Operational Guide for School Oral Health Program

Basic Principles of Work Simplification

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Time management is an element of survival for the dental practitioners. Dentistry is a "hands on" profession, where the office team must maximize the usage of time effectively through proper planning to provide an optimal treatment for each patient.

Stress is a by-product of various pressures, created by a demand for increased productivity. To reduce stress, each team member must follow the methods that will simplify the work and reduce the fatigue.

Techniques for making work easier, safer and more effective have been developed over the years by major industries in an attempt to make better products at a competitive price. As a result of the researches done by industrial engineers, four basic principles of work simplification have been established. These principles can be applied in the dental office to simplify work and make a more comfortable working environment. All aspects of the dental practices should be analyzed by applying the following four principles of work simplification:

1. Elimination: A 100% saving can be accomplished by elimination of unnecessary equipment, instruments, steps in procedures and movements.

2. Combination: If the functions performed by two instruments or pieces of equipment can be combined into one instrument or a piece of equipment, or if two steps in a procedure can be combined to accomplished in one step, a 50% saving can be realized.

3. Rearrangement: It may be possible to rearrange equipments and materials in the operatory, scheduling of patients, or steps in clinical procedures to take better advantage of available space and time.

4. Simplification: Every effort should be made to simplify dental office equipment and patient treatment procedures in order to introduce a minimum number of variables and permit the team to function most effectively.

Motion economy

When a dentist works alone preparing an average class II Amalgam restoration, his or her eyes and hands must leave the operating field an average of 150 times to get needed instruments or materials to restore the tooth. Since wasted motions use time and reduce efficiency, the dental team must eliminate unnecessary motion in the treatment area.

When working with a chair side dental assistant, the dentist should be able to complete an entire dental procedure without having to take his/her eyes or

hands out of the operating field. Motions required exchanging instruments with the dental assistant should be confined to Class I, II and III movements. If the dentist frequently uses class IV and V motions, it is apparent that the dental team is not utilizing the principles of 4 - handed dentistry.

Classification of motion

Motions are classified into five categories from the simple to the more complex patterns.

Class 1 motions involve the movement of only fingers.

(Fig. 11)

Class II motions involve movement of the fingers and wrist.

(Fig. 12)

Class III motions involve movement of the fingers, wrist and elbow.

(Fig. 13)

Class IV motion involves movement of the entire arm from the shoulder.

(Fig. 14)

Class V motions involve movement of the arm and twisting of the body.

(Fig. 15)

Class IV and V motions are fatiguing and time consuming. They require arm and body movement, re-focusing and re-accommodation of the eyes. Efficient dentistry will require elimination of Class IV and V movements whenever possible. Applying the following principles of motion will conserve time, save energy, increase production and reduce fatigue.

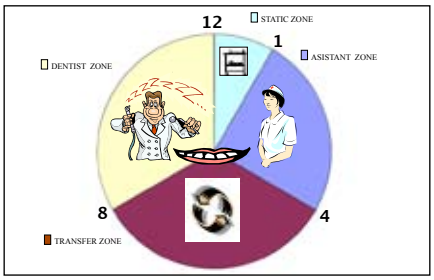
Principles of motion

1. Use body motions requiring the least amount of time and energey.
2. Minimize the number of body motions.
3. Reduce the length of motions.
4. Smooth, continuous motions are preferable to zigzag jerky motions.
5. Minimize the number of eye fixations.
6. Design the work environment to accommodate natural and consistent movements.

Work zones in the dental operatory (Fig. 16)

Work zones refer to four specific areas around the patient's chair, which designate the location of the dentist, assistant and equipment with reference

to the dental patient. If the patient's chair is superimposed over the face of a clock with the patient's face being at the center of the clock, the work zones can then be referred to certain time positions i.e. 12 o'clock, 1 o'clock, etc.



(Fig. 16)

Note: The designation of clock position will be exactly opposite for right and left-handed operators.

When working efficiently with a dental assistant, the operator must limit his/her location to one side of the patient chair. This area should be free from equipment, hoses or other material, which will hinder movement of the operator.

