HANDBOOK FOR DENTAL CHAIR SIDE ASSISTANTS

PART 2

Editor:
Namita Kalra

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Handbook for Dental Chair Side Assistants (Part 2)

Edited by

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PREFACE

This book was conceived over a period of more than a decade. The chairside assistant plays a pivotal role in successful management of dental patients as they enter the dental clinic. The chairside assistant helps in allaying anxiety of the patient, maintains records of dental patients, and helps to lay out all the necessary instruments and materials for the procedure as per the plan. The chairside assistant needs to have good knowledge of anatomy, psychology, diseases, instruments, materials, procedures, and the latest technology. This book intends to prepare dental chairside assistants and dental nurses to provide efficient assistance to the dentist in a dental clinic. They play a silent but crucial role in overall management of patients with various orodental disorders. The book will provide them with the theoretical background and practical tips, and give them deeper insight into their work and responsibilities. It will give them a chance to upgrade their knowledge and skills. The book is rich in real-life pictures, which are well described to make the process of learning attractive and lucid.

This book will also provide an overview to the dental interns for good revision and useful tips to the students as they enter the internship phase. It will also be useful to the postgraduate students before they enter the dental clinics. The book has many real-life photographs, which make it very interesting.

Most of all, this will provide dental chairside assistants and dental nurses with a handbook to which they can refer to and learn, facilitating their role as good dental chairside assistants and dental nurses.

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Part 1: Emergency Care

CHAPTER 1

Resuscitation Aids

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Abstract: The chapter deals with the various instruments and gadgets necessary to revive a patient in a dental clinic. The list is precise and practical. The chapter is not only of great value to the aspiring dental chairside assistant but also to all aspiring dental surgeons as a ready guide when they are about to start their dental practice. It also deals with the management of syncope and details the emergency drug tray and its contents. Some real-life photographs are included at the end of the chapter to give the student a very good orientation.

Keywords: Automatic external defibrillator, Flumazenil, Glucagon, Hypoglycaemia, Portable suction device, Oropharyngeal airway, Seizures.

INTRODUCTION

The disciplines of dentistry are closely associated with medicine and its biological roots. An experienced dentist should be aware of the pathophysiology of certain disorders as well as the complex pathways and impacts of the body systems. Dental professionals have a duty of responsibility to ensure that their patients gain appropriate and healthy treatment.

The aim of this chapter is to provide an overview of the management of medical emergencies and resuscitation in dental practice.

All dental practitioners should follow the systemic ABCDE approach when assessing an acutely sick patient.

Resuscitation Equipment

The resuscitation equipment must be present in the dental practice every time.

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Namita Kalra (Ed.)

Airway Equipment

A set of oropharyngeal airways, basic set (0, 1, 2, 3, 4) for adults and children. (Fig. **1**). Portable suction device (Fig. **2**).

Fig. (1). Airway tubes.

Fig. (2). Portable suction device.

Breathing Equipment

Self-inflating resuscitation bag with oxygen reservoir and tubing (Figs. **4** & **5**).

Pocket mask with oxygen port.

Oxygen cylinder (Fig. **3**).

Oxygen face mask with tubing.

Fig. (3). Oxygen cylinder.

Fig. (4). Airway tubes.

CHAPTER 2

Basic Life Support

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Abstract: The chapter is essential for the dental chairside assistant. It details the first step that needs to be provided to the victim of a life-threatening injury, cardiopulmonary arrest, or sudden cessation of breathing. It deals with basic medical skills, and if implemented, these can enable saving a life. The basic life support provider needs practical training, which needs to be further updated at regular intervals. The details of various algorithms, chances of survival, sequence of action, airway obstruction in children, method of defibrillator use and cardiopulmonary resuscitation are also explained in detail.

Keywords: Compression, Defibrillation, Heimlich's maneuver, Resuscitation, Rescue breathing, Unresponsive, Unconscious.

INTRODUCTION

Basic life support (**BLS**) is the first level of medical care provided to the victims of cardiopulmonary arrest, obstructed airway or life-threatening injuries by either the first responder or the healthcare professional till they receive advanced medical care. Cardiopulmonary arrest (CPA) is a sudden cessation of effective respiration, circulation, or both. Basic life support is provided by any bystander who is trained in BLS or trained medical personnel, including emergency paramedics. A lot of emphasis has been laid upon providing the training of BLS skills to everyone, including laypersons. However, it is paramount that all medical doctors, including dental practitioners, and medical and paramedical staff, should be trained in high-quality cardiopulmonary resuscitation (CPR); needless to say, it is a basic medical skill, which can save many lives when implemented properly on time. BLS training has been highly recommended for all healthcare professionals. In our country, though it is increasingly becoming a part of the teaching curriculum of medical students, awareness about the correct technique among dental practitioners is still deficient.

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Cardiac arrest can occur in dental practice. Therefore, BLS education is highly recommended for dentists and has become universal among various dental schools worldwide; however, there has been variation in its reinforcement. The CPCR guidelines are consistent with the 2015 American Heart Association (AHA) guidelines update for Cardio-Pulmonary Resuscitation (CPR) and Emergency Cardiovascular Care (ECC). BLS healthcare provider courses are designed by AHA and are standardized worldwide, even in India. However, its further reinforcement in dental education is deemed essential.

AHA CHAIN OF SURVIVAL

The early recognition of CPA, followed by CPR, is crucial for improved patient outcome. Hence, learning the skills of high-quality CPR can save many lives. The American Heart Association advocates a "chain of survival" for both in-hospital and out-hospital cardiac arrest (IHCA, OHCA) for all victims needing CPR. It includes early recognition of a victim, activation of emergency medical services, early CPR, rapid defibrillation, effective advanced life support, and integrated post-cardiac arrest care (Fig. **1**). Amongst these, the initial steps constitute what is known as basic life support (BLS). Early and effective BLS can greatly improve the chances of survival as the central nervous system can undergo irreversible damage within 3-4 min of hypoxia or anoxia. The cause of cardiac arrest in adults is cardiac; however, in children, the cause is respiratory failure and shock. This has led to the introduction of a prevention link in the paediatric chain of survival while the rest is the same as of adult chain of survival (Fig. **2**).

Fig. (1). AHA adult chain of survival.

Fig. (2). Paediatric chain of survival.

A. Key Components of BLS:

On the contrary to the previous A-B-C protocol, the latest 2015 guidelines reinforce C-A-B protocol, *i.e.*, Compression first, followed by Airway and Breathing.

I. **Chest compression**: it is an integral component of high-quality CPCR and "push hard and push fast" is the key for its success.

1. For providing effective chest compression, one must position at the victim's side.

2. Victim must be lying on a flat surface with face up. In case of suspected head and neck injury, the patient's movement must be done cautiously with the head, neck and torso in a line. The heel of one hand or the dominant hand must be positioned in the centre of the victim's chest, on the lower half of the breastbone, while the heel of the other hand must be on the top of the first hand. The arms must be straight, and shoulders must be directly over the hands (Fig. **3**).

Fig. (3). Chest compression.

3. The chest compression must be given at the rate of 100-120/min.

4. The depth of compression must be at least 5 cm, with each compression force directed downwards.

CHAPTER 3

Medical Emergencies in Dental Clinic

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Abstract: Very often and quite unavoidably, a medical emergency may arise in a dental clinic. If left unrecognized and unattended, it may lead to a life-threatening situation. The dental chairside assistant should be well-armed with the knowledge of any such condition and be responsible for a well-maintained setup. All the basic equipment and trained staff to manage medical emergencies should always be available. In this chapter, all the aspects of medical emergencies, such as diagnosis, clinical presentation, and armamentarium required for management, are discussed in a concise manner.

