

Application of Four-Handed Dentistry in Clinical Practice : A Review

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ABSTRACT

Routine clinical practice in dentistry has seen numerous advancements with the motive to reduce the burden on practitioners, of which the concept of four-handed dentistry has proved to be one the most relied and efficient one. Four handed dentistry should be practiced by the dental professionals in the clinical and business areas of the office in combination with the practice of ergonomics. Young practitioners of 21st century are less exposed to true-four handed dentistry. This article aims in making the young dentists and professional clinical practitioners get aware and acquainted with the concepts of true four handed dentistry and the ways in which it can be made a part of the technological advanced dental set-up.

KEYWORD: Auxiliary, Dental clinics, Ergonomics

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INTRODUCTION

Glene Robinson in 1968, described four handed dentistry as a practice in which the dentist and the assistant work as a team to perform some operations that has been planned with an intention to benefit the patient. It involves the coordinated and skilful work of a full time chair side assistant who has been trained to work with the dentist during any clinical procedure and other works in the dental office.¹

Four handed dentistry involves a careful study of different phases of office management with an intention to conserve time and reduce practice associated stress. In this form of dentistry, the dentist, discharges some obligations to the auxiliary and assigns him all other tasks. This complements the application of most modern dental equipment which has been deliberately selected for the operation.

To be more productive, four handed dentistry needs some basic elements, such as selection of equipment. Selection and development of techniques should aim to obtain maximum operating efficiency. Operating equipment that would facilitate four handed dentistry should be selected and arranged for the ease of both the assistant and the operator. Regardless of the configuration selected, the end result should be such that both the operator and the assistant gain better accessibility and visibility during any clinical procedures.²

Past few decades have seen a declining emphasis on the principles of four-handed dentistry in formal dental education, which has resulted in production of dental professionals without ample knowledge of proper ergonomic

strategies to be followed in private dental office.

PRINCIPLES OF FOUR HANDED DENTISTRY

The use of four handed dentistry has been considered as an essential part of clinical dentistry. It has become quite evident that a well-trained and skilled dental auxiliary is as important as any sophisticated instrument in the clinical set-up. Proper utilisation of an extra pair of hands of the auxiliary in a four-handed sit-down dentistry setup is generally regarded as an ideal method of delivering dental services.³

In 1960, the term four handed dentistry was first used and applied in The proceedings on "training dental students to use chair side assistants". This term has been widely used since then.¹

This concept of delivering dental services consists of four basic principles:

- Performing Operation in a seated position.
- Proper utilisation of the skills of the auxiliary.
- Proper organisation of different parts of the practice.
- Simplifying the planned task to the minimum.

BASIC PRECEPT OF FOUR HANDED DENTISTRY

According to the claims made by some dentists and assistants, in practicing four-handed-dentistry, they suffer from work related stress due to inappropriate techniques that don't meet the basic precept of four handed dentistry. Dentists following the habit of changing their own burs, or twisting and turning to reach desired equipment can still be observed in

clinics practicing four handed dentistry. True four handed dentistry is said to be not practiced, if the auxiliary does not take up the charge of instrument transfer. It is basically based on a set of criteria that define the conditions under which efficiency can be attained. In order to practice true fourhanded dentistry, the following criteria must be met:⁴

- All equipment must be ergonomically designed.
- The operating team and patient must be seated comfortably in ergonomically designed equipment.
- Motion economy should be practiced.
- Pre-set cassettes/trays should be utilized.
- The dentist should all legally delegable duties to qualified auxiliaries based on the state's guidelines.
- Patient treatment should be planned in advance in a logical sequence.

DIFFERENT ZONES OF ACTIVITY

The treatment activities in a clinical practice basically revolve around the patient. The dental team involving the practitioner and the auxiliary should be aware of the chairs-side functional spatial relationship, before any equipment selection. The work area around the patient is basically divided into four zones called as "zones of activity". Zones of activity are identified using the patient's face as the face of a clock. The zones for right-handed operators are shown in Figure No.1. The zones for the left-handed operator is depicted in Figure No. 2.⁴

The four zones of activity are:

- Operator's zone
- Assistant's zone
- Transfer zone
- Static zone

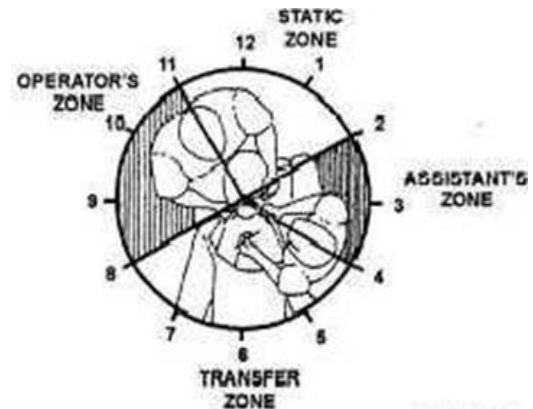


FIGURE NO.1 Zones of Activity for Right Handed Dentist.

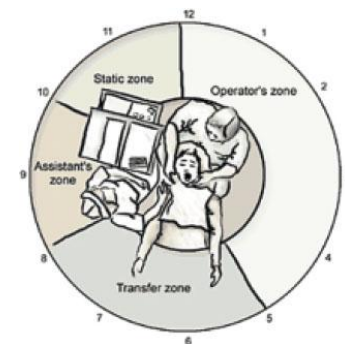


FIGURE NO.2 Zones of Activity for Left Handed Dentist.

