faculty of medical institutes.

## THE SUMMARY

Oral and maxillofacial surgery is the specialty of dentistry that includes the diagnosis and surgical and adjunctive treatment of diseases, injuries, and defects, including both the functional and esthetic aspects of the hard and soft tissues of the oral and maxillofacial regions. This definition is intentionally broad and all-inclusive, primarily pertaining to the specialty of oral and maxillofacial surgery. The surgery performed in the office by general practitioners is usually much less extensive than that practiced by specialists in oral and maxillofacial surgery.

The scope of oral and maxillofacial surgery for the general practitioner is defend by several factors. The dentist's desire to perform surgical procedures is the first. Some dentists have little or no interest in doing surgical procedures, whereas other dentists enjoy it. The second factor is the dentist's training and experience in performing complex surgical procedures.

A dentist may be interested in performing surgery for the removal of impacted teeth; however, without adequate surgical training and experience and the ability to deliver advanced forms of anesthesia, it would be unwise to do so. The third factor defining the scope of a dentist's surgical practice is the level of skill of the dentist. Even with a high interest level and with extensive training, a dentist has little or no skill in the surgical arena, or has let those skills go unused for a period in time should not perform complex surgical procedures. On the other hand, with a high level of interest, extensive training, and sufficient skill, the general practitioner can seriously consider performing more complex surgical procedures.

The fourth and final factor is the availability of specialists in the dentist's vicinity If specialists in oral and maxillofacial surgery are geographically separated from the general practitioner by a large distance, the general practitioner may wish to perform more surgical procedures and surgery of greater complexity than if there were a specialist relatively near. It is important to note that the scope of oral and maxillofacial surgery practice for the general practitioner of dentistry is not usually defended by state law. Most state dental boards issue a single license for the practice of

dentistry to both general practitioners and specialists. The general practitioner has the legal right to perform any oral and maxillofacial surgery procedure. Therefore, each dentist must decide which surgical procedures to perform and which should referred to a specialist, keeping in mind the best interests of the patient. The factors previously listed are those on which such decisions should make. The scope of oral and maxillofacial surgery for the general practitioner usually includes several surgical procedures. The extraction of erupted teeth and the removal of fractured roots are the procedures most often performed.

On completion of dental school, every dentist should have adequate training, experience, and skill to provide these services. The dentist should be able to perform minor preprosthetic surgical procedures, which include most procedures that can perform with local anesthesia in an office setting. The dentist should be able to manage minor infections of he teeth and soft tissues of the mouth. Because most odontogenic infections are minor, the reasonably experienced general dentist can manage them. The dentist should be able to evaluate the patient with an oral pathologic lesion and determine whether a biopsy is necessary In many situations, the dentist should be the one who performs such a biopsy.

Finally, the general dentist should have facility to manage traumatic injuries of the teeth and surrounding soft tissues. In many situations, definitive care must provided by specialists, but initial care often can be provided by the general dentist. The specialist in oral and maxillofacial surgery is a dentist who has had formal training in oral and maxillofacial surgery for 4 or more years after completing dental school. During this period, he or she has gained extensive experience in complex surgical and medical management and has received extensive training and experience in the diagnosis and surgical management of impacted teeth, as well as experience with the techniques of tooth extraction in patients with severe medical compromises. Important to the training of oral and maxillofacial surgeons is the acquisition of knowledge and skill in advanced and complex pain control, including intravenous sedation and ambulatory general anesthesia. In addition, the oral and maxillofacial surgeon receives extensive

training and experience in the full evaluation and definitive care of the trauma patient, management of extensive odontogenic infections of the head and neck, management of oral and maxillofacial pathologic lesions (such as cysts and tumors of the jaws), diagnosis and management of dent facial deformities (congenital, developmental, or acquired), complex maxillofacial preprosthetic surgery (including the use of dental implants), reconstruction with bone grafts of missing portions of the jaws, and management of facial pain and temporomandibular joint disorders.

Surgery does not require technical skill alone; it a complex discipline that includes many factors. Surgical skill is the technical portion of the total surgical activity and accounts for less than one third of a surgeon's ability. Surgical judgment is the wisdom to make decisions about the need for surgery and the management of the patient undergoing a surgical procedure. Most important, the discipline of surgery includes the diagnosis of the surgical problem; the preparation of the patient, both psychologically and physiologically, for the procedure;

The timing of the operation for the patient's maximal benefit; the adjustment and modification of standard surgical procedures to ft the individual needs of each patient; Finally, the supportive postoperative care that is essential for an uneventful recovery from the surgical procedure. To be excellent, a surgeon must be technically skilled but must also have strong components of humanism, kindness, humility, and compassion. It is important that he or she have a great deal of insight into the patient's concerns regarding the upcoming surgical procedure.

The surgeon must take advantage of this insight and project an image of caring about these concerns, which all patients have. This humanistic approach will be the most important factor in the patient's judgment of the surgeon's overall skill. The excellent surgeon must have good surgical judgment, which is a measure of both maturity and surgical experience. Finally, the surgeon must have great respect for soft tissue, as well as hard tissue. Surgeons with little respect for tissue will cause patients to have a longer recuperation and a higher incidence of complications.

# WORK PROGRAMME FOR DISCIPLINE
# ORAL SURGERY
## Introduction

Standard Program The game is intended for a third year student at the Dental Institute V and VI semester in the subject propaedeutic dental diseases. Typical program compiled from National Standards and taking into account the characteristics of the qualification of general practice dentist. A typical program includes theory and a practical knowledge of the organization of surgical dental department, anesthesia methods, types of anesthesia used in modern surgical dentistry in clinical outpatient conditions, the choice of method of anesthesia and the drug used; indications and contraindications with extractions, etiopathogenesis and nonodontogenic, odontogenic diseases, clinical treatment guidelines and prevention methods.

The fact that the spread of the coronavirus pandemic has fundamentally changed the world and the minds of millions of people. This is not the first time humanity has faced such an epidemic. But this time, the scale of its development became truly inconceivable. Who would have thought that in an age of globalization, technological progress and innovation in healthcare, we would be forced to spend months in isolation? This situation once again proved the importance of preserving such concepts as kindness, mutual assistance and mercy in society.

In order for all the actions planned by the leadership to be fully implemented and have a positive effect in reducing the spread of coronavirus infection, the head of state once again called on society to consolidate efforts, display conscientiousness, patience and responsibility, and adhere to iron discipline. Only in this case we will be able to overcome the pandemic with the least losses and as soon as possible.

### 1.1 Objectives and discipline problems

**The purpose of training** discipline diseases propaedeutics of surgical stomatology is to teach students the organization of outpatient and clinical surgical dental care to the population, taking into account the purpose -

training of future specialists - general dentist in the direction of vocational education (Dentistry).

**1.1.2. Learning objectives:**

- To study the organization of surgical dental office (office);
- To learn the structure of the Department of Surgical Dentistry;
- Learn the staff standards in the dental office (office);
- Examine the organization and equipping of care;
- Learned from what departments is dental surgical hospital;
- To master the maintenance of medical records in the clinic and the hospital;

**1.2.Trebovaniya to knowledge, skills and abilities for diseases propaedeutics of surgical stomatology.**

1.2.1. **The** student should **know:**

- goals and objectives of the discipline, its significance for the activities of a dentist general practitioner;
- the most important principles of clinical research methods;
- types of anesthesia used in modern surgical dentistry in clinical and outpatient conditions, the choice of method of anesthesia and the drug used;
- clinic, diagnosis and treatment of inflammatory diseases MFRe.

. 1.2.2 **The student should be able to:**

- to carry out local species of anesthesia;
- manually delete various groups of teeth;
- independently carry out practical skills to evaluate the results obtained;
- be able to independently use scientific literature.

. 1.2.3**The student must have skills:** of outpatient events underlying the preservation and strengthening of health, maintaining health with clinical relevance:

- Implementation of infiltration anesthesia in patients (volunteers).
- Carrying infraorbital anesthesia on the phantom:
- Carrying extraoral infraorbital anesthesia method in patients (volunteers):

- Carrying intraoral infraorbital anesthesia method in patients (volunteers):
- Carrying palatal anesthesia in a patient (volunteer):
- Carrying posterior superior alveolar nerve block on the phantom.
- Carrying posterior superior alveolar nerve block in a patient (volunteer)
- Carrying incisive anesthesia in a patient (volunteer):
- Carrying mandibular anesthesia at phantom.
- Carrying mandibular anesthesia using palpation of the patient (the volunteer).
- Carrying mandibular anesthesia apodaktyl way the patient (volunteer).
- Carrying extraoral mandibular anesthesia method in a patient (volunteer).
- Carrying torusal anesthesia at phantom.
- Carrying torusal anesthesia in a patient (volunteer).
- Implementation of mental nerve anesthesia extraoral way the patient (volunteer).
- Implementation of mental nerve anesthesia intraoral way the patient (volunteer).
- Anesthesia of the maxillary nerve by Vaisblat SN, under molar way (stem anesthesia) on a phantom.
- Anesthesia of the mandibular nerve in the foramen ovale by S.N.Vaysblat on the phantom.
- Determination of forceps to remove the teeth on the upper jaw.
- Determination of forceps for removing teeth and lower jaw roots.
- Determination of elevators to remove the roots of the teeth.
- Methods of removing the forceps teeth.
- Removal of certain groups of the upper jaw teeth.
- Removal of certain groups of the lower jaw teeth.
- Determination of causal teeth with odontogenic inflammatory diseases and palpation transition folds, alveolar bone with periostitis and osteomyelitis.
- Carrying tooth save operations (in phantom).

- Soft tissue palpation with abscesses, phlegmon and lymphadenitis MFRe various localization.
- Diagnosis and basic principles of their treatment.
- Treatment of acute suppurative periostitis.
- Opening the abscess.

### 1.3. Communication object with other items, prescribed in the curriculum and its place in the health system

This course is closely related to the following items, provided the curriculum: normal anatomy, normal and pathological physiology, microbiology, biochemistry, clinical pharmacology, propaedeutics of internal diseases, Therapy.

The findings of the exercises are the basis for the study of dental diseases that can be caused by pathological processes in other organs and systems (eg, upper respiratory diseases, endocrinology, internal medicine, dentistry, etc.)

### 1.4. Modern information and pedagogical technologies in the study of the subject

The provisions related to the process of teaching and governing the quality of education: teaching at a high scientific and pedagogical level, the reading problem lectures, organization of educational process in the form of questions and answers, the use of advanced educational technologies and multimedia, to the students to put the problems that will make them clinically think, demands, individual work with the students accustom students to free communication, involving research.

When planning a study of the subject of dental disease applied the following conceptual approaches:

**Education aimed at a person.** Assumes the full development of each participant in the educational process. In turn, the planning of the educational process must take into account not only the identity of the individual student, but also the specifics of his future profession.

**A systematic approach** Educational Technology should contain all the features of the system: the logic of the process, the connection of all its parts, integrity.

**An active approach.** It means learning process aimed at the formation of personality, activation and activity intensisification learner in the learning process to take into account all the capacity and capabilities of the student, open his initiative.

**The dialogic approach.** This approach is the need of creation of educational relations. As a result, it enhances the ability of the individual self and the activation of self-realization.

The organization of educational process on the basis of cooperation. It indicates the need for democracy, equality, the formation process of the content of teaching and the student, and paying attention to the need to implement cooperation in the evaluation of the results.

**Problem** learning. The method of presenting educational content due to problems helps to activate the activity of the student. This results in an independent activity of students.

The use of modern methods and techniques of information transmission - the introduction of new information and computer technologies in educational process.

**Methods and techniques of teaching.** Lectures, problem-based learning, case studies, pinbord paradox and design method, practical work.

The forms of organization of the educational process: dialogue, cooperation and mutual learning frontal, team and group.

**Means of education:** Along with traditional forms of learning (tutorial, lecture texts) computer and information technology.

**Communication methods:** direct mutual communication based on immediate feedback from students.

**Methods and feedback** means: observation, quiz, diagnosis of learning based on analysis of current data, intermediate and final control.

**The methods and means of** management: planning of training sessions based on the chronological maps, joint actions of the teacher and the student to achieve the goals, control not only the classroom but also outside the classroom work.

**Monitoring and evaluation:** planned control of learning outcomes within each class and all. At the end of the cycle to assess the level of knowledge of students.

In the process of studying the subject propaedeutic dental disease will be applied training and checking computer programs, handouts on topics classes.

## Thematic planlecture

| | names of practice | T |
|---|---|---|
| 1. | Surgery and its contents. Organization of surgical dental care. Features of surgical procedures conducted on the face and the oral cavity. Anesthesia in surgical dentistry. Indications and contraindications. Operation tooth extraction. Indications and contraindications. | 2 |
| 2. | Inflammatory diseases MFR. Classification, etiopathogenesis. Periodontitis, abscess, osteomyelitis. Classification, clinical features, diagnosis, surgical treatment. | 2 |
| 3. | Odontogenic inflammatory diseases MFR. Abscesses, cellulitis. Classification, pathogenesis. Clinic, diagnostics, principles of treatment. Odontogenic sinusitis. Clinic, diagnostics, treatment. | 2 |
| 4. | Nonodontogenic inflammatory diseases. Furuncle, carbuncle, erysipelas and Nome. Clinic, diagnostics, treatment | 2 |
| 5. | Complications of inflammatory diseases MFR (thrombophlebitis of the facial vein, cavernous sinus thrombosis, meningitis, mediastinitis, sepsis) | 2 |

## Thematic plan workshops on subject oral surgery

| | names of practice | total |
|---|---|---|
| 1 | The organization's office in surgical dental clinic (department) .Observe surgical dental patient. Observe surgical dental patients. | 4 |
| 2 | Methods of local anesthesia in dentistry and their classification. Local anesthetics, and drugs that have prolonged the properties. The anatomy of the trigeminal nerve. Innervation zone I and II of the branches of the trigeminal nerve. Methods of conductive and infiltration anesthesia. | 4 |
| 3 | Insisual anesthesia. All methods of mandibular anesthesia. Literature: A - 1,2,3, Q-1,2,3,4,5,6,7,8,9 | 4 |
| 4 | Lower alveolar nerve pain relief. Torusal anesthesia. Mental anesthesia. Literature: A - 1,2,3, Q-1,2,3,4,5,6,7,8,9 | 4 |
| 5 | Local complications arising under local anesthesia Common complications that arise when local anesthesia. . Causes, diagnosis, treatment and prevention. | 4 |
| 6 | Clinical signs of anaphylactic shock. Cardiopulmonary resuscitation. Cornavirus is a global problem in the world. Reforms adopted in Uzbekistan against coronavirus infection. Literature: A - 1,2,3, Q-1,2,3,4,5,6,7,8,9 | 4 |
| 7 | Removal of a tooth. Tooth extraction tools. The technique of removing the upper frontal, small molars and more molars. Determination of coronavirus infection in patients and symptoms of the disease. Literature: A - 1,2,3, Q-1,2,3,4,5,6,7,8,9 | 4 |

| | | |
|---|---|---|
| 8 | Technique for the removal of the lower frontal, small molars and more molars Literature: A - 1,2,3, Q-1,2,3,4,5,6,7,8,9 | 6 |
| 9 | Root removal technique for the upper and lower jaw. Removing the roots of the bur with a machine and chisel on the upper and lower jaw. Literature: A - 1,2,3, Q-1,2,3,4,5,6,7,8,9 | 6 |
| 10 | Complications after tooth extraction in the upper and lower jaw. Literature: A - 1,2,3, Q-1,2,3,4,5,6,7,8,9 | 6 |
| 11 | The reasons for the difficult eruption of 8 teeth. Operations for periodontitis. (tooth replantation, root apex resection, root amputation, tooth hemisection). Pericoronitis. Purulent diseases in the oral cavity: pereostitis, palatine abscess, under the lingual abscess. Literature: A - 1,2,3, Q-1,2,3,4,5,6,7,8,9 | 6 |
| 12 | Preparation of the oral cavity for prosthetics Literature: A - 1,2,3, Q-1,2,3,4,5,6,7,8,9 | 6 |
| | | 58 |

## 1. Lecture course

### 1.1 The content of the lecture material

**Theme 1.** Surgery and its contents. Organization of surgical dental care. Features of surgical procedures conducted on the face and the oral cavity. Anesthesia in surgical dentistry. Indications and contraindications. Operation tooth extraction. Indications and contraindications.

Organization of Operative Dentistry. The origins and history of surgical dentistry.

The history of the development of surgical stomatology in TSDI. Sections of Operative Dentistry. Types of anesthesia Local anesthesia and painkillers.

Indications and contraindications for local anesthesia. Operation tooth extraction. Indications, contraindications and complications.

**Surgery** - one of the independent clinical disciplines of dentistry that studies diseases of the teeth and damage organs of the mouth, face, and neck, facial bones, requiring complex treatment. Among these methods, surgery is leading. Surgery is closely associated with other dental specialties - therapy, orthopedics, pediatric dentistry shared with them the methods of diagnosis and treatment. Surgery is closely linked with other health professions - medicine, surgery, otolaryngology, ophthalmology, nephrology, Radiologists. This discipline at the same time based on the achievements of the natural sciences, physics, chemistry and many sections of Fundamental Medicine: normal and topographical anatomy, norms and pathophysiology, microbiology, US Pat. anatomy, pharmacology, etc. operative surgery.

Surgical dentistry teeth may require emergency surgical intervention (acute inflammatory and traumatic dental disease, including arising from them, choking, bleeding, shock, etc.) And planned operations (chronic inflammatory dental disease, trauma, tumors, tumor-like diseases, defects and deformation person, birth defects and malformations, and others.)

**Literature:** On (primary) - 1 L (optional) - 3,4,5,7,19,24,26 .

**Theme 2. Inflammatory diseases MFR. Classification, etiopathogenesis. Periodontitis, abscess, osteomyelitis. Classification, clinical features, diagnosis, surgical treatment. (2h.)**

Classification of odontogenic inflammatory processes. Periodontitis and their features. Periostitis and their complications. Osteomyelitis. Differential diagnosis and treatment in a clinic. Prevention of inflammation MFR.

Literature: On (primary) - 1 L (optional) - 5,6,8,9,10,18.

**Theme 2**. Odontogenic inflammatory diseases MFR. Abscesses, cellulitis. Classification, pathogenesis. Clinic, diagnostics, principles of treatment. Odontogenic sinusitis. Clinic, diagnostics, treatment.

General characteristics of the concepts of abscesses and abscesses, the similarities and difference between them. Marking the words verbatim and understanding their broadest sense, their significance in surgery. The etiology and pathogenesis of abscesses and abscesses, abscesses and abscesses classification MFR. Features of clinical manifestations of abscesses and abscesses MFRe, depending on the anatomical location. General and local symptoms. The features and modern principles of diagnosis of abscesses and abscesses MFR. New methods of study patients. Procedures of opening operations of abscesses and abscesses, depending on the anatomical location. Highlights of the postoperative treatment of patients with abscesses and phlegmon MFR, especially postoperative management. The etiology and pathogenesis of odontogenic sinusitis. Clinical manifestations and diagnosis of odontogenic sinusitis.

Principles of medical and surgical methods for the treatment of patients and ways of prevention of odontogenic sinusitis.

Literature: On (primary) - 1 L (optional) - 9,10,18,24,26.

**Theme 3.** Odontogenic inflammatory diseases MFR. Abscesses, cellulitis. Classification, pathogenesis. Clinic, diagnostics, principles of treatment. Odontogenic sinusitis. Clinic, diagnostics, treatment.

The etiology and pathogenesis of inflammatory diseases nonodontogenic MFR. Features nonodontogenic clinical manifestations of inflammatory diseases MFR. General and local symptoms. The features and modern principles of diagnosis of inflammatory diseases nonodontogenic MFR. Principles of medical and surgical treatments for inflammatory diseases nonodontogenic MFR.

Literature: On (primary) - 1 L (optional ND) - 3,9,13,17,25.

**Theme 5.** Nonodontogenic inflammatory diseases. Furuncle, carbuncle, erysipelas and Nome. Clinic, diagnostics, treatment

The etiology and pathogenesis of inflammatory diseases nonodontogenic MFR. Features nonodontogenic clinical manifestations of inflammatory diseases MFR. General and local symptoms. The features and modern principles of diagnosis of inflammatory diseases nonodontogenic MFR. Principles of medical and surgical treatments for inflammatory diseases nonodontogenic MFR.

Literature: On (primary) - 1 L (optional ND) - 3,9,13,17,25.

**Theme 6.** Complications of inflammatory diseases MFR (thrombophlebitis of the facial vein, cavernous sinus thrombosis, meningitis, mediastinitis, sepsis) (2 hours)

The etiology and pathogenesis of complications of inflammatory diseases of MFR. Features of clinical manifestations of complications of inflammatory diseases of MFR. General and local symptoms. The features and modern principles of diagnosis complication of inflammatory diseases MFR. New methods of research. Highlights and features of surgical treatment of postoperative complications patients inflammatory diseases MFR.

Literature: On (primary) - 1 L (optional) - 17,20,24,26,27

## 2.4. Guidelines on the organization of the course work

In a typical program are not provided on the subject coursework

## 2.5. Form and content of independent work

Independent work on the subject Propaedeutics surgical dentistry is an integral part of the study of the subject and fully provided with methodological and information resources.

The forms of independent work on the subject:

- . Create a training stand, the size of 1x2 m, 1,5h2 m .
- Be the essay on the theme of the CDS (10 printed pages).
- Create a report on the subject of the CDS (15-20 min.) With the delivery of the text .
- Create a presentation on the CDS with the delivery of a report or essay.

- Working with the electronic media (the Internet) with the delivery of a report or essay.
- The study of modern clinical and physiological examination methods, new techniques and tools, as well as scientific technology with the delivery of a report or essay .
- Create handouts and handed over to the approved form ( tables , diagrams s , pictures , graphic , and )
- Create and deliver complex situational problems 10 problems .
- Making tests on CDS - 20 test of s . 10 of them have to be multimedia governmental .
- Preparation of models for practical training
- Upgrading Fund classroom tables. - 10 tables .
- The constituents ix educational games on CDS - 1 job .
- Create crossword of 40 case studies on the subject - one crossword puzzle.
- Drawing scanvord, cainvord and riddles on the topic . As the complexity of the work 1 .
- Work with scientific literature ( journal articles , monographs , and , create referat reports from Medline ). 10 printed sheets .
- Create research papers for scientific conference .
- Participate in scientific experiments, as well as to process the results of statistical data . Create a report .
  - Create a color photo on the subject .
  - Create a video animation on the topic .
  - Create videos on the subject .
  - To conduct research on the topic . Print this Article .
  - Create reports and essays based on multimedia .

Independent work of students is carried out in the classroom and extracurricular. Student at the V - VI of semester according to the above mentioned topics, in addition must pass two independent-work.

## Classroom independent work

Classroom independent work carried out during the practice session under the guidance of the teacher, and the student performs individual tasks in the form of supervision of patients, analysis of the medical records, laboratory data analysis, the decision of situational problems, the solution of cases, preparation of the organizers. During a self-study teacher works individually with each student, consults them, examines the work.

## Extracurricular independent work

Students' independent work includes preparation for practical training, writing abstracts on a given topic, homework, learning some theoretical tasks on their own with the help of textbooks, preparation of essays on a given topic, the preparation of a scientific paper or thesis for the conference. Extracurricular CP helps to deepen the knowledge of students, teaches them to make their own decisions.

## 2.7. Information and methodological support of the program

In the process of learning the subject propaedeutic surgical dentistry involves the use of modern pedagogical and information-communication technologies. On the practical and lecture classes used multimedia presentations, educational films and computer programs.

1. At each lecture on the subject of using modern electronic presentations and didactic technology :

- Modern online tutorials, videos ;
- For each class are color presentations .
- There are computer tests and interactive games for each lesson .
- Are collections of tests for each student .

2. Each object lesson apply such technology ped as brainstorming, black box, the spider web, technology and case syllabus .

## 2.8. Ranking criteria for the evaluation and control of knowledge and skills for

In the first lesson, students are provided with information on the rating control of its forms, the date of the interim and final control, data pass marks.

According to the State standard on the subject provided by conducting the following types of control:

- The current estimate (MOT);
- Independent work of students (IWS);
- Final evaluation (IE)

During the cycle the student performance is evaluated on a 100 point scale.

100 points in the whole of the discipline are distributed as follows:

| number | Type of control | The maximum score | Coefficient | Passing score |
|---|---|---|---|---|
| 1 | Monitoring based on ISW | 50 | 0.5 | 2 7 5 |
| 2 | Independent student work | | | |
| 3 | Intermediate control | 20 | 0.2 | 1.0 |
| 4 | Total control | thirty | 0.3 | 16.5 |
| | TOTAL: | 100 | 1 | 55.0 |

**Note: the final control of the test stands 15%, 15% for OSKE**

**Current estimates (CE)**

THAT the definition and assessment of students' knowledge on the topics of the subject and practical skills. By Subject propaedeutic surgical dentistry can be performed vvide oral questioning, work with training programs, the development of practical skills, the implementation of the CDS, checking homework, and other forms of control.

In assessing the level of knowledge of students are taken into account, the development of practical training materials, active in the discussion of theoretical material and interactive learning methods.

In each session, all students should be assessed.

When the current control-based model of education level of the students is measured at the following parts: a theoretical part and a practical part of the CDS (30:60:10)

## INTERIM CONTROL

At U By valued knowledge and practical skills of several topics or sections of the student learned.

P K on the subject of Real estate Rent 2 times a year to 1 mu once each semester : On P K students are not allowed with outstanding practical exercises .

Decree of the cathedral congregation II to the wire in the V and VI semester e . V semester oral questioning and test, VI semester oral questioning .

During the PC control is carried out by the Commission established by the head of the department, when it detects violations of the PC and the results produced onuliruyutsya Retake the PC.

| progress % | Evaluation | Stepe student knowledge |
|---|---|---|
| 96-100 % | Excellent "5" | The student answers each question ticket correctly and confidently . In solving situational problems thinking positively responds correctly and can substantiate your answer. When an answer is to unite all the knowledge on the subject of propaedeutics of surgical stomatology and can somostoyatelno draw conclusions . At the time performed and mastered tasks on self work . |
| 91-95 % | Excellent "5" | The student answers each question ticket correctly and confidently . Ima e t knowledge on the |

| | | |
|---|---|---|
| | | subject Propaedeutics surgical dentistry . At the decision of situational problems thinking positively responds correctly and can substantiate your answer. When an answer is to unite knowledge on the subject of propaedeutics of surgical stomatology and can somostoyatelno do conclusions . at the time performed and mastered tasks for independent work. |
| 86-90 % | Excellent "5" | The student answers each question correctly and confidently ticket . At the decision of situational problems thinking positively responds correctly and can substantiate your answer. When an answer is to unite knowledge on the subject of propaedeutics of surgical stomatology. In time performed and mastered tasks for independent work . |
| 81-85 % | Well it is "4" | On these questions the student gives a complete answer . Ima e t sufficient knowledge on the subject of propaedeutics of surgical stomatology . At the decision of situational problems thinking positively responds correctly . When the answer is to unite knowledge on the subject of propaedeutics of surgical stomatology . In time performed and mastered tasks for independent work . |
| 76-80 % | Well "4" | On these questions the student gives a complete answer but a little more difficult when justifying the answer. Has sufficient knowledge on the subject of propaedeutics of surgical stomatology . At the decision of situational problems thinking positively responds correctly, but is difficult to justify . While the answer may unite knowledge on the subject of propaedeutics of surgical stomatology . In time to perform a task for independent work but the quality is not high-grade . |
| 71-75 % | Well "4" | The student responds to 75-80% of the issues raised.Has knowledge on the subject Propaedeutics |

| | | |
|---|---|---|
| | | surgical dentistry . At the decision of situational problems thinking positively responds correctly, but is difficult to justify . In time to perform a task for independent work but the quality is not high-grade . |
| 66-70 % | Satisfactorily " 3 " | Kўyilgan savollarning 65-70% n Talaba zhavob Barada . Hirurgik dentistry kasalliklar propedevtikasi faniga mansub bilimini tariflashda ayrim chalkashliklarga yўl қўyadi. Vaziyatli masalani echishda ayrim hatoliklarga yўl қўyadi.Mustaқil talim topshiriқlarini bazharilishi Sifat pastes ўzlashtirishi etarli darazhada EMAS. |
| 615 % | Satisfactorily " 3 " | Student answers to 60% of the issues raised. In the description of the subject of propaedeutics of surgical stomatology and solving situational problems makes mistakes, can not justify your answer. Implementation and development of independent work of low quality. |
| 55-60% | Satisfactorily " 3" | In the description of the subject of propaedeutics of surgical stomatology, performing skills on the subject and the decision of situational problems admits gross errors. Execution of independent work is not quality. |
| 54 % or less | not satisfactory " 2 " | It does not have the knowledge on the subject of propaedeutics of surgical stomatology can not perform practical skills in the subject and can not solve situational problems. |

**Final control (FC)**

. On the IR assessed knowledge and practical skills of the student on the subject of IR carried out after the end of practical training at the department in two stages: the USC e . And test OSKE carried out at the Department of the schedule drawn up by the education department at the end

of workshops and lectures. In OSKE students have not allowed payable on practical training . OSKE consists from 8 stations:

**Criteria for evaluation of FC .**

100-86 score s - distinction

85,9-71 score s - is well

70,9-55 score s - satisfactory

54.9 or lower - is not satisfactory .