Keywords: Adrenal insufficiency, Anaphylaxis, Cardiovascular emergency, Hypoglycemic reactions, Hyperventilation syndrome, Local anesthesia toxicity, Pulmonary edema.

INTRODUCTION

Even after the design and development of efficient and time-tested methodologies, life-threatening emergencies are not uncommon in clinics. Such emergencies may occur anywhere. It is important to have good concepts about an emergency scenario as to which one is likely to encounter. If there is a lack of knowledge and slow recognition of early signs and symptoms, an avoidable situation may end in the loss of life.

Response to acute illness should include the following:

1. Anticipation based on history and clinical situation.

2. A search for illness or injury likely to be present.

3. Readiness to provide appropriate treatment.

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First of all, let us understand the various life-threatening situations as follows:

Based on Cardiac Etiology

Noncardiovascular emergency - This may be related to the following condi- tion:

1. Stress-induced

a. Syncope.

b. Fast and shallow breathing as in hyperventilation syndrome.

c. Difficulty in breathing and cough as in asthma.

d. Impaired adrenal function, like adrenal insufficiency.

e. Hypoglycemic reactions.

f. Epilepsy.

g. Thyroid crisis.

2. Non- stress related

a. Hypotension on standing, also called postural hypotension.

b. Local anaesthesia toxicity may present with symptoms like respiratory distress or seizure.

c. Raised blood glucose.

d. Anaphylixis or allergies.

Cardiovascular emergency

1. Stress-related emergencies are as follows:

a. Angina.

b. Myocardial infraction.

c. Cardiac failure, followed by.

d. Cerebral ischemia.

2. Non-stress related:

a. Acute myocardial infarction.

Classification on the Basis of Manifestations and Signs

a. Postural hypotension.

b. Respiratory difficulty.

c. Syncope.

d. Cardiac failure.

e. Anaphylaxis.

f. Cerebrovascular accident.

g. Cardiac arrest.

h. Pulmonary edema.

Now, we need to understand how we can prevent them.

Prevention of Above-mentioned Life-threatening Situations

Physical Evaluation

i. Medical history questionnaire: a detailed history mostly in a prepared proforma brings out past illness and history.

ii. Clinical examination includes auscultation of the chest and heart, besides other functional and vital signs.

• Vital signs – pulse, blood pressure, respiratory rate.

• Visual inspection – pallor, sweating, rapid breathing.

Laboratory investigation – haemoglobin, blood glucose, bleeding time, clotting time, complete kidney function.

iii. Dialogue history (recognition of anxiety)

Psychological Examination

iv. Medical history questionnaire.

v. Anxiety questionnaire.

CHAPTER 4

Comprehensive Goals, Role and Duties of a Dental Chairside Assistant

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Abstract: The role of a dental assistant is to help the dentist in carrying out dental treatment efficiently. The name suggests that he is an assistant, but his importance cannot be neglected as he plays a pivotal role in the smooth functioning of a dental clinic. So a well-trained dental assistant is critical for well-organized and hassle-free working of the dentist. Thus, the training of an assistant is important and discussed in the chapter.

Keywords: Assistance, Dental assistant, Dental chair, Treatment.

INTRODUCTION

The purpose of this chapter is to train chairside dental assistants for the dental operatory and also to make them understand their true role in the dental clinic. The chairside assistant not only assists the dentist but also helps in keeping the surgical instrument ready. However, his/her role is beyond that in the successful delivery of dental care.

Goals of Chairside Dental Assistant

Confidence

Once the training is completed, the individual must be equipped to help the dentist by taking details from the patient. He/she must be able to disseminate knowledge and self-assurance in the area of work.

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Earning Potential & Independence

As a healthcare worker, chairside assistant will be able to earn a respectable living.

Professionalism

This includes having a responsible position in the society. It is also about being accountable and performing different duties and tasks in the dental clinic. At the end of the training, the chairside assistant turns out to be a mature individual.

Outline of the Chapter (Fig. 1)

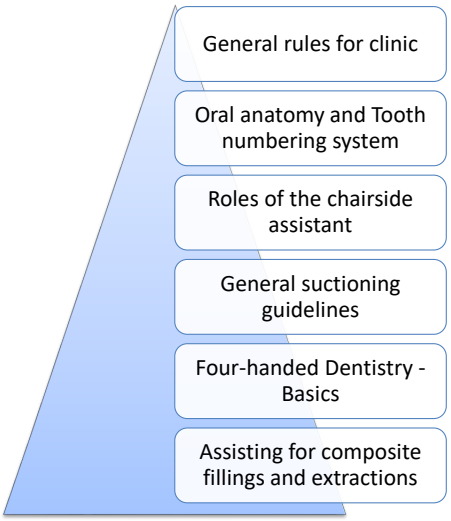

Fig. (1). Sequential outline for dental nurse and dental chair-side assistant.

CLINIC RULES FOR CHAIRSIDE ASSISTANTS

- When there are no patients in the clinic, utilise that time as a bonus and try to keep the treatment rooms, burs, and trays in order and in the disinfected state. Treatment rooms should always look ready to work at all times. Do not use cell phones in the clinic. Always make sure that you have eaten while going to the clinic and are well hydrated.
- Mandatory attire: scrubs, nametags, disposable gowns, and closed-toe shoes with socks. Do not wear excessive jewellery. Hair should be short and tied behind the ears. Infection control guidelines must be strictly followed.
- When the patient has arrived, it is your duty to make them seated immediately. After this, the dentist must be informed. Also, try to explain to the patient about the waiting time in the chair.

- It is also your duty to go through medical history and re-examine treatments that remain to be completed. You must also be ready to answer any queries of the patient about the appointment he has come for.
- While assisting the doctor, comfort the patients. To minimize their anxiety, explain to patients that they do not need to worry about anything.
- When the doctor asks for anything, it is mandatory to answer verbally. If some instruction is not clear, it is better that you ask for repeat instructions rather than make a mistake. You should always see that light is at the patient's mouth. As the doctor asks the patient to move, the chairside assistant must move the light accordingly. It is important to have a small clean gauge piece ready to be able to clean the mouth mirror repeatedly.
- Must keep tray plus countertop clean. Remove all debris. Always arrange the instruments in a proper manner.

ORAL ANATOMY AND TOOTH NUMBERING SYSTEM

The dental anatomy is once again described in the above picture to enable the student to revisualise (Fig. **2**).

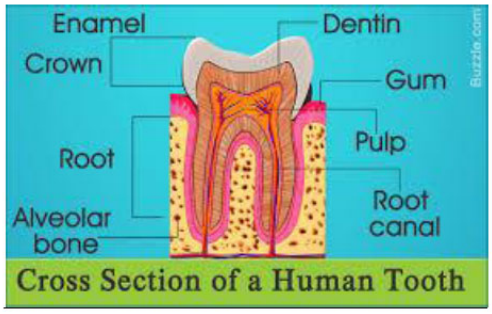

Fig. (2). Basics of the tooth anatomy.

a. Enamel
b. Dentine
c. Crown
d. Root
e. Cementum
f. Root canal
g. Alveolar bone
h. Gum

The tooth numbering system is also illustrated for the student to understand the numbering system given by the universal method, Palmer and Federation Dentaire International (FDI) (Fig. **3**).

