

## Equipments Utilized By A General Dental Professional

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### ABSTRACT

In the present investigation tools utilized by dentists have been studied in detail. The significance of tools and equipments in dentistry is important for diagnosis, and treatments of orthodontic problems. Each tool has been specified with its function and its use is essential for functioning.

Standard instruments are the instruments used to examine, restore and extract teeth and manipulate tissues.

From protective gear to specialized equipment, there are many tools available to the dentist trade. While some tools are specific to certain branches of dentistry, there are a few basic instruments that are used in just about all dental practices.

A mouth mirror is a hand-held tool that allows the dentist to see inside the patient's mouth, at a variety of angles. The tool is designed to provide indirect vision, as well as reflect light and magnify the interior of the mouth. Today's mouth mirrors can be single-sided or double-sided, and some are even disposable.

### INTRODUCTION

Tools utilization in dentistry

Dental instruments are tools that dental professionals use to provide dental treatment. They include tools to examine, manipulate, treat, restore and remove teeth and surrounding oral structures (1).

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Several different kinds of hand-held probes are used by the dentist. The one that is used most often in a regular examination is the sickle or contra-angled probe. This probe allows the dentist

to detect pits and fissures, calculus, issues with bridges and crowns, and caries. A periodontal probe measures the depth of periodontal pockets, while a briault probe detects caries on mesial and distal surfaces.

College tweezers are another basic piece of equipment used in dentistry. These allow the dentist to place and retrieve small objects into and from the mouth. Some of them have a locking mechanism to prevent the object from being dropped. A metal ruler is often used to measure the length of endodontic K files(3).

In addition to the tools used in a basic dental exam, other tools are used for other purposes. Most dentists and their hygienists use masks, protective gloves, safety glasses, and face shields during dental procedures to protect them from debris, bacteria, and chemicals.

Most dentists also have radiograph equipment in their offices, to allow them to x-ray their patients' teeth. In addition to the actual x-ray machine, radiograph film is also needed to complete the procedure. Radiograph film comes in several sizes and shapes, depending upon the area of the mouth to be x-rayed.

Since dental work often results in excess saliva and moisture, most dentists use specific instruments designed to control moisture. The most commonly used is the disposable saliva ejector, which uses a low volume of suction to remove saliva from the mouth during procedures. A variety of cotton wool rolls and pellets are also available to absorb saliva, blood, and excess dental material (4).

For painful dental procedures, the dentist will need tools, like syringes and disposable needles, that provide anaesthesia. In procedures where a dentist is isolating one tooth or one specific part of the mouth, a rubber dam is used to allow the dentist to see better, as well as protect the patient's airway.

When it comes to filling cavities, repairing chips, or any other process that requires smoothing, dental burs are used to smooth and polish. They are also used to remove tooth tissue before restorations or other work. Burs come in several sizes and shapes, depending upon where and how they are going to be used. Most of us are familiar with the dental handpiece, or dentist drill, which can rotate a bur at high speeds (5,6).

Aims and Objectives of the present study are:

1. Investigation of any dental clinic
2. Enlistment of tools / equipments utilized by the dentist for patients
3. Enumeration of the significance of each dentistry tool.

## **MATERIALS AND METHODS**

Usage of some important tools is given as under:

**A Mouth Mirror Or Dentist's Mirror**

is an instrument used in dentistry. The head of the mirror is usually round, and the most

common sizes used are the No. 4 Ø (18 mm) and No. 5 (Ø 20 mm).[1] A No. 2 is sometimes used when a smaller mirror is needed, such as when working on back teeth with adental dam in place. The mouth mirror has a wide range of uses. Three of its most important functions are allowing indirect vision by the dentist, reflecting light onto desired surfaces, and retraction of soft tissues. There exists 2 different norms of the thread that are not compatible to each other. The US norm have a taper thread and is mostly used in the United States, Canada, Spain and South Korea.[2]

Indirect vision is needed in certain locations of the mouth where visibility is difficult or impossible. The posterior (or lingual) surfaces of the anteriormaxillary teeth is a notable area where mouth mirrors are often used. Other areas of the mouth can be viewed more readily with the mouth mirror, even though it would be possible to see them if the dentist or dental hygienist adjusted their body into a poor position. Without the mouth mirror, poor body positioning would occur daily and lead to chronic postural problems, especially of the back and neck (7,8).