If the assessment OSKE is unsatisfactory that is below 55% of the student is not permitted on the test control takes place in the test center .

Retake OSKE carried out with a resolution of the dean's office at the end of the semester .

For the IC card is composed OSKE

Number of Student accumulate enough for THAT, PC and CPC allowed on IR.

By order of the rector holding IR periodically monitored by internal inspection and monitoring department, when errors of the results of FC discharged and repeated exam.

**Definition of a student in the subject rankings**

At the Department of Oral Surgery and Dental Implantology on the 3rd course on the subject of Propaedeutics surgical dentistry V-VI semester teaching hours up to 90 hours .

On basis "Regulations on the ranking of the PC to the V-VI semester as OSKE and test , with 50% TO 20% IC and 30% FC.

By order of the cathedral congregation PC is carried out in the form of OSCE and oral response.

Workload is shown on Table 1.

Rating of the student in the subject is determined by the following formula: the $R_f$ =

where: the V - the total load on the subject (in hours);

- The level of assimilation of the subject (in points).

The pass mark for TC and IC is 55 and above.

The total score of the student in the subject is equal to the arithmetic sum of the TC and IC.

**Timing of control**

Final control held in the calendar thematic plan and approved by the education department of the schedule of the final control.

Students do not receive a passing grade or did not participate at the final control are given the opportunity and time to retake the exam.

A student who missed practice sessions or intermediate, final control due to illness according to the order by the dean of faculty is given two-week period after the start of training for castings

The student that at the current, final control has not received a passing grade is considered academic debtors on the subject.

Academic debtors after the end of the semester are available for 1 month of detentions. If within this period the student will not be able to master the subject on the recommendation of the dean of faculty and the rector of the order will be deducted from the ranks of students.

If a student does not agree with the assessment of the ad since the evaluation during the day has the right to apply to the dean of the faculty. In such cases, on the recommendation of the dean of the Rector's order drawn up Appeal Commission consisting of 3 people.

Appeal Panel after reviewing the student's statement on the same day is to give its opinion.

The assessment of students' knowledge in accordance with the requirements in the approved time should be monitored dean, head of the department, education department and internal inspection and monitoring department.

**Literature for reading.**

*Summary:*

1. David A. Mitchell, Anastasia N. Kanatas. Oral is to the Introduction of An and Maxilla the facial surgery-2015 (translated on Russian the department ) .

2. Azimov M.I. Propedevtic surgery dentistry – Tashkent- 2009

3. Robustova T.G., Romacheva I.F., Karapetyan and others Surgery – M. Medical, 1996

4. Robustova T.G. Surgery. - Moscow: "Medicine", 2003.

5. Bezrukov V.M., Robustova T.G. - Guidelines for the Surgical Dentistry and Maxillofacial Surgery. - Moscow: "Medicine", 2000.

*Additional:*

1. Anil Malik Neelima , Textbook of Oral and Maxillofacial Surgery- 2008

2. Badalyan V.A. Rabuhina N.A., L.A. Grigoryan "The dynamics of healing of periapical destructive lesions in the X-ray image" (Dentistry.- 2000. - №2.- S. 12).

3. Bezrukov V.M., L.A. Grigoryan "Operations at teeth in ambulatory surgical practice" (Tr. In Congress stomatol.assots. Russia.- M., 1999.- pp 224-226.)

4. Volozhin A.I. "Features of the pathogenesis of chronic periodontitis"

Topical issues of endodontics:.Tr .Dentistry. CRI-M, 1990-C. 11-13.

6. Volchenkova G.V. "Combined treatment of patients with chronic apical periodontitis large and small molars using argon plasma flow: - Smolensk, 1998.- 19 p.

7. Gritsuk S.F. "Anesthesia in dentistry" 1998

8. G.V. Ziryanov "The flow of apical periodontitis in secondary immunodeficiency, caused by X-ray irradiation, and justification of path genetic treatment: 1992.- 14p.

9. Kozlov A.V. "Surgery in the clinic," 1989

10. Mashkovskii M.D. 1998 "Drugs".

11. Milych M.V., Anton A. A. Syphilis // Guidelines for skin and venereal diseases. - M , 1992..

12. Mordovtsev V.N., Shapoval M. I. Tuberculosis skin // Skin and venereal disease. - M : Medicine, 1995. - P. 395-422..

13. Robustova T.G.. Specific inflammatory diseases of maxillofacial area // Surgery. - M : Medicine, 1996..

14. Skripkin J.K., Mashkeyleson A.L., Sharapova G.Y. Guidelines for skin and venereal diseases. - The M : Medicine, 1995. - 464 p..

15. Solovieva A. M . "Clinical and experimental substantiation of application timogena in the treatment of chronic apical periodontitis" Avtoref.dis .. kand.med.nauk.- L., 1991.- 17c.

16. Khomenko A.G. Tuberculosis. - The M : Medicine, 1995..

17. Shargorodskii A.G., "Inflammatory diseases of maxillofacial area and neck" .Moskva, 1988.

18. Yahyayev B.M ."Methodical development for pain relief," 1999.

19. F. Stanley's Malamed , Handbook of the Local Anasthesia 4Th Ed is - 1997.

20. Stuart J. Froun, Dental implant Complications, 2010

Internet data is taken from the following sites

www.e-stomatoly

www.ziyonet.uz

www.edentwold

www.histol chuvashia.com

donhist. fromru.com.

catalog delovik.com

## Practical part

### 1. The organization's office in surgical dental clinic (department) .Observe surgical dental patient. Observe surgical dental patients.

**Chronological map of classes**
**(on classes in the clinic)**

| Time | Stages of training | Forms of training | Duration in minutes. _____min |
|---|---|---|---|
| _____ __ | Parenthesis of the teacher (theme substantiation) | | - |
| _____ __ | Discussion of homework | The survey, an explanation | |
| _____ __ | Inspection of the patient in a hospital | | |
| _____ __ | Improvement of practical skills, work with the dummy, clinical and laboratory equipment, apparatus | Working with clinical and laboratory equipment | |
| _____ __ | Discussion of a practical part of training | The survey, an explanation | |
| _____ __ | Discussion of a theme of training, the abstract report, seminar, discussion | Abstract messages, seminars, discussions | |
| _____ __ | Working in a group. Demonstration videos on the topic, analysis of situational tasks, | The demonstration, interactive forms, | |

| | | | |
|---|---|---|---|
| | computer software, business games, etc. | active and passive | |
| ____ __ | The conclusion of the teacher on the given trining. An estimation of knowledge of students on 100 ball system and its announcement. Giving of the task to students on following classes (the complete set of questions) | Information, questions for self-training | |

What is oral and maxillofacial surgery?

The words mean, very simply, surgery of the mouth, jaws and face, and the specialty concerns itself with the diagnosis and treatment of conditions arising in and aff cting the mouth, jaws, face, neck and skull and surrounding structures. It is an area of surgi- cal practice that has been largely recognized in European countries as encompassing all the sub-disciplines listed in the contents, but internationally the practice of some oral and maxillofacial surgeons may be very much more limited than those of others. European oral and maxillofacial surgery (OMFS) essentially emerged from surgical dentistry and surgery of the jaws following injuries, particularly in the First and Second World Wars.

From these beginnings a specialty developed that nowadays requires trainees to complete both undergraduate dental and medical degrees. In the United Kingdom this is followed by basic profes- sional training up to the standards of obtaining the membership diplomas in both dental surgery and surgery in general before entering a structured postgraduate training period. It is the youngest of the ten recognized surgical specialties within the United Kingdom and remains unique in requiring this dual base.

As in the United Kingdom, OMFS in Germany is the youngest of the recognized surgical special- ties and remains unique in requiring a dual

quali- fication in medicine and dentistry. In Germany, OMFS specialists have two main options after finishing the required 5 years of higher surgical training, namely working autonomously in private practice or pursuing a career in secondary care. The former surgeon's main workload consists of surgical dentistry and implantology. Some minor skin surgery can be integrated into the daily rou- tine. In practice, this work has much in common with that carried out by oral surgeons – these are dentists completing a 3-year training programme consisting purely of intraoral operations.

With the advent of specialization and special- ist lists in the United Kingdom there has been a move toward the creation of specialists in surgical dentistry, which is of course a small but very com- monly required area of OMFS. Oral surgery is in effect a form of clinical practice restricting (usually academic) surgeons to a specific range of practice and subdivisions within the overall field of OMFS such as those who specialize in the maxillofacial component of head and neck oncological and reconstructive surgery, cleft lip and palate surgery or craniofacial surgery.

The official OMFS subspecializations that have appeared in the United Kingdom (i.e. head and neck oncology and reconstructive surgery, cleft lip and palate surgery and craniofacial surgery) do not exist in Germany. Every department and in fact every specialist, at least every Head of Department (Chief), is expected to cover the whole range of OMFS. It is still under discussion whether further subspecialization improves the outcome of the sur- gical treatment or only narrows the experience and surgical skills of the surgeons within the specialty. In North America the specialty is primarily den- tally based (although some training programmes include a formal medical degree) with a career for most oral and maxillofacial surgeons based in an office practice concentrating on dentoalveolar surgery, implantology and sedation and anaesthe- sia. A hospital-based career is perfectly possible

whether with an academic or specialist service and

training base; it is simply that, as a proportion of those trained, most of these surgeons are in office rather than full-time hospital practice.

Although these geographic differences illustrate some of the diversity of the specialty internation- ally, huge areas remain – the Pacific Rim, itself massively variable; the Asian subcontinent; the Sino-Asian regions; South America and Africa, to name a few. My apologies. I hope the differences and similarities within this text at least reflect some of the experiences in these diverse cultural and geographic regions.

Within an international context these artificial subdivisions are recognized as the basic compo- nents of the specialty. Fortunately, to date, the specialty encompasses all these potential divisions within the overall remit of OMFS.

From the point of view of the undergraduate student or the early postgraduate studying for a membership diploma, an awareness of the range of the specialty, as well as some factual knowl- edge and basic skills within the overall fi ld, is what is needed.

The majority of practical skills that will be required of people at this level centre on surgery of the tooth-bearing portions of the jaws and soft tissue surgery in relation to facial trauma. For this reason in this book a large amount of space is devoted to common practical skills and knowledge at the earlier end of training, and surgical detail of the more complex and esoteric areas of the field aims to inform readers of the basics and inspire them to explore further.

At the end of each chapter you will find some guidance for further reading; at the end of some

chapters (where there is a clear diff ence in inter-

national perspective) you will find commentaries from North American and German authorities in the fi ld. The final chapter discusses the very substantial diff ences in training – which often seem greater than the diff ences in surgical practice.

All any teacher can hope to do is inspire and guide. The rest is up to you.

## Aim

The aim of this chapter is to introduce you to a series of principles that affect all aspects of surgery.

## Learning outcomes

At the end of reading and understanding this chapter, you will have a framework to allow you to plan, think through and carry out an operation in general terms. You should be able to demonstrate this by describing the steps involved in the generic envelope that surrounds each individual operation.

## General points

The head and neck in general, and the mouth in particular, are remarkably forgiving areas in which to work. Partly this is because of an excellent blood supply, and partly it is because of the robust and

special nature of the tissues in this region. Within the mouth the beneficial effects of saliva and com- mensal organisms are also seen.

## Planning

'Perfect planning prevents poor performance'. This old Armed Forces adage conveys the very essence of sound surgical practice. Every operation should be thought through, even if only briefly, in the mind of the surgeon. If you can think through every step of an operation that you are about to perform you will be in a position to perform that operation safely and competently. If you have no idea how to get from stage to stage in the operation then you will simply be blundering through it. This is no way to con- duct surgery. If you have no real idea what you are trying to achieve and the steps involved in doing it, how can you explain the process to the patient for informed consent, explain it to your assistants so that they can do their job or brief the nursing

team and anaesthetist? In this way the steps of the operation mirror the generic steps of the patient's journey from initial consultation to discharge. Both sequences are essential to good surgery.

Planning starts with understanding why the operation is being performed and ensuring that the patient has given appropriate consent for the surgery. It is essential that you know the envi- ronment in which you are going to carry out the operation and whether this environment is safe

and appropriate for that particular operation. This could be something as simple as being aware of good chairside lighting and assistance for the surgical removal of a tooth to having an appropriate level of theatre facility with adequate microscopic capabilities that you understand and can use for a major microvascular procedure. It is paramount that if you feel that your environment is not appro- priate for surgery to proceed, then you should not start the operation. Coming to the realization that the operation cannot be conducted successfully because of some problem that was easily foreseeable is unacceptable.

Planning the steps of an operation requires an understanding of the pathology of the disease pro- cess, the immediate anatomy through which you will be operating and the procedure by which the patient's pain and anxiety will be controlled, be this local or general anaesthesia.

The background factors such as the patient's medical history and the age or race of the patient may create difficulties in otherwise routine surgery (e.g. very old patients may have osteoporotic or brittle bone and may be using bisphosphonates with the associated risk of osteonecrosis). Heavily

**Figure 2.1** All surgery is carried out by a team whether small….

built male patients are often described as having particularly robust bone and teeth that are dif- ficult to remove. Irradiated bone is particularly prone to breakdown (osteoradionecrosis) and infection after surgery and should not be operated on (even for extractions) without advice from a specialist.

## Environment and equipment

Before commencing any type of surgical proce- dure, get to know the people you will be working with; your assistants are essential to the progress of the operation and knowing their strengths, weak- nesses and limitations is as valuable as understand- ing the patient's background medical history. You cannot always assume that you are going to have ideal assistance; if this is the case make sure that you can compensate in some other way (Figure 2.1 and Figure 2.2).

Ensure that wherever possible you have gone through the instrumentation and that it is read- ily available. There are few things more irritating to staff or distressing to the patient than surgeons who are continually flustered because the instru- mentation they need is not available and new packs must be repeatedly opened and instruments fetched to the area.

Light is essential, particularly when working in the mouth, which is very much a deep, dark hole. Various specialized lights are designed for both theatre and surgery use. One of the requirements of the light is that it can be adjusted by the opera- tor. Sterile light handles or plastic drapes are used

**Figure 2.2** …or large.

**Figure 2.3** In open surgery, such as parotidectomy, suction is less helpful, whereas controlled pressure with a swab is ideal for controlling and localizing bleeding before definitive haemostasis with dia- thermy or ligation.

to ensure that the light can be easily adjusted. An alternative is a headlight. High-vacuum suction apparatus is routinely available in the dental surgery environment and suction is essential to improve your view, particularly when working in a confined space. When working on open soft tissue it is often more useful to use direct pressure from swabs and diathermy to control bleeding (Figure 2.3).

Pressure followed by accurate diathermy or ves- sel ligation is the haemostatic technique of choice in open wounds (Figure 2.4 and Figure 2.5).

All instrumentation must be sterilized or dis- posable, particularly in light of controversy over prion transmission. Instrumentation is covered in Chapter 3. Sutures for intraoral work are usu- ally resorbable. Synthetics such as polyglactin are in common use. The advantage of these sutures is that they do not need to be removed. They do not

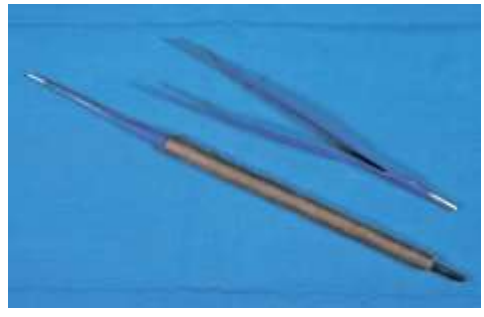

**Figure 2.4** Bipolar (top instrument) and cutting (monopolar; bottom instrument) diathermy.

**Figure 2.5** Prepacked diathermy kit.

resorb in the mouth as quickly as they do when they are buried in soft tissue because of the pH buffer- ing effect of saliva. Patients should be told to expect these resorbable sutures to disappear gradually over a 4-week period. Skin is closed with nonresorbable monofilament synthetic sutures (nylon, polypro- pylene, polybutester) skin staples or tissue adhesive. A number of different dressings may be used depending on the type of surgery that is under- taken. Additional dressings such as bismuth iodoform paraffin paste (BIPP) and Whitehead's varnish (a form of iodine in an ether carrier that evaporates) are frequently used to soak gauze to create antiseptic dressings. These dressings can be used to pack cavities of virtually any size. Proprietary dressings such as Alvogyl are designed to be placed in 'dry' sockets. These contain a com- bination of lidocaine and iodoform that provides analgesia and antisepsis. Sedative dressing materi- als such as zinc oxide/eugenol and cotton wool gly- oxide pastes (e.g. Coe-Pak) are used to relieve pain and cover raw bleeding areas within the mouth such as following excision of hard palate muco- periosteum. Everyone has his or her own favourite skin dressing, which may range from an antiseptic ointment to sterile occlusive dressings. Few dress-

ings have any strong evidence base.

Special dressings such as vacuum dressings require specialized equipment to be effective. Make sure that this equipment is available before the operation is started.

## Thinking through alternatives

One of the problems with being a surgeon is the natural tendency o think that all problems



present before you require surgery. This is mani- festly not the case and it is important to remem- ber that many conditions have more than one perfectly acceptable treatment alternative. Just because you own a hammer does not mean every problem becomes a nail.

Always think through the possible treatment alternatives and think what you would prefer to have done to you, particularly if there is a choice between two treatments that have a statistically similar outcome. *Do as you would be done by* is probably the most useful ethical tenet a surgeon can live by, followed immediately afterward by *do no further (net) harm* (thank you, Daniel Sokol, sometime medical ethicist writing in the *BMJ* who coined the 'net' addition).

## Medicolegal aspects

Consent is defined as the voluntary and continu- ing permission of the patient to receive a particular treatment based on an adequate knowledge of the purpose, nature and likely sequelae of treatment including the likelihood of its success, complica- tions and any alternatives to it. Permission given under any unfair or undue pressure is not con- sent. It seems self-evident that anyone undergo- ing surgery should understand exactly why he or she is undergoing this procedure and whether it is indeed the right thing to undergo. Being honest with the patient before surgery is a vital component that protects both the patient and the surgeon. The point of obtaining consent is twofold. Clinically it enlists the patient's faith and confidence in the validity of the treatment. Legally it provides those treating the patient with defence to a crimi- nal charge of assault or battery or a civil claim for trespass to the person. Briefly if you advise a patient appropriately, the patient will understand the nature and risks of the procedure, and if you carry it out as a trained person to the best of your ability there should really be no problem. Having a signed consent form that a patient did not under- stand or carrying out a procedure in a careless or haphazard fashion or performing a procedure you are not trained to do in a negligent fashion is not defensible no matter how complex your consent form may be. No other person can give consent for a competent adult in UK law.

## Self-determination

Any adult patient who has a sound mental capac- ity has an absolute right to choose whether or not to consent to medical treatment. The patient

may therefore choose to refuse treatment or to go for one option rather than another even if the doctor believes that choice to be inappropriate. The 'age of consent' is generally held to be 16 years because there is no presumption of competence under this age. The crucial test is the degree of understand- ing shown by the child. (The age of consent in the United States is 18 years unless the patient is an emancipated minor.)

## Consent

Consent can be implied (e.g. when a patient holds out his or her arm to allow blood to be taken), ver- bal (by spoken agreement) or written. Written con- sent is usually required for procedures performed with the patient under sedation or anaesthesia. For consent to be valid, three criteria must be met:

1. The consent must be voluntary and obtained without coercion or deceit.
2. The patient must be of sufficient age and men- tal capacity to be considered competent to give consent. Mentally handicapped and confused patients are thus often incapable of giving consent. In such cases, treatment considered to be in the patient's best interest can be car- ried out legally without consent, but for rou- tine procedures it is desirable to obtain the assent of the next of kin or carer. Although 16 years is the legal age of consent, a child with sufficient understanding is capable of consent- ing to or refusing treatment and deserves ade- quate information, even when a parent signs the consent form.
3. The consent must be informed, meaning that adequate explanation of the procedure must be given, including any alternatives available. The patient should be informed of any seri- ous or life-threatening risks of the operation, even if the probability of such complications is very small (>1%). Warnings given to the patient should be documented in the notes, and it may be advisable to provide addi- tional written information in the form of a small pamphlet with simple diagrams where appropriate.

In practical terms, to obtain consent involves the following:

- Determine the patient's level of understanding and pitch explanations to the same level.
- Ask the patient to describe what he or she understands about the procedure.
- Describe the procedure in plain language but adequate detail. Explain the benefits and risks, expected postoperative course, wound and scar size and site, drips, drains, monitors and catheters.
- In some institutions it is possible to arrange a visit to the intensive care or high depen- dency unit or, if the patient is a child, the ward or theatre if appropriate, to familiarize the patient with the surroundings.
- Allow time for the patient to formulate any questions and adequate time to answer them. Most advice suggests that there should be an interval between consent and undergoing a pro- cedure. The period varies with the procedure.
- Obtain verbal and written consent.

In elective surgery in Germany, a minimum of 24 hours should be left between consent and surgery. Although standard consent forms are available for routine procedures, the explanation of the surgical procedure itself always must be conducted individu- ally and can be documented on these forms by draw- ings or by noting specific questions. In Germany the consent form is a legal document. A copy of the con- sent form has to be handed to the patient.

*Competency*

A patient must be competent to give valid con- sent. A patient is not competent if he or she is premedicated, in labour, under undue stress or being affected by known mental illness or known organic brain disease. A patient who is immature by nature of learning difficulties or who is less than 16 years old is in a similar situation. Consent must be obtained from someone who has been deemed competent; in the case of a child, this is the parent or guardian, although a child with good understand- ing of the situation can give consent. In strictly

legal terms a parent can consent to treatment if a child refuses; however, a parent *cannot* refuse treat- ment on a child's behalf if the child is 'competent' and consents to treatment. No one can give consent for an incompetent adult. A clinician can proceed 'in the best interests of the patient' but must abide by any preexisting competent declarations made by the patient.

In Germany, a district court has to appoint a legal guardian to look after the medical interests of adults deemed incompetent to consent. This person may be a family member such as a spouse but may even be a friend or a court-appointed custodian.

### *Who should obtain the consent?*

In most areas the practitioner who will or is capa- ble of carrying out the surgery should take the consent.

### *Warnings*

There is a tendency to carry out defensive medicine promulgated by the threat of litigation. In North America this puts a tremendous burden on patients by forcing doctors to explain every last potential risk and complication of any operation, often when the patient has no real valid alternative given the nature of the pathology. This creates significant additional psychological morbidity for patients. The tendency in the United Kingdom is to follow a similar approach. It is generally accepted that if there is a material risk higher than 1:100 then patients should be advised about this. This trans- lates into, for example, when obtaining consent for third molar surgery advising the patients about the risks of lingual and inferior alveolar nerve sensory damage, pain, swelling and trismus.

In Germany, irrespective of whether an opera- tion carries a material risk of greater than 1:100, if said risk can bring significant harm to the patient, the patient has to be informed. For instance, although there is a low risk of mandibular fracture when removing wisdom teeth, the consequence is significant. It is also very rare to suffer blindness following a Le Fort I osteotomy but it is a rare and recognized complication of which it is mandatory to inform patients.

Consent for anaesthesia should be obtained by the anaesthetist, who is the only person in a posi- tion to carry out this particular intervention.

## Medical notes

It is worthwhile remembering that legible repro- ducible medical notes are a legal requirement in the management of all patients. Notes should be accurate and complete, dated and timed with an identifiable signature. If your signature is illegible your name should be printed beside it. These notes should be made at the same time or immediately after consulting with the patient and not inserted after the fact. Language should be professional and noncontentious. All efforts should be made to keep the writing legible, and a minimum number of abbreviations and acronyms should be used. Do not write R or L for right and left. Avoid 'personal' acronyms – no one is going to be very impressed if you have to explain in court what KTBO (kick the bugger out) stands for.

If a patient takes a surgeon to court in Germany for malpractice, the prosecuting side must prove that the doctor has made a mistake. If the court finds that the doctor made a severe mistake, the burden of proof is turned upside down. Now the doctor has to prove that he did not make a mistake and worked according to national medical stan- dards. Statistical reports from the association of lawyers in Germany show that in more than 50% of the cases in which doctors are sued, the underly- ing cause is insufficient documentation.

Once the decision has been made to operate, the environment has been prepared and the patient has been informed and has consented, a surgical plan

needs to be formulated. The first step is to indicate on which side or in which quadrant of the mouth you intend to operate. This is done either by mark- ing the patient in indelible ink for surgery to be performed under general anaesthesia or by mak- ing absolutely clear which area you are operating on for this particular patient. Imaging in the form of plain radiographs, computed tomography scans, ultrasound scans or magnetic

resonance imaging, used to localize pathology or assess their extent, should be available during the operation.

## Patient preparation

Most hospitals have a series of guidelines issued by the radiology and anaesthetic departments on the minimum acceptable investigations for surgery. Practically nowhere is it regarded as acceptable to take routine preoperative chest radiographs, and most radiology departments have specific indica- tions for a chest radiograph such as recent acute chest disease, risk of metastases or pathology spe- cific to the chest. Conversely, many hospitals expect any patient who is more than 50 or 55 years old to have an electrocardiogram (ECG) because this is regarded as a useful noninvasive and inexpensive test. The most useful thing you can do is be familiar with your own hospital's protocols and stick to them. If you can work out the justifications for these proto- cols you will find that you quite quickly understand the reasons for being efficient and thoughtful about preoperative investigations. Preoperative investiga- tion is covered in more detail in Chapter 5.

Preparing a patient for surgery obviously varies widely depending on whether the patient is going to have surgery under local anaesthesia in an out- patient setting, surgery under local anaesthesia with or without sedation in an inpatient setting or surgery under general anaesthesia, which will be in some form of hospital setting either in a day unit or as an inpatient.