CHAPTER 5

Oral Medicine and Radiology Perspectives for Dental Auxiliaries

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Abstract: This chapter has been designed to provide a comprehensive overview of the clinical procedures performed at the Department of Oral Medicine and Radiology and the knowledge expected from the dental auxiliaries working in this speciality both at the institutional level and in isolated clinics. The content is very much in line with the equipment used in a modern clinical setup.

Keywords: Biopsy, Chairside investigations, Diagnostic aids, Radiation protection.

INTRODUCTION

Oral Medicine

- Definition
- Case history proforma
- Armamentarium used for diagnosis of oral diseases
- Instruments
- Diagnostic aids used in the detection of oral cancer and precancer
- Miscellaneous
- Biopsy
- Sample care
- Transportation of sample

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Oral Radiology

• Definition

• Introduction to X-rays

• Patient preparation for exposure

• Types of X-ray films

  • Intraoral

  • Extraoral

• Dark room instruction

ORAL MEDICINE

Oral medicine is a branch of dentistry that aims to diagnose and manage the problems related to the oral cavity itself or problems of oral cavity relating to systemic disorders.

Case History Recording

It is a professionally planned dialogue mandatory between the patient and the clinician that enables the patient to convey his/her symptoms effectively to the clinician and ultimately act as a guide to the clinician for relevant clinical examination.

Significance of Case History

• Provides information regarding etiology and diagnosis.

• Insight to review general health and nutritional status of the patient.

• Reveals conditions that require precautions or modifications during appointments.

• Identification of the possible unrecognized condition for which the patient should be referred.

• Insight into emotional and psychological factors that may affect continuing care.

• Provides records for reference and comparison for periodic follow-up.

• Can be produced as evidence in legal matters.

Methods for Recording Case History

- Interview
- Health questionnaire
- Combination of two

Components of Case History Taking and Examination

Demographic profile/Bio-data of the patient

Chief complaints

History of present illness

Previous medical history

Previous dental history

History of familal diseases

Personal history

Examination

- General physical examination
- Extra-oral examination
- Intraoral examination
- Examination of the lesion (if any)

Provisional diagnosis

Differential diagnosis

Investigations (if any)

Referral (if any)

Final diagnosis

Treatment plan

Prognosis

Part 2: Role of Dental Chair Side Assistant in Various Settings

CHAPTER 6

Role of Dental Chairside Assistant in Paedodontics

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Abstract: The chapter gives a detailed plan of how to deal with a child patient in the dental setting. It teaches the student about approach, time management, and chairside discipline in a structured manner. It also updates the student on the psychological management of the child before starting the treatment. A few real-life pictures, which are self-explanatory and with footnotes, are also included. These will serve to enrich the student in clinical knowledge.

Keywords: Four-handed dentistry, Teeth alignment, Uncooperative, Xylocaine.

INTRODUCTION

Rationale

The rationale is to save time and energy, which are limited when child patients are being treated. The role of a chairside assistant is very crucial to successful paedodontic practice since time is limited as the child exhibits patience and tolerance for a short duration. Not only it is important for the chairside assistant to be communicative and effusive with the child patient, but also it is important to get down to the child's level of psychological development.

Preparations to be made Before the Child comes to the Clinic

The preparations that need to be made before the child comes to the clinic are as follows:

1. Take out records

2. See they are complete

3. See the previous history for

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(i) Type of behavior

(ii) Type of behavior management technique used in the last visit.

4. Prepare the chair once the child arrives

(i) Put the child in a comfortable position

(ii) Seat the child

(iii) Use sweet words and handle them gently

(iv) Talk about impending work procedure in a pleasant manner

(v) Introduce the bib in a playful manner. Take permission to put it on. Put it on after the introduction is complete.

(vi) Introduce the child to the chair and explain the light and up-down movements of the dental chair.

(vii) If the child is uncooperative, then keep talking to him till the dentist arrives. Keep the child's mind and thoughts away from fearful situations and ideas (Fig. **1**).

Fig. (1). Paedodontic clinic showing the in-progress treatment of a child.

STEPS TO BE TAKEN WHILE THE PATIENT IS SEATED IN THE CHAIR BEFORE STARTING THE TREATMENT

1. Put a big or small apron on the child. It should be pretty, clean, and according to the age and physique of the child.

2. Explain the child about:

a. Spittoon

b. Suction

c. Air pressure in a 3-way syringe

d. Light

e. Filling

f. Sleeping medicine/local anaesthesia

Preparation for Instruments

From the patient's file record, it is possible to understand the plan. It is best to keep the instruments ready. Please refer to the Appendix given at the end of the chapter to arrange the instruments and medicament.

Instrument trays should be ready according to the plan mentioned in the patient's file and also according to the anticipated plan. Here is described a situation when the chairside assistant has to use his logic and imagination:

Spittoon- where patient spit out during dental procedure.

Suction- to remove excess saliva and to keep the patient mouth dry during procedure.

Air pressure- to spray air and water in a patient's mouth during treatment.

Light- to illuminate the inside of the mouth or oral cavity.

Filling- to restore the tooth with restorative materials.

Four-handed dentistry is a result of well-trained chair side assistant. A few common situations of a paedodontic clinic have been assessed (Figs. **2-5**).

CHAPTER 7

Role of Dental Chairside Assistant in Minor Surgery

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Abstract: In order to become a good chairside assistant, it is important to understand the basic fundamentals of oral surgery. The dental chairside assistant helps to save time, improve communications and handle emergencies. He/she is crucial in care and sterilization of instruments. This chapter provides a framework for learning the basic skills of assisting in minor oral surgery procedures.

Keywords: Autoclave, Decontamination, Rebound haemorrhage, Vitals.

INTRODUCTION

Minor oral surgery procedures, like simple extraction, surgical removal of third molars, cyst removals and dental implants, *etc.*, are routinely performed on the dental chair under local anesthesia. Each of these procedures requires specific instruments and preparation according to the procedure. There is an important role of chair side assistant in assisting the surgeon for the procedure. A few activities, such as sterilization and arrangement of the instruments, patient's dental record maintenance, and preparing the patient, should be performed by the assistant. The assistant should also help the surgeon in putting protective clothing, such as masks, gloves, and eyeglasses.

The assistant should have good knowledge of the following things while assisting with oral surgery procedures:

• Sterilization

• Autoclave

• Local anesthesia

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• Occupational safety for needle stick injuries

• Surgical instruments

• Patient preparation

• Postoperative instructions

• Biomedical waste management

In this chapter, we will discuss these aspects of chairside assistance so as to improve the overall efficiency of work in the dental setup.

STERILIZATION

The chairside assistant is a key member of the oral surgery department and has to ensure that instruments required for procedures are clean and sterilized, and prepares the instruments for use. The assistant must be able to take direction and follow through on all assignments. A lab coat is part of his/her uniform in the dental clinic. Other personal protective equipment, such as eyewear, masks and gloves, should be used while sterilizing the instruments, and he/she should follow company-specific safety guidelines when handling hazardous materials. The assistant should have a thorough knowledge of instrument categories: critical, semi-critical and noncritical, and various techniques of sterilization. The autoclaving is the first choice for the sterilization of the instruments. For those instruments that are thermosensitive and cannot tolerate the cycles of autoclaving, chemical sterilization is a method used for decontamination.

The assistant has to prepare the patient and instrument trolley before the procedure. He should know the technique of opening the needle, syringes and gloves from the packaging and maintain their sterilization. The art of glove-wearing and cleaning/draping of the patient should be well-known to the assistant. During the procedures, he/she has to do retraction and suction, keeping in mind the sterilization principles. Once the procedure is over, instruments should be washed properly and sterilized for the next patient. All the waste should be disposed according to the color coding guidelines of waste management. The assistant has a vital role in cross-infection control during oral surgical procedures.