There are other areas of the mouth where lighting is difficult, even with overhead dentists' lights. In these instances, the mouth mirror is used to reflect light onto those surfaces. This is especially useful if the mirror is simultaneously being used for indirect vision of an obscure area.

Additionally, the mouth mirror is used to retract tissues, such as the tongue or cheeks, to gain better visualization of the teeth.

Dentist's mirrors are also commonly used by engineers to allow vision in tight spaces and around corners in equipment. They are a common tool inoptics and laser labs as well.

#### **A PERIODONTAL PROBE**

is an instrument in dentistry commonly used in the dental armamentarium. It is usually long, thin, and blunted at the end. The primary purpose of a periodontal probe is to measure pocket depths around a tooth in order to establish the state of health of the periodontium. There are markings inscribed onto the head of the instrument for accuracy and readability.

#### **A DENTAL SYRINGE**

is a used by dentists for the injection of an anesthetic. It consists of a breech-loading syringe fitted with a sealed cartridge containing anesthetic solution.

The ancillary tool (generally part of a dental engine) used to supply water, compressed air or mist (formed by combination of water and compressed air) to the oral cavity for the purpose of irrigation (cleaning debris away from the area the dentist is working on), is also referred to as a dental syringe or a dental irrigation nozzle. A 3-way syringe / nozzle has separate internal channels supplying air, water or a mist created by combining the pressurized air with the waterflow. The syringe tip can be separated from the main body and replaced when necessary (9,10).

#### **A DENTAL DRILL OR DENTIST'S DRILL**

is a small, high-speed drill used during dental procedures, usually to remove decay and shape tooth structure prior to the insertion of a filling or crown. A dental drill may also be used in the

cleaning and shaping of root canals during endodontic treatment, or to remove old or temporary fillings or crowns prior to the insertion of new or permanent restorations. The term "dental drill" is considered the more colloquial form of the term "dental handpiece," although it can also be construed as to include the power source for one or more handpieces, a "dental engine." "Handpiece" and "engine" are more generic and euphemistic terms for generic dental tools.

Modern dental drills can rotate at up to 400,000 rpm,[1] and generally use hard metal alloy bits known as burs. Dental burs come in a great variety of shapes designed for specific applications. They are often made of steel with a tungsten carbide coating, or of tungsten carbide entirely. The burr may also have a diamond coating (11,12)

### **A DENTAL TORQUE WRENCH**

or restorative torque wrench is a torque wrench used to precisely apply a specific torque to a fastener bolt for fixation of an abutment, dentures or prosthetics[1] on a dental implant

### **A Dental Explorer Or Sickle Probe**

is an instrument in dentistry commonly used in the dental armamentarium. A sharp point at the end of the explorer is used to enhance tactile sensation.

In the past it was usual for dentists to use the explorer to probe teeth for the presence of cavities. Some dental professionals have questioned this practice in the first decade of the twenty-first century.[1][2] Since tooth enamel is demineralized in the early stages of tooth decay, the use of an explorer could open a cavity in the enamel where none existed previously. Instead, they argue that fluoride and oral hygiene should be used to remineralize the enamel and prevent it from decaying further. This debate still continues because sometimes decay can be difficult to diagnose without tactile verification. Additionally, radiographs and other products designed to identify decay (such as measuring fluorescence from a laser) help the dental professional make a final diagnosis of tooth decay (13,14)

### **A LENTULO SPIRAL**

is a dental instrument used to properly distribute root canal sealer and cement evenly throughout the root canal system, as when performing endodontic therapy or a post and core cementation.

The instrument has an atypical left-handed screw threading (like the screw in the left pedal of a bicycle) so that the application of sealer or cement will flow down the tip of the spiral when the slow-speed is in forward mode.