A useful way of thinking about how to prepare each individual patient is to walk through in your own head what is likely to happen to the patient. For example, if the patient is a healthy young adult coming in to have a third molar removed under local anaesthesia then the patient will simply be able to walk in, give consent, sit down in the chair, be put into a comfortable position (more of this

in a minute), be deemed suitable for anaesthesia, have the surgery, recover from the surgery for a few minutes and leave. In that case all you need to do is have an area where the patient can sign con- sent, sit down in comfort and undergo surgery. At the other extreme, if the patient has spinal

injuries and must be transferred from one ward where the staff members are not used to sending patients to an operating theatre some distance away for sali- vary gland surgery, then there is a whole series of steps that, if you do not think them through, will create massive problems for all concerned. For example, a patient with spinal injuries presents a handling problem; the nurses on the ward may be aware of this but the staff in theatre may not. The operating theatre staff must be informed and be in a position to make appropriate arrangements to move the patient safely from a trolley onto an operating theatre table into a safe and comfort- able position. The type of surgery the patient is going to undergo may require modifications to the anaesthetic regimen. Therefore the anaesthe- tists need to be aware of the specific operation to be carried out and the type of patient, to allow them to decide what sort of anaesthetic modifica- tion they will have to make. A patient such as this may well have other underlying medical problems and is going to need a reasonable range of inves- tigations (e.g. an ECG) and a range of biochemi- cal tests (e.g. urea and electrolytes) at the very least. Because the patient is going to be immobile before, during and after surgery, he or she may well require some form of prophylaxis against deep venous thrombosis.

It is only by thinking about each individual patient separately and working through in your head the kind of steps that will be involved in the surgery that you can adequately prepare the patient. There is little point in using some form of blanket checklist for every patient because it will be overkill for many patients and inadequate for some. The lesson to learn here is to think it through for each individual patient. Even if it does take a little longer it will save you time in the long run.

As part of an effort to avoid surgical errors the World Health Organization has devised a surgi- cal checklist that has been adopted in many guises throughout the world. This checklist basically fol- lows the concepts outlined earlier, with named individuals taking responsibility for each step of the patient's journey from leaving the ward to the anaesthetic room through surgery and back.

FURTHER READING

British Medical Association. *Consent tool kit,* 2001: www.bma.org.uk

*This is a source of definitive information.*

Deitch EA. *Tools of the trade and rules of the road: a surgical guide.* Philadelphia: Lippincott- Raven, 1997.

*This is a fascinating little book full of quirky facts and a sound surgical philosophy.*

General Medical Council. *Good medical practice,* 2013: www.gmc-uk.org

*This website contains comprehensive guidance and includes an understanding that patients and doctors are making decisions together.*

*World Health Organization. World Health Organization surgical checklist,* 2009: www. who.int.

*This list aims to improve the safety of surgical care around the world.*

## New pedagogical technologies used on given employment: «the Handle on the table middle»

METHOD USE

«THE HANDLE ON THE TABLE MIDDLE»

The method provides joint activity and active participation in employment of each student, the teacher works with all group.

For work it is necessary:

1. The Questions which have been unpacked on single sheets.
2. Blank leaves of a paper, the handle.
3. The Working writing-book.

Work course:

1. All students of group share a toss-up on 3 subgroups on 4 students in everyone.

2. Each subgroup sits down a separate table, prepares a blank leaf of a paper and the handle.

3. On sheet date, number, groups, faculty, ФИ students-participants of the given subgroup (the name of business game) is written.

4. The task Is offered: to answer one concrete question to all subgroup.

5. Each student writes down the surname and one variant of the answer on sheet and transfers sheet to the neighbour, and the handle moves on the table middle.

6. The Teacher supervises work of group and participation in it everyone. The general correct variant registers in a writing-book.

7. The Students, which distances correct variants of answers, get the maximum point - 100 %, from a rating of a theoretical part - 0,8. The students who have occupied 2 place - 85,9 % of a rating; the occupied 3 place - 70,9 ratings. On answered or answered incorrectly - 0.

8. On sheet of answers the teacher puts a point and the signature.

9. The point got by students is considered at estimation exhibiting for current employment.

10. In the bottom free part of magazine the mark about carrying out of the given business game becomes, the head appends the signature.

11. Works of students remain the teacher.

## QUESTIONS FOR GAME CARRYING OUT: «THE HANDLE ON THE TABLE MIDDLE»

1. The Organization of the polyclinic surgical dental help to the population.

2. The Premise of surgical branch (office).

3. Equipment surgical (office) branch.

4. Regular specifications of the budgetary medical organizations.

5. The Organization of work and medical work in surgical branch (office).

6. The Organization of work of a surgical dental hospital.

7. Conducting the medical documentation.

8. Aseptic, antiseptics.

6.2. An analytical part

Situational problems:

1. At survey of surgical stomatologic polyclinic it was revealed that it is developed in the adapted premise. Walls of offices are covered on l of length by wall-paper, second half and a ceiling are whitewashed, a floor wooden, the ceiling is whitewashed, the room for sterilization of tools 5м2, is not present a bactericidal lamp.

1. You have found out what infringements of the sanitary code of the device of polyclinic?

2. How you would organize devices of offices?

2. The staff nurse before the operation beginning has covered a sterile table on which the table most part has taken away for a material, and smaller - for toolkit.

1. Whether the staff nurse has correctly covered a table?

2. How correctly it is necessary to cover a table?

The answer: 1. incorrectly.

2. The most part is taken away to toolkit, smaller - to a material.

3. In stomatologic polyclinic 3 staff of the surgeon-stomatologist is allocated. Work of a surgical office where 2 armchairs are developed, is organized in 2 changes. Considering the big stream of patients in the morning in the first change 2 doctors of the higher and first category, one medical sister and санитарка work, in the second change the stream of patients less and works one doctor who has finished clinical internship one year ago, one medical sister without санитарки.

1. Whether arrangement of the medical personnel on work changes is correctly organized?

2. Whether the list of staff provided by the order of Ministry of Health is sustained?

The answer: 1. incorrectly.

2. Staff of staff nurses is established from calculation one post of the staff nurse on each post of the doctor-surgeon. Staff санитарок is established from calculation one post on each post of the doctor.

6.3. A practical part

In a practical part of employment after theme discussion acquaintance of students with polyclinic and a hospital of surgical stomatology is spent. Show equipment of an office, the operational block, stomatologic equipment and toolkit.

The attention to illumination of offices (natural and additional), the area, coloring of walls, ceilings, doors and windows, a floor covering is paid. Acquaint with other premises - a premise for expectation of patients, preoperative, operational, sterilising.

Also it is shown, how the medical documentation in polyclinic and clinic of surgical stomatology is conducted.

Analyzing the obtained data, the student independently defines correctness of observance of the sanitary code.

7. Forms of control of knowledge, skills and abilities

- The oral;
- The written;
- Testing;
- The decision of situational problems;
- Demonstration of the mastered practical skills.

In the end of employment discussion of completeness of theoretical knowledge of students of correctness of carrying out of stages anesthesia, interpretation of the situational problems admitted thus of errors by each of students is spent.

**2. Methods of local anesthesia in dentistry and their classification. Local anesthetics, and drugs that have prolonged the properties. The anatomy of the trigeminal nerve. Innervation zone I and II of the branches of the trigeminal nerve. Methods of conductive and infiltration anesthesia.**

**Chronological map of classes**
**(on classes in the clinic)**

| **Time** | **Stages of training** | **Forms of training** | **Duration in minutes. _____min** |
|---|---|---|---|
| _____ | Parenthesis of the teacher (theme substantiation) | | - |
| _____ | Discussion of homework | The survey, an explanation | |
| _____ | Inspection of the patient in a hospital | | |
| _____ | Improvement of practical skills, work with the dummy, clinical and laboratory equipment, apparatus | Working with clinical and laboratory equipment | |
| _____ | Discussion of a practical part of training | The survey, an explanation | |
| _____ | Discussion of a theme of training, the abstract report, seminar, discussion | Abstract messages, seminars, discussions | |

| | | | |
|---|---|---|---|
| ____ __ | Working in a group. Demonstration videos on the topic, analysis of situational tasks, computer software, business games, etc. | The demonstration, interactive forms, active and passive | |
| ____ __ | The conclusion of the teacher on the given trining. An estimation of knowledge of students on 100 ball system and its announcement. Giving of the task to students on following classes (the complete set of questions) | Information, questions for self-training | |

Aim

4.To gain a basic understanding of psychological (behaviour management) and pharmacologi- cal approaches to pain and anxiety control.

Learning outcomes

For undergraduates:

5.To be able to describe appropriate techniques for analgesia, sedation and anaesthesia for individuals.

6.To be able to describe common complications of analgesia, sedation and anaesthesia.

For postgraduates:

7.To be able to discuss the common techniques for analgesia and sedation.

- To be able to prescribe appropriate analge- sia for individuals and recognize potential complications.
- To be able to select appropriately patients requiring local analgesia, sedation, a combi- nation of the two or general anaesthesia.

Any patient who attends a healthcare worker is subjected to some form of behaviour man- agement. This is commonly in the form of compassion regarding the patient's problems and a listening ear.

Other techniques include 'tell, show, do' and positive reinforcement. Although mainly used with children, this approach helps to reduce anxiety and builds trust.

Anxiety is an inevitable and probably appro- priate response to surgery. Pain is an inevitable response to surgery, and the purpose of pain is to warn the body of damage. Pain has been defined as 'an unpleasant experience associated with actual



or potential tissue damage'. It is evident that pain and anxiety are inextricably linked. Anxiety exac- erbates the sensation of pain and can promote pain even in the absence of organic stimulus.

There is no single nerve pathway that is devoted exclusively to pain. The peripheral and central pathways of the nervous system associated with pain are complex and heavily influenced by the cerebral cortex.

Most types of dental pain arise as a result of infection or damage to tissue.

The emphasis in this chapter is on how to man- age pain. A primary consideration is recognizing that your patient is in pain. Patients who present with extreme anxiety and who describe pains that have no true anatomical or physiological character- istics can be extremely challenging. In such cases it is important to acknowledge that the patient has pain, whether or not an organic cause can be iden- tified. The primary consideration with this kind of patient is to control the pain in the first instance. Patients who are in pain may range from postop- erative patients who have been given inadequate analgesia to those who have breakthrough pain despite what would usually be adequate analgesia. In these instances it is often worthwhile resorting to combination analgesics.

Patients with localized or surgical pain can often be helped by deposition of local analgesia or by splinting.

Other patients may attend with very specific pain. Symptoms such as lancinating pain (com- monly referred to as an ‘electric shock’ sensation) originating from a specific sensory nerve are characteristic of trigeminal neuralgia. In this instance both diagnosis and adequate therapy can be achieved by starting carbamazepine. For less typical cases it is worth noting that an alternative, pregabalin, has anxiety-reducing properties.

Patients who attend with bizarre or atypical pain, or long-standing chronic pain, may be helped by a combination of analgesia and antidepressants. If antidepressant use is being considered, it is well worthwhile spending time ascertaining whether the patient has problems with sleeping, in which case a sedative antidepressant taken at night is often helpful. Alternatively if somnolence is a concern, a rela- tively stimulating antidepressant such as a selective serotonin reuptake inhibitor is of greater advantage.

## Local anaesthesia

Local anaesthesia is defined as ‘a loss of sensation in a specific area of the body by a depression of excitation in nerve endings’.

Surgery performed using local anaesthesia has a number of advantages:

- Minor treatment or investigation can be offered immediately. Many simple procedures can be carried out using local anaesthesia (e.g. biopsy, exodontia, scar revision).
- It avoids admission or fasting (especially for children and medically compromised patients).
- Local anaesthesia is often safer (in appropri- ate doses, and sometimes general anaesthesia is actually safer).
- It is more cost effective than admission and general anaesthesia.
- In experienced hands, the block can be easily and quickly performed.
- With the addition of a vasoconstrictor in the local anaesthetic solution, surgical bleeding is reduced.

- Uses can be diagnostic and therapeutic – nerve blocks can be used as a diagnostic test for trigeminal neuralgia or pain thought to be caused by nerve irritation (e.g. neuroma).

The ability to produce effective local anaesthesia in the head and neck, especially the mouth, is an essential skill in oral and maxillofacial surgery. In experienced hands, extensive areas of anaesthesia are possible – almost anywhere in the face, neck, scalp and oral cavity can be effectively anaesthe- tized. Various techniques can be used, extending from minimally invasive topical anaesthesia to nerve block techniques in which local anaesthetic is placed at sites where large nerve trunks emerge from foramina. When necessary, local anaesthesia may be supplemented with sedation. This is par- ticularly useful in anxious patients or in children. However, it must be remembered that sedation in itself is not a substitute for good local anaesthetic technique – a good working knowledge of anatomy, an adequate dose of local anaesthetic drug, knowl- edge of drug doses and onset times, and, impor- tantly, patient cooperation are needed. The reward of good technique is good surgical anaesthesia.

Beginning with the technique that requires the least skill, *topical* application allows a local anaes- thetic to be absorbed through the skin and mucosa, thus rendering them insensate to further needling.

*Infiltration* refers to the injection of local anaes- thetic close to the area and sometimes through traumatic wound edges, which may be less painful – by diffusion, the sensory nerves are anaesthetized. Anaesthetizing a peripheral nerve at its most practically reached proximal point results in sen- sory and sometimes motor block. This is referred to as a *nerve block* (also called a *field block*). Another use of field blocks is the treatment of some types of chronic pain, in which longer-acting local anaes- thetic agents are used. (Detailed description of commonly performed dentoalveolar blocks is pro-

vided in this chapter.)

With appropriate case selection and good tech- nique the need for admission and general anaes- thesia for many minor and intermediate operations can often be avoided. There is a caveat when chil- dren, confused patients and psychiatrically unwell patients are being considered for local anaesthetic techniques – good patient understanding and cooperation can mean the difference between a successful and a potentially disastrous outcome.

## Local anaesthetic drugs

preparation. Proprietary names are Xylocaine, Lignospan and Lignostab. In the United Kingdom, 2.2 mL of solution is present in den- tal cartridges; each cartridge contains 44 mg of lidocaine.

Uses and routes of administration – infiltration, intraligamentary and regional block anaes- thesia for most patients.

Onset of action – anaesthesia is obtained in 2 to 3 minutes.

Duration of action – the plain/hypobaric solu- tion is classified as short acting, its duration of action being 10 minutes. The addition of adrenaline decreases absorption of local anaesthetic from the area, thereby increasing the duration of action 4- to 10-fold, depending on the route of administration.

Although adrenaline is naturally occurring in the body, the concentration present in local anaes- thetic/vasoconstrictor combinations is supraphysi- ological. Adverse effects of high levels of exogenous adrenaline such as tachycardia, hypertension, arrhythmias and cardiac arrest can occur with intravascular injection, necessitating aspiration during injection techniques, particularly around prominent vessels.

Controversy remains about the use of adrenaline- containing local anaesthesia in cardiac patients.

Risk/benefit considerations are important – if poor

## Classification

1. Chemically – the local anaesthetic agents are either amides or esters.

2.Duration of action – they may be described as short-, intermediate- or long-acting agents, within each of the foregoing chemical groups.

## Amide local anaesthetics

- Lidocaine (new internationally recognized name; previously lignocaine)

This is the most commonly used local anaesthetic drug in the United Kingdom.

Presentation – available in dental local anaes- thetic cartridges as a plain 2% solution or with 1:80 000 adrenaline. The 2% with 1:80 000 adrenaline is the most commonly used

general health precludes general anaesthesia, a procedure using local anaesthesia may be the only alternative, and a lidocaine/adrenaline preparation remains the most effective.

### *Doses*

For *plain* lidocaine – maximum recommended dose is 3 mg/kg (per kg doses refer to the patient's body weight).

For lidocaine and a vasoconstrictor – inclusion of 1:80 000 adrenaline increases the maximum dose to 7 mg/kg.

- Prilocaine

This is an amide local anaesthetic, as potent as lidocaine, but less toxic. Prilocaine is more rapidly metabolized than lidocaine; this may explain its clinical impression as a less effective local anaesthetic. One of its



metabolites, in excessive amounts, may cause methaemoglobinaemia.

Presentation – available as plain 4% prilocaine or as 3% prilocaine with 0.03 IU/mL felypressin. In the United Kingdom, the solution with felypressin is the usual alternative to lidocaine with adrenaline. Proprietary name – Citanest. Uses and routes of administration – most effective when infiltrated or as a regional block.

Onset of action – comparable to that of lidocaine. Duration of action – 1.5 times that of lidocaine.

*Doses*

The maximum recommended dose is 6 mg/kg (8 mg/kg with felypressin).

- Bupivacaine (proprietary name – Marcain) This long-lasting local anaesthetic is not supplied in dental local anaesthetic cartridges in the United Kingdom. (Its stereoisomer, levobupivacaine, is available as Chirocaine. The properties of levobupivacaine are similar to those of Bupivacaine, but with less cardiotoxic potential at higher doses.)

Presentation – available in concentrations of 0.25%, 0.5% and 0.75%. The 0.25% and 0.5%

are available with or without 1:200 000 adrenaline. Because of its high degree of protein binding, the duration of bupivacaine is not significantly enhanced with the addition of a vasoconstrictor.

Uses and routes of administration – topically and via infiltration, Bupivacaine is useful for postoperative pain control. It can be delivered using an epidural catheter and filter as a wound irrigant to reduce pain from flap and graft donor sites.

Onset of action – peak effect is achieved in 10 to 15 minutes.

Duration of action – 5 to 10 hours, depending on the route of administration.

*Dose*

The maximum dose is 2 mg/kg, with or without a vasoconstrictor (Figure 4.1).

Other amides include mepivacaine, etidocaine, and articaine. Articaine is interesting in that it is thought to have the ability to diffuse effectively into bone. It has been suggested that palatal anaesthesia may be achieved following maxillary buccal infil- tration and that pulpal anaesthesia is possible after infiltrations in the mandible; the evidence for this is inconclusive.

### Ester local anaesthetics

- Benzocaine

Most commonly used in lozenges and topical preparations, it has poor water solubility and is not injectable.

- Procaine

This is no longer available in the United Kingdom in dental cartridge form. Its only use is when there is a proven allergy to amide local anaesthetics (which is very rare, if indeed it exists). Procaine provides very short-lived pulpal anaesthesia lasting 5 minutes and is therefore not very useful clinically.

- Cocaine

This produces vasoconstriction and is avail- able as a topical preparation usually used to anaesthetize the nasal mucosa. It is sometimes used topically during nasoendotracheal intu- bations or before packing a nose to treat epi- staxis. The vasoconstrictive effect is the reason habitual recreational use of this drug can lead to septal ischaemic necrosis.

## Local anaesthetic techniques

### Topical

Anaesthetic agents for topical use are supplied as gels, sprays or ointments.

*Intraoral use*

- The most common agents used intraorally are lidocaine and benzocaine. Lidocaine is avail- able as a 10% spray (Xylocaine spray) and a 5% ointment (Figure 4.2).

- Benzocaine is normally used as a 20% gel. Different flavours are added to this, to make it popular among children (Figure 4.3).
- These topical anaesthetics penetrate nonke- ratinized tissues (reflected mucosa) very well and anaesthetize to a depth of 2 to 3 mm.
- The anaesthetic should be applied for 2 min- utes to give maximum effect.

*Cutaneous use*

- Topical anaesthetics for skin have been devel- oped that penetrate highly keratinized tis- sues. This is useful before venipuncture or for superficial soft tissue manipulation.
- Preparations include EMLA cream (this is an acronym: Eutectic Mixture of Local Anaesthetics), which is a mixture of lidocaine and prilocaine, and Ametop, which is ametho- caine based.

**Figure 4.2** Lidocaine (Xylocaine) 5% ointment. **Figure 4.3** Benzocaine 20% gel. Walterberry flavour.

- Both preparations are applied to skin and are covered with a dressing left in place for 1 hour before the procedure (e.g. cannulation) (Figures 4.4 and 4.5).

## Injection techniques

A good working knowledge of anatomy is essential. Bone is porous in the maxilla; therefore, infiltra- tion techniques are effective for pulpal anaesthesia. Mandibular bone is denser, infiltration is less effec- tive and regional blocks are needed. The needle, dental local anaesthetic cartridge

and syringe are the three components needed to deliver conven- tional dentoalveolar local anaesthesia.

Needles are supplied presterilized and are single use only. Commonly, two lengths are used (short and long), and they are of a very narrow diameter (Figure 4.6).

Cartridges are prefilled by manufacturers and are sterile. Syringes are usually nondisposable and are sterilized in an autoclave between patients.

Any needle and syringe combination can be used to deliver local anaesthesia, but if using a con- ventional needle/syringe combination, remember


**Figure 4.4** EMLA cream.

**Figure 4.5** EMLA cream applied to skin.

**Figure 4.6** Dental local anaesthetic cartridges and needles.

to aspirate and remember to use a Luer-lock sys- tem because the pressure exerted can often blow the needle off the syringe.

Common techniques include the following:

3.**Insisual anesthesia. All methods of mandibular anesthesia.**

4.**Chronological map of classes**

**(on classes in the clinic)**

| **Time** | **Stages of training** | **Forms of training** | **Duration in minutes. _____min** |
|---|---|---|---|
| _____ __ | Parenthesis of the teacher (theme substantiation) | | - |
| _____ __ | Discussion of homework | The survey, an explanation | |
| _____ __ | Inspection of the patient in a hospital | | |
| _____ __ | Improvement of practical skills, work with the dummy, clinical and laboratory equipment, apparatus | Working with clinical and laboratory equipment | |
| _____ __ | Discussion of a practical part of training | The survey, an explanation | |
| _____ __ | Discussion of a theme of training, the abstract report, seminar, discussion | Abstract messages, seminars, discussions | |
| _____ __ | Working in a group. Demonstration videos on the topic, analysis of situational tasks, computer software, business games, etc. | The demonstration, interactive forms, active and passive | |

| | | | |
|---|---|---|---|
| ____ __ | The conclusion of the teacher on the given trining. An estimation of knowledge of students on 100 ball system and its announcement. Giving of the task to students on following classes (the complete set of questions) | Information, questions for self-training | |

*Infraorbital nerve block* The infraorbital nerve passes along the floor of the orbit and emerges into the cheek about 1 cm below the deepest margin of the orbital rim. This can be infiltrated either directly through the over- lying skin or intraorally by lifting the upper lip and injecting in to the depth of the buccal sulcus between the canine and premolar teeth. This block provides anaesthesia to most of the cheek and the side of the nose on the injected side.

*Posterior superior alveolar block*

This block is rarely needed. The needle is inserted distal to the maxillary second molar and is advanced inward and backward for about 2 cm. Local anaesthetic is deposited above the tuberosity.

*Sublingual nerve block*

The anterior extension of the lingual nerve can be blocked by placing the needle just submucosally lingual to the premolars.

*Intraligamentary analgesia*

Individual teeth may be rendered pain free by injecting local anaesthetic directly into the peri- odontal membrane by using small amounts of local anaesthetic. A specific high-pressure cartridge sys- tem is available for this purpose (Figure 4.12).

*Infiltration anaesthesia*

The aim is to deposit local anaesthetic supra- periosteally, as close to the apex of the tooth to be anaesthetized as possible. The lip or cheek is reflected to place the mucosa under tension, and the needle is inserted along the long axis of the tooth and is aimed toward bone. Local anaesthetic is injected slowly (Figure 4.13).

### *Palatal infiltrations*

These infiltrations are needed when manipu- lating palatal soft tissue and bone (e.g. during extractions). The palatal mucosa is penetrated directly, and small amounts of local anaesthetic are deposited under force. This is uncomfortable, so the patient should be warned. The discomfort can be minimized by using topical anaesthetic, or infiltrating buccally, then into interdental papillae, then the palatal attached gingivae, thus gradually expanding the area of anaesthesia (Figure 4.14).

**Figure 4.12** Direct intraligamentary injection using a conventional needle and cartridge syringe; specific intraligamentary syringe systems also exist.

**Figure 4.13** Example of local infiltration around the upper molars.

## Complications of local anaesthesia

Fortunately, the most common complications are minor. These include the following:

- **Incorrect placement,** resulting in inadequate anaesthesia – this is most likely the result of poor technique, and it tends to occur with

**Figure 4.14** Example of palatal injection.

inexperienced operators. It is more likely with regional blocks. To overcome this problem, technique needs to be improved or an alterna- tive method of local anaesthesia sought. IDN blocks can be given either directly or via the Gow-Gates/Akinosi technique.

- Injection of local anaesthetic within the parotid fascia (e.g. caused by incorrect dis- tal placement of the needle tip, thus allow- ing local anaesthetic to permeate the parotid gland) can result in **temporary facial nerve**

**paralysis.** An eye patch may be required until

normal eyelid closure returns.

- **Visual disturbances** – temporary blind- ness in one eye has been reported following local anaesthesia. This is likely to result from accidental intravascular injection. The local anaesthetic is thought to reach the ophthalmic artery and cause temporary loss of function of the optic nerve.
- **Diplopia** has also been reported, probably

from accidental intravascular injection with loss of motor function to the extraocular muscles.

- **Muscle injury** (e.g. medial pterygoid during

inferior alveolar nerve injection) can result in muscle spasm (trismus). Usually this is caused by haematoma that resolves spontaneously, but it may require antibiotics and gradual stretching of the muscle. This stretching can be achieved by placing a gradually increasing number of wooden spatulas between the inci- sors or using a ‘trismus screw’.

- **Needle tract infection** – this is surprisingly rare.
- **Postinjection problems** – it is important to tell the patient to avoid smoking, drinking hot liquids or biting the lip or cheek until sensation is fully returned, to prevent self-traumatizing of the mouth.
- Adjacent vessels may be punctured, resulting in a local **haematoma.** In the majority of cases this is not a serious problem, but beware in patients who are anticoagulated or have bleeding disorders.
- Rapid injection, especially into tight tissues, is **painful.**
- Local anaesthetic should not be injected into inflamed or infected tissues. The altered pH in this environment inactivates the local anaesthetic and results in block failure, and there is a risk of direct spread of infection.

## Management of failed local anaesthetic block

Find the cause of the failure, and treat it! Possibilities may include the following:

- **Incorrect placement** – this is described in the previous list.
- **Inadequate volume of local anaesthetic** – however, if the placement is correct, more volume should not improve the block!
- **Impatience** – know the onset time of the local anaesthetic agent, and allow enough time for the drug to take effect.
- **Anatomical variation** – the nerve trunk may be in an unusual position. If this is a suspected reason, infiltrate more widely.
- **Accessory or aberrant nerve supply** – find it and block it.
- **Inability of local anaesthetic during infiltrations to reach the area** – this is usually the result of dense cortical bone. Counteract by using intraligamentary or regional local anaesthesia.
- **Patient understanding** – the importance of choosing patients correctly cannot be overestimated. Some pressure sensation may be felt, and this must be distinguished from pain.
- **Presence of infection** – infection at or around the site is strictly a contraindication to injection of a local block. Do not expect the block to be effective under these tissue conditions.

**Major** complications include the following:

- Injection of local anaesthetic directly into the venous circulation results in rapid onset of



toxic symptoms. These can range from light- headedness and dizziness to confusion. In severe cases, seizures and cardiorespiratory arrest may follow. (In the case of bupivacaine toxicity, cardiac arrest may be refractory to all attempts at cardiopulmonary resuscitation.)

- Inadvertent intra-arterial injection – local anaesthetic entering the internal carotid artery (via the external carotid artery) is directly delivered to the brain, with dire consequences.

'Self-aspirating' syringes commonly used in dental practice may indicate that the needle is in a blood vessel – Unfortunately, this technique is not foolproof. Nonaspirating syringes (sometimes used in theatre) must be manually aspirated.

Rarely hypersensitivity may occur to preser- vatives in local anaesthetic preparation – This accounts for virtually all allergic reactions to local anaesthetic agents. Fainting on receiving a local anaesthetic is *not* an allergic response, but it must clearly be distinguished from a seizure.

## Sedation

Sedation is not a substitute for effective local anaesthesia. If local anaesthesia is inadequate, the patient will still experience pain and may become extremely agitated. Patients do not need to be starved before sedation (although a heavy meal is inadvisable), and any routine medication should be taken as normal. Patients must have an escort to take them home and look after them for 24 hours. Informed consent both for sedation and surgery is required, preferably written.