AUTOCLAVE

Autoclave is the commonly used equipment for the sterilization of dental instruments. The assistant should know the principle of autoclaving and its functioning. In the preliminary phase of the sterilization cycle, aspiration of the air is performed by a pump. The air acts as an insulating medium and can prevent

the proper penetration of the steam into the instruments. All the latest generation autoclaves have this vacuum phase installed in them.

After the evacuation of the air from the chamber, the steam is inserted. After this phase, the pressure inside the chamber is raised even higher than the atmospheric one, which leads to an increase in the boiling point of the water and, as a consequence, a hotter vapor is produced. The equipment in the autoclave is then left in contact with the steam for a prescribed time period. This will help in the killing of most of the microorganisms, including vegetative forms and living spores. Once this cycle is completed, the evacuation of steam is performed, and the equipment is dried by a vacuum cycle. The next phase is very important for an assistant, and he/she should keep in mind to restore the sterilization chamber pressure to the same level as the atmospheric one before opening the gate of the autoclave. At this stage, the instruments are ready for use for the clinical or surgical purposes.

LOCAL ANESTHESIA

Nowadays, dental practice depends a lot on the use of local anesthesia with a recent trend of providing painless dental procedures. Most clinicians are trying to provide a pain-free treatment to their patients. The dental assistant has the responsibility of assuring the comfort and safety of the patients before and after the administration of local anesthesia. Thus, a dental assistant should have a thorough knowledge of local anesthetic solutions, their composition, and most importantly, the complications. The assistant should ensure the patient about any history of previous allergic reaction to the local anesthetic solution.

The dental assistant is often responsible for loading the anesthetic solution into the syringe. He/she should ensure the expiry of the solution before handing it over to the clinician. While handing over the syringes and needles to the clinician, it is his/her responsibility to ensure that the needle tip should not touch any contaminated area and also avoid any needle stick injury.

The list of material required for injection procedure:

- Lignocaine jelly for topical application
- Sterile cotton rolls/gauze pieces
- Appropriate size sterile syringe
- Anesthetic solution
- Appropriate diameter and length of dental needles

CHAPTER 8

Role of Dental Chairside Assistant in Periodontics

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Abstract: The following chapter aims to facilitate the dental assistant's work in the field of periodontology. The first section provides a comprehensive introduction to the terminology used in periodontology. The next section focuses on the practical aspects of work in a clinical setup, including sterilization and disinfection, as well as basic periodontal procedures. Lastly, a special emphasis has been placed on teaching various oral hygiene aids and concepts of patient motivation for self-care.

Keywords: Gingiva, Gingivitis, Periodontitis, Periodontium, Oral hygiene, Oral hygiene, Scaling, Root planing.

INTRODUCTION

Role of Dental Assistant in Periodontal Clinic

The following aspects are described in the chapter that constitutes the role of a dental assistant in the field of periodontics.

1. Introduction to Periodontology

2. Patient Reception

3. Work Area Preparation Before and in Between Appointments

- Cleaning
- Disinfection
- Arranging instrument tray
- Arranging disposable items for use by clinician, patient and self (gloves, face-mask, syringes, needles)

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4. Instrument Management (Cleaning, Sterilization, Storage and Sharpening)

5. Patient Preparation

6. Chairside Assistance During Clinical Procedures

- Saliva evacuation
- Tissue retraction
- Instrument transfer
- Recording periodontal parameters as dictated by the clinician during charting

7. Clinical Procedures Carried Out Under Supervision of a Dentist

- Placing and removing the periodontal dressing
- Sutural removal
- Taking dental impressions

8. Delivering Post-operative Instructions (After Periodontal Surgery)

9. Patient Education and Motivation

10. Laboratory Tasks

- Pouring dental impressions to prepare study models

INTRODUCTION TO PERIODONTOLOGY

Periodontology is the study of the specialized complex of hard and soft tissues, which supports the teeth and maintains their position in the jaws.

Periodontics is the dental speciality focusing on the prevention, diagnosis and treatment of the inflammatory diseases affecting the periodontal tissues.

The **Periodontium** (peri-around, odontos-tooth) is a collective term that refers to the parts of tooth and alveolar bone, which surround the teeth and maintain their attachment to the jaw bone. It is comprised of the following four structures:

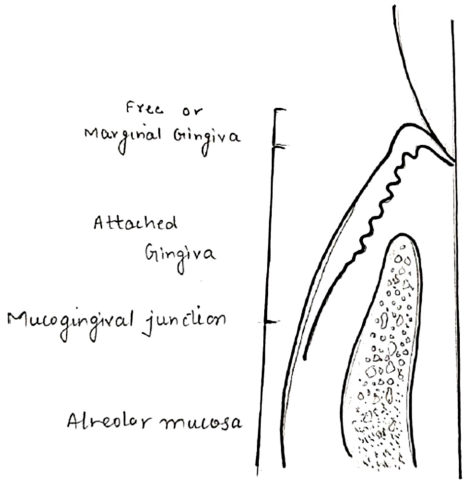

Fig. (1). Gingiva: Anatomical divisions (Marginal gingiva and Attached gingiva).

1. **Gingiva** - soft tissue covering the cervical portion of teeth and the alveolar process of the jaws. Gingival margin is the coronal most boundary of the gingiva, while apically, it extends till the mucogingival junction. The gingiva serves to protect the underlying tissues from the oral environment (temperature changes, mechanical stimulus, and microorganisms). It can be divided into three anatomical parts, as shown in Fig. (**1**).

• **Free gingiva** - also known as marginal gingiva, is the unattached portion of gingiva present coronal to the CEJ (cementoenamel junction). It is possible to gently deflect the free gingiva away from the tooth surface with a periodontal probe.

• **Gingival sulcus** - it is the V-shaped space between the tooth surface and the free gingiva. As measured with a periodontal probe, the depth of a clinically normal gingival sulcus ranges from 1-3 mm.

• **Attached gingiva** - part of gingiva firmly attached to underlying tissues.

• **Interdental gingiva** – it is triangular in shape and consists of a facial and a lingual papilla.

2. **Periodontal ligament**- it is a fiber complex that is present around the tooth root. The fibers are embedded in the cementum on one side and in the alveolar bone on the other side. The periodontal ligament performs the following functions:

CHAPTER 9

Role of Dental Chairside Assistant in Orthodontics

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Abstract: The role of chairside assistant is especially important in the speciality of orthodontics as many of the important orthodontic steps, like bonding and banding, require precision and are to be managed within the limited time period . A well-trained orthodontic chairside assistant is a great boon to an orthodontist in achieving that high level of precision and quality results . Therefore, it is essential that the assistant is well versed with the armamentarium and procedures, many of which are unique to the speciality of orthodontics. The chapter will be helpful to an orthodontic chairside assistant.

Keywords: Clinical records, Malocclusion, Pliers.

INTRODUCTION

Orthodontic Assistant Tasks

The role of orthodontic dental assistants is to help orthodontists in managing patients who require orthodontic management for malocclusion (Fig. **1**) problems, like alignment and spacing. The orthodontic chairside assistant helps the orthodontist by making the patients ready for the scheduled work, ensuring their comfort and providing another set of hands during the scheduled orthodontic procedure.

DUTIES OF AN ORTHODONTIC ASSISTANT

1. Patient-related duties
2. Care of instruments
3. Maintenance of clinical records
4. Coordination with technician
5. Coordination with store

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Class I malocclusion.