A common criticism of the Lentulo spiral is that the long term failures resulting from marginally poorer cement/sealer distribution are less problematic than the possibility of the spiral breaking inside the root canal. Proper use, maintenance, and disposal of old instruments should minimize breakage however.

## RESULTS AND DISCUSSION

Orthodontia, also known as orthodontics and dentofacial orthopedics, is a specialty field of dentistry. An orthodontist is a specialist who has undergone special training in a dental school or college after they have graduated in dentistry. It was established by the efforts of pioneering orthodontists such as Edward Angle and Norman William Kingsley. The specialty deals primarily with the diagnosis, prevention and correction of malpositioned teeth and the jaws.

### STRUCTURE OF TOOTH

The tooth has two anatomical parts. The crown of a tooth is that part of the tooth which is covered with enamel and this is the part usually visible in the mouth.

The root is the part embedded in the jaw. It anchors the tooth in its bony socket and is normally not visible (15).

**Enamel** The hard outer layer of the crown. Enamel is the hardest substance in the body.

**Dentine** Not as hard as enamel, forms the bulk of the tooth and can be sensitive if the protection of the enamel is lost.

**Pulp** Soft tissue containing the blood and nerve supply to the tooth. The pulp extends from the crown to the tip of the root.

**Cementum** The layer of bone-like tissue covering the root. It is not as hard as enamel.

### STRUCTURES AROUND THE TOOTH

**Periodontal ligament:** Made up of thousands of fibres which fasten the cementum to the bony socket. These fibres anchor the tooth to the jaw bone and act as shock absorbers for the tooth which is subjected to heavy forces during chewing.

**Oral Mucosa:** This is the term used to describe the moist tissue that lines the mouth.

**Gingivae (gums):** Soft tissue that immediately surrounds the teeth and bone. It protects the bone and the roots of the teeth and provides an easily lubricated surface.

**Bone:** Provides a socket to surround and support the roots of the teeth.

**Nerves and blood supply:** Each tooth and periodontal ligament has a nerve supply and the teeth are sensitive to a wide variety of stimuli. The blood supply is necessary to maintain the vitality of the tooth.

### Maintenance of dental tools and equipments

Effective maintenance of equipment in a dental surgery or laboratory is essential to the smooth functioning of both. Without strict adherence to scrupulous maintenance procedures, practitioners run the risk of equipment breakdown and even complete failure, causing inconvenience to both staff and patients.

Dental instruments and equipment represent a significant financial investment, and most practitioners cannot afford the expense of costly repairs and replacements. Dental instruments,



and especially handpieces, are intricately designed with sensitive inner workings, which are difficult and time consuming to replace, but are also easily damaged by age and frequent use. Faulty equipment has the potential to cause injury both physically and biologically, so your patient's health is very much at risk if strict maintenance protocols are not adhered to. It goes without saying, that prevention is better than cure with regards to surgery equipment.

To facilitate efficient instrument maintenance, practitioners should carefully consider any new equipment that they purchase and assess the item's quality. From June 1998, it was ruled that all medical devices must have a "CE" mark to show that the item has been manufactured to high standards, and that it complies with health and safety standards. This legislation was brought in with the express purpose of protecting the public and the user from inferior products that could fail. Care should be taken to insure that new instruments are compatible with equipment already in place and that it is fit-for-purpose, remembering that the cheapest product is not necessarily the best option.

A manufacturer's instructions are sacrosanct when it comes to the maintenance of new and existing dental equipment. Failure to follow their recommendations will invalidate the warranty, which in turn may require maintenance and repairs to be carried out by registered technicians. Furthermore, all members of staff have a "duty of care" under the Health and Safety at Work Act 1974, preventing them from performing any action, which may put others or themselves at risk. This includes attempting inappropriate maintenance on dental equipment, which should be carried out by a fully-trained and qualified specialist. Therefore, it is vital that rigorous maintenance regimes are set up and adhered to, this being the responsibility of the practice owner or practice manager in charge.