The operator zone for a right-handed dentist will permit the dentist to work within the area bounded by the 8 o'clock to 12 o'clock positions. (12 o'clock to 4 o'clock - for left handed operator). When the patient's head is properly positioned, the operator will find good access and visibility to most areas of the mouth while working in the 12 o'clock to 10:30 o'clock position. (12 o'clock to 1:30 o'clock - for left handed operator).

The work area between the dentist and assistant around the patient's head is normally an area of low activity, (unless a behind-the-patient delivery system is followed). Equipment, which does not need to be adjusted frequently (cavitron, curing light for composites) are usually placed in the static zone. The static zone is bounded by the 12 o'clock to 1 o'clock positions for the right-handed operator and by the 11 o'clock to 12 o'clock positions for the left handed operator.

The assistant's zone is bounded by the 1 o'clock to 4 o'clock positions for the right handed operator and by the 8 o'clock to 11 o'clock for the left handed. If the dental operatory is arranged for efficiency, the assistant will not have to significantly change his/her location. Usually the assistant sits at the 3 o'clock position. This places the hips of the dental assistant at about the patient's shoulder area. The legs of the assistant are normally directed toward the patient's face. Obviously, the assistant sits sideways with reference to the patient and has access to the transfer zone for instrument transfer, as well as

to the static zone. The assistant's mobile cabinet is also located partially in the assistant's zone.

Everything that enters or leaves the patient's mouth must pass through the transfer zone. As the area extends away from the mouth, it spreads like a triangle toward the foot of the patient's chair and is bounded by the 4 o'clock to 8 o'clock positions for right-handed operators.

The boundaries for the left-handed operator are the 4 o'clock to 8 o'clock positions. The dentist and assistant exchange all instruments in the transfer zone, as close to the patient's mouth as practical. Over-the-patient delivery systems are placed in this zone.

Positioning the operating team

Webster defines posture as the position or bearing of the body, whether characteristic or assumed, for a special purpose. The posture taken by the dentist for the special purpose of delivering dental care is governed by the dentist's work environment. Observations of dentists at works verify that many dentists ignore the bearing of their bodies and operate in postures, which are stressful. Whenever possible, work environments must be altered so that the dentist can utilize work positions which are more characteristic to human form.

Work posture, which is characteristic to human form, will relieve the force of strain resulting from imbalance and will provide relaxation for the muscular, vascular and skeletal systems. Posture characteristic to human body form will permit even distribution of body weight to the body parts that are best designed for support. A balanced work posture is less fatiguing, more efficient and healthier than a strained work posture. Health maladies (i.e. varicosities, scoliosis and back and neck pain) are associated with inappropriate dental work posture. A seated work position can be less stressful than a standing position, but appropriate sitting posture means more than just sitting to work.

The profile of a dentist's work posture, which is characteristic to human form, will include:

1. The dentist is in a seated work position.
2. The weight of the operator's head is centered over the spinal column.
3. The operator's back is upright and the neck is only slightly forward with the head slightly titled.
4. The vertebral column is slightly flattened in the lumbar area.
5. The top of the shoulders is parallel to the floor.

6. The operator's elbows are close to his/her body.
7. The face and knees of the operators are fixed in the same direction so that there is no twisting of the trunk.
8. A line drawn parallel to the operator's femur is on a horizontal plane and the operator's feet are flat on the floor.
9. The distance from the dentist's nose to the patient's mouth is 14 to 18 inches.

To obtain this type of work posture, the dental team must manipulate their work surroundings.

The dentist operating stool – (Should have the following features): (Fig.17)

1. The stool must be adjusted low enough to relieve pressure on the blood vessels under the knee and thighs of the operator.
2. The stool must permit upper body weight of the dentist to be evenly distributed over the seat portion.
3. The chair should provide support in the operator's lumbar area without impending to his/her movements.
4. The stool must be stable, but mobile enough for the operator to easily change his or her work position.