Sedation can be given in three ways.

### Inhalational sedation

This is a relatively safe form of sedation used in dentistry although it has little role to play in more extensive surgery. It is particularly useful in chil- dren and can be helpful in quick procedures such as reduction of a dislocated mandible.

A variable percentage mix of nitrous oxide ($N_2O$) mixed with oxygen ($O_2$) is used for this technique. $N_2O$ is an extremely potent analge- sic, rapidly taken up and excreted by the lungs.

The $N_2O/O_2$ mix has both sedative and analgesic

effects. The drug is not metabolized within the

The UK General Dental Council (GDC, 1999) defines conscious sedation as follows:

A technique in which the use of a drug or drugs produces a state of depression of the cen- tral 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 con- scious sedation for dental treatment should carry a margin of safety wide enough to ren- der loss of consciousness unlikely.

The level of sedation must be such that the patient remains conscious, retains protective reflexes and is able to understand and respond to ver- bal commands.

Sedation is a useful technique in anxious patients, children and in those undergoing more lengthy procedures. Patients often experience a sense of disorientation or detachment and may describe the experience as similar to being mildly drunk. In some it can induce sexual fantasies and a chaperone is essential.

body to any significant extent, thus adding to its safety. This technique does not involve the use of injections, and this may be an important factor for some patients.

Note that the terms ‘relative analgesia’ and ‘inha- lational sedation’ both refer to $N_2O/O_2$ inhaled techniques. Relative analgesia involves titrating

the $N_2O$, dose whereas inhalational sedation uses a fixed dose of $N_2O$. Both have a fixed minimum inhaled dose of 30% $O_2$.

The mix of $N_2O/O_2$ is used as an adjunct to a local anaesthetic technique and is in no way meant to be used as the sole analgesic. With correct patient selection, adequate local anaesthetic use, combined with reassurance, many dental proce- dures may be accomplished.

Following administration, patients make a quick recovery with no lasting effects.

Historically, when using $N_2O$ sedation, long- term exposure was thought to lead to vitamin $B_{12}$ depletion and subacute degeneration of the spinal cord. With modern scavenging systems, extensive research has not found this to be a major concern. An additional concern is the potential for abuse of

$N_2O$ by staff for recreational purposes; this should be actively guarded against.

## Oral sedation

This is useful in mildly anxious patients and can be administered at home before the appointment. The advantage is acceptability to both patient and surgeon. However, it is essential that monitoring be used during any procedure if the patient has had oral sedation (Figure 4.15).

The disadvantage is that the surgeon has to rely on a compliant patient to self-administer the medi- cation before coming to surgery, within an allotted period of time, for the sedative to be of benefit. This does require a motivated, cooperative patient.

Drugs administered orally take 30 to 60 minutes for any clinical effect to be seen. The dose required to produce sedation is unpredictable, and absorp- tion of drugs from the gastrointestinal tract is also variable. The effects are therefore variable in depth and duration.

There is the potential for complications should multiple doses be administered outside of a moni- tored environment. It is the responsibility

of the prescriber to ensure that all the rules and regula- tions relating to sedation are applied and strictly followed.

Diazepam is fairly rapidly absorbed from the gut. As a guide, a dose between 0.1 and 0.25 mg/kg of body weight will produce sedation.

Temazepam may be used, 10 to 20 mg 1 hour before treatment.

### Intravenous sedation

In the United Kingdom the only recommended intravenous sedation method is the 'single injec- tion of a single drug'. In this country the admin- istration of multiple drugs should be carried out only by fully trained anaesthetists and in a hospi- tal setting, with full monitoring and resuscitation equipment available.

The 'single drug' in question is a benzodiazepine, usually midazolam. The advantages of the benzo- diazepines are anterograde amnesia, anxiolysis and a degree of muscle relaxation. Midazolam has a wide margin of safety and is particularly suited to outpatient sedation. It causes minimal respira- tory depression, although as patients relax they will often 'forget' to breathe – vigilance is required. Doses of midazolam for any individual patient are difficult to predict. Most patients reach an adequate degree of sedation with 10 mg or less. Bear in mind that the onset time may be delayed in elderly patients because of a slowed circulationti me; patience will avoid inadvertent overdose.

GDC guidelines state that the patient's pulse, respiratory rate and $O_2$ saturation must be moni- tored during the procedure. Noninvasive blood pressure recordings must be made at regular inter- vals, and a defibrillator should be available in the procedure room. All staff involved must be pro- ficient in cardiopulmonary resuscitation in the event of medical emergencies (regulations man- date a 'second appropriate person').

Skills need to be acquired in venipuncture to carry out intravenous sedation (Figures 4.16, 4.17, 4.18, 4.19, 4.20, 4.21 and 4.22).

Flumazenil, a specific benzodiazepine reversal agent, must be available. It rapidly reverses all the effects of the benzodiazepines at a dose of 200 μg intravenously over 15 seconds, followed by 100 μg at 60-

second intervals until reversal occurs. Bear in mind that flumazenil has a shorter dura- tion of action, so multiple doses may be required (Figures 4.23, 4.24 and 4.25).



**Figure 4.16** Equipment for venipuncture.

**Figure 4.17** Application of a tourniquet and veins on the dorsal hand.

**Figure 4.18** Insertion of cannula.

**Figure 4.19** Flashback of blood.

**Figure 4.20** Removal of needle.

**Figure 4.21** Saline flush.

Children may react with the opposite effect; paradoxical stimulation and agitation are well described following intravenous sedation. This method is therefore not recommended in the out- patient paediatric population. Both rectally and orally administered benzodiazepines are popular in paediatric wards for minor procedures such as suture removal.

## Analgesia

Dental procedures can be painful, and a sound knowledge of good analgesic prescribing is essen- tial. The principles are simple: give appropriate drugs, in sufficient dose, on a regular basis, at sufficient time intervals. Where possible, use of smaller doses of a combination of drugs will have


**Figure 4.22** Securing Venflon.

**Figure 4.24** Midazolam and flumazenil.

**Figure 4.23** Saline drawn up for flush.

**Figure 4.25** Patient attempting to touch nose fol- lowing administration of intravenous midazolam.

a synergistic effect, while minimizing side effects. When oral analgesics are combined with effective local anaesthetic techniques, the results can be very rewarding.

There are numerous approaches to this end. The simplest is set out in the World Health Organization analgesic ladder on the next page. Devised by the World Health Organization (WHO), it outlines a systematic approach to pain control that will sat- isfy the needs of the majority of patients.

## Simple analgesics

Simple analgesics (e.g. paracetamol) are useful for mild pain. Minimal side effects at therapeutic doses make this an attractive option. Hepatotoxicity is a problem only at toxic doses. Paracetamol has antipyretic and analgesic properties. It is a useful

analgesic if nonsteroidal anti-inflammatory drugs (NSAIDs) are contraindicated.

## Doses

Adult dose – 1 g every 4 to 6 hours. Maximum daily dose – 4 g.

Paediatrics – dependent on age, consult recent formulary.

## Nonsteroidal anti-inflammatory drugs

NSAIDs (e.g. aspirin, diclofenac, ibuprofen, ketoro- lac) have both anti-inflammatory and analgesic eff cts; therefore, they are useful particularly when inflammation is the primary cause of the pain. Following oral surgical procedures involving the teeth and bones (e.g. wisdom teeth removal, apicec-tomies), NSAIDs can be given orally, i.m. or rectally.

5.**Lower alveolar nerve pain relief. Torusal anesthesia. Mental anesthesia**.

**Chronological map of classes**

**(on classes in the clinic)**

| **Time** | **Stages of training** | **Forms of training** | **Duration in inutes. _____min** |
|---|---|---|---|
| _____ __ | Parenthesis of the teacher (theme substantiation) | | - |
| _____ __ | Discussion of homework | The survey, an explanation | |
| _____ __ | Inspection of the patient in a hospital | | |
| _____ __ | Improvement of practical skills, work with the dummy, clinical and laboratory equipment, apparatus | Working with clinical and laboratory equipment | |
| _____ __ | Discussion of a practical part of training | The survey, an explanation | |
| _____ __ | Discussion of a theme of training, the abstract report, seminar, discussion | Abstract messages, seminars, discussions | |
| _____ __ | Working in a group. Demonstration videos on the topic, analysis of situational tasks, computer software, business games, etc. | The demonstration, interactive forms, active and passive | |

| | | | |
|---|---|---|---|
| ____ __ | The conclusion of the teacher on the given trining. An estimation of knowledge of students on 100 ball system and its announcement. Giving of the task to students on following classes (the complete set of questions) | Information, questions for self-training | |

*Inferior alveolar (inferior dental) nerve block*

Local anaesthetic is placed around the interior alveolar nerve as it enters the mandible at the lin- gula. There are several methods to achieve this:

*Direct method*

- Administration – the patient's mouth must be wide open. The external and internal oblique ridges are palpated; the line of the pterygo-mandibular raphe is noted. With the palpating thumb lying in the retromolar fossa, the nee- dle is inserted slightly above the occlusal plane (lateral to the pterygomandibular raphe). The needle is advanced to make contact with the lingula. Once bony contact is made the needle is withdrawn slightly and local anaesthetic is injected after aspiration.
- This provides anaesthesia for most of the mandibular teeth, although the more anterior teeth usually need additional local infiltration because of contralateral supply and sometimes sensory branches from the mylohyoid nerve (Figure 4.7).

*Gow-Gates technique*

- This method describes the deposition of local anaesthetic close to the head of the condyle. In addition to anaesthetizing the inferior den- tal nerve (IDN), the lingual and long buccal nerves are anaesthetized.

**Figure 4.8** Gow-Gates block.

- Administration – the mouth is wide open. The landmarks are the same as for direct IDN block.
- The needle approaches the puncture point from the opposite corner of the mouth and is slid across the mesiopalatal cusp of the maxil- lary second molar on the side to be injected.
- The point of bony contact is the neck of the condyle.
- Solution is deposited after aspiration.
- Advantage – it uses one injection to block every branch of the mandibular nerve.
- Disadvantage – it requires wide mouth open- ing. There is a risk to the maxillary artery winding behind the condylar neck (Figure 4.8).

*Akinosi method*

- Closed mouth technique – this approach can be advantageous in nervous patients or if the tongue interferes with the direct approach to the IDN. The end point does not rely on bony contact.
- Administration – the tissues of the cheek are retracted with the patient's mouth closed. The needle is advanced at the level of the maxillary mucogingival junction parallel to maxillary occlusal plane.
- The needle is inserted into the retromolar mucosa and advanced until its hub is at the level of the distal aspect of the upper second molar tooth when the anaesthetic is injected after aspiration.

*Indirect method (used in some German universities)*

- With the thumb in the retromolar fossa and the index finger holding the angle of the man- dible, the needle is inserted slightly above the occlusal plane. Then the needle is advanced almost parallel to the lingula from the midline of the mandible.
- Once bony contact at the lingula is made the needle has to be angled behind the lingula where the inferior alveolar nerve enters the bone. This is done by angling the syringe from midline area to the contralateral premolar region.
- The needle is withdrawn slightly and local anaesthetic is injected after aspiration.

*Lingual nerve block*

- The lingual nerve is often anaesthetized at the same time as the inferior alveolar nerve, thus producing anaesthesia to the lining of the floor of the mouth and tongue on that side.
- After deposition of solution at the IDN site, the needle is withdrawn to half its length and local anaesthetic is deposited (Figure 4.9).

*Long buccal nerve block*

This block is achieved by injecting local anaes- thetic posterior and buccal to the last molar tooth (Figure 4.10).

**Figure 4.9** Lingual block.

**Figure 4.10** Infiltration of local anaesthetic in the region of terminal branches of the long buccal nerve.

*Mental nerve block*

The mental nerve is the continuation of the infe- rior alveolar nerve. It leaves the mandible below and between the apices of the first and second pre- molars at the mental foramen and supplies sensa- tion to the lower lip. Local anaesthetic injected in this region diffuses in through the mental foramen and provides anaesthesia to the ipsilateral lower lip, gingivae and teeth. The lip needs to be placed under tension and the needle is inserted parallel to the long axis of the premolars angling toward bone. Local anaesthetic is then injected.

Bilateral blocks can anaesthetize the entire lower lip and are effective for soft tissue anaesthesia and some restorative procedures (Figure 4.11).

**Figure 4.11** Site of injection for mental nerve block.

These drugs are contraindicated in patients with peptic ulcer disease, renal impairment and coagula- tion disorders and in patients who have had a

previ- ous hypersensitivity reaction to aspirin or NSAIDs. A note about asthmatic patients and NSAIDs – These drugs are not absolutely contraindicated in asthma. There is, however, a higher chance of allergy and an increased chance of exacerbation of

asthma symptoms.

Side effects include gastrointestinal upset, bleed- ing, hypersensitivity reactions and wheezing. Use with caution in elderly patients – Long-term use can result in severe gastrointestinal haemorrhage.

Doses

Adult dose – Ibuprofen 400 to 600 mg three times daily. Take with food to reduce chances of gas- trointestinal upset. Maximum daily dose – 2.4 g.

Diclofenac 50 mg three times daily. Take with food. Child dose – dependent on weight, consult recent formulary. Avoid aspirin in children with recent flu-like illness – Potentially lethal

Reye's syndrome may result.

## Minor opioids

Given orally or i.m. They can be given in combina- tion with paracetamol.

Side effects include nausea, constipation and confusion, especially in elderly patients.

## Doses

Codeine – 30 to 60 mg every 4 to 6 hours to a maximum of 240 mg daily.

Tramadol – 50 to 100 mg every 4 to 6 hours; said to be less likely to interfere with pupillary response in head injury.

## Compound analgesic (Co-Codamol [codeine and paracetamol])

This drug is used for mild to moderate pain relief or pyrexia.

## Presentations

**8/500** – 8 mg codeine phosphate, 500 mg paracetamol. (If Co-Codamol is prescribed with no stated strength, this will be dispensed.) Given orally, constipation and rebound 'anal- gesic headache' are the main complications. Adult dose – 1 to 2 tablets every 4 to 6 hours.

Maximum daily – 8 tablets. Child dose – dependent on age.

**30/500** - 30 mg codeine phosphate, 500 mg paracetamol.

Dose – 1 to 2 tablets every 4 hours. Maximum daily – 8 tablets. Not recommended for children.

**60/1000** – 60 mg codeine phosphate, 1 g paracetamol.

Dose – 1 tablet every 4 hours. Maximum daily – 4 tablets.

Opioids (e.g. morphine, diamorphine)

These are the most potent of the analgesics. The opioids are seldom used after office procedures. The role is analgesia in the postoperative period after major surgery.

Routes of administration – Options include oral (Oramorph), i.m., subcutaneous and intravenous administration and patient-controlled analge- sia (PCA). Because of the side effect profile of the opioids, they should be administered only in an inpatient setting, where respiratory monitoring is available.

Side effects – Nausea and vomiting, constipa- tion, sedation, confusion and respiratory depres- sion. Prescription of naloxone, a specific opioid antagonist, and an antiemetic for use alongside the opioid is humane. Consider addition of a laxative, especially in elderly patients or if long-term use is anticipated.

Postoperative pain control

Assessment and measurement of pain

Effective pain management depends on accurate assessment. This can be difficult in children or in patients who cannot speak following surgery. The most reliable indicator of pain is the patient's ver- bal report or a written equivalent.

By far the simplest tools that rely on the patient's report of pain are Visual Analogue Scale and the Verbal Rating Scale.

For more complex assessment, the McGill Pain Questionnaire explores the sensory, affective and evaluative dimensions of pain. It is a self-adminis- tered questionnaire consisting of 21 questions with diagrams for chief pain location and a numerical pain scale.

Assessing pain in children, or in patients with whom we cannot communicate, is particularly difficult. For the paediatric group, several meth- ods are available, depending on each age group. Whereas adolescents can describe their pain in detail, a baby has no such verbal

capacity. Vocal expressions, especially crying, and physiologi- cal measures, such as tachycardia, are said to be reliable indicators of acute pain. Other methods include the Children's Hospital of Eastern Ontario Pain Scale (CHEOPS), the Princess Margaret Hospital Pain Assessment Tool (PMHPAT) and

The King's Healthcare Pain Assessment Tool for

Children (PATCH).

Other pain control techniques Cryotherapy

This is the therapeutic use of extreme cold, achieved by using $N_2O$ or liquid nitrogen to freeze tissues. Cell death and subsequent tissue necrosis result in analgesia.

Intractable or recurrent pain from nerve infil- tration (e.g. malignancy or physiological condi- tions such as trigeminal neuralgia) may be treated by cryotherapy.

The diagnosis must be established beforehand, and this is most easily done by a nerve block. In such cases the nerve (e.g. inferior alveolar, infraor- bital) can then be exposed and frozen.

Procedure

Informed consent must be gained. In particular, patients must be warned of postoperative oedema and ulceration, which may be quite severe.

A local anaesthetic should be used to anaesthe- tize the area, followed by selection of appropriate probe tip. A lubricant jelly (such as KY) should be applied to the area to improve contact between

adjacent teeth (make sure they are not loose first).

This is usually a temporary measure before open reduction and internal fixation of the fractures. This works in the same way that a broken arm is put in a back slab for pain relief. The basic principle is that a broken mobile bone is much more painful than a broken immobile bone.

Adhesive dental materials acid etched onto teeth can aid stabilization of dentoalveolar fractures and reduce pain in the same way.

This technique is thought to work via the ‘gate control’ theory. Rubbing or massaging a painful area, or the application of a small electrical cur- rent to the skin, closes the ‘gate’ at the spinal cord level and prevents pain fibres from conducting impulses to the brain. Transcutaneous electrical nerve stimulation (TENS) and some types of acu- puncture are also thought to promote endogenous opioid release in the brain. In the maxillofacial region this can be effective in postherpetic neu- ralgia and other forms of deep-seated facial pain. TENS is contraindicated in patients with pace- makers and should be avoided over the carotid sinus.

Management of cancer painprobe and tissue. Freeze for 1 minute; thaw for 1

minute is the usual cycle.

During thawing, be careful not to pull the probe from the tissue because this will result in damage to tissue. At least two cycles are used. One may need to overlap ice zones.

Follow up to check symptoms.

The duration of paraesthesia varies, but there is usually an analgesic period after the paraesthesia resolves. If necessary, cryotherapy can be repeated at a later date.

Splinting of fractures

This very simple measure is often forgotten. Displaced, mobile fractures (usually mandibular) should be reduced (after a local anaesthetic has been given) and then immobilized. This can be done simply using a figure-of-eight wire around the

Cancer can cause a variety of pain syndromes. However, most of these respond to drug therapy. The WHO analgesic ladder (see the previous box) is a useful guide. This is a step-by-step approach that is effective in the majority of cases. Patients are started on a nonopioid analgesic such as an NSAID or paracetamol. If the pain persists or increases, a weak opioid such as codeine is commenced, with or without the addition of an NSAID. If this

proves to be inadequate a strong opioid is substituted for the weak opioid. 'Adjuvant' treatment includes ste- roids, antidepressants, antiepileptics, some drugs specific for neurogenic pain (e.g. gabapentin, pre- gabalin) and psychological management. The pres- ence of cannabinoid receptors in epithelial cells has produced a potentially useful role for medici- nal cannabis both systemically and topically. The topical preparation (Sativex) is available in the United Kingdom.

This is thought to produce a state of altered con- sciousness and relaxation. Hypnosis is generally believed to be an altered state of consciousness. Sleep is the best-known altered state. The aim of hypnosis is to teach people to cope with the situa- tion to the best of their ability.

It has been suggested that in a hypnotic state, patients do not act against their own consciences and always cooperate voluntarily. Always have a chaperone.

Induction of the hypnotic state can be performed verbally by the surgeon, visually or by the patients themselves. Multiple sessions can prepare patients to autohypnotize or respond to posthypnotic sug- gestion by using key words or procedures.

Acupuncture

Traditionally acupuncture is a holistic approach to the management of disease as well as maintenance of health. It involves insertion of needles into vari- ous parts of the body and should be regarded as a supplement to conventional treatment.

It has value in control of postoperative pain and in the management of myofascial pain dys- function and facial pain. Its value as a sole anal- gesic for operative treatment is questionable; however, it may play a role in reducing anxiety preoperatively.

The United Kingdom and German-speaking countries are fairly similar in this area. The United States is a little different.

North America

The routine use of office-based, surgeon-adminis- tered sedation and anaesthesia is perhaps the most noticeable practice difference in North America compared with the rest of the world.

Oral and maxillofacial surgery trainees in North America spend a significant portion of their training on the anaesthesia service. This is in addition to the other monitoring mentioned in this chapter.

Benzodiazepines in the form of midazolam are the basis of most intravenous anaesthetic tech- niques. This provides anxiolysis and amnesia and also helps to attenuate the 'emergence phenomena' associated with dissociative agents such as ket- amine. In many cases, particularly those patients with medical comorbidities, this may be the only agent used. Other agents used to deepen the seda- tion and anaesthesia include fentanyl, a short- acting opioid (its antagonist, naloxone, must be available for use in the event that the patient is ren- dered apnoeic and requires reversal). Ketamine, a drug that acts on *N*-methyl-d-aspartate receptors to produce a dissociative anaesthetic state and additional analgesia, and propofol, a short-acting intravenous anaesthetic agent, are regularly used. All of these agents depend on the presence of good-quality local anaesthesia for painless sur- gery. They are not a substitute for good local anaesthetic techniques. Most 'rocky' sedations are the consequence of a failure of local anaes- thesia. Before using any of these agents, train- ing is required in advanced airway management, including endotracheal intubation, because sur- gery is being carried out on an unprotected air- way and the drugs may produce a deeper level of sedation than planned, resulting in loss of the air- way and ventilation.

## FURTHER READING

Ghoneum NM, Mewaldt SP. Benzodiazepines and human memory: a review. *Anesthesiology* 1990;72:926–38.

*For those who are in need of details about the psy- choactive effects of these drugs.*

Girdler NM, Hill CM. *Sedation In dentistry.* London: Butterworth-Heinemann, 1998.

*A useful overview.*

Introduction to acupuncture in dentistry. *Br Dent J* 2000;189:136–40.

*Useful basic introduction.*

*Joint Formulary Committee. British national for- mulary. London: Pharmaceutical Press. Number 48 was the first to contain an amalgamated Dental Practitioners' Formulary. Use the most recent edition.*

*Definitive text.*

Meechan JG, Robb ND, Seymour RA. *Pain and anx- iety control for the conscious dental patient.* Oxford: Oxford University Press, 1998.

*Hugely detailed; everything you ever wanted to know.*

Meechan JG, Robb ND. Sedation in dental prac- tice 3: the role of sedation in management of problems with local anaesthesia. *Dent Update* 1997;24:32–5.

*Practical details.*

Mitchell DA, Mitchell L. *Oxford handbook of clinical dentistry,* 6th ed. Oxford: Oxford University Press, 2014.

*Well obviously!*

*Specific literature includes the following:*

Armfield J, Heaton LJ. Management of fear and anxiety in the dental clinic: a review. *Aust Dent J* 2013; 58:390–407.

El-Kholey KE. Infiltration anesthesia for extraction of the mandibular molars. *J Oral Maxillofac Surg,* 2013;10:1658.e1–5.

Facco E, Casiglia E, Masiero S, Tikhonoff V, Giacomello M, Zanette G. Effects of hypnotic focused analgesia on dental pain threshold. *Int J Clin Exp Hypn* 2011;59:454–8.

Haraji A, Rakhshan V, Khamverdi N, Alisahi HK. Effects of intra-alveolar placement of 0.2% chlorhexidine bioadhesive gel on dry socket incidence and postsurgical pain: a double- blind split-mouth randomised controlled clinical trial. *J Orofac Pain* 2013;27; 256–62.

Oni G, Rasko Y, Kenkel J. Topical lidocaine enhanced by laser pretreatment: a safe and effective method of analgesia for facial rejuvenation. *Aesthet Surg J* 2013; 33:854–61.

Passavanti MB, Grella E, Pace MC, Di Gennaro TL, Aurilio C. Tramadol as a local anesthetic: prospects for use in oncological day surgery. *Plast Reconstr Surg* 2013;131:942e.

Whaley MG, Brooks GB. Enhancement of suggest- ibility and imaginative ability with nitrous oxide. *Psychopharmacology* 2009; 203;745–52.

## 5. Local complications arising under local anesthesia Common complications that arise when local anesthesia. . Causes, diagnosis, treatment and prevention.

**Chronological map of classes**
**(on classes in the clinic)**

| Time | Stages of training | Forms of training | Duration in minutes. _____min |
|---|---|---|---|
| _____ __ | Parenthesis of the teacher (theme substantiation) | | - |
| _____ __ | Discussion of homework | The survey, an explanation | |
| _____ __ | Inspection of the patient in a hospital | | |
| _____ __ | Improvement of practical skills, work with the dummy, clinical and laboratory equipment, apparatus | Working with clinical and laboratory equipment | |
| _____ __ | Discussion of a practical part of training | The survey, an explanation | |

| | | | |
|---|---|---|---|
| ____ __ | Discussion of a theme of training, the abstract report, seminar, discussion | Abstract messages, seminars, discussions | |
| ____ __ | Working in a group. Demonstration videos on the topic, analysis of situational tasks, computer software, business games, etc. | The demonstration, interactive forms, active and passive | |
| ____ __ | The conclusion of the teacher on the given trining. An estimation of knowledge of students on 100 ball system and its announcement. Giving of the task to students on following classes (the complete set of questions) | Information, questions for self-training | |

The bleeder

Bleeders can be grouped into two kinds: iatrogenic and congenital. All patients who fall into this cat- egory require an FBC and clotting screen/INR/ APTT/PT, depending on local protocol. The risk is obviously in the perioperative period, when intra- operative or postoperative haemorrhage compli- cates management.

the potential for perioperative haemorrhage.

Congenital coagulation defects

All these defects require consultation with haema- tologists. Despite this, most of these patients are managed using self-delivery of cryoprecipitate and can often be managed essentially the same way as patients without bleeding disorders.

8. **Haemophilia A** (factor VIII deficiency) is the most common congenital clotting defect. It is an X-linked recessive condition, predominantly affecting males, with female carriers. In one-third of cases there is no family his- tory. The disease varies in severity, depending on the level of factor VIII. Characteristically, the patient will initially appear to stop bleeding after a surgical insult but will then start to ooze uncontrollably several hours later.

9. **Christmas disease** is identical in its clinical

presentation to haemophilia A, but is caused by factor IX deficiency. Most patients with haemo- philia can be treated using factor VIII cryoprecipitate with factor IX. Discuss any proposed surgery with the

haematologist, and ensure that adequate prophylactic measures, including the use of clotting factor concentrates and DDAVP, are instituted. Unfortunately, many patients with haemophilia were infected with HIV and hepatitis C before the routine screening of blood and blood products in 1985. Acquired immunodeficiency syndrome (AIDS) is now the most common cause of death in patients with severe haemophilia.

10. **Von Willebrand's disease** is a condition

caused by von Willebrand factor deficiency, leading to defective platelet function. The clin- ical presentation ranges from mild to moder- ate bleeding following surgery or trauma, although it is rarely as severe as in patients with haemophilia. Management is similar to that of mild haemophilia.

Platelet disorders

These disorders result from abnormal platelet *func- tion* (e.g. from aspirin therapy, chronic renal insuf- ficiency and myeloproliferative diseases) or from abnormal platelet *number* (thrombocytopaenia), which may be caused by immune system destruc- tion, bone marrow failure or drugs or may be part of a coagulation syndrome such as disseminated intravascular coagulation and idiopathic throm- bocytopaenic purpura. The results are excessive bruising and purpura, mucosal haemorrhage including epistaxes and postextraction bleeding.