#### Hand instruments

Many hand instruments need no care other than effective cleaning. However, some of the main problems that dental practitioners come up against in the surgery are caused by blunt items, these being part of a group of instruments requiring more specific maintenance other than simply cleaning. Many of the instruments a practitioner uses must be sharp for optimum performance. Probes, excavators, carvers, chisels, cervical trimmers and hand scales are all needed for precise work, and due to cleaning and sterilisation they can quickly become blunt and ineffective.

Sharp hand instruments promote precision, decrease operator fatigue, and reduce the time it takes to complete a procedure. Regular sharpening is very important, although care must be taken to avoid fracturing a brittle and weak instrument, which could cause damage to the patient's mouth.

#### Handpieces and other rotary or air driven instruments

Handpieces are costly, complicated instruments that demand careful maintenance and care. Contracts should be set up and approved by certified technicians as neither the practitioner nor their colleagues should service these hand pieces other than everyday cleaning, lubrication and

sterilisation.

### **SUCTION EQUIPMENT**

To keep suction equipment working effectively, filters must be cleaned regularly with a disinfectant solution running through the tubings. To avoid the build up of mucous, suction tubing should also have water aspirated through it after every patient.

### **ELECTRICAL EQUIPMENT**

The variety and complexity of electrical dental equipment is constantly growing and evolving. Considerable inconvenience to the dental team can be avoided by careful maintenance of the dental unit – the most important piece of electrical equipment in surgery. Again, this and other electrical equipment should be cared for by specialist technicians. This is particularly important for radiography equipment, which should have its chemicals changed regularly.

Good maintenance of medical devices in the dental environment goes hand-in-hand with sound surgery protocols. This will ensure high standards of service for patients. Proper training is a must in order to ensure that dental professionals are aware of the correct working of equipment. They must also be alert to malfunction so that repairs can be carried out immediately.

schülke, providers of infection control product and training solutions, is dedicated to increasing industry awareness of correct product maintenance and decontamination.

### **NEW DENTAL IMPLANTS**

Dental implants are an option for tooth loss due to an accident or infection or as an alternative to bridges and dentures. The implants are tooth root substitutes that are surgically anchored in place in the jawbone and act to stabilize the artificial teeth to which they are attached. Suitable candidates for dental implants need to have an adequate bone level and density, must not be prone to infection, and must be willing to maintain good oral hygiene practices(13).

### **DENTURES**

Dentures are removable false teeth made of acrylic (plastic), nylon or metal. They fit snugly over the gums to replace missing teeth and eliminate potential problems caused by gaps.

Gaps left by missing teeth can cause problems with eating and speech, and teeth either side of the gap may grow into the space at an angle. Sometimes, all the teeth need to be removed and replaced.

You may therefore need either:

- complete dentures (a full set) – which replace all your upper or lower teeth, or
- partial dentures – which replace just one tooth or a few missing teeth

Dentures can help to prevent problems with eating and speech and, if you need complete dentures, they can also improve the appearance of your smile and give you confidence

Improve fit of dentures. For first-time denture wearers, oral surgery can be done to correct any irregularities of the jaws prior to creating the dentures to ensure a better fit. Oral surgery can also help long-term denture wearers. Supporting bone often deteriorates over time, resulting in dentures that no longer fit properly. In severe cases, an oral surgeon can add a bone graft to areas where little bone remains.

### Complete dentures

A full denture will be fitted if all your upper or lower teeth need to be removed or you're having an old complete denture replaced.

The denture will usually be fitted as soon as your teeth are removed, which means you won't be without teeth. The denture will fit snugly over your gums and jawbone.

However, if you have dentures fitted immediately after the removal of several teeth, the gums and bone will alter in shape fairly quickly and the dentures will probably need relining or remaking after a few months.

Occasionally, your gums may need to be left to heal and alter in shape for several months before dentures can be fitted.

You can either see a dentist or a qualified clinical dental technician to have your dentures made and fitted. The difference between a dentist and a clinical dental technician (in terms of producing dentures) is outlined below.