For a right-handed operator, the operator's zone extends from 7 to 12 o'clock, the assistant's zone from 2 to 4 o'clock, the instrument transfer zone from 4 to 7 o'clock and the static zone from 12 to 2 o'clock.⁵

STRATEGIES TO ENSURE EFFECTIVE FOURHANDED DENTISTRY

a)Teamwork:

In order to effectively implement the techniques of true four-handed dentistry each member of the dental team must take up individual as well as team responsibilities. Every member of the team should recognise the need to exchange instruments, reposition patient and improve accessibility and visibility to the working area.⁶

b) Strategies for the Operator:

The practitioner must prepare a methodology for performing some basic dental procedures. This may involve non-verbal communications indicating the need for exchange of instruments or materials.⁶

c) Strategies for the Dental Assistant:

The auxiliary must develop a proper understanding of the procedure, anticipate the operator's need, and recognize any change in the procedure or instruments.^{6,7}

TEAM RESPONSIBILITIES DURING INSTRUMENT TRANSFER

a) Operator Requirements:

So as to maximize the efficacy of an instrument transfer procedure the operator should take the help of a finger rest for his/her working hand in the oral cavity which in turn would help the team members locate the point of instrument transfer. Specific non-verbal signal and verbal communications should be planned for ease of work.⁸

b) Assistant Requirements:

In order to enhance the efficiency of an instrument transfer technique, the assistant should arrange instruments on a pre-set instrument tray or cassette as per the sequence of use in the operation. The assistant should anticipate the need for any instruments to be sequentially delivered and he should stay agile for any change in the procedure.⁹

c) Team Requirements:

The operating team should observe patient movements, especially during any exchange of an syringes or other sharp instruments. The team should follow a safe and standardised procedure for any treatment.

TYPES OF INSTRUMENT TRANSFER

The three most common instrument transfers used today in dentistry are the single-handed, two-handed, and hidden syringe transfers.

Single-Handed Transfer Technique (Right-handed operator)¹⁰:

This is the most common type of transfer technique. In this procedure, the assistant transfers the instrument with the left hand and holds the evacuator tip or any water syringe in the right hand. For a left hand operator, all the positions are reversed. The single handed instrument transfer with a right-handed operator is illustrated in the following procedural guidelines. All the instruments should be assembled in sequence of use and the instrument tray should be placed as close to the patient as possible. The tray must be positioned in either vertical or horizontal position. The auxiliary equipment such as rubber dam, syringes should be placed on the mobile cabinet at a far distance from the patient

At the start of any procedure, the mirror should be passed with the right hand and the explorer should be passed with the left hand. The instrument to be transferred should be picked in the left hand and it should be positioned in between the first finger and thumb. The instrument should be rested on the middle finger, such that the working end is positioned for the correct arch and it is positioned within 10-12 inches from the operator's hand. The operator should signal for any exchange to be made by moving the instrument being used till it is above the first knuckle. Care should be taken to avoid puncturing the gloves.

The Two-Handed Transfer¹¹:

This form of transfer is mostly used during transfer of bulky instruments such as rubber dam clamp forceps or surgical forceps. In this process of transfer, the assistant picks up the used instrument with one hand while carrying the instrument to be delivered in the opposite hand. The use of high volume suction and air-water syringe gets limited during this type of transfer.

Delivery of the Dental Mirror and Explorer:

At the beginning of most of the dental procedures, these two diagnostic instruments are transferred simultaneously by the assistant. Using the right hand the dental mirror is carried up from the handle. Simultaneously, the explorer is carried up holding at one-third of the handle of the instrument close to the assistant. The instruments are positioned in the delivery portion of the hands and those should be passed in the desired manner when the operator gives any verbal or non-verbal signal.

Use of Non-Locking Tissue Forceps¹²:

During the use of non-locking forceps, concern should be taken regarding the grasp on the forceps so as to avoid any separation of beaks. During the transfer; forceps are paralleled with the used instrument that is to be exchanged. During the return of the forceps, the working end should be grasped in the palm to avoid spilling and dropping of the contents.

Delivery of Small Items¹³:

Cotton applicators and other small instruments should be carried like other instruments. For transferring medications, the insertion instrument should be passed and then the pad with the medicament should be carried for better accessibility to the operator.

Delivery of Scissors:

For the delivery of the scissors, the assistant should parallel them with the instruments to be exchanged. Accordingly, the operator should modify the hand position to place the thumb and first or second finger into the rings of the handle. During the return of scissors, beaks should point toward the assistant.

Six Handed Transfer:

During any complex surgical cases like endodontic surgeries, high powered microscope plays crucial role. A third set of hand becomes significant for isolation, retraction, material preparation etc. While the first auxiliary remains in sync with the operator at the operation site, the second auxiliary anticipates the need of both, the primary assistant and the operator.

CONCLUSION

Numerous studies have reported the correlation between the applications of four handed dentistry with clinical productivity. Survey on reviews of practitioners have depicted of increase in efficiency and ease of work after implementation of four-handed dentistry practice in the dental set-up. Reports show an increase of productivity by 33%-75%. But for beginners, the practice seems quite difficult during implementation of the principles of true four handed dentistry. For better output using this technique, ample knowledge about it and proper training; both practical and theoretical has to be imparted to the chair side assistants to make four handed dentistry more effective.¹⁴

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