Class II divison 1 malocclusion.

Class II divison 2 malocclusion.

Class III malocclusion.

Fig. (1). Types of malocclusion.

Patient-related Duties

- Preparing the clinic and operatory before the patient's scheduled visit, taking and updating (at subsequent visits) the patient's general and oral health history, and making the patient ready before the orthodontist arrives to see the patient.
- Helping orthodontists in various aspects of the care of the patient and the scheduled procedures.
- Helping orthodontists in taking photographs of the teeth and creating moulds of a patient's bite.
- Preparing for procedures by arranging the necessary tools in place after proper sterilization.
- Help in keeping a clean and dry working field during procedures and handing out the necessary tools to the orthodontist at the appropriate time.

The assistant also acts as a bridge between the patient, his attendants, and the orthodontist. This helps him influence the patients to carry out the given instructions and reinforce that they play their role in obtaining the best result at the end of the orthodontic treatment.

Expected Behaviour of the Assistant in the Operatory

- Maintain pleasant demeanour.
- Introduce the workplace and himself to the patient, and enquire, "How may I help you?" Address using proper names and avoid the use of nicknames or other terms of endearment, like sweetie, *etc.*, in an office setting.
- The subjects of religion, politics, ethnicity, gender, and off-color jokes should be avoided.
- Greet the patient as soon as he enters.
- The schedule should be reviewed at the start of the day.
- The patient should be properly oriented to the procedure.
- A relationship should be established with the patient.
- Use the patient's proper name.

Ensure that the patient's registration forms and medical/dental history have been completed by the patient before the start of the treatment.

Care of Instruments

The orthodontic treatment requires many instruments that are unique to the discipline of dentistry. A proper knowledge of these instruments and their manner of use is essential for all dental assistants. Some of the more commonly used instruments for treating an orthodontic patient are described briefly below and

CHAPTER 10

Role of Dental Chairside Assistant in Endodontics

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Abstract: This chapter represents an overview of common terminologies used in the field of conservative dentistry and endodontics. After going through this chapter, the student should be able to correctly describe and communicate commonly encountered terms, diseases, instruments, materials and procedures related to the field of conservative dentistry and endodontics. This chapter is intended to develop a basic understanding of the common terms used in the specialty so that the student is better able to communicate, chart and assist various procedures performed in the specialty.

Keywords: Dental caries, Dental trauma terminology, Diseases of pulp, Dental cavity, Dental filling materials, Restoration, Root canal treatment.

INTRODUCTION

Operative Dentistry: It is the branch of dentistry that deals with the diagnosis, prevention, treatment, and prognosis of carious and non-carious defects of teeth resulting in restoration of its form, function, and esthetics.

Endodontics: It is the branch of dentistry that is concerned with the functioning of the normal dental pulp, along with its pathology, treatment and prevention of diseases as well as injuries of the pulp and associated peri-radicular tissues.

While operative dentistry deals with the functional and esthetic correction of hard tissues (mainly enamel and dentin) of teeth, endodontics deals with the management of diseases of the pulp and peri-radicular tissues, and their sequalae.

COMMON DISEASES AND CONDITIONS AFFECTING DENTAL HARD TISSUES

Dental caries: Dental caries is a preventable chronic infectious disease of teeth caused by microbes, resulting in localized dissolution and destruction of the calcified tissues of teeth.

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Crown fracture: Fracture of the crown portion of the tooth involving enamel and/or dentin that may or may not involve the pulp.

Crown-root fracture: Fracture of tooth involving enamel, dentin and cementum that may or may not involve the pulp.

Root fracture: Fracture involving only the root portion of the tooth. It may occur in the cervical, middle or apical portion of the root. Pulp, dentin and cementum are also involved.

Luxation: Luxation is the displacement or partial dislocation of the tooth from its socket. It is further classified as concussion, subluxation, extrusion, intrusion, and lateral luxation.

Avulsion: It is the total displacement of the tooth out of the socket.

Non-Carious Cervical Lesions (NCCL): It is the loss of dental hard tissue at the cervical area of the tooth near the cemento-enamel junction (CEJ) without caries decay. It includes abrasion, erosion, and abfraction.

COMMON DISEASES AND CONDITIONS AFFECTING DENTAL PULP AND PERI-RADICULAR TISSUES

Pulpitis: it is the inflammation of dental pulp tissue. It can be reversible or irreversible, acute or chronic, symptomatic or asymptomatic, and partial or total.

Pulp necrosis: It refers to the death of the pulp tissue. It can be partial or complete. It may occur due to trauma, caries, or irreversible pulpitis.

Apical periodontitis: It is the inflammation of the peri-radicular tissues. It can be symptomatic or asymptomatic.

Symptomatic apical periodontitis: It is a painful inflammation of the apical periodontium resulting from trauma, irritation, or infection through the root canal, producing clinical symptoms of pain while biting and percussion.

Asymptomatic apical periodontitis: It is inflammation and destruction of apical periodontium that originates from pulpal inflammation/infection. It does not present clinical symptoms and appears as an apical radiolucency in the radiograph.

Dental abscess: Dental abscess or dentoalveolar abscess or periapical abscess is the collection of pus in the periapical area due to infection of the root canal. It can be acute or chronic.

COMMON TREATMENT PROCEDURES DONE IN OPERATIVE DENTISTRY AND ENDODONTICS

Root canal treatment (RCT): It is the treatment of diseased pulp aimed to maintain or restore the health of peri-radicular tissues. It includes mechanical cleaning of the root canal system, its chemical debridement, and filling with an inert material.

Direct restoration: These are the restorations in which the material is applied into a prepared cavity while it is in the plastic phase to construct the restoration intra-orally. Examples include composite, GIC, amalgam, direct filling gold, *etc.*

Indirect restoration: These are restorations that are fabricated outside the oral cavity in laboratory, following which they are luted to the tooth with cement. Examples include cast inlays and onlays.

Peri-radicular surgery: It is the surgical management of a tooth with periapical lesion, which cannot be resolved by conventional root canal treatment.

COMMON TERMINOLOGIES

Black's classification of caries: This has been given by G V Black.

Class I: Caries affecting pits and fissures on the occlusal surface of molars and premolars, occlusal two-thirds of facial and lingual surfaces of molars, and lingual surfaces of maxillary of anterior teeth.

Class II: Caries affecting proximal surfaces (mesial and distal) of posterior teeth (molars and premolars).

Class III: Caries affecting proximal surfaces of anterior teeth without involving the incisal angles.

Class IV: Caries affecting proximal surfaces of anterior teeth, including the incisal angles.

Class V: Caries affecting gingival 1/3 of facial or lingual surfaces of anterior or posterior teeth.

Tenderness on Percussion (TOP): It is the pain that elicits when a tooth is gently percussed. It indicates inflammation of the apical periodontium.

CHAPTER 11

Role of Dental Chair Side Assistant in Public Health Dentistry

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Abstract: Traditional use of two-handed dentistry has been replaced by four-handed dentistry to provide ease and good quality oral health care services. The four-handed dentistry involves the use of dental chair side assistant along with the dentist, which plays a pivotal role in assisting the delivery of oral health care services. These dental chair side assistants are being provided a certified degree that allows them to perform specific duties and responsibilities towards their patients. The duties performed are greeting, calming, comforting, cleaning, organizing, and dismissing the patients, and the list further goes on. They are a big boon for every dentist as they are an integral part of the success of the dental practice and perform their duties with pride and dignity.