Management must include consultation with haematologists. Assuming normal platelet

function, levels greater than $50 \times 10^9$/l are pref- erable for surgery. Should platelet transfusion be required, this should be performed by the anaes- thetist in the immediate preoperative period. The management of postoperative bleeding includes local measures and the use of tranexamic acid, which is effective as a mouth rinse for intraoral haemorrhage.

The 'deranged' patient

Acute confusion is a common problem, especially in elderly patients. The patient may display con- fusion with decreased responsiveness, agitation, aggression, delusions or hallucinations. The causes are varied – it is important to exclude the most likely by looking for pointers in the history, exami- nation and review of the recent blood results. Some possibilities include the following:

- Hypoxia (check the oxygen saturation with a pulse oximeter).
- Alcohol/drug withdrawal.
- Metabolic upset, particularly hypoglycaemia.
- Hypothermia.
- Infection (urinary tract, chest and wound are likely suspects).
- Drug reaction (even mild opioids such as co-codamol can cause problems in elderly patients).
- Disorientation to unfamiliar surroundings.
- Constipation.
- Acute retention of urine.

As for management, treat the underlying cause! The patient should preferably be nursed in a well- lit side room. Administer facemask oxygen if saturations are reduced. Resist the urge to sedate confused patients without carefully exploring treatable, reversible causes. Attempt to settle the patient with sympathetic nursing care; if that fails, consult with physicians specializing in care of elderly patients.

## Postoperative problems

Abnormal symptoms or signs in the postoperative period may indicate complications. This finding warrants a detailed history, thorough examination and appropriate investigations, not wishful think- ing. The most common problems are outlined here.

- **Pain** – adequate pain control is of paramount importance in the postoperative period (see earlier).
- **Nausea and vomiting** – anaesthetic agents, opioid analgesia, swallowed blood and pain all contribute. Ensure that all patients are prescribed an antiemetic (e.g. cyclizine or ondansetron).
- **Fever** – common causes are basal atelectasis with or without chest infection, wound infec- tion and urinary tract infection. Sputum and blood cultures and midstream urine speci- mens are usual investigations. Usually empir- ical antibiotic treatment is started if there is a likely culprit – prescribe according to the local guidelines until sensitivities are avail- able. Other important causes are DVT and PE, reaction to blood transfusion and drug reactions.
- **Tachycardia** – this is a physiological response to pain and sepsis. In older patients consider heart failure or a dysrhythmia, which may result from myocardial infarction or fluid overload. In the absence of an easily identifi- able cause, an ECG and chest radiograph can aid diagnosis.
- **Hypotension** – in elective maxillofacial surgical patients, this is very rarely caused by excessive blood loss or hypovolaemia. Treatment consists of elevating the foot of the bed and administering i.v. fluids. Always exclude the possibility of myocardial infarc- tion as a cause!
- **Urinary retention** – this exists almost exclu- sively in male patients. The risk increases with age as the prostate hypertrophies, causing a tendency toward urinary outflow obstruction. Prevention is by early mobili- zation and adequate analgesia. Treatment is urinary catheterization.

## Critical care

Patients who undergo major surgery involving the head and neck, especially those with preoperative

cardiorespiratory disease and those in whom surgery compromises the airway, often require a period of intensive monitoring and treatment in the immediate postoperative period. This can be in a high-dependency unit, or, if ventilation is required, in the intensive care unit (these are sometimes referred to as levels 1, 2 and 3, in order of intensity of care, with 3 being highest). Whatever the setting, no amount of monitoring equipment is a substitute for thorough and regular clinical examination by clinicians who know what they are doing.

Monitoring and care of such patients involves the following:

6. Maintenance of the airway – this involves reg- ular humidification and suction if an artificial airway is in place.

7. Oxygenation – all patients require oxygen; the aim is to maintain oxygen saturations at an acceptable level without causing carbon dioxide retention, especially in patients with COPD. Regular clinical examination of the chest, measurements of arterial blood gases and pulse oximetry are the means of moni- toring. Chest physiotherapy is used to help prevent atelectasis (collapse of small airways), which reduces oxygenation and predisposes patients to chest infections.

8. Circulatory support – this maintains a blood pressure adequate to perfuse tissues. A car- diac monitor is used to assess heart rate and rhythm, and invasive (arterial line) or non- invasive (blood pressure cuff) blood pressure monitoring is used. In maxillofacial microvas- cular surgery, circulatory support is mainly achieved with i.v. fluids because there has been controversy over the risks of the vasoconstric- tive effects of inotropes on flaps. This risk has probably been overstated.

9. Fluid balance – this involves monitoring and charting input and output (urinary, fae- cal and insensible losses plus extra losses,

e.g. from haemorrhage, drains, vomiting or sweating), aiming to match input to out- put. This usually requires urinary catheter- ization, especially if the patient is sedated. Regular clinical examination to

determine fluid status is vital; where fluid management is difficult, central venous pressure monitor- ing helps.

- Temperature control – this prevents hypother- mia and maintains tissue perfusion.
- Nutritional support – this should be instituted after several days if prolonged periods of criti- cal care are anticipated. Nasogastric feeding can often be started 24 hours after major head and neck surgery.

Emergencies

An emergency requires urgent management to limit serious morbidity and prevent mortality. By following certain basic principles, it should be pos- sible to manage any emergency regardless of the cause until expert help becomes available.

Syncope

the next section. Only then is it necessary to establish and treat the underlying cause. The unconscious (but breathing with a pulse) patient should be nursed in the recovery posi- tion, with the airway protected.

Cardiorespiratory arrest

Suspect cardiorespiratory arrest in a collapsed patient with no spontaneous breathing and absence of a pulse (Figures 5.25 and 5.26). The initial management is as noted earlier: Alert the crash team. Management of the airway involves extending the neck and opening the mouth. If the airway is blocked, use suction to clear debris, blood and secretions. Next look for chest move- ment and listen for breath sounds; if absent give two rescue breaths (ones that elevate the chest wall). Feel for a carotid pulse for 10 seconds; if a collapsed patient is breathing spontaneously and has a pulse, the most common cause is a sim- ple faint. Often the patient will anticipate the event by feeling nauseated and lightheaded before the collapse. The treatment is to lay the patient flat and loosen constrictive clothing; if the patient fails to recover very rapidly, rethink the diagnosis.

6. **Clinical signs of anaphylactic shock. Cardiopulmonary resuscitation. Cornavirus is a global problem in the world. Reforms adopted in Uzbekistan against coronavirus infection.**

**Chronological map of classes**

**(on classes in the clinic)**

| **Time** | **Stages of training** | **Forms of training** | **Duration in minutes. _____min** |
|---|---|---|---|
| _____ __ | Parenthesis of the teacher (theme substantiation) | | - |
| _____ __ | Discussion of homework | The survey, an explanation | |
| _____ __ | Inspection of the patient in a hospital | | |
| _____ __ | Improvement of practical skills, work with the dummy, clinical and laboratory equipment, apparatus | Working with clinical and laboratory equipment | |
| _____ __ | Discussion of a practical part of training | The survey, an explanation | |
| _____ __ | Discussion of a theme of training, the abstract report, seminar, discussion | Abstract messages, seminars, discussions | |
| _____ __ | Working in a group. Demonstration videos on the topic, analysis of situational tasks, computer software, business games, etc. | The demonstration, interactive forms, active and passive | |

| | | | |
|---|---|---|---|
| ____ __ | The conclusion of the teacher on the given trining. An estimation of knowledge of students on 100 ball system and its announcement. Giving of the task to students on following classes (the complete set of questions) | Information, questions for self-training | |

Collapse

When called to see a collapsed patient, the basic principles of resuscitation are required.

**HHH** (**H**azards **H**ello **H**elp) – check for any potential hazard to you or other rescuers. This may include exposed electrical wires! Call the patient's name. Call for help.

**ABC** – if there is no response, lay the patient flat, and work through the **ABCs** of resuscitation. The airway is patent and secure if feasible, checking for evidence of spontaneous breath- ing and ventilating with oxygen if not; estab- lish that a pulse is present, and compressing the heart 100 times per minute if not, thereby maintaining adequate circulation to perfuse the vital organs. See the detailed description of cardiopulmonary resuscitation (CPR) in absent begin CPR.

CPR involves delivering 100 chest compressions per minute in tandem with 15 breaths per minute in a ratio of 15:2. This is a practical skill that needs to be practised regularly on a manikin. It is vital to realize that CPR only buys time; if a patient is in ventricular fibrillation, defibrillation is the immediate treatment and optimally needs to be delivered within 90 seconds. Asystole will require further drug treatment (adrenaline 1 mg i.v., atro- pine 3 mg i.v. and some others); pulseless electrical activity requires treatment of the underlying cause for any hope of recovery. All these activities, in reality, can be accomplished only by trained teams, so **get help.**

## Hypoglycaemia

In diabetic patients, consider hypoglycaemia as a cause of collapse. Often the patient anticipates the onset of hypoglycaemia – feeling anxious, sweaty and irritable – and at this stage an oral glucose drink should abort the attack. Occasionally the patient's ability to detect hypoglycaemia is lost. Thus, following basic resuscitation, IM gluca- gon 1 mg or 50 mL of i.v. 50% dextrose should be urgently administered to any collapsed diabetic patient.

## Addisonian crisis

As discussed, patients who take corticosteroids on a long-term basis have a suppressed adrenal response to stress and are at risk of hypotension and collapse when exposed to stress (e.g. surgery or trauma). If collapse occurs in such a patient, man- agement is to lay the patient flat, maintain the air- way and administer 100 mg of i.v. hydrocortisone, which can be repeated up to a dose of 500 mg.

## Seizures

In an epileptic patient who is having a seizure, the priority is to ensure safety by maintaining the air- way and preventing any unintentional self-harm. Place the patient in the recovery position (if pos- sible) and wait for spontaneous recovery. If the fit is prolonged, rectal diazepam 5 mg or i.v. diazepam 5 to 20 mg should stop the seizure. If the fit per- sists, call for expert help.

## Chest pain

Sudden, severe central chest pain may be caused by angina or a myocardial infarction. The pain is often described as gripping, heavy or like a tight con- stricting band around the chest, and it may be asso- ciated with panic, sweating and breathlessness. If the patient is known to have angina, nurse upright, give oxygen and administer a sublingual glyceryl trinitrate (GTN) tablet, which should relieve pain resulting from angina. Try and obtain an ECG dur- ing the episode – it may confirm the diagnosis. If the pain is unrelieved by GTN, establish i.v. access, give 5 to 10 mg morphine

with an antiemetic and telephone for help from the on-call medical senior house officer or resident medical officer.

Difficulty breathing

Acute breathlessness may occur in patients with a background of airway disease such as asthma or chronic bronchitis or unexpectedly.

If an **asthmatic patient** becomes breathless and

wheezy, sit the patient upright and give nebulized salbutamol 5 mg with oxygen and 30 mg oral pred- nisolone. If the attack is not quickly aborted, or there are features of life-threatening asthma (the absence of breath sounds, cyanosis, bradycardia or exhaustion), **call for help,** repeat the nebulizer, check the arterial blood gases and arrange for a portable chest radiograph.

In cases of unexpected breathlessness, there are several causes:

- PE.
- Acute pulmonary oedema.
- Hyperventilation from anxiety.
- Anaphylaxis.

Regardless of the underlying cause, the manage- ment principles are the same because the basic prin- ciples of resuscitation apply. Check that the airway is patent, measure the oxygen saturation and give oxygen. Inspect and auscultate the chest for sym- metrical movements and bilateral breath sounds. Listen for added sounds such as a wheeze or crack- les. If the oxygen saturations are low (<94%), check arterial blood gases and ask someone to arrange an urgent portable chest radiograph.

**Hyperventilation** is recognized by tachypnoea

and anxiety, with an otherwise normal respiratory examination. The patient may describe paraesthe- sia and extreme fear. Pulse oximetry shows normal oxygen saturations, but a low carbon dioxide is pres- ent on arterial blood gas sample. Carpopedal spasm can develop. Management consists of reassuring the patient in a calm environment, accompanied by having the patient rebreathe into a bag if needed.

**Anaphylaxis** is a hypersensitivity reaction following exposure, usually injection or ingestion, of an allergen. It is recognized by facial oedema and flushing, itching, cyanosis and wheezing, which can result in collapse resulting from hypotension. **Call for help**. Lay the patient flat, maintain the airway, give high flow oxygen and administer 0.5 mL of 1:1000 IM adrenaline, which may be repeated every 10 minutes until the patient recovers, 100 mg of i.v. hydrocortisone, i.v. chlorpheniramine 20 mg and an infusion of i.v. crystalloid to maintain the blood pressure. Following recovery the patient must be informed of the possible allergy, and arrangement is made for confirmatory testing (Figure 5.27).

**Acute pulmonary oedema** is usually caused by fluid overload in elderly patients, those with preexisting cardiovascular disease or those with left ventricular impairment. It may accompany an acute myocardial infarction, which should always be considered as an underlying diagnosis. It is recognized by breathlessness, tachypnoea, cyanosis, tachycardia and fine inspiratory crackles on chest auscultation. The treatment is to sit the patient upright and give oxygen, 2 to 5 mg of morphine and 40 mg of i.v. frusemide. Check the U&Es and arterial blood gases and arrange a portable chest radiograph. Following the administration of frusemide, the urine output should be monitored to ensure an adequate diuresis – this may require catheterization.

A nonfatal PE may manifest as acute breathlessness and collapse, classically following major surgery, but often following a period of reduced mobility (e.g. long flights or bus trips). The patient may complain of chest pain that is worse on inspiration; there may or may not be evidence of DVT. Signs include tachypnoea, cyanosis, hypotension, haemoptysis, raised JVP and tachycardia. The diagnosis is initially clinical, and management consists of basic resuscitation, high flow oxygen, and i.v. heparin or an equivalent treatment dose of subcutaneous enoxaparin. A chest radiograph and ventilation-perfusion scan can then be arranged to assist in the diagnosis.

**Foreign bodies in the upper aerodigestive tract**

- objects in the mouth and nose may be swallowed or inhaled, usually in young children. Usually the cough reflex prevents objects from lodging in the upper airway. However, this reflex may be lost, par- ticularly if the patient is obtunded in some way.

Foreign bodies may lodge in the following sites:

**Pharynx and oesophagus** – the pharynx is the site where teeth, dentures, blood and so forth tend to collect following trauma. Fishbones commonly wedge in the tonsils or the back of the tongue. Sharp, localized pain on swallow- ing is highly suggestive of this condition, and these bones can often be removed the patient under anaesthesia may be neces- sary. In elderly patients, dry food may become stuck in the oesophagus and cause severe retrosternal discomfort (which may mimic cardiac pain) and dysphagia. This should always raise the suspicion of a stricture (pos- sibly malignant) and further investigations should be carried out.

- **Larynx** – this can result in severe respiratory

distress, and patients usually have stridor. It requires immediate attention (either the Heimlich manoeuvre in a mobile patient or a surgical airway if the patient is obtunded).

- **Tracheobronchial tree** – here foreign bod-

ies tend to lodge in the right main bronchus. If not removed, they will lead to collapse of the associated lung. Removal using a rigid bronchoscope with the patient under general anaesthesia is necessary.

The airway is simply assessed by asking the patient ‘What happened?’, and any foreign bodies

are looked for and are removed with a finger or with suction. In all cases, where teeth, dentures, crowns and so forth are missing, they *must* be accounted for. If they are still not found, radiographs of the chest and soft tissues of the neck must be taken. A foreign body found at either site must be removed. Remember, when looking for fishbones, radio- graphs are not

100% reliable because many ‘bones’ are in fact cartilage and will not show up.

Vomiting in the drowsy patient is a particu- lar problem, especially after heavy drinking. Aspiration can occur if the patient is left lying on their back, which can lead to obstruction and pneumonitis. If vomiting does occur, patients need to be turned on their side. If a spinal injury is suspected (all significant injuries above the clavicle), the patient must be immobilized and turned en bloc – the ‘log roll’ manoeuvre (Figure 5.28).

Another aspect to consider includes pulmonary aspiration following surgery. This is an infrequent but potentially serious anaesthesia-related com- plication that carries a considerable mortality,

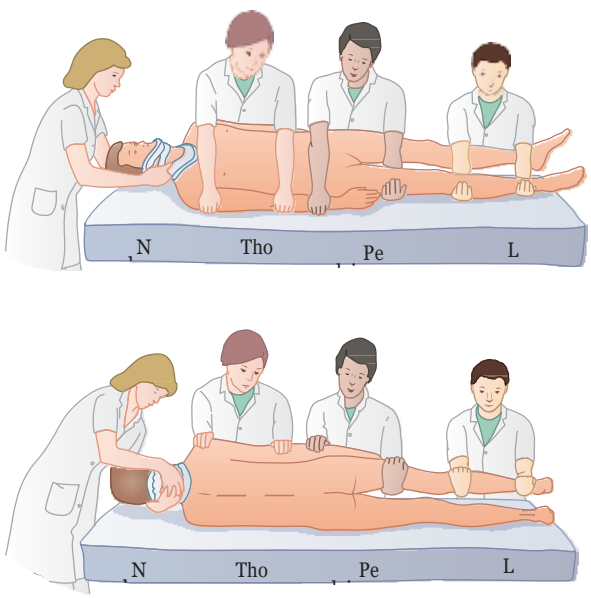


**Figure 5.28** A safe log roll needs four people to move the patient and one to examine them.

especially in elderly patients. The management of aspiration includes the following:

- Position the patient head down to limit pul- monary contamination and suctioning to clear the oropharynx.
- Administer 100% oxygen.
- Apply cricoid pressure and ventilate.
- Use rapid sequence anaesthesia.
- Intubate the trachea and perform trachea suc- tion and bronchoscopy.
- Administer bronchodilators if necessary.
- Chest radiograph is useful (but in approxi- mately 25% no changes are noted).
- Observe after extubation for 2 hours.
- If well, discharge from recovery.

*No evidence supports the use of antibiotics or ste- roids in these patients.*

Paperwork and relationships

communication are the keys to success, and good relationships among colleagues can make life con- siderably easier and happier. Teamwork should bring with it a sense of camaraderie and a system of communication among colleagues to ensure potential problems can be swiftly sorted out.

Never be afraid to ask for help or feel too proud to admit to finding it difficult to cope. There should be at least one sympathetic listener in the team. The pressures imposed by unfamiliar duties, stressful clinical situations and long hours can be too much for some people. If someone in the team is showing signs of excess stress, try talking to the person about possible solutions, such as arranging teaching from the more senior colleagues, altering the timetable to give a fair division of labour, or making provision for a change of shifts. If this fails, talk in confidence about the problem to a trusted senior colleague. The formal mechanism for this should be your appraisal, although these are often too distant to be of direct help.

Breaking bad news is a skill requiring sensitivity and empathy, but also practice and confidence, and it is usually the responsibility of a senior cli- nician. It is useful to 'sit in' with a consultant to get a feel for how, or how not, to talk to patients about difficult issues. It is likely that at some point, patients will ask junior staff questions about their diagnosis or prognosis, and with certain basic principles, it should be possible to deal with these appropriately.

- Always set aside adequate time for interviews with patients and relatives.
- Treat the patient as you would expect your closest relative or friend to be treated.
- Speak to the patient in a quiet room, away from the busy ward, and where you are unlikely to be interrupted (Figure 5.29). Leave your bleep with someone else.

**Figure 5.29** A relaxed, nonthreatening environment for breaking bad news.

- Assess how much the patient understands about the tests that have been performed and the possible diagnosis. Avoid being too brusque; instead introduce the subject gently, leading the patient to the diagnosis or result. An example is given here:

Clinician: 'I understand you had a biopsy recently, do you know what it was we were looking for?'

Patient: 'I'm not sure; they think I may have a growth.'

Clinician: ‘I have the results here. You were right, there is a type of growth, but some of the cells in the sample looked abnormal.’

Patient: ‘What do you mean “abnormal”?’ Clinician: ‘Some of the cells were cancerous.’ Patient: ‘Do you mean I have cancer?’

Clinician: ‘Yes, you have a type of cancer; I’ll explain what we can do to help in a minute. How do you feel about that news?’

Note: Although it seems silly to ask patients how they feel about such news, this gives them the opportunity to absorb the information and express themselves. You will always be sur- prised at some of the responses.

- Allow time for the information to sink in and answer questions honestly and openly; if you do not know the answer, say so, but explain that you will find someone who does, and do so.
- Patients rarely remember many of the facts of the conversation, so write down the salient points.
- Allow the patient time to digest the informa- tion. Suggest that the patient have some time alone and with the family, and that he or she write down any questions that arise. Explain that you or a senior colleague will return to discuss the treatment options and answer any questions at a definite time in the near future.

FURTHER READING

American College of Surgeons. *Advanced trauma life support course: student manual,* 6th ed. Chicago: American College of Surgeons, 2009.

*This manual is available as part of the ATLS course and is updated regularly, details are available from the ATLS office RCS in England and the American College of Surgeons in the United States. Whatever your opportunities, you must go on one of these courses if you have any seri- ous interest in working at even a fairly basic level in postgraduate oral and maxillofacial surgery.*

Deitch EA. *Tools of the trade and rules of the road: a surgical guide.* Philadelphia: Lippincott Williams & Wilkins,1997.

*A slightly quirky view of an American house sur- geon's life but full of gems.*

Donald A, Stein M, Muthu V. *The hands-on guide for house officers,* 2nd ed. Oxford: Wiley- Blackwell, 2002.

## 7. **Removal of a tooth. Tooth extraction tools. The technique of removing the upper frontal, small molars and more molars. Determination of coronavirus infection in patients and symptoms of the disease**.

**Chronological map of classes**
**(on classes in the clinic)**

| **Time** | **Stages of training** | **Forms of training** | **Duration in minutes. _____min** |
|---|---|---|---|
| _____ __ | Parenthesis of the teacher (theme substantiation) | | - |
| _____ __ | Discussion of homework | The survey, an explanation | |
| _____ __ | Inspection of the patient in a hospital | | |
| _____ __ | Improvement of practical skills, work with the dummy, clinical and laboratory equipment, apparatus | Working with clinical and laboratory equipment | |
| _____ __ | Discussion of a practical part of training | The survey, an explanation | |
| _____ __ | Discussion of a theme of training, the abstract report, | Abstract messages, seminars, | |

| | | | |
|---|---|---|---|
| | seminar, discussion | discussions | |
| ____ __ | Working in a group. Demonstration videos on the topic, analysis of situational tasks, computer software, business games, etc. | The demonstration, interactive forms, active and passive | |
| ____ __ | The conclusion of the teacher on the given trining. An estimation of knowledge of students on 100 ball system and its announcement. Giving of the task to students on following classes (the complete set of questions) | Information, questions for self-training | |

Aims and learning outcomes

For undergraduates:

Understanding of this chapter should enable you to:

11. Describe when it is appropriate and when it is inappropriate to remove teeth.
12. Select the appropriate instruments for remov- ing teeth.
13. Describe and demonstrate the importance of patient positioning and self-positioning dur- ing tooth extraction.
14. Be able to describe the body movements required to remove the majority of teeth under usual circumstances.
15. List and understand the reasons for postop- erative instructions after tooth extraction.

- Identify preoperatively and deal with post- operatively common complications of tooth extraction.
- Describe the steps involved in the transalveo- lar removal of retained roots.

For postgraduates:

This chapter should enable you to refresh your memory and reemphasizes the importance of this often denigrated but essential oral surgical proce- dure. In addition some of the hints and tips regard- ing transalveolar tooth removal should augment your current knowledge.

'Exodontia' refers to the extraction of teeth (sometimes referred to as the simple extraction of teeth; however, the ability to remove a tooth with forceps and elevators is an acquired skill that you will have to work at to achieve).

Patient assessment

Assessment of patients is essentially covered in Chapter 5, and controlling pain and anxiety is cov- ered in Chapter 4. These are clearly essential pre- requisites to actually removing teeth; however, this chapter concentrates on the removal and problem already obtained in patient management, and they are best worked through by case example and repeated exposure to patients.

Patients 'anticoagulated' with aspirin or most other antiplatelet drugs rarely present a problem that can- not be dealt with by simple pressure, oxidized cel- lulose packs or suturing (see later).

Patients taking warfarin have been a source of concern for a long time (see Chapter 5). There is, however, evidence to show that for a small number of extractions all that has to be done is:

- Plan the extraction.
- Check the international normalized ratio (INR), either by testing it yourself or via the patient's anticoagulation clinic.
- If the INR is less than 4, carry on as normal but pack and stitch the socket.

- If the INR is greater than 4, complex extrac- tions are anticipated or the patient is a medical ‘high risk’, refer.

## Assessment of the need for tooth removal

It is worthwhile considering the justification and need for tooth removal. This procedure may be indicated or contraindicated along two broad lines

– the patient and the tooth itself.

Patients may require removal of restorable teeth because of underlying medical problems (e.g. infec- tive endocarditis) or before radiotherapy of the jaws or face. Other patients may require a modification or support to the medical condition (e.g. supple- mentary oxygen). Yet other patients may be medi- cally healthy but require anxiolysis because of an inability to cope with what you would perceive as a relatively straightforward procedure.

These situations need to be addressed individu- ally with the background knowledge that you have

quate mouth opening with a visible crown and has no coexisting medical problems presents little problem. Patients without these factors become increasingly more diffi ult to manage. Teeth that are signifi antly displaced from the arch, or are lingually inclined, may be impossible to remove with conventional forceps, and the application of brute force and ignorance will not help in this situation (Figures 6.1 and 6.2).

## Bone density

Bone density increases and elasticity decreases with increasing age, and teeth become increasingly brittle with increasing age. This can result in the sensation of removing a milk bottle embedded in concrete in some older patients (Figure 6.3).

Extensive restorations or abrasion cavities, particularly associated with root fillings or exten- sive caries, make teeth more likely to shatter on application of forceps (Figure 6.4).

**Figure 6.1** Clinical example of carious tooth for extraction.

**Figure 6.2** Clinical example of a displaced lower premolar.

**Figure 6.3** Radiograph of a root filled upper molar with sclerotic bone, likely to be a difficult extraction.

**Figure 6.4** An example of abrasion cavities.

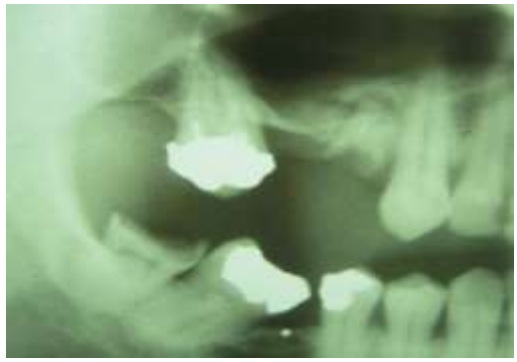

**Figure 6.5** Radiograph showing several teeth and roots – which are the difficult ones?

In instances where you have doubts about your treatment plan or some of the foregoing features apply (e.g. extensive periapical infection, heavily restored or root-filled teeth, single standing upper molar teeth), or if the patient volunteers previ- ous difficulties with extractions, it is worthwhile taking a radiograph. For single teeth, often all that is required is a periapical radiograph; for multi- ple teeth, a dental panoramic tomogram is better (Figures 6.5 and 6.6).

Once you have satisfied yourself that the tooth can be removed under whichever form of anaes- thesia is deemed appropriate and you have the rel- evant investigations to hand, it is time to remove the tooth.

**Figure 6.6** Beware the grossly broken down upper molar.

Elevators

These instruments are discussed in Chapter 3. Elevators are instruments that are designed to wedge a lever between tooth and tooth or

between tooth and bone to mobilize the tooth. They may be used for removing roots or third molars in iso- lation, or they may be used in standing teeth by introducing the elevator between the bone of the socket and the root of the tooth or into a point of application created in the root of the tooth.