(Fig. 17)

The patient chair must be positioned to maximum access to the mouth and visibility for operating team. After obtaining maximum benefit from operator stool adjustment, the dentist should establish the following dentist-to-patient work environment:

1. The patient's head will be placed in the midline of the dentist and as close as possible.
2. The height of the patient's head will be just above the height of the dentist's

elbows. (Elbows are at the dentist's side and they create an approximate 90° angle with the forearms).

3. The dentist's thighs will be placed under the patient's chair with the patient's head over the dentist's lap.
4. The patient will be in a reclined chair position with his/her eyes directed towards the ceiling.
5. The patient's mouth will be open and the head will be rotated laterally or tilted upward or downward to provide maximum access and visibility for the operating team.
6. An attempt is made to bring the patient to the dentist, rather than to distort the dentist's work posture by bringing the dentist to the patient.

The dental assistant stool must permit the assistant to: (Fig. 18)

1. Work seated with his/her legs directed toward the patient's head.
2. Position his/her hips in line with the patient's shoulders.
3. Sit higher than the dentist to gain best visibility into the mouth.
4. Lean forward and still have upper body support via an abdominal rest.
5. Experience no pressure on the blood vessels under the knees or thighs. (A foot rest is usually necessary for the assistant to achieve balanced posture)
6. Meet the requirements of work posture characteristic to human form, which apply to the dentist, (with the exception of leaning forward and twisting slightly at the trunk).

(Fig. 18)

Balanced posture must be considered for each treatment procedure and must be reinforced by each team member. To receive the health benefits from good work posture, it must be practiced and perfected. Posture that is characteristic to human form will require proper positioning of the dentist, assistant and the patient.

Seating the dental patient

The following procedures should be done by the dental assistants before seating the patient:

1. The patient chair is lowered to its minimum height.
2. The patient chair back is raised to a semi-reclining position.
3. If the armrest of the patient chair is movable, it must be lowered/raised on the side of the chair where the patient will enter.
4. The operating light is to be moved away from the patient chair to prevent accidental bumping of the patient's head.
5. If an over-the-patient delivery system is used, the dental unit is moved from the patient's entry path.
6. A preset instrument tray is placed in position on top of the work cabinet.
7. The anesthetic syringe is set up and made ready for use.
8. The patient's radiographs are placed on the view box. (If available)

Procedure for seating patients:

1. As the dental assistant leads the patient into the operatory, he/she directs the patient to the dental chair and verbally explains the seating instructions. After the patient is seated, the assistant lowers/raises the arm of the chair, place a napkin on the patient.
2. The patient is then asked to relax against the chair backrest as the entire chair is tilted into a reclining position. The patient is moved slowly and is reassured that the chair placement will provide maximum support for the patient and best access and visibility for the operating team. As the chair is being tilted to a fully supine position, the chair base may be raised or lowered to the desired operating height.

Remember: The operator's thighs must fit under the backrest of the patient chair when the operator is seated on the operating stool.

Final preparations before beginning treatment:

1. When the dentist enters the clinic, the dental assistant after washing his/her hands, gets properly seated on the assistant's stool and pulls the mobile cabinet into work position.
2. The dentist greets the patient, washes his/her hands and checks the patient chart and radiographs to confirm the treatment plan.

3. The dentist then seats himself/herself so that his/her thighs are approximately parallel to the floor and makes final adjustments to the patient's chair height.
4. The assistant turns on and positions the operating light.
5. The assistant places the mouth mirror and explorer into the dentist's hand and immediately brings the air-water syringe and aspirator tip to the work zone to dry the treatment area.

Exchange of instruments between the dentist and the assistant

The exchange of dental instruments has been a task of the dental team right from the first known hiring of a dental assistant in 1885. The technique of instrument exchange described below is referred as the "pick up and delivery method of instrument transfer". This procedure can be carried out using only one hand of the assistant; thereby freeing the assistant's other hand for holding the oral evacuator, air-water syringe or for mixing dental materials. To properly perform this chair side procedure, both the dentist and the dental assistant must perform specific responsibilities or duties.