Keywords: Dental workforce, Duties and responsibility, Utilization of dental services.

INTRODUCTION

Dental chairside assistant is an important non-operating auxiliary who helps the dentist deliver quality dental services to the patient. Dental assistant plays a pivotal role in the smooth functioning of dental care center, assisting dentists in delivering oral health services in an impeccable manner. For the success of dental practice, dental assistant should follow certain duties and responsibilities, and it is important to abide by the guidelines provided by the dental care centre or professional associations and regulatory authorities. This chapter discusses the duties of dental chair assistants and their responsibilities toward patient care.

Activities Performed by Dental Chair Side Assistant for Delivering Dental Health Care Services

1. Assisting dental staff in delivering oral health services.

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2. Ensuring proper disposal and infection control in clinics.

3. Performing the specified work assigned by the dentist.

4. Performing sterilization and infection control practices in the dental clinic.

5. Maintaining cleanliness and sanitation of the dental clinic.

6. Helping patients feel comfortable before, during, and after dental treatment.

7. Teaching patients appropriate oral hygiene strategies to maintain good oral health (*e.g.,* tooth brushing, flossing, and nutritional counseling).

8. Providing health education to school children and other disadvantaged groups in the society.

9. Recording patient's medical history and measuring blood pressure and pulse.

10. Communicating with patients and suppliers of consumable and non-consumable items (*e.g.,* scheduling appointments, answering the telephone, billing, and ordering supplies).

11. Maintaining records for the dental chair, lab equipment, and stock entries of consumable and non-consumable items as well as for the dental outreach camps.

12. Oral health promotion of physically/mentally challenged, old age home, orphanage, and other weaker sections of the society by regularly reinforcing them through proper oral hygiene instructions.

DUTIES OF DENTAL CHAIRSIDE ASSISTANT

Managing Reception of the Patients

Dental chair side assistant being a non-operating auxiliary is trained to handle multiple areas of administration of a dental care centre, and managing the front desk of the dental health care centre is an important aspect. The chair side assistant should have adequate soft skills to manage and communicate patients in such a that it is easy to comprehend. Verbal and non-verbal communication with patients should be soft, polite, and in a gentle manner. He should be able to arrange the appointments by communicating telephonically with the patients. It is the duty of the chairside assistant to be courteous and empathetic towards patients in scheduling the appointments, communicating with patients with regards to change in the schedule, fee structure, providing assistance for dental insurance claims and giving priority to emergency care patients. The communication is an

important art to maintain a sound and long-term fruitful healthy relation with the patients, making patients feel more comfortable in expressing their fears and dental problems.

Managing Patient Data and Statistics

Dental assistants should have adequate computer knowledge as managing patient records on a computer is essential for patient care, such as scheduled appointments, fee receipts, dental and medical history, dental treatment procedures, and details of investigations. In recent times, many commercial patient appointment software are available, and it is the duty of the dental chair side technician to be abreast with the technology.

Maintenance of Hygiene, Sanitation, and Upkeep of the Dental Operatory

Cleanliness and hygiene are paramount in patient care as they prevent cross infections. The dental operatory should be sanitized with surface disinfectants like 1% sodium hypochlorite. Dental chair side assistant should maintain the sanitation protocol after every patient visit, and comprehensive cleaning and sanitation should be carried out well before patients arrive and also should be carried out after the care of the last patient.

Management of Sterilization and Infection Control Practices

The dental chairside assistant should assist and help the dentist in carrying out safe procedures by proper sterilization of instruments in school and community-based settings.

After the treatment of the patients, the chairside assistant should wrap up the used instruments and should know about the standard protocol for the infection control and sterilization of the instrument and should comply with it on daily basis. The quality monitoring of the autoclave and other sterilizer equipment should be monitored and recorded on monthly basis so that if any complaints arises, the chairside assistant should be able to handle it accordingly.

Maintaining Records for the Dental Chair, Lab Equipment, Consumable and Non–consumable Items

The dental chairside assistant should have sufficient knowledge regarding the functioning of the dental chair, IOPAR machine, air rotors, micro-motors, ultrasonic scalers, lasers, and other machinery used in patient care. Knowledge about the properties of dental materials and medicaments is also essential. There should be different labeled registers for maintaining the records for the repair of the dental chair and lab equipment, and stock entries should be made of any new

CHAPTER 12

Role of Dental Chairside Assistant in Prosthodontics

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Abstract: The importance of understanding the various procedures in a proper sequence is very vital to the assistance expected from a dental chairside assistant. Emphasis has been laid on fixed and removable prosthodontics, and denture making. The different procedures are explained in a step-by-step manner.

Keywords: Articulator, Acrylization, Jaw relations, Metal framework.

INTRODUCTION

Fixed Prosthodontics

It is a specialty that deals with the artificial replacement of missing teeth that cannot be easily removed by the patient. For the fabrication of these prostheses (artificial replacement of the missing oral tissues), impressions (replica of patient's oral cavity) are made in the dental clinic and sent to dental laboratories. When the completed prosthesis is obtained from the laboratory, it is cemented in patient's oral cavity using a suitable dental cement.

Types of Fixed Prosthesis

1. Crowns: Crowns provide coverage to extensively damaged or decayed teeth. Crowns are further of 2 types:

Full crown: This type of crown covers all five surfaces (labial, lingual, mesial, distal and occlusal) of the tooth.

Partial crown: This type of crown covers three or more but not all the surfaces of the tooth.

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2. Fixed dental prosthesis: It is used to replace one or more missing teeth. The natural teeth surrounding the edentulous space on both sides act as abutments (support for FDP). The abutment teeth are prepared, and impressions are made. The part of FDP that replaces the missing tooth/teeth is known as 'pontic', whereas the part which covers the abutment is known as 'retainer'. The retainer and pontic are joined to each other by 'connector'.

3. Inlays and onlays: These are intracoronal restorations (placed within the tooth). Inlays are placed in the centre of the occlusal surface of the tooth between the cusps. These may extend up to the proximal surfaces, if required. Onlays are similar to inlays except for the fact that they provide cusp coverage.

4. Veneers: These are tooth-colored fixed prostheses, which cover the facial/labial surface of a tooth to enhance esthetics.

PREPARATION FOR A CROWN OR A BRIDGE

This procedure requires two appointments:

1. First appointment for tooth preparation, impression and temporization

2. Second appointment for cementation

Role of dental assistant:

• Preoperative role: Taking medical and dental history, taking the required radiographs, taking diagnostic impressions (optional), making diagnostic casts, taking photographs, and maintaining records.

• Intraoperative role during the first appointment: Arranging instruments and materials required during the procedure, retraction of oral tissues, maintaining isolation, handing over the instruments and materials to the dentist, mixing of impression materials, and fabrication of temporary crowns.

• Postoperative role: Sending the impressions, bite registrations and laboratory prescription form to the lab.

• Role at the cementation appointment: Arrangement of materials and instruments required, giving post-operative instructions to the patient.