Three groups of elevators are commonly used in the United Kingdom: Warwick-James right, left and straight; Coupland's 1, 2 and 3; and Cryer's right and left (Figure 6.7). In Germany a universal eleva- tor called Bein, a lower third molar elevator (Barry) and an upper third molar elevator (Flohr) are used. Periotomes are increasing in popularity.

**Figure 6.7** Range of elevators – from left, Warwick- James (three), Coupland's (three), Cryer's (two).

Elevators are used as rotational levers around their long axis. They should not be used as first class levers along their length. If you are using another tooth as a fulcrum, it has to be accepted that the other tooth will move, and therefore this technique is appropriate only if the tooth against which it is being used as a fulcrum is also being removed. In all other cases, the bone of the socket should be used as the fulcrum. Elevators need to be handled, and it would be useful to obtain some elevators and hold them in your hand to identify the manner in which you can produce a finger rest to stop the elevator from slipping when in use and to learn to hold it appropriately (Figure 6.8).

Use of elevators

From the point of view of straightforward tooth removal, elevators are principally used when removing multiple teeth, and the adjacent teeth can be used as the elevator's fulcrum to loosen and mobilize the teeth before extracting them with forceps. Heavily broken down teeth, particularly those that are periodontally involved, may be removed using elevators only. A bifurcation can be engaged by the point of an angled elevator such as Cryer's or Warwick-James. On occasion very bro- ken down multirooted teeth can be split by plac- ing a straight elevator such as Coupland's between the bifurcation, separating the roots this way and

**Figure 6.8** The way to use an elevator appropriately.

**Figure 6.9** Warwick-James elevator in use.
**Figure 6.10** Coupland's elevator in use.

**Figure 6.11** Cryer's elevator in use.

then elevating the roots using the opposite root as a fulcrum. An angled elevator such as Cryer's can then be placed into the now empty socket of the first root and used to elevate the second root (Figures 6.9, 6.10 and 6.11).

The other main indication for the use of eleva- tors is in elevating unerupted teeth or third molar teeth that are either partially erupted or unerupted. These are principal areas in which forceps are either less useful or potentially dangerous.

Dental extraction forceps

Upper extraction forceps are designed as straight- handled, straight-beaked forceps with a variety of designs on the beak. These may be slightly off-set as in bayonet forceps or designed to engage bifur- cations of multirooted teeth (Figure 6.12).

Lower extraction forceps are designed with the beaks at right angles to the handle. The controlled force used to extract teeth is directed down along the root of the tooth (Figure 6.13).

The angulation and design of dental extraction forceps carry with it an implication that you and your patient must be appropriately sited to make

**Figure 6.12** Upper extraction forceps.
**Figure 6.13** Lower extractions forceps.

8. **Technique for the removal of the lower frontal, small molars and more molars Chronological map of classes (on classes in the clinic)**

| **Time** | **Stages of training** | **Forms of training** | **Duration in minutes. _____min** |
|---|---|---|---|
| _____ __ | Parenthesis of the teacher (theme substantiation) | | - |
| _____ __ | Discussion of homework | The survey, an explanation | |
| _____ __ | Inspection of the patient in a hospital | | |
| _____ __ | Improvement of practical skills, work with the dummy, clinical and laboratory equipment, apparatus | Working with clinical and laboratory equipment | |
| _____ __ | Discussion of a practical part of training | The survey, an explanation | |
| _____ __ | Discussion of a theme of training, the abstract report, seminar, discussion | Abstract messages, seminars, | |

| | | | |
|---|---|---|---|
| | | discussions | |
| ____ __ | Working in a group. Demonstration videos on the topic, analysis of situational tasks, computer software, business games, etc. | The demonstration, interactive forms, active and passive | |
| ____ __ | The conclusion of the teacher on the given trining. An estimation of knowledge of students on 100 ball system and its announcement. Giving of the task to students on following classes (the complete set of questions) | Information, questions for self-training | |

General principles of forceps

Essentially all extraction forceps consist of two blades and a set of handles attached to a hinge. The blades fit in a concave fashion around the tooth root. The tips of the blades are sharp, to divide periodontal ligaments and wedge into the socket in an attempt to dilate the socket as they engage the root of the tooth so that both the dilating action and the force needed to mobilize the root before lifting it out can be generated (Figure 6.14).

**Figure 6.14** Range of extraction forceps.

Removal of upper teeth

After appropriate assessment and provision of local analgesia, the patient is positioned semisu- pine with the chair elevated so that the patient's face is at the approximate level of the surgeon's elbow (Figure 6.15).

Upper extraction forceps come in universal, pre- molar and molar patterns.

The forceps are positioned as shown (Figure 6.16). Force is then generated using a straight arm. The blade of the forceps is driven through the periodon- tal membrane into the socket to dilate the socket and firmly engage the root. Upper anterior teeth can then be removed by a rotating motion that disrupts the periodontal membrane, enlarges the socket and then allows the tooth to be lifted from the socket while the rotating motion is continued. Upper premolar teeth have a more oblong pat- tern to the root and can seldom be rotated, par- ticularly the often two-rooted first premolar. In this instance the driving force is the same, but the motion to remove the tooth is more of a buccal 'bend', which can be repeated to 'wiggle' the tooth before either 'bending' it buccally out or 'pulling' it straight down.

Upper molar teeth are usually removed using molar forceps. These are designed as left and right because the buccal beak of the forceps is pointed to fit into the bifurcation or trifurcation of the molar teeth. Maxillary molar teeth are removed by applying a vertical force up along the roots into the socket, in this instance manipulating the

**Figure 6.15** Positioning of patient for extraction of upper teeth.

**Figure 6.16** Positioning of upper extraction forceps on upper tooth.

tooth buccally. Actual buccal palatal movement with the final buccal movement accompanied by downward force will usually deliver maxillary molars, but it is not uncommon for the buccal roots to fracture or indeed for the bone on the buccal plate, which is very thin, to fracture with the removal of the tooth.

Removal of mandibular teeth

Mandibular teeth are removed using lower extrac- tion forceps. Again these may be straight bladed for incisors, canines and premolars and modified to engage the bifurcation with molars. Removing mandibular teeth on the patient's right, the patient is in a sitting position with the surgeon standing behind the patient using lower extraction forceps widely used in the United Kingdom and continen- tal Europe (Figure 6.17).

For lower left teeth the patient is again in a sit- ting position, and the surgeon in this case is stand- ing in front of the patient (Figure 6.18).

**Figure 6.17** Positioning of patient for extraction of lower teeth on right.

**Figure 6.18** Positioning of patient for extraction of lower teeth on left.

**Figure 6.19** US adult extraction forceps.

Mandibular molars

Again as with maxillary molars these multirooted teeth have to be displaced by force acting buc- cally, and the teeth are mobilized buccolingually. However, generating a figure-of-eight motion can mobilize the roots of these teeth and allow consid- erable mobility before the teeth are eventually deliv- ered with a buccal movement.

Attempting forceps extractions of lower third molars that have partially erupted or are awk- wardly angled is potentially dangerous because of the risk of generating fracture-inducing forces through the angle of the mandible.

Mandibular incisors

The mandibular incisors have roots that are not sufficiently conical to allow rotatory movement. These teeth are delivered by buccolingual force, again by 'wiggling' the tooth buccolingually until it is mobilized and

then delivering the tooth with either a small rotatory and significant amount of buccal force or a purely buccal force.

Mandibular canines

All the information with regard to body and patient positioning described for adult teeth applies to deciduous extraction. There are, however, some small but specific differences.

Deciduous extraction forceps

These forceps are essentially miniature versions of adult extraction forceps. The molar forceps, par- ticularly lower molar forceps, have a slightly more rounded appearance that allows them to circumvent the more bulbous aspect of the crowns of deciduous teeth and engage the root. It is possible to remove deciduous teeth with adult extraction forceps, but the main risk in doing so is that the side of the for- ceps will be difficult to use in the smaller child's mouth, and you have a higher risk of engaging an underlying permanent tooth and damaging it while removing the deciduous tooth.

Therefore, deciduous extraction forceps should be used (Figure 6.20). Mandibular canines are delivered using a similar technique, but both maxillary and mandibular canines are often long rooted and frequently anky- losed teeth that require considerably more force to deliver than incisors.

Mandibular premolars

These teeth have conical roots and can be delivered by rotation.

Anatomy and physiology of deciduous teeth

The important point here is that most deciduous teeth have an underlying successor that must not be damaged in the process of removing the decidu- ous tooth. This is particularly a risk in removing deciduous molars when the underlying premolar may lie between the very thin, fragile roots of the deciduous molar. The way to avoid this is to try

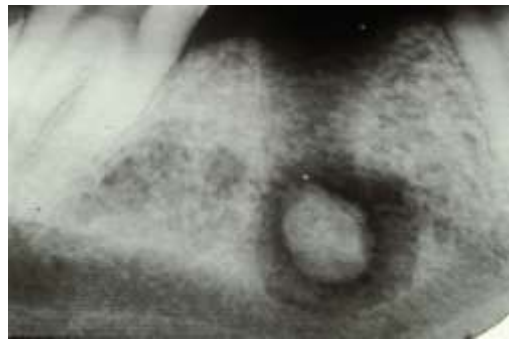

**Figure 6.20** Comparison of adult (left) and decidu- ous (right) extraction forceps.

**Figure 6.21** Root displaced into an infected cystic apical cavity.

to engage the roots of the deciduous tooth as you remove it. In addition these very thin roots are quite liable to break, and it is not at all uncommon to fracture the roots of deciduous teeth. These roots can be removed by the use of a small curved eleva- tor in much the same way as the roots of adult teeth can be removed. Once again you have to remember you are working in a socket that probably contains a permanent successor that must not be damaged.

### 9. Root removal technique for the upper and lower jaw. Removing the roots of the bur with a machine and chisel on the upper and lower jaw.

**Chronological map of classes**
**(on classes in the clinic)**

| Time | Stages of training | Forms of training | Duration in minutes. _____min |
|---|---|---|---|
| _____ __ | Parenthesis of the teacher (theme substantiation) | | - |
| _____ __ | Discussion of homework | The survey, an explanation | |

| | | | |
|---|---|---|---|
| ____ __ | Inspection of the patient in a hospital | | |
| ____ __ | Improvement of practical skills, work with the dummy, clinical and laboratory equipment, apparatus | Working with clinical and laboratory equipment | |
| ____ __ | Discussion of a practical part of training | The survey, an explanation | |
| ____ __ | Discussion of a theme of training, the abstract report, seminar, discussion | Abstract messages, seminars, discussions | |
| ____ __ | Working in a group. Demonstration videos on the topic, analysis of situational tasks, computer software, business games, etc. | The demonstration, interactive forms, active and passive | |
| ____ __ | The conclusion of the teacher on the given trining. An estimation of knowledge of students on 100 ball system and its announcement. Giving of the task to students on following classes (the complete set of questions) | Information, questions for self-training | |

Transalveolar approach – raising the flap

For transalveolar surgery the flap to be elevated is a full-thickness mucoperiosteal flap. This means that the bone is directly visualized and the plane of dis- section of the flap is between the bone and the peri- osteum.

This is a very safe area to be working in, gives excellent visualization and access to retained roots with relatively minimal bleeding. Only a small number of vital structures will lie in this plane; tiny vessels and the mental nerve emerge just below the apices of the first and second mandibular premo- lars. This is why relieving incisions are not made in this region. In the palate the main problem is the course of the greater palatine artery; for this reason, vertical relieving incisions are not made in the pal- ate. When a flap is raised without vertical relieving incisions, it is known as an envelope flap.

For exposure to palatal roots, an envelope flap is always raised, and this runs from the distal aspect of the upper molar tooth behind the retained root to the canine on the contralateral side if length is required to gain access.

In the region of the mandibular first molar and second premolar where a relieving incision can- not be made, the envelope flap extends at least two teeth on either side of the retained root. In all other instances a vertical relieving incision can be made. If a relieving incision is to be made, it is only necessary to extend the incision one tooth width behind and one tooth width in front of the retained root in question because mobilization of the flap is obtained by the vertical relieving incision, which is designed immediately before or after the interden- tal papilla so that this is not split in two.

The incision is carried out in the gingival crev- ice and down to bone. If you are making a verti- cal relieving incision, it continues down on bone into the reflection of the alveolar mucosa. This always blunts the scalpel blade, and the blade should be discarded after a full-thickness flap has been raised. The second relieving incision may be made behind the area of the retained root. This is seldom required because access is usually adequate with a single anterior relieving incision or the long envelope flap. The flap is elevated in a subperiosteal plane (Figure 6.22). This is most easily identified in the area of the loose alveolar mucosa by plac- ing an elevator (e.g. as Howarth's) into the incision and down onto bone; a small scraping movement will expose bone, and it is directly onto the bone that you want

to work with your instruments. The alveolar mucosa area is more easily peeled off, and it is worthwhile doing this and then working up to the more densely bound down attached gingiva to avoid tearing the flap. This can be achieved in a few seconds. A retractor can then be placed to hold the flap back, and this should give you a good view of the alveolar bone, the area that contains the retained root and the tooth in front and behind the area of interest. It is essential when learning how to make these incisions that you first watch some- one doing this and then are taken through it step by step because simply reading this information will not teach you a safe transalveolar approach.

The next thing stopping you from removing a retained root is the enveloping bone. In most cases this is buccal bone, which is removed with a surgi- cal burr (Figure 6.23). A number 8 tungsten car- bide burr is usually used for this purpose. The burr should be cooled with saline irrigant, which not only cools the burr but also prevents bone over- heating and washes away bone debris.

The bone to be removed is that lying buccal to the retained root to provide a point of appli- cation for an elevator. You start coronally and remove 2 or 3 millimetres of buccal bone to expose the root (Figure 6.24). Once the root is

**Figure 6.23** A range of burrs for bone removal.

**Figure 6.24** Bone removal for retained roots.

visualized it may be possible to drill into the root to create a point of application or identify a point of application, in which case an elevator is placed and the root is elevated from the socket. If it is a two-rooted tooth that is retained, again remove some coronal bone and then change to the

fis- sure burr and divide the roots so that an elevator can be placed between the two roots and con- trolled force used, by having one retained root as a fulcrum to elevate the other and then using an angled elevator in the then empty socket to cre- ate a point of application with the burr if need be in the other root to elevate it.

What is very important is not to cut into the tooth root as you drill away the coronal bone. This leads to a loss of root anatomy and makes it quite difficult to distinguish the root from the bone (although usually root is more yellow than the bone and bone will bleed, even if only slightly). If it becomes impossible to remove the root despite removing several millimetres of coronal bone, it is sometimes worthwhile placing a fissure burr vertically inside the socket to cut the bone away around the root to mobilize it. There is an advan- tage in preserving alveolar bone height because simply completely destroying the buccal cortex will result in significant bone resorption in this area with inevitable problems for prosthesis (see Chapter 15). Following the removal of the roots, any sharp spicules of bone should be smoothed, although excessive reduction of alveolar bone should be avoided because again this will reduce bone height unnecessarily early in the patient's life. Remember to wash away any bone dust; collection of bone dust underneath the mucoperiosteal flap is probably one of the most important causes of per- sistent, inexplicable discomfort following transal- veolar surgery. The flap is then repositioned and sutured with interrupted sutures across the socket, with a single suture holding the relieving inci- sion. Resorbable synthetic sutures such as poly- glactide are the most appropriate for this purpose. Suture materials such as catgut have been with- drawn from use in most countries (although not the United States), and nonresorbable sutures (e.g. black silk), although very easy to use, necessitate further appointments for removal of sutures and frequently become extremely dirty in the mouth.

Suturing is a skill best learnt by practice. You should use a needle holder with a suture with a reverse cutting or cutting needle if at all possible, carrying a 3-0 or 4-0 resorbable synthetic suture.

The suture should be passed through the free edge of the flap and then through the fixed site to which it is being sutured (Figure 6.25). The flap is then mobilized to its resting position, and the posi- tion is controlled by tightening of the first knot of the suture. This is achieved by passing the thread

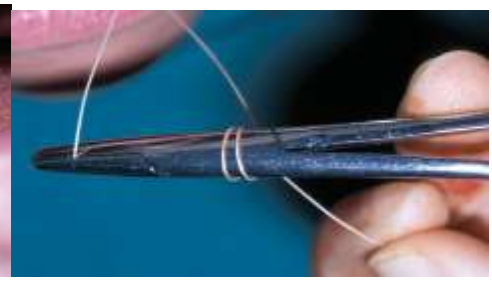

**Figure 6.25** Suture the edge of the free tissue to fixed.

**Figure 6.26** Loop the suture material twice around the needle holders to create the first part of the knot.

twice around the needle holder, grasping the free end and pulling it through (Figure 6.26). This cre- ates a first knot that has some resistance to loosen- ing and allows you to position the flap. This is then tightened, and the procedure is reversed with a sin- gle throw in the opposite direction to lock it; then this is repeated to ensure that the lock is secure. Patients who have had transalveolar surgery are at

**If you have had a general anaesthetic (that is to say you have been put to sleep) you should:**

16. On arriving home, go to bed for the remainder of the day.
17. You must NOT drive a car or operate machin- ery for at least 24 hours.
18. You must NOT consume alcohol in any form for at least 24 hours.
19. You must be supervised by a responsible adult for 24 hours.

The day after your general anaesthetic you may experience some stiffness of the limbs and feel ‘under the weather’. This is common following general anaesthesia and usually goes away in 1 or 2 days. You may have a dry or sore throat, which will be eased by frequent drinks.

After care – local anaesthetic and general anaesthetic

a higher risk of wound infection and most certainly have postoperative discomfort. All such patients

should be provided with adequate analgesia such as ibuprofen 400 to 600 mg three times a day with or without paracetamol 100 mg four times daily with or without codeine (8 to 30 mg depending on antici- pated degree of pain) four times daily, and an anti- biotic such as amoxycillin 250 mg three times daily or metronidazole 400 mg three times daily.

Patients taking antiresorptive medication (bisphosphonates, denusomab) should have an attempted watertight mucosal closure with as little periosteal disturbance as possible.

Postoperative instructions

The following advice should be given to patients who have had operations on their mouths.

**Following your operation you can expect to have the following difficulties:**

- Some swelling of the face.
- Stiffness of the jaws, particularly when lower wisdom teeth have been removed.
- Slight oozing of blood. This may last for 12 hours or longer.
- Pain.

It is important to keep your mouth clean. We recommend gentle mouth washing with salt and warm water. After meals, any remaining teeth should be carefully brushed. There is no limitation on eating or drinking.

You may have stitches in your mouth and will be instructed when you leave hospital about whether these stitches will dissolve or need removal later.

## 10. Complications after tooth extraction in the upper and lower jaw

### Chronological map of classes (on classes in the clinic)

| Time | Stages of training | Forms of training | Duration in minutes. _____min |
|---|---|---|---|
| _____ __ | Parenthesis of the teacher (theme substantiation) | | - |
| _____ __ | Discussion of homework | The survey, an explanation | |
| _____ __ | Inspection of the patient in a hospital | | |
| _____ __ | Improvement of practical skills, work with the dummy, clinical and laboratory equipment, apparatus | Working with clinical and laboratory equipment | |
| _____ __ | Discussion of a practical part of training | The survey, an explanation | |
| _____ __ | Discussion of a theme of training, the abstract report, seminar, discussion | Abstract messages, seminars, | |

| | | | |
|---|---|---|---|
| | | discussions | |
| ____ __ | Working in a group. Demonstration videos on the topic, analysis of situational tasks, computer software, business games, etc. | The demonstration, interactive forms, active and passive | |
| ____ __ | The conclusion of the teacher on the given trining. An estimation of knowledge of students on 100 ball system and its announcement. Giving of the task to students on following classes (the complete set of questions) | Information, questions for self-training | |

Complications and how to deal with them

- **Bleeding** – if the bleeding is from one small area or tooth socket, take a clean handker- chief, knot one corner and firmly apply it to the bleeding area. Do NOT keep rinsing out your mouth because this will make the bleed- ing worse. Any blood accumulating in the mouth should be gently spat out.
- **Pain** – it is normal to have pain after oral surgery that will be controlled by simple pain-killing tablets taken on demand. If pain becomes more severe 3 or 4 days after opera- tion, you may be developing an infection and you should seek advice.

10. **Swelling** – this will normally settle after 3 days, but if it is getting worse after 3 days you should seek advice.
11. **Bruising** – this can vary with the individual and gradually goes away.

What to do when postoperative instructions “have not helped”

Patients do develop complications following both straightforward extractions and transalveolar sur- gery. The important thing for you is to recognize when these are genuine complications or simply the expected sequelae of the procedure. First it helps if you ask yourself *'Is the problem real?'* You can improve things by asking patients to describe the pain that they may have. The classical pain of a dry socket is that they had toothache before the tooth was removed, and the toothache has not gone away at any point and in fact is now worse. This is a typical *complaint* from somebody with a dry socket, and this can be an extremely painful condition in which the blood clot has broken down and they have superficial inflammation of the bone of the socket.

Patients may describe localized pain made worse when they bite their teeth together or an abnor- mality in their bite. This is a classical description of a fracture, which is a very rare occurrence but can happen following tooth removal.

They may describe a tense swelling that has become increasingly painful, the kind of pain expe- rienced with an infected haematoma; or it may be the most terrible pain they have ever experienced and that goes all over their head and down their arms and over their body and is stopping them sleeping at night, and the family pet has left as a result. This is a fairly typical blunderbuss approach to the description of pain seen in patients who are grossly exaggerating their symptoms for a variety of different reasons. This kind of symptomatology is not an emergency.

In addition you should ask patients to describe any bleeding they may be experiencing. If they describe chunks of blood clot rather like liver coming out of their mouth, this is almost certainly gen- uine and is describing persisting bleeding from the socket that needs immediate attention.

Alternatively, patients may describe fresh red blood coming from their mouth. This is unlikely, and rare, but it can occur if a small vessel has been cut in a transalveolar procedure. Again this needs to be seen immediately.

Patients could also describe blood on their pil- low, or blood that they keep on spitting out. Often this is simply blood-stained saliva, and the patient has not paid attention to the postoperative advice that had already warned them about this.

It is also helpful to ask patients to describe swell- ing. If they have had rapid onset of swelling that is hard, then this is usually a haematoma, and you will need to see these patients immediately. If it was of delayed onset, but is hard and painful, then this is often a collection of pus, which can be very painful and certainly will need to be seen immedi- ately. Rapid onset of soft swelling is usually oedema and does not mandate immediate attention.

After you have had a description of their prob- lems, and decided whether or not there is a real problem, check that the patients have followed the postoperative instructions. If they have not fol- lowed the postoperative instructions, they should do so and then recontact you after half an hour to see whether this has solved the problem.

If patients have followed postoperative instruc- tions and the problem from the description of symptoms appears to be real, then see them imme- diately. The main genuine problems centre around haemorrhage, infection, and pain, and these may be interrelated. The common conditions are as follows:

### Dry socket

This condition has a number of different names, and it occurs in approximately 3% of routine extractions and in up to 20% of surgical extrac- tions (Figure 6.27 and 6.28). The pain is localized to the site of extraction and is often throbbing and very severe. It will often keep the patient awake at night, and the classical description is of a tooth- ache that never went away when the tooth was removed. Some dry sockets may start after the tooth is removed, and the pain does not com- mence until the clot has completely broken down and established bony inflammation has started. Although some patients benefit from the use of nonsteroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen, the pain can often be so severe that these analgesics do not really help.

**Figure 6.27** ‘Dry socket’ – a painful osteitis of the tooth socket.

**Figure 6.28** At the extreme end of the ‘dry socket’ spectrum sequestration can occur.

Examination of the socket shows either a yel- low sloughy clot or a completely denuded socket of exposed bone. The surrounding gingivae are often

If the patient is not prepared to tolerate a local anaesthetic, then provision of antibiotics (particu- larly an anaerobicidal drug such as metronidazole) and of systemic analgesics (NSAID with or without codeine/paracetamol) with an antiseptic mouth- wash is just about all that can be achieved.

The aetiology of dry socket has been subject to a number of studies. It is generally considered to be more common in the following patients: women taking oral contraceptives; smokers; patients who are more than 40 years old and are having molar teeth, particularly lower molar teeth, removed using local anaesthesia. Curiously dry socket has a diurnal variation, with a higher spring and autumn prevalence.

It is most likely a condition that is instigated by a susceptible patient whose blood clot undergoes a local fibrinolysis possibly because of an opportu- nistic infection with anaerobic bacteria, although the causative rather than associative role of bacte- ria has not been conclusively established.

It is well worth noting that patients who advise you that they have postoperative problems with dry socket are almost certainly correct, and some people do seem to be much more prone to this con- dition than others.

Postextraction haemorrhage

There is often associated halitosis, and the role of anaerobic bacteria in the infective component of dry socket has been well described.

Established localized alveolar osteitis such as this is best treated by local means. If the patient can tolerate the application of a local anaesthetic, then cleaning out the socket and dressing it with either commercially available resorbable antiseptic or an analgesic pack (Alvogyl) will often be all that is needed. If this approach has already been tried and is ineff ctive, and particularly if a number of other treatments have been tried, including analgesics, then applying a local anaesthetic, cleaning out the socket and placing a pack made up of cotton wool, a small amount of zinc oxide powder and eugenol will provide complete pain relief. This pack will have to be removed and sometimes has to be replaced, but it is almost unique in providing complete pain relief in patients with really intractable dry socket pain.

Once the tooth is removed, bleeding should stop after approximately 10 minutes. Bleeding that occurs after this time or continues beyond it is usu- ally the result of small vessels bleeding from muco- sal tear or, very occasionally, significant bleeding from the bone of the socket.

### Reactive haemorrhage

Reactive haemorrhage following resolution of the vasoconstrictor in local anaesthesia is sometimes seen. This is often caused by small tears in the mucosa that allow little capillaries previously in spasm to open up.

Secondary haemorrhage caused by second- ary infection of the clot is comparatively rare and occurs after a number of days.

### Bleeding from the socket

Bleeding from the socket can be dealt with first by pressure, and patients are always advised to do this in their postoperative advice sheet. If this does not work, you need to see the patient, remove any estab- lished clot and identify the source of bleeding. If the bleeding is coming from the socket, the socket itself will need to be packed in some way to apply direct pressure to the bleeding site. This can be done with ribbon gauze dipped in antiseptic such as bismuth iodoform paraffin paste or Whitehead's

varnish, which will provide a tamponade effect within the socket and stop the bleeding, but it does need to be removed and will mean that the socket will heal very slowly. Oxidized cellulose agents can be placed in the socket; this approach is designed to provide scaffolding for normal clotting, rather than creating an actual tamponade effect within the socket, and many low-grade bleeding sockets will respond to this.

If the bleeding is from the gingival margins or mucosal tears, then suturing the socket will be effective. Almost any form of suture – simple inter- rupted, figure of eight or mattress sutures – will be effective in swaging the mucosa to the bone and effectively strangling minor capillary bleeding and preventing further haemorrhage.

Patients who have been bleeding for hours, par- ticularly if they attend with a large number of rela- tives, should be moved to an area where you can work with them in peace. Always wear protective clothing because these patients will often have swallowed a fair amount of blood and are likely to vomit on you as blood is an extreme irritant to the stomach. You need to have some decent light and suction. Remove the clot, clean out the socket and use a combination of oxidized cellulose within the socket and suturing and pressure. If patients con- tinue to ooze beyond, get them to the hospital and keep a pressure pack, in addition to the other mea- sures, on overnight. Patients can then be provided with antiemetics and, if need be, intravenous fluid, which will make them feel considerably better.