- A dentist – will take measurements and impressions (moulds) of your mouth, and then order your full or partial dentures from a dental technician (14).
- A clinical dental technician – will provide a full set of dentures directly without you having to see your dentist (although you should still have regular dental check-ups with your dentist).

A trial denture will be created from the impressions taken of your mouth. The dentist or clinical dental technician will try this in your mouth to assess the fit and for you to assess the appearance. The shape and colour may be adjusted before the final denture is produced.

## CONCLUSION

### Tooth Saving Tips

Patients today have more options than ever before to treat their teeth. Understanding your choices and their impact on your future dental health and lifestyle is important. Read on to learn why nothing is as good as your natural tooth and get simple tips for saving your teeth!

Saving a natural tooth through endodontic treatment should always be the first choice for the best health and cosmetic results. There are many advantages to saving your natural tooth:

- Efficient chewing
- Normal biting force, so you can continue to eat your favorite foods
- Maintains a natural appearance



- Limits the need for more costly, ongoing dental work

### **TIPS FOR SAVING YOUR TEETH**

1. If you are given a choice between root canal treatment or tooth extraction, always choose root canal treatment. Dentistry has yet to produce a denture, bridge or implant that looks, feels and functions as well as a natural tooth.
2. Most endodontists offer tremendous flexibility in accommodating emergency cases including weekends in some cases so your pain can be relieved quickly.
3. If your dentist recommends tooth extraction, ask whether root canal treatment is an option.
4. If your dentist says that an endodontic procedure is not an option, ask why, and request a referral to an endodontist. Endodontists are dentists who specialize in saving teeth, and have at least two years of advanced training in root canal procedures. They are experts at diagnosing and relieving tooth pain, and use advanced equipment to treat patients quickly and comfortably. Your dentist probably has partnerships with endodontists in your area already.

### **What to Avoid**

- Never choose extraction because you think it will be cheaper! When a natural tooth is extracted, it must be replaced with an artificial tooth to prevent other teeth from shifting, and to prevent future dental problems. The cost of a denture, bridge or implant, plus the extraction, often is higher than the cost of an endodontic procedure that would save the tooth for years to come. Most dental insurance plans cover endodontic treatment.
- Never choose extraction because you think root canal treatment will be painful! Modern techniques and effective anesthesia make root canal treatment virtually painless. In fact, discomfort after the procedure is generally greater with a tooth extraction. Patients who have experienced root canal treatment are six times more likely to describe it as "painless" than patients who have not had a root canal.
- Never choose extraction because you think it will be quicker! Endodontic treatments generally require one to two visits lasting less than an hour each. An extraction requires one visit, but the denture, bridge or implant will require several additional visits with your dentist.

### **Indian Orthodontic Society**

- The Indian Orthodontic Society held its first annual conference in 1967 in New Delhi. The Journal of the Indian Orthodontic Society was started by H. D. Merchant, its first Editor. He was also the founding President of the Society. Naishadh Parikh was the founding Secretary and Treasurer. The other founding members were A.B. Modi, Keki Mistry, Mohandas Bhat, Prem Prakash and the late H.S. Shaikh.
- The Society established the Indian Board of Orthodontics in 1999, the first such board in the field of dentistry in India and the third in the world.[1] The Board was established to examine members with five years of experience after they have completed MDS[clarification needed] in

clinical excellence in the practice of Orthodontics. The Indian Orthodontic Society also became part of World Federation of Orthodontics at its inception in 1995

It is estimated that nearly 5% of the UK or USA population present with dentofacial deformities that are not amenable to orthodontic treatment requiring orthognathic surgery as a part of their definitive treatment.[2][3][4] Orthognathic surgery can be used to correct;

- Gross jaw discrepancies (anteroposterior, vertical, or transverse discrepancies)[5]
- Facial skeletal discrepancies associated with documented sleep apnea, airway defects, and soft tissue discrepancies
- Facial skeletal discrepancies associated with documented temporomandibular joint pathology.

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