First Appointment: Tooth Preparation, Impression and Temporization

Instruments and Materials Required

• Diagnostic instruments: Mouth mirror, explorer, and tweezers

- Gloves, mask, and patient's drapes
- Needle, syringe, and local anesthetic agent
- High vacuum suction tip
- Cheek and tongue retractors
- Air rotor handpiece and burs for tooth preparation
- Magnification loupes (optional)
- Scalers
- Cement carrier, condensers, cement spatula, and plastic filling instrument
- Post and core kit (optional)
- Gingival retraction cord, retraction solution, and cord packer
- Scissors
- Wax sheets
- Bite registration material
- Shade guide
- Sectional impression trays
- Stock impression trays (maxillary and mandibular)
- Impression material
- Tray adhesive (optional)
- Bowl and spatula
- Automix gun
- Bite registration material
- Triple tray (optional)
- Material for fabrication of the temporary crown
- Micromotor, straight handpiece, and burs

CHAPTER 13

Lasers in Dentistry

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Abstract: Lasers in dentistry is a relatively new concept with unique advantages. Lasers are helpful in the treatment of hard and soft tissue of the oral cavity. The laser light is created by an external light source reflected by mirrors. The mirrors are placed around the active medium. The photons of light that reach the active medium activate more photons exponentially. This results in a large amount of laser energy that is highly focused and directional. This laser energy may be useful to cut or ablate. The mechanism is that this laser energy is absorbed by the tissue according to the penetration depth. A few real-life pictures are included at the end of the chapter for learning experience of the student. These are pre- and post-operative pictures of five interesting cases.

Keywords: Argon, Co_2, Diode, Emission, ErYag, Electromagnetic spectrum, Flexible fiberoptics, Invisible light, NaYag, Orbit, Optical cavity, Radiation, Rigid glass fibres, Scattering, Visible light.

INTRODUCTION

Laser History

The use of lasers began as early as 1913 after Niel Bohr compounded the spontaneous emission theory. After several years of research, in 1917, theory related to absorption and emission was studied. Albert Einstein defined the theory of stimulated emission of radiation. Einstein formulated the term "stimulated emission", which was developed on the theory of quantum (Fig. **1**).

In the year 1958, Arthur Schawlow and Charles Townes created the term 'maser'- an acronym used for microwave amplification by stimulated emission of radiation. In the year 1960, Theodore Maiman developed the laser device, using an acronym 'laser' for light amplification by stimulated emission of radiation. The device comprised of a rod inserted into a photographic flash lamp with pulsed ruby laser. Another device of similar make was developed by Elias Snitzer in the

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year 1961, which was neodymium-doped yttrium aluminum garnet (Nd:YAG) laser.

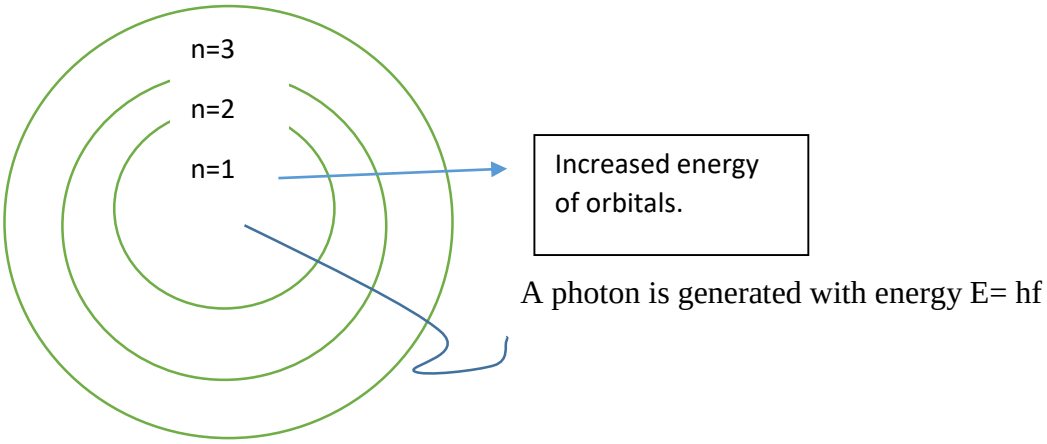

Fig. (1). Spontaneous emission. The Bohr model shows different energy levels of electrons with different energy orbitals n=1, n=2, n=3, and with increasing energy of orbits. In simplified words, when an electron moves from a high-energy orbit to a low-energy orbit, it releases energy or photon, which is equivalent to the difference in energy level between the orbits.

In mid-1960s, Reidar Sognnaes and Ralph Stern showed keen interest in the effects of using lasers on enamel and denture and surface alterations that occur after laser use. In the year 1965, physician Leon Goldman experimented with using the Ruby laser and found that the laser required large amount of energy to achieve the clinical effect.

About a decade later, the development of pulse technology with carbon dioxide wavelengths made the use of laser successful in the dental field, mainly for soft tissue applications. In the detailed research on surface effects of the Co_2 laser, Featherstone showed that the carbon dioxide wavelengths have a higher affinity for hydroxyapatite, which would be favorable not only for enamel and dentin removal but also make their surface susceptible to acid demineralization. In 1989, Hibst and Keller discovered the erbium laser that could cut tooth structure.

LASER LIGHT CHARACTERISTICS

Light is an electromagnetic radiation having wave characteristics that are typical, and also has a photonic nature that allows the transport of a specific quantum of energy. Electromagnetic energy varies from gamma rays to radio waves.

Ordinary light is a polychromatic light with a wavelength ranging from four hundred to seven hundred nanometers, whereas laser light is a monochromatic

beam that is of one color and uniform wavelength. An ordinary light is non-collimated, whereas the laser light is collimated with all beams in one direction and within the same plane. The temporal phase of ordinary light is non-coherent or disorganized, whereas temporal phase of a laser light is organized.

In the laser, the source of energy is derived from light or electrical field producing a spontaneously emitted beam of photons with optical activity. The photon interacts with the molecules of the medium, such as carbon dioxide gas or an yttrium scandium gallium garnet (YSGG) crystal, causing an electron to move to get excited to a high energy level. As this high energy level is less stable, it immediately reverts back to its more stable state, *i.e.,* lower energy level. As the electron returns to a lower state, it releases a photon of energy. Through the interactions with the molecules of the medium, the one spontaneously emitted photon will create two photons. The stimulated photons will interact with several other molecules of the medium, exponentially increasing the number of similar photons. Soon, there would be a large amount of laser energy that is highly focused and directional.

COMPONENTS OF LASER

Every laser is comprised of three basic goals:

1. Source of out/external energy

2. A resonation for optical functions

3. An active medium called lasing medium

The sources of external energy are a) flash lamps, b) arc lamps, c) light from another laser light or chemical reaction. Induction happens with photons that strike it at a high speed. The active medium is placed between both the mirrors. The mirrors are placed parallel, as shown in Fig. (**2**).

LASER WAVELENGTH ON ELECTROMAGNETIC SPECTRUM

The electromagnetic spectrum varies from ultraviolet to infrared rays and between gamma rays, x-rays, microwaves, radio waves, and gamma rays. The frequency of the laser represents oscillations in one second. ‘Frequency’ is a term used to express the pulse repetition rate. The dental laser wavelength ranges from 488 to 10,600 nm and is emitted in a form of non-ionizing radiation, which may be mutagenic to the DNA of the cell. The lasers are in an invisible infrared spectrum, though some may be visible.

CHAPTER 14

Intra-oral Camera and its Application in Dentistry

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Abstract: Intraoral camera has been proven to be an invaluable tool in the field of clinical dentistry. With the advent of handy intraoral cameras, exhaustive labour techniques were reduced with better elucidation and diagnosis of the clinical oral condition. This has improved the clarity of treatment plan options with better patient compliance which has resulted in quality treatment delivery.

The intra-oral camera possesses many advantages that include easy sterilisation, reusability and portability. It also serves as a better tool for patient education, awareness, and knowledge that enhances the scope for understanding the concepts of treatment and inculcating a positive attitude towards oral health. This review also discusses the application of intraoral cameras in various specialities of dentistry and adds a short description of various clinical trials corroborating the existing literature that emphasises the need of the hour in the utilisation of this technology in the field.