This combination will always prove to be effec- tive unless the patient has a significant bleeding diathesis. This may be either iatrogenic, caused by anticoagulants such as warfarin, or undiag- nosed, such as haemophilia. Patients who have had

**Figure 6.29** Woven and fibrillar oxidized cellulose and bone wax, examples of the aids to haemostasis.

palatal flaps may bleed from perforating vessels from bone. This is particularly likely around the incisive foramen and papillae. This bleeding can be effectively controlled by a material known as bone wax, which is massaged into the bleeding site. This is a very effective way of stopping bleeding from bone. Unfortunately it tends to form a small gran- uloma in the long term at this site because it is not resorbable. It should therefore be used in the small- est possible quantity (Figure 6.29).

Very rarely, significant vessels such as the pala- tine artery may be cut. This should be controlled by conventional methods such as diathermy or ligation. For other information regarding the man- agement of patients who have either iatrogenic or congenital bleeding diatheses, see Chapter 5.

Fractures

The most likely fracture to occur is fracture of the maxillary tuberosity or buccal plate of the jaws (Figure 6.30). Most often this is seen at the time of extraction, and nothing more than dissecting the piece of bone free and closing the mucosa are needed. If a tooth has been removed and fracture of the buccal plate or the alveolus has not been noted, then this may sequester and become loose, painful or infected. The sequestrum will need to be removed.

Fracture of the mandible or maxilla follow- ing tooth removal is comparatively rare but can occur in the third molar region if excessive force

**Figure 6.30** A fractured tuberosity with upper molar.

is used, particularly in patients who have had for- ceps extraction of lower third molars. It is difficult to justify carrying out such a procedure because of the known risks of fracture. In this instance patients may present with malocclusion, pain on biting or persisting infection and pain in the region of the extraction. Fractures of the mandi- ble are managed as described in Chapter 16.

## FURTHER READING


Moore U. *Principles of oral and maxillofacial sur- gery*, 3rd ed. Oxford: Blackwell Science, 2010.

*An update of an old established basic text mainly concerned with traditional oral surgery.*

Pedlar J, Frame JW. *Oral and maxillofacial sur- gery: an objective based textbook*, 2nd ed. Edinburgh: Churchill Livingstone, 2009.

*This is a nicely written and well thought out intro- ductory text with a good section on exodontia and transalveolar surgery.*

*Specific literature includes the following:*

Bajkin BV, Bajkin IA, Petrovic BB. The effects of combined oral anticoagulant-aspirin ther- apy in patients undergoing tooth extrac- tions: a prospective study. *J Am Dent Assoc* 2012;143:771–6.

Lillis T, Ziakas A, Koskinas K, Tsirlis A, Giannoglou

G. Safety of dental extractions during unin- terrupted single or dual antiplatelet treat- ment. *Am J Cardiol* 2011;108:964–7.

Morimoto Y, Niwa H, Minematsu K. Risk factors affecting postoperative hemorrhage after tooth extraction in patients receiving oral antithrombotic therapy. *J Oral Maxillofac Surg* 2011;69:1550–6.

Morimoto Y, Niwa H, Minematsu K. Hemostatic management of tooth extractions in patients on oral antithrombotic therapy. *J Oral Maxillofac Surg* 2008;66:51–7.

Powless RA, Omar HR, Mangar D, Camporesi EM. Management of antithrombotic therapy before full-mouth extraction. *J Calif Dent Assoc* 2013;41:417–20.

11. **The reasons for the difficult eruption of 8 teeth. Operations for periodontitis. (tooth replantation, root apex resection, root amputation, tooth hemisection). Pericoronitis. Purulent diseases in the oral cavity: pereostitis, palatine abscess, under the lingual abscess.**

**Chronological map of classes**
**(on classes in the clinic)**

| **Time** | **Stages of training** | **Forms of training** | **Duration in minutes. _____min** |
|---|---|---|---|
| _____ __ | Parenthesis of the teacher (theme substantiation) | | - |
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| | | | |
|---|---|---|---|
| ____ __ | Working in a group. Demonstration videos on the topic, analysis of situational tasks, computer software, business games, etc. | The demonstration, interactive forms, active and passive | |
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Aim

20. To appreciate the importance of infectious processes in oral and maxillofacial surgery.

Learning outcomes for undergraduates and postgraduates

- To understand the role of infection in the prevention and treatment of bisphosphonate- related osteonecrosis of the jaws.

The oral and maxillofacial microbial flora

The oral and maxillofacial region is the major interface between the individual and the external environment. As a result it is constantly exposed

- To be able to describe how microorganisms may cause infections of the maxillofacial region.
- To be able to discuss how infections remote from the maxillofacial region may complicate treatment of the oral and maxillofacial sur- gery patient.

- To be able to describe how these infections may be prevented and treated.

to microorganisms that may give rise to infection. Three areas, each with their own specific micro- flora,are of importance to the oral and maxillofa cial surgeon:

12. The cutaneous regions of the face.
13. The oral cavity.
14. The nasal cavity and paranasal air sinuses.

A basic knowledge of the microflora of these areas is important when planning prophylaxis or empirical treatment of infection.

Skin flora

- Staphylococci.
- Streptococci of the viridans group.
- Gram-positive andgram-negativediphtheroids.
- *Candida albicans.*
- *Malassezia furfur.*

Mouth flora

Diagnosis of infections

Accurate diagnosis of infection is important both for treatment and for public health man- agement. Prompt identification of the organism causing infection enables the antimicrobial ther- apy to be specifically directed, which may allow rapid resolution of symptoms and minimizes the opportunity for the development of resistant strains of bacteria. This approach requires care- ful collection of specimens, accurate labelling and the provision of adequate clinical details to allow the clinical microbiologist to carry out the appropriate culture and sensitivity testing. It is important to be aware that the specimen can be contaminated by normal flora, and where possi-

- Alpha-haemolytic streptococci.
- Nonhaemolytic streptococci.

- Gram-negative cocci.
- *Actinomyces* species.
- *Actinobacillus actinomycetemcomitans.*
- Gram-negative anaerobic rods.
- Spirochaetes.
- *Candida* species.

Nasal cavity and paranasal sinuses

ble the sample should be obtained by aspiration, rather than by swabbing the area or collecting a 'pure' pus sample from a drained abscess. If anaerobic or specific infections (e.g. tuberculo- sis) are suspected, then designated containers should be used. Samples should be sent to the laboratory without delay to ensure that culture of any organisms is possible. Warn the laboratory if a biohazard specimen such as tuberculosis is suspected.

Serology can be useful, particularly in the case of viral and mycoplasmal infections. It may be possible to identify viral antigens in serum, but it is

- Gram-positive rods.
- Gram-positive cocci.
- Gram-negative cocci (e.g. *Neisseria*).

Host defence mechanisms

Specific and nonspecific host defence mechanisms exist to prevent microbial infection. These are well developed in the head and neck region. These mechanisms include the following: an intact epi- thelial surface; and nasal mucus, saliva and tears, all of which have antimicrobial properties. The mixed microbial flora that is present also acts as an important nonspecific defence mechanism (com- mensal microflora). If this flora is altered, over- growth of certain organisms can occur, leading to symptomatic infection (opportunistic infection). This is exemplified by the frequency with which candidal infection occurs following broad-spec- trum antibiotic therapy. more common to measure serum antibodies. This

can allow the demonstration of a rising antibody titre over several days. It can also allow for identifi- cation of previous exposure.

Prophylaxis

It is not possible to sterilize the oral cavity before intraoral surgery, and bacteraemia is inevitable. What is not known is the significance of this bacteraemia.

This is also the case in traumatic wounds to the facial skin. The bacteraemia may be mild and readily dealt with by a patient with an intact host defence system. However, in the presence of underlying systemic disease, host defences may be overwhelmed. This may give rise to wound infec- tion or more generalized sepsis. If the patient has a foreign body in place (e.g. a prosthetic joint or a structural lesion of a heart valve), then infection may develop at these sites following the bacterae- mia. Examples of at-risk patients include the fol- lowing categories:

- Advanced age.
- Prolonged surgery – longer than 3 hours.
- Prosthetic material placed (e.g. implants including plates and screws).
- Impaired host defences – malignancy, mal- nutrition, uncompensated metabolic dis- ease (e.g. diabetes, patients on steroids or other immunosuppressants).
- Patients with cardiac valve lesions (e.g. after rheumatic fever, endocarditis; patients with prosthetic valves). This illustrates well the capacity for international controversy – the current UK National Institute for Health and Care Excellence (NICE) guidelines do not require clinicians to provide antibiotic cover for patients at risk of infective endo- carditis (CG64). However, similar national by the opposing tooth and become inflamed. The most common symptom is pain associated with a partially erupted tooth. The operculum is inflamed, and it may be possible to express pus or food debris from beneath the flap. The degree of systemic upset is variable. There may be trismus, lymphadenopathy and spread of infection to the adjacent fascial spaces.

Treatment

Débridement of the infected area may be all that is required in uncomplicated cases if the tooth is to be retained. Any abscess should be drained. If there is obvious trauma from an opposing tooth that is otherwise nonfunctional, then removal of this tooth may allow resolution of the symptoms. The affected tooth can be reviewed and arrange- ments made for its removal, if indicated.

Alveolar osteitis bodies in many other countries recommend the exact opposite.

The principles of prophylaxis are as follows:

- The procedure must carry a significant risk of postoperative infection or the consequence of infection must be significant.
- The correct antibiotic should be used (i.e. one that the relevant bacteria are sensitive to and the patient is not allergic to).
- The antibiotic should be administered in the correct manner at the correct time (i.e. just before the bacteraemia, to ensure a microbici- dal level of antibiotic is in the tissue that will be contaminated).

Acutebacterialinfections Pericoronitis

The lower third molars are the most commonly affected in pericoronitis (see also Chapter 8). During eruption the tooth is covered by a flap of gingival tissue, the operculum. This can result in the formation of a pocket, which may act as a food trap and provide a favourable environment for anaerobic bacteria. This flap can be traumatized

Dry socket occurs when there is loss of the clot formed at the time of tooth extraction (see also Chapter 6). This results in local osteitis of the extraction socket. It is characterized by a distinc- tive pain (often described as a toothache getting worse after the tooth has been removed) and an offensive smell.

Treatment

Treatment consists of irrigation of the socket and placement of an obtundent dressing. This may be supplemented with metronidazole 200–

400 mg three times a day for 3 days to eradicate any sec- ondary anaerobic infection that is present.

### Acute periodontal disease

This is much less common than chronic periodon- tal disease, which is universal. It is being seen much more frequently in patients with impaired host mechanisms such as those with human immuno- deficiency virus (HIV) infection. It tends to be an exacerbation of underlying chronic periodontal disease. Treatment of the underlying condition must be considered when planning management of these patients.

### Necrotizing ulcerative gingivitis

This is a painful and unpleasant condition. It is most commonly seen in patients who smoke and have poor oral hygiene. It may be more common at times of severe stress. Pain is a prominent fea- ture and may prevent the patient from achieving adequate food and fluid intake. There is usually an offensive odour from the mouth and bleeding from the gingivae following minimal pressure. The interdental papillae are initially affected, with the rest of the gingivae subsequently becoming involved (Figure 10.1). There may be marked loss of periodontal support. Cancrum oris (noma) is an extreme form with marked soft tissue and bony destruction. It is thought that a mixed spirochaete and fusiform bacterial infection is the cause. It is particularly common in the horn of Africa (e.g. Ethiopia), where malnutrition and lack of access to simple antibiotics such as metronidazole are an everyday problem.

### Treatment

Adequate analgesia is vital to allow adequate fluid intake and débridement of the affected tissue. Good oral hygiene is essential. This is supplemented with antibiotic therapy. Metronidazole 200–400 mg three times a day is the initial drug of choice. Noma presents a chronic problem created by extreme, often absolute, trismus resulting from destruction of facial tissue that requires division and recon- struction with robust vascularized tissue – the sub- mental flap works well for this.

**Figure 10.1** Necrotizing ulcerative gingivitis. (Courtesy of Mr R.F. Crosher.)

**Figure 10.2** Dental abscess pointing intraorally.

Dentoalveolar abscess

Oral microorganisms can reach the periapical tissues via the root canal system or via the peri- odontal ligament. If the bacteria are sufficiently virulent and/or the host defences compromised, then the infection may give rise to a dentoalveo- lar abscess. The complex attachment of facial fascia determines how these infections spread. The abscess may remain localized and drain via a small intraoral sinus (Figure 10.2), or it may spread, giving rise to severe cellulitis involving multiple tissue spaces (Figures 10.3, 10.4, 10.5 and 10.6). Various organisms are involved in these infections. There is an increasing recognition of the role of anaerobic bacteria, especially streptococci, in these infections. The specific signs and symptoms depend on which tissue spaces are involved. The symptoms may include pain, swelling, discharge, tenderness to percus- sion of involved teeth, trismus and dysphagia. Trismus or dysphagia, particularly for fluids (ask whether the patient can swallow his or her own.

12. **Preparation of the oral cavity for prosthetics**

**Chronological map of classes**

**(on classes in the clinic)**

| **Time** | **Stages of training** | **Forms of training** | **Duration in minutes. _____min** |
|---|---|---|---|
| _____ __ | Parenthesis of the teacher (theme substantiation) | | - |
| _____ __ | Discussion of homework | The survey, an explanation | |
| _____ __ | Inspection of the patient in a hospital | | |
| _____ __ | Improvement of practical skills, work with the dummy, clinical and laboratory equipment, apparatus | Working with clinical and laboratory equipment | |
| _____ __ | Discussion of a practical part of training | The survey, an explanation | |
| _____ __ | Discussion of a theme of training, the abstract report, seminar, discussion | Abstract messages, seminars, discussions | |
| _____ __ | Working in a group. Demonstration videos on the topic, analysis of situational tasks, computer software, business games, etc. | The demonstration, interactive forms, active and passive | |

| | | | |
|---|---|---|---|
| ____ __ | The conclusion of the teacher on the given trining. An estimation of knowledge of students on 100 ball system and its announcement. Giving of the task to students on following classes (the complete set of questions) | Information, questions for self-training | |

Aims and learning outcomes

For undergraduates:

21. To be able to list the range of preprosthetic procedures available.

22. To be able to describe the principles, indica- tions and steps of common implant procedures.

23. To demonstrate an awareness of the less com- mon procedures.

For postgraduates:

24. To be able to describe the principles of all pre- prosthetic procedures.

25. To be able to describe the steps of individual implant procedures.

26. To demonstrate the ability to link individual preprosthetic problems to surgical and non- surgical solutions.

Introduction

The core problem in prosthetics is tooth loss. Th s may seem self-evident, but in relation to preprosthetic

surgery it is the progressive loss of the residual alveo- lar bone at the rate of 0.5 to 1.0 mm/year following tooth loss that generates a patient's diffi ulties. Th s results in a progressive loss of bone stock and second- ary soft tissue support for any prosthesis. To compen- sate for this loss of soft tissue support and to maintain the occlusal vertical dimension there is an increase in bulk of the dentures that leads to further instability. The initial healing of the extraction socket by second- ary intention with the formation of myofibroblasts within the organizing blood clot also hastens this loss of bone

stock. Finally, the pathological processes that have led to the initial loss of teeth may continue, thus leading to the progressive loss of remaining teeth.

## Atraumatic exodontia

Taking the foregoing observations into account, surgery for prosthodontics begins with the extrac- tion of teeth and the removal of retained roots and unerupted teeth (see Chapter 6). The need to preserve alveolar bone is paramount and is best achieved by atraumatic exodontia including socket compression. Socket compression reduces any expansion of the buccal plate and also reduces the residual blood clot within the socket. This blood clot may be further diminished by intraradicular radiculectomy and crush.

## Intraradicular radiculectomy and crush

these prostheses is invariably confined to periapical surgery (see Chapter 7) or to periodontal procedures.

## Removable prostheses

Surgery for removable prostheses can be consid- ered under soft tissue and hard tissue surgery. In either case, surgery is aimed at improving reten- tion and stability of the prosthesis, improving the patient's comfort or removing pathological tissue.

Th s technique reduces the socket dead space follow- ing multiple extractions, usually in the upper and lower labial segments. Following extraction, the bony septum between the sockets is removed by means of rongeurs (Figure 15.1). The buccal plate is then com- pressed manually and is in-fractured to reduce the socket space. The approximation of buccal and lin- gual/palatal plates of the socket allows the gingival margins to be sutured to maintain the compression. Th s technique is of particular benefit for the imme- diate insertion of dentures (Figure 15.2 (a) and (b)).

## Surgery for conventional prosthodontics

It should be considered best practice for the sur- geon to work in close collaboration with the pros- thetist in the joint management of these patients.

Soft tissue surgery

Common soft tissue procedures include:

- Fraenectomy.
- Ridge reduction.
- Removal of irritation (‘denture’) hyperplasia.
- Vestibuloplasty.

Fraenectomy

Large fraena or resorption of the residual ridge can interfere with the peripheral seal of the denture and lead to poor retention. The relief for such

Fixed and removable prosthesis

Fixed prostheses

Nonimplant fixed prostheses are predominately confined to crowns and bridgework. Surgery for fraena may also result in repeat fractures of the prosthesis and discomfort. In these cases, fraenec- tomy may be carried out using a technique as for upper labial fraenectomy for orthodontic indica- tions (see Chapter 9) (Figure 15.3).

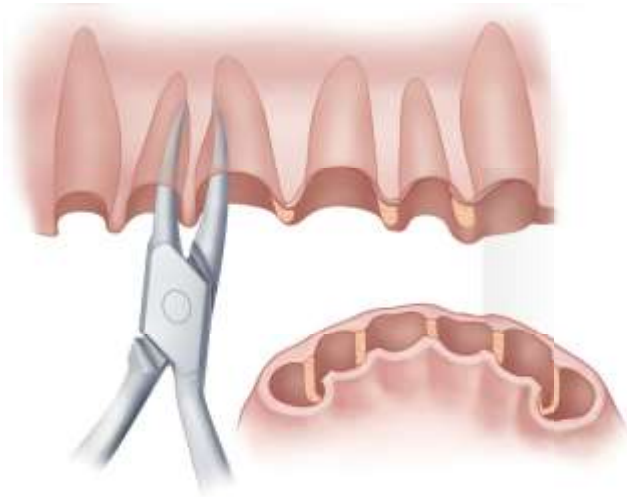
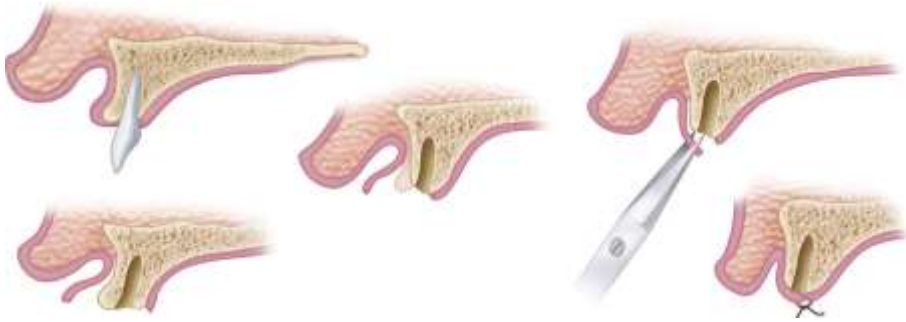


**Figure 15.1** (a) and (b) Diagrams representing the removal of intrabony septa with rongeurs.



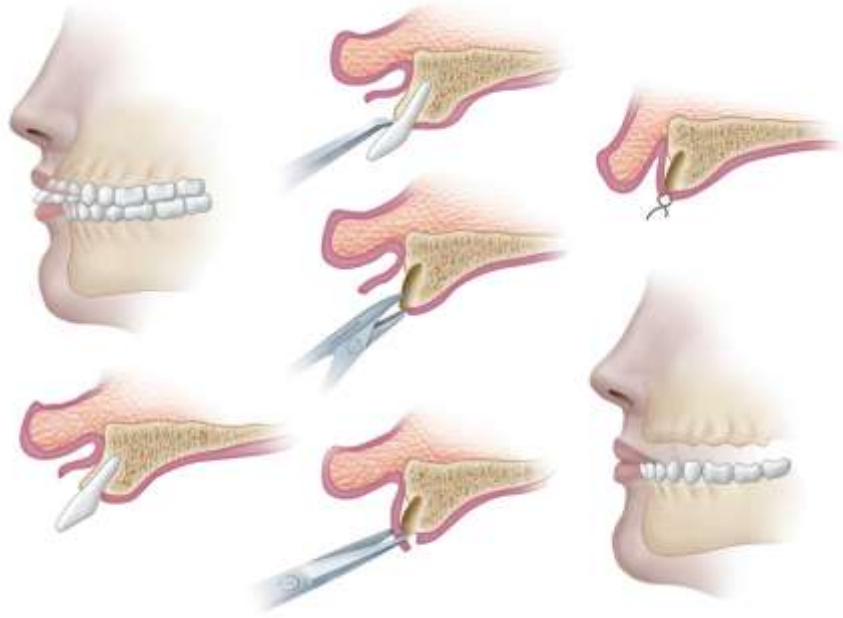


**Figure 15.2** The first procedure (a) is socket reduction where a bony undercut needs to be reduced. (A) Vertically positioned tooth with prominent bony undercut. (B) Atraumatic removal of tooth. (C) Full-thickness mucoperiosteal flap and removal of bone. (D) Trimming of excess mucosa. (E) Suturing mucosa to seal socket. The second procedure (b) is socket reduction where excessive angulation of tooth and socket requires infrac- ture of labial plate of socket. (A) Class II div I angulation of incisor teeth. (B) Full-thickness mucoperiosteal flap raised. (C) Atraumatic removal of tooth. (D) Infracture of labial plate of socket. (E) Repositioning of labial plate and trimming of mucosa. (F) Closure of wound. (G) Final alveolar bone shape and profile change.

'Flabby' ridge reduction – 'Schlotterkamm'

In patients who have tooth loss associated with advanced periodontal disease, the excess of soft tissue may result in a flabby ridge, which in turn causes poor denture stability. This commonly affects the maxillary tuberosity region and labial segments. The localized bone loss can be further accelerated if natural standing teeth oppose a den- ture. In

these cases soft tissue reduction is carried out by excision of the underlying fibrous tissue

while preserving, where possible, the attached mucosa (Figure 15.4). In these cases it is important to have a replacement baseplate in which a tissue conditioner can be placed to enable close adapta- tion of the mucosa to the underlying bony ridge.

Irritation (denture) hyperplasia

Resorption of the residual ridge continues after initial socket healing. The loss of bone height causes a previously adequately extended denture

**Figure 15.3** High fraenal attachments like the lingual attachment shown here can be simply divided. The tight 'bowstring' opens into a loose diamond shape which can be closed primarily. This automatically deepens the sulcus.

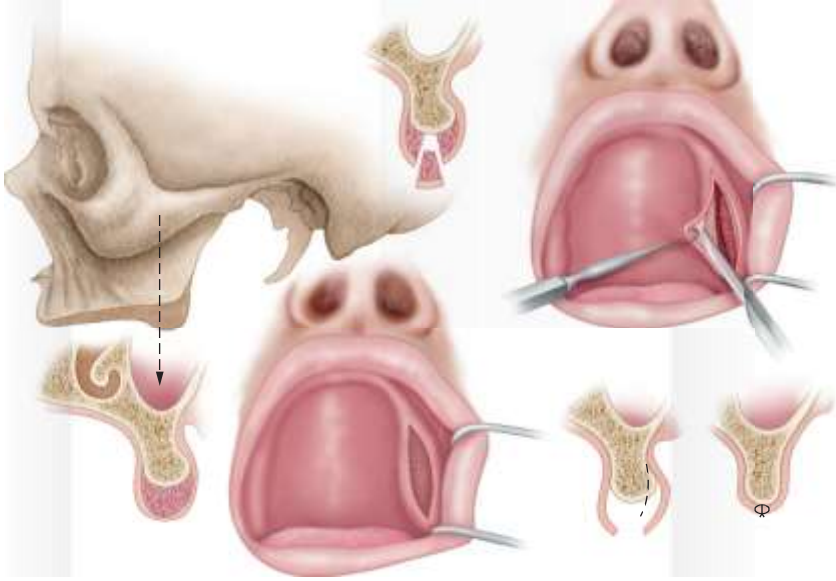


**Figure 15.4** These steps illustrate the common region of the maxilla to have a ‘flabby’ ridge. (a) Tuberosity region. (b) Cross section showing antrum, alveolar bone, excessive fibrous tissue and attached gingivae. (c) Elliptical excision of attached gingiva exposes underlying excess fibrous tissue. (d) Wedge of excess tissue excised. (e) Residual excess fibrous tissue excised down to bone but preserving attached gingivae. (f) Excessive undercuts removed if necessary. (g) Attached gingivae sutured adherent to underlying bone.

to have a peripheral margin that is overextended, usually into the buccal or labial sulcus. This leads to a traumatic ulcer in the sulcus, which, with repeated trauma, produces an overgrowth of fibrous tissue. Initial management is by the drastic

local relief of the flange of the denture and strict instructions to the patient to leave the denture out as much as possible (‘social use only’). After a period of a few weeks, inflammation is reduced and the hyperplastic tissue decreases in size. In

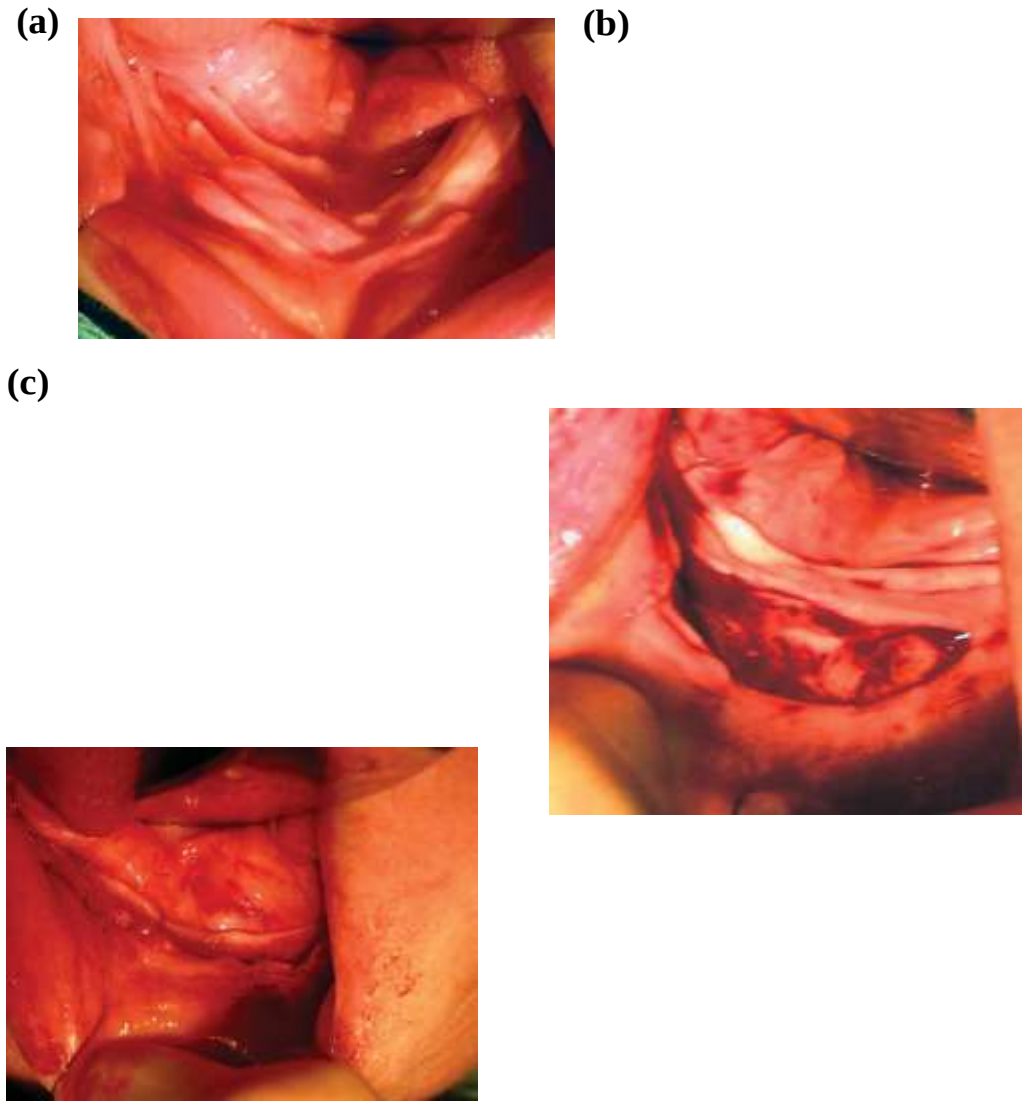



**Figure 15.5** (a) Irritation hyperplasia; if leaving the lower full denture out does not allow the area to settle, excision is indicated. (b) Excision of irritation hyperplasia. (c) Mucosa should be preserved wherever possible.

many cases the reduction in size is such that the hyperplastic tissue will not interfere with new denture construction.