Keywords: Application, Dentistry, Diagnosis, Decision-making, Intraoral camera.

INTRODUCTION

The intraoral camera has been very well accepted in dentistry since its inception in the late 80s. To begin with, the intraoral cameras were bulky and very expensive. Over time, more compact forms of intraoral scanners emerged. The first registered trademark of an intra-oral camera was received by the Fuji Optical system, which was cumbersome, This necessitated the development of a novel intra-oral camera by Video Dental Concepts. These intraoral cameras are as sleek as air-rotor handpieces with the advantage of reduced size and cost-effectiveness, and are ergonomic. The camera can be connected to the recipient's computer easily for further use and storage of data. Also, they are more user-friendly with the reduced requirement of expertise training. After the breakthrough of Video Dental Concepts, technology took giant leaps, and highly sophisticated high-end intraoral cameras came into the market. These have a wide spectrum of applica-

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tions in the field of dentistry. Today, intra-oral cameras are relatively inexpensive, are very affordable, and are found commonly in dental practices all over the world.

An intraoral camera consists of four parts, *i.e.,* a camera with a light source, a video display, a handpiece, and a processing unit. Its features range from macro mode magnification to fluorescence for the detection of caries, plaque, and gingival inflammation. The sensor on the handpiece could be a complementary metal-oxide-semiconductor or a charged coupled device.

WORKING PRINCIPLE OF AN INTRA-ORAL CAMERA

Light received by the sensors is converted to an electronic signal that produces an image on the monitor by the intraoral camera image software. These images are then stored in the built-in memory or in the computer itself by a cloud-based storage system (Fig. **1**).

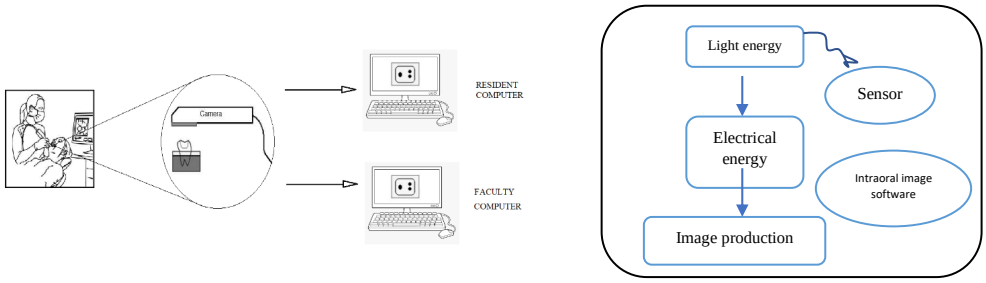

Fig. (1). A schematic representation of the working principle of image acquisition by intraoral scanner with digital connection at the recipient end.

The image quality is improved when the sensor is positioned closer to the lens. The advent of cordless intra-oral camera increased the portability and performance that could transmit images using Bluetooth or Wi-Fi connectivity.

The advantages and disadvantages of intra oral camera are listed in (Table **1**).

Table 1. Advantages and Disadvantages of Intra-oral Camera.

Advantages	Disadvantages
1. Allows active patient participation. The patient can understand his condition and decide with full knowledge.	1. Additional software is required for the digital application of the intraoral camera.

(Table 1) cont.....

Advantages	Disadvantages
2. The patient can visualize plaque and calculus-prone tooth areas, which helps them to enhance their oral hygiene practices, thereby preventing advanced periodontal problems.	-
3. Improves communication between patient and dentist, dental student and instructor, and also dentist and lab technician.	-
4. Easy to handle. No expertise training is required.	-
5. It can be easily sterilized.	-
6. It has a relatively low cost.	-
7. An intraoral camera decreases examiner bias through its reproducibility.	-
8. It is easy to obtain pictures of narrow areas and occlusal surfaces of the teeth as compared to routine photographic techniques.	-
9. Facilitates easy storage of information.	-
10. It decreases dental visits through its application in teledentistry.	-
11. Timely management of oral health examination through teledentistry for the patient in remote areas.	-
12. It is portable and lightweight.	-
13. It increases patient compliance by increasing patients' awareness.	-
14. Noninvasive diagnostic aid.	-
15. Repeatability and reproducibility of the images.	-
16. It simplifies the education of patients and also facilitates patient awareness by allowing them to see the oral details. This process increases patient compliance.	-

APPLICATIONS OF THE INTRAORAL CAMERA

The various applications of intra oral camera are listed in (Fig. **2**).

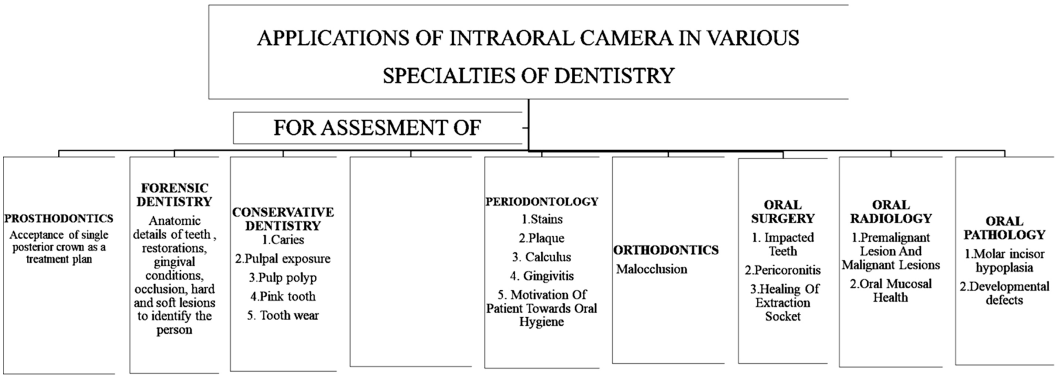

Fig. (2). Applications of intraoral camera in various dental fields.

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Namita Kalra

Dr. Namita Kalra has 42 years of experience in dentistry, and more than 38 years of experience in teaching. She has 23 years of experience as a professor. She qualified for BDS with honours in human physiology. For her post-graduate training, she was selected at the prestigious India Institute of AIIMS, Delhi and earned her master's degree for PGIMER, Chandigarh.

Her teaching career started at Dental College Rohtak, Haryana in 1984 and she dedicated herself to paediatric dentistry till 1988. Following this, she set up the Department of Dentistry at the University College of Medical Sciences (UCMS), Delhi under the Delhi University in 1988 and developed general dentistry with special emphasis on geriatric dentistry, dental emergencies, paediatric dentistry and general anaesthesia in dentistry. She also made an initiative to provide services for mentally challenged patients at the Guru Teg Bahadur Hospital, Delhi attached to UCMS. She has been heading the Department from 1988 till date. She also provided post-graduate training in paediatric dentistry at the University College of Medical Sciences (UCMS), Delhi University.

The author has numerous chapters in books to her credit, and almost 106 publications in both national and international indexed journals, with numerous communications at conferences and awards of excellence. She received many awards such as the Common Wealth Academic Staff Fellowship in Paedodontics at the Department of Paediatric Dentistry, University of Glasgow Dental School, Scotland, King's College, London, Distinguished Dental Services by the Delhi State Govt in 2015, the Distinguished Woman of the year in 2021 by the Indian Society of Paedodontics and Preventive Dentistry and also the Best Doctor award in 2014. Recently, she was elected as a Fellow of the National Academy of Medical Sciences in 2021.