When the residual hyperplastic tissue will inter- fere with denture construction, excision is indi- cated (Figure 15.5 (a)). This may take the

form of *simple excision* with elliptical excision of the excess tissue at its base. In large areas of hyperplasia, simple excision may create a shallow V-shaped sul- cus. In these cases a *mucosal-preserving approach* should be attempted, by dissecting and preserv- ing the buccal/labial mucosa while excising the remainder of the hyperplastic lesion, with the pre- served mucosa inlaid as a graft to preserve sulcus depth (Figure 15.5 (b) and (c)). In this case a heal- ing baseplate suitably lined with tissue conditioner is essential to try to maintain sulcus depth.

Vestibuloplasty

In areas where residual ridge height or sulcus depth has been lost, commonly because of loss of attached mucosa, vestibuloplasty may be benefi- cial. In these cases a supraperiosteal mucosal flap is reflected and sutured 'apically' in the sulcus.

Muscle attachments may need to be released to achieve the desired increase in sulcus depth. The exposed periosteum may be left to granulate; however, this may result in scarring and a narrow V-shaped sulcus, which the prosthetist may have difficulty using. Scar reduction may be achieved by grafting with palatal mucosal free graft or split-thickness skin graft. In either case a healing baseplate lined with gutta percha or a proprietary denture liner should be fixed in place for the ini- tial healing period by means of heavy nonresorb- able suture (or stainless steel wire) passed around the mandible or less often through the maxillary antrum or screws directly into the hard palate.

In the case of lingual vestibuloplasty, following release of the lingual muscle attachments, the new sulcus depth is created by a temporary baseplate secured by circummandibular wires or heavy non- resorbable sutures.

After initial healing, a temporary denture extended to the full depth of the new sulcus should be provided. Unfortunately, the benefits of vestib- uloplasty are lost if subsequent prostheses do not make full use of the new sulcus depth.

# GLOSSARY

**Abscesses (abscessus)**. Purulent surgical infection. An abscess in the area of the face is caused by injury or inflammation of the skin, oral mucosa, lips, nose eyelids. Formed abscess is bulging, dome-shaped, bright congested section. The skin is thinned above him.

**Agenesis (agenesia).** Congenital absence or hypoplasia of the body part, body parts. For example, the lack of (an X-ray control) lateral teeth and third molars.

**Agnathy (agnathia).** Congenital absence of upper or lower jaw, a very rare anomaly.

**Phlegmonous adenitis** - diffuse purulent inflammation of tissue resulting from infection by a stretch of the affected lymph node. Edentulous - reducing the total number of teeth

**Edentulous (complete)** - a complete lack of teeth on any of the jaws

Edentulous (partial) - partial absence of teeth

**Actinomycosis** - specific chronic inflammatory disease affecting various tissue structures and organs, characterized by wavy long over.

**Allograft** - extracted tooth transplantation from one person to another in the presence of the bank's teeth, specially treated and stored in preservatives.

**ALVELOTOMIYA -** dissection of the wall of the tooth alveoli.

**ALVEOLA** - hole in the alveolar bone of the jaw where the tooth is located.

**Alveoli** (alveolar pain) - inflammation of the tooth extraction wells. It is a complication of tooth extraction surgery. It occurs most often in complicated removal. The cause - the lack of a blood clot formed in the well, which is why it disrupts the normal process of healing.

The alveolar process - part of the jaw bone, which is a tooth (arched bony ridge is an extension of the body of the upper jaw and the lower jaw down upwards)

**ALVEOEKTOMIYA** - removal of the tooth edges of the alveoli and sites mezhalveolyarnyh partitions.

**Ankylosis** - ankylosis of the temporomandibular joint are characterized by partial or total immobility of the lower jaw, caused by pathological changes in the joint.

Arthritis of the temporomandibular joint (TMJ) - an inflammatory or inflammatory-dystrophic disease of a joint.

**ARTHROSIS** temporomandibular joint (TMJ) - a degenerative lesion of the temporomandibular joint.

**Asphyxia** - occurs when the front of the head injuries, gunshot wounds, chronic inflammatory diseases (abscesses, cellulitis, glossitis, Ludwig's angina), in the course of anesthesia and surgical interventions.

**Atheroma** - sebocystoma resulting from difficulty removing the contents through the gland duct.

Mouth disease - a chronic inflammatory disease of the oral mucosa, characterized by the emergence of the AFL, occurring with periodic exacerbations and remissions.

**BANDAGE.** Dressing, bandage, tire machine.

**BEHCHEGA** syndrome. Chronic disease is suspected viral etiology, characterized by aphthous-yazvennmi changes of the oral mucosa, genital inflammation of the eye, recurrent course.

**Biopsy** (biopsia). In vivo excision of parts of tissue for microscopic examination.

Bifurcation (bifurcatio). The division into two parts, and relates to the trachea tooth roots.

**BLOCKADE MANDIBLE** (English blocade -. Obstruction, retention) - partial or full restriction of its movement. The reasons are: occlusive disorders as a result of deformations of dentition, deep bite, infringement of the articular disk dysfunction lateral pterygoid muscles; osteoarthritis and ankylosis of the temporomandibular joint, contracture, scarring of the skin and mucous membrane after injury, burns.

**DISEASE** Mikulic. The disease, which is characterized by increase in salivary and lacrimal glands. Increases in volume as large (parotid, submandibular, sublingual), and small (labial, buccal, and palatal - lingual) salivary gland. The disease is prolonged. As the salivary glands increases dry mouth, lacrimal - dry in the conjunctiva.

**DISEASE** teething. Teething third molars, especially the lower ones, are often complicated by the development of infectious-inflammatory process in the tissues of the gums, overhanging crown

**DISEASE** slyunnokamennaya. The formation of stones in the salivary gland.

**Post-extraction PAIN** - pain after tooth extraction, infection associated with a hit in the well (blank well), bone formation sequestration, break off the sharp edge of the walls of the alveoli, as well as trauma to the mucosa of the oral cavity edges uncorrected prosthesis.

**Furrow** (PEEP) gum - a narrow slit-like space between the tooth and gum, ranges from the free gingival margin to the attachment of the epithelium. The depth of the gingival sulcus is 0.5 - 3 mm.

**Furrow chin - LIP** - being the lower limit of the lower lip, separating the latter from the mental projection.

**Bruxism** (brucsismus). Tooth grinding, crunching night; If these phenomena occur during the day, then talk about bruksomanii.

**Hillock alveolar** - paired distal end of the alveolar process of the maxilla, located in pozadimolyarnoy area. What matters is how the anatomical point of retention at fixing dentures on the upper jaw.

**Articular tubercle -** formation of a convex base of the zygomatic process of the temporal bone. It is the front limitation of articular pit. He ramp slides articular disc and the head of the mandible when opening the mouth, jaw thrust forward.

**Vandervuda syndrome**. Symmetrically arranged mucous cystoma lower lip; splitting of the upper sky, sometimes upper lip.

**Vincent symptom.** Anesthesia or paresthesia in the half of the lower lip and chin in inflammation, rupture or compression of the inferior alveolar nerve fibers caused by pathological changes in the tissues of the lower jaw.

**VESTIBULOPLASTIKA** - soft tissue redistribution, carried out with the aim of deepening the vestibule of mouth and expansion of attached gingiva area.

**Temporomandibular joint** (TMJ) (articulatio temporoman-dibularae). It consists of the articular pit (fossa mandibularis), located in the temporal bone, and joint heads of the lower jaw.

**Blister** (urtica). There is on the skin, if a limited area suddenly appears swelling (due to inflammation), which raises the surface. Blister pale, blubber, surrounded by a congested area. This early immune lesion type I, in which the immediate positive skin test takes the form of a blister. The oral blister usually not formed. Angioedema on the lips is not a true blister.

**Dislocation of the tooth** - damage ligamentous apparatus of the tooth, leading to his removal.

**Sinusitis** (highmoritis). Inflammation of the maxillary sinus (from the name of the English anatomist Highmore, first described the maxillary sinus).

**Hemangiomas** (haemangioma). Benign tumor originating from the blood vessels. In the presence of hemangioma of oral prosthesis is contraindicated.

**Hemarthrosis** (haemarthrosis). Bleeding into the joint cavity (eg, temporomandibular injuries on the ground).

**Hemorrhage** (haemorragia). Bleeding. For example, bleeding gums - hemorrhagic gingivitis. The accumulation of blood extravasated from the blood vessels, tissues or the body cavities. Depending on the size divided into petechiae and ecchymosis.

**GUERIN symptom**. Symptom maxilla fracture: the wide-open mouth and pressing forefingers on hooks pterygoid processes of the sphenoid bone pain occur, spreading all over the damaged bone.

**GLOSSALGIYA** (glossalgia). Disease language, accompanied by neurological symptoms order -.. Burning, paresthesia, etc. There is also at lower occlusal height.

**Granuloma** (granuloma). Inflammatory tissue growth (eg, tooth root - apical).

**"Hanging out" COMB**. Excess mucous membrane of the alveolar bone in the form of rolling ridge.

**Desna** (gingiva). The mucosa covering the alveolar ridge and covering the neck of the teeth in the form of rim-shaped crescent notch, fills the gap between necks of two adjacent teeth and interdental papilla forms a triangle with the apex pointing towards the contact points.

**Closed c**urettage of the tooth-gum pockets - deep-removal of subgingival plaque and inflamed tissue in the tooth.

**TOOTH -** luxation (dens luxatio). There are part-time and full. Etiology: injury. The main symptoms: a partial dislocation - pathological immobility during rotation, a full - after an injury a tooth is completely

removed from the wells and its connection to the well broken. Treatment: partial dislocation - splinting, with full - replantation - tooth and the hole to be treated with antibiotics, a tooth set in shinirovat well and, after removing the pulp and root canal sealed

**DENTAL bag.** Formed in the embryonic stage of tooth development. It appears in the form of condensed mesenchyme embracing tooth rudiment. dental follicle tissue merges with the mesenchyme of the dental papilla at the base of the tooth germ, in other places the dental sac is closely adjacent to the outer surface of the enamel organ.

**DENTAL papilla.** It is formed from mesenchyme grows into the recesses of the enamel organ, in the 10th week of fetal life. The outlines of the dental papillae correspond to the shape of the future baby tooth crowns.

**IMPLANT.** The device of any materials being introduced into the body by surgery for permanent or temporary carry out various functions. A dental implant consists of several parts parts - implanted in jaw bone or under the gum, supragingival part and superstructure (artificial teeth, removable prosthesis).

**Dental Implantation** (implantation). Operation of creating additional support at the end or connected dentition defects by using different types of special implants made of different materials.

**Carbuncle** - acute purulent inflammation of the skin and subcutaneous tissue, which applies to some of the hair follicles, sebaceous glands.

**Gingival pocket (**periodontal pocket, periodontal pocket) - a space formed as a result of the destruction of the periodontal connection and the circular ligament tooth and bone resorption and alveolar walls.

**Angioedema.**

Etiology: constitutional violations vasomotor innervation. At the heart of angioedema is increased tone of the parasympathetic nervous system, manifested by local expansion of capillaries and arterioles, followed by an

increase in their permeability, arises in the sensitized organism under the influence of specific allergens (food - egg, strawberries, etc., flowers, animals.) And non-specific stimuli ( cooling, infections, intoxication, mental and physical trauma).

Clinic: developing acute swelling of the skin and subcutaneous tissue. The most frequent localization of edema - open areas of the body - the face (lips, eyelids, cheeks), hands. Observed swelling of the mucous - pharynx, larynx, stomach, manifested asphyxia, vomiting, diarrhea. Otechny land raised above the surrounding skin. Swelling tight, pressure-sensitive recess is left fingers, felt the tension and itching. It lasts from several hours to several days, accompanied by the general poor state of health. Swelling disappears without a trace. Angioedema appears in most cases at a young age, and then observed for many years. Danger to life are cases when the larynx is affected. Quincke's disease prevention is possible to avoid that the factor that causes a particular patient attack: certain foods, cooling odor and so decrease the amount of water introduced into the organism and salt..

Treatment: the means increase the tone of the sympathetic nervous B system (10% calcium chloride solution, 10.0 intravenously, ascorbic acid, ephedrine). Antihistamines (pipolfen, diphenhydramine, suprastin, alfadril, pernovin), gamma globulin, gistoglobulin. Tools that reduce the activity of the parasympathetic (atropine). Desensitizing therapy (ACTH, prednisolone), asphyxia induced airway mucosal edema, injection of adrenaline solution 1,0-0,1%. If no effect is required tracheotomy.

**Cyst** (c kiste- bubble.) - Hollow tumor formation, the inner surface of which is lined with epithelium, and the outer part of the wall consists of fibrous tissue. The cavity often contains clear, at least - opalescent liquid.

**CYST tooth.** Synonym - jaw radicular cyst - a cavity located in the thickness of the alveolar processes, and sometimes even the body of the jaws, lined with casing and is usually filled with a yellowish or brown viscous liquid containing cholesterol crystals, pus (purulent cysts), mucus.

Kistogranulema (Latin granulum -. Seed) - cavity with epithelial lining option granule-matous periodontitis. Kistogranulemy diameter of 0.5 - 0.8 cm.

The root of the tongue - a back part of the tongue attached to the lower jaw and the hyoid bone

Contracture (lat contractura -. Constriction, contraction) - a persistent limit joint mobility due to pathological changes in the soft tissues (skin, muscles, ligaments, fascia), or nerves that are functionally related joint.

**Leukoplakia** (leucoplakia). A chronic disease of the mucous membranes, characterized by increased keratinization of the epithelium, and inflammation of the mucous membrane itself.

**LOCAL ANAESTHESIA** - analgesia one or more teeth by introducing anesthetic into the soft tissue of the drug substance.

**NADDESNEVIK** (epulis) - a collective term for a variety of origin of education, localized in the gingival papillae and around the neck of the tooth.

Periosteum - a thin, dense layer of connective tissue that covers the top of the jaw bone.

Neuralgia - a defeat mainly sensory nerves. It is a short (1-2 min.) Or permanent attacks of excruciating pain in the area of innervation of the first - third branches of the trigeminal nerve. Pain is accompanied by vegetative symptoms (facial flushing, dacryo- and salivation).

**Odontoma** (odontoma). Swelling of the dental tissue (benign). The tumor is a conglomeration of various tissues of the tooth and periodontal.

**OSTEOGINGIVOPLASTIKA** - flap surgery with the use of tools that promote reparative processes in the periodontium.

**OSTEOMYELITIS -** inflammation of bone and bone marrow. There are acute (hospital similar to acute periodontitis) and chronic. It requires intensive care in the hospital.

**PAPILLOMA.** A benign tumor composed of connective tissue framework and the burgeoning of the epithelial layer of the coating.

**Papillomatosis.** Papillary proliferation proper mucosal layer protruding above the level of the mucosa of the oral cavity, disturbing its configuration.

**Periodontitis** (synonyms: parodontium, paradentsium). It is a functional complex, which includes all dental and periodontal tissue that cause as one the main function of the teeth during the act of chewing - acceptance, transfer and transformation of chewing pressure.

**Periodontitis.** Periodontitis is called a disease in which inflammation of the gums spreads to other periodontal tissues.

Periodontitis (parodontos). Periodontal disease refers to diseases of primary degenerative nature.

**PERIKORONARIT** - inflammation of the soft tissue due to the shortness of tooth eruption.

**Periodontitis -** periodontal disease tissue, which often occurs in the presence of microorganisms or by trauma.

**Periosteum -** inflammation of the periosteum to form a first serous, then purulent focus between the bone and the periosteum.

**PERIOSTOTOMIYA** - dissection of the periosteum with a partial detachment from the bone. Often accompanied by a drainage installation.

**Premedication** (Latin rgae-ahead + medicatio -. The appointment or prescription medication, treatment) - the use of drugs in patient preparation for anesthesia or local anesthesia in order to increase their efficiency and prevention of complications.

**Ranuli (ranula).** Literally "frog tumor." Sublingual retention cyst (in the name of "hydroglossa" reflected similarities with laryngeal cysts bubble frog).

Root apex resection - surgery that is performed in order to remove a chronic focus of infection at the root tip.

**TOOTH replantation** - tooth extraction in order to remove a chronic source of infection and its subsequent transfer to their original location (in its own well).

**RETENTION teeth** (retentia). Delayed eruption.

**Sialadenitis** (sialoadenitis). Inflammation of the salivary gland.

**Sialography** (sialographia). Method X-ray examination of the salivary ducts by filling their contrast agents.

**Angiosialitis.** Chronic inflammation of the excretory ducts of the salivary glands.

**STOMATITIS** (stomatitis). Inflammation of the oral mucosa.

**Uranoplasty** (uranoplastica). Surgical reconstructive surgery for congenital cleft palate.

**FRENULOPLASTIKA** - plastic bridles upper and lower lips and tongue. Frenotomy - frenotomy (in children). Frenulektomiya - complete excision of the frenulum.

**Cystotomy** - the creation of a wide communication between the cyst cavity and oral cavity without husking cystic membrane and stitching the edges of the oral mucosa with a cyst shell to create a wide-open space, communicating with the vestibule of the mouth.

**Cystectomy** (removal of cysts) - surgery to remove the cyst (cystic shell husking followed by suturing the wound tightly).

**Exostosis** (exostosis). Bony prominences (tumor formation in the body of the jaw), most often located in the area of the premolars of the mandible and maxilla mounds.

**Exudate -** the accumulation of tissue fluid (serous), may contain microbial products (purulent), or blood (hemorrhagic).

**ELEVATOR**. A tool for separating bone from the periosteum or tooth extraction. There are straight and at an angle to the left-hand and right-hand bending cheek.

## TESTS

1. Formalin vapours it is necessary to sterilise

+instruments with optical системами*

- Cutting tools

- Rubber gloves

- Gauze napkins

2. That concerns to antiseptics from group of dyes

+ rivanol, methylenium blue*

- phuracylinium, phuraginum

- iodonat, iodopiron

- A solution chloric to exhaust

3. What of the listed complications concern to kept away after tooth removal

+ неврит lower алвеолярного nerve*

- Crisis of the lower jaw

- Bottom punching гайморовой bosoms

- Fang crisis

4. What teeth on the upper jaw deletes by means of rotational movements

+ incisal*

- All teeth

- All premolars

- All premolars and molars

5. The main contra-indications to a narcosis in polyclinic

+ sharp diseases of parenchymal organs *

- Chronic inflammatory diseases of the upper respiratory ways

- Cordially - vascular insufficiency in indemnification stage

- A hungry stomach

6. Complications инфраорбитальной anesthesias

+ diplopia*

- Decrease in a sharpness sight

- nystagmus

- Violation of motion of an eyeball

7. That does not correspond to the requirements shown to the operational

+ sunscreen curtains on окнах*

- The ceilings painted by an oil paint

- Warm, cold water supply is hot also

- A floor covered with linoleum

8. For infiltration anesthesias it is not applied

+ 3 % a solution dicaine*

- 2 % a lidocaine solution

- 2 % a solution trimecaine

- 1-2 % a solution novocaine

9. A zone innervation a palatal nerve is mucous the sky at level

+ molars, premolars*

- Upper premolars

- All upper teeth on the one hand

- Only level molars the upper jaw

10. What anaesthesia apply at removal 7 upper teeth

+ premolars*

- infraorbital and incisival, palatinal

- Local infiltration and incisival

- Local infiltration and palatinal

11. For preparation iodophormного a wad use

+ iodophorm, spiritus*

- Iodine, phuracillin

- phuracillin, iodine

- A physiological solution, glycerine

12. Local complications at removal of teeth

+ crisis каронки*

- Faint development

- anaphylactic shock

- alveolar a bleeding

13. Treatment chronic odontogenic an antritis consists in

+ radical operations on Kolduell-Ljuk*

- Washing maxillary bosoms

- antibiotic treatment

- physiotherapy

14. Indications for narcosis carrying out in polyclinic

+ allergic reaction*

- Presence of the centres of a purulent inflammation

- Traumatic intervention

- Removal impacted tooth

15. In pathogenesis odontogenic an osteomyelitis an important role plays

+ sensitization*

- Presence of the destroyed tooth

- Infection presence in an oral cavity

- Violation of nose breath

16. What sign is not characteristic for a phlegmon of parotic-chewing area

+ pains at Swallowing*

- Asymmetry of the person

- Painful infiltrate

- A hypostasis of a mucous membrane of a cheek

17. The exciter of a sharp purulent osteomyelitis most often is

+ aureus and white стафилококк*

- phusobacterium

- bacteroidum

- pneumococcus

18. Name the factor promoting increase of nonspecific resistance of an organism at jaws sick of an osteomyelitis

+ balanced diet*

- Overcooling

- Mental stresses

- Treatment

19. What symptom will allow to differentiate a sharp osteomyelitis of the lower jaw from periostitis

+ feelings numbness in the field of a lower lip mental*

- Body temperature rise

- leucocytosis with shift to the left

- A swelling in the field of the lower jaw

20. Indicate term of formation of sequesters at adults at an osteomyelitis of the lower jaw

+ 4 week*

- 1 week

- 3 months

- 4 months

21. The thrombophlebitis of veins of the person is complication is more often

+ furuncle*

- Superficial phlegmons of a neck

- deep neck phlegmons

- An erysipelatous inflammation of a skin

22. The thrombosis пещеристого a sine is more often advanced at

+ furuncle  of face*

- Deep phlegmons of a neck

- To a mouth floor phlegmon

- To a phlegmon of temporal area

23. At a phlegmon of a bottom of a cavity in process it is not involved

+ buccal area*

- genioglossal a fillet

- The hypoglossal platen

- submental a triangle

24. What sign is characteristic for a phlegmon submental areas

+ a swelling and pains of fabrics submental area*

- Limitation of opening of a mouth

- Painful chewing

- hyperemia a soft palate mucous membrane

25. Duration of time invalidity at purulent periostitisx it is equal on the average

+ 3 days*

- 2 weeks

- 6-9 days

- Month

25. A leading direction of medicamentous treatment sharp odontogenic an osteomyelitis

+ Desensitizing terapy*

- Venting of purulent-nekroticheskogo centre, treatment of "causal" tooth

- Antimicrobal and stimulating therapy

- Treatment of "causal" tooth

26. The deep phlegmon admaxillary fabrics is characterised

+ Painful swallowing*

- A dense swelling of the person

- Painless swallowing

- Absence contracture chewing muscles

27. For an eye-socket phlegmon it is characteristic

+ Exophtalmus*

- Purulent separated from a nose

- A rhinitis

- Lacrimation, exophtalmus

28. The combination of the limited opening of a mouth to painful swallowing is characteristic for a phlegmon

+ Pterygopalatinum ямки*

- A mouth floor

- Submental of area

- Submandibularof area

29. For an abscess subtempolar and pterygopalatinal poles it is characterised

+ Has flowed temporal area*

- Free opening of a mouth

- A lower eyelid hypostasis

- Vybuhanie of a lateral wall drinks

30. For an abscess genioglossal a fillet it is characterised

+ Painful opening mouth*

- Increased salivation

- The limited opening of a mouth

- Mouth opening is sharply limited, swallowing painless

31. About distribution of a purulent inflammation from buccal spaces in subtemporal a pole testifies a symptom

+ the Pain at swallowing*

- A fever

- A fever, a pain at swallowing

- A lower eyelid hypostasis

31. The phlegmon peripharyngeal spaces differs from a phlegmon pterygomandibularspaces a symptom combination

+ the Hypostasis and uvula mixture in healthy side*

- A pain at swallowing, free breath

- Free breath

- Absence of external signs

32. Indicate a back, participating in formation ciliary ganglion

+ Sensitive - from nasociliaris nerve*

- Sensitive - from an internal sleepy texture

- Sympathetic - from nasociliaris a nerve

- Oculomotors - from nasociliaris a nerve

33. At carrying out torusal anesthesias it is switched off

+ Lingual*

- Upper alveolar

- Chewing

- Obverse

34. The local reason alveolar bleedings

+ Otlom of a part of an alveolus, rupture gingiva*

- Increase of arterial pressure

- Psychoemotional pressure strengthening

- Reception of anticoagulants

35. A phlegmon placing about the lower jaw

+ Pterygomandibular spaces*

- Subtemporal of a pole

- Malar area

- Eye-sockets

36. For a phlegmon retromandibular spaces it is characteristic

+ Shortness turn head*

- A symptom of "sand-glass"

- Sharply complicated opening of a mouth

- A half-open mouth, salivation

37. The form actynomycosis

+ Skin*

- Fibrous

- Granulating

- Gangrenous

38. A phlegmon placing about the upper jaw

+ Infraorbital area*

- Buccal of area

- Parotic-chewing area

- Peripharyngeal of space

39. Anatomic formation making border submental areas

+ Mandibular-hypoglossal muscle*

- Medial pterygoid a muscle

- A lateral wall drinks

- Lateral pterygoid a muscle

40. Anatomic formation making border of parotic-chewing area

+ edge Low of a malar arc and bone*

- Forward paunches of a two-belly muscle

- Superficial fascies necks

- A body of a hypoglossal bone

41. Anatomic formation making border submental areas

+ the Basis lower jaw*

- A first line of actually chewing area

- External acoustical pass and back edge of a branch of the lower jaw

- Superficial fascies necks

42. Anatomic formation making border of infraorbital area

+ edge Low orbita*

- External acoustical pass and back edge of a branch of the lower jaw

- Bottom edge of a malar arc and a bone

- Parotic salivary gland

43. The furuncle of what localisation becomes complicated a thrombophlebitis of an angular vein of the person most often

+ upper lip*

- periorbital areas

- Nose bridges

- A lower lip

44. Sounding is used at a pathology of maxillofacial area

+ at presence fistula*

- At diseases of salivary glands

- At crises of a malar bone

- At phlegmons of maxillofacial area

45. To occurrence alveolitis promotes

+ Pushing in alveola tooth adjournment during time extraction*

- The wrong engineering of anaesthesia

- Insufficient compression of edges of a wound after tooth removal

- Anaesthesia application in парадентальной areas

46. At a bleeding from лунки the wad impregnated is applied

+ Jodo-formom*

- Gemofobina

- An epsilon-aminokapron acid

- A solution of calcium of chloride

47. The marginal periodontitis arises owing to

+ infection Penetration through gingival pocket*

- Traumatic occlusion

- A deep bite

- Complication of treatment of deep caries

48. A sharp periodontitis differentiate from:

+ Sharp pulpitis*

- Sharp gingivitis

- Odontoma

- Supragingival of an abscess

49. On what therapy is directed at a sharp periodontitis

+ the Termination inflammatory process*

- To periodontosis preventive maintenance

- Tooth paintings

- Destruction of a crown of tooth

50. A kind odontogenic granuloma met at a chronic periodontitis

+ Subperiostal*

- Axillary

- Podzhirovuju

- Intrabone