Dentist duties

1. To be as predictable as possible in your work by establishing a definite routine for each procedure.
2. To anticipate and communicate the need for supplies and instruments which may be used out of the routine sequence of cavity preparation.
3. To maintain a finger rest for assuring a smooth transfer of instruments.
4. To maintain his/her hands and eyes in the operating field during the entire dental procedure.
5. To use preset instrument trays for all dental restorative procedures.

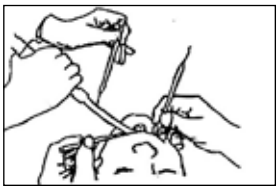
Dental assistant duties

1. Remain attentive to signals from the dentist which indicate a need for the next instrument.
2. Anticipate the next instrument which would normally be used in the sequence and hold it in a position ready for the next exchange.
3. Return each used instrument to the preset tray in its proper place.
4. Be organized and systematic.
5. Learn to efficiently exchange instruments using only one hand.

Instrument Exchange Sequence

1. Ready position/preparation: (Fig. 19)

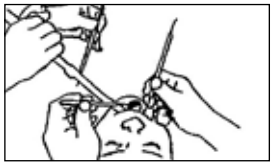
The dental assistant holds the instrument to be delivered in his/her thumb and first fingers at a distance of 8 - 10 inches from the patient's mouth. The instrument must be held close to its non-working end to allow space at the working end for the operator to grasp the instrument. The operator should receive the instrument properly oriented for the quadrant being treated. Burs and cutting edges of hand instruments should be directed toward the area of the planned operation.



(Fig. 19)

2. Signal by dentist: (Fig. 20)

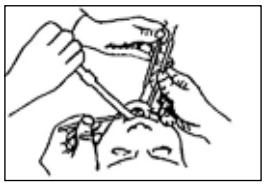
The operator signals a readiness to exchange instruments by lifting the instrument out of the patient's mouth, using only the thumb and first finger.



(Fig. 20)

3. Paralleling of instruments: (Fig. 21)

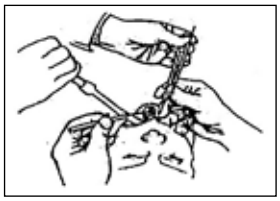
At this moment the assistant positions the instrument to be exchanged close to and parallel to the instrument in the dentist's hand.



(Fig. 21)

4. Instrument pick up: (Fig. 22)

The assistant will extend his/her two fingers and remove the unwanted instrument from the hand of the operator at the end of the instrument, most distant from the patient's mouth. By folding the pick up fingers into the palm, the assistant will lift the unwanted instrument out of the operating field.



(Fig. 22)

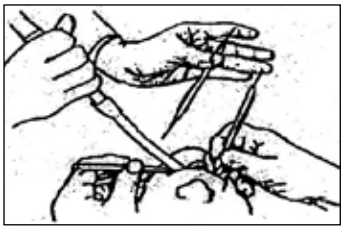
5. Delivery: (Fig. 23)

The instrument to be delivered is then lowered into the operator's hand and he/she can resume work in the patient's mouth.

(Fig. 23)

6. Rolling movement used delivery position: (Fig. 24)

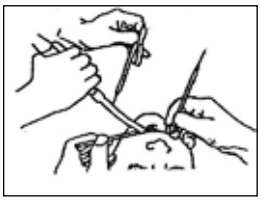
If the instrument taken from the operator is to be reused immediately, the assistant must move the instrument from his/her pickup fingers back into the delivery portion of the hand. This can be accomplished by rolling the instrument between the thumb and pickup fingers back into the ready position.



(Fig. 24)

7. Ready for next exchange: (Fig. 25)

If the instrument taken from the operator is not to be used again, the assistant returns the used instrument to the instrument tray and selects the next instrument in the sequence according to the treatment. This instrument is then held in the ready position until the dentist makes another signal for exchange.



(Fig. 25)

Certain instruments will require that the dentist release his/her finger rest at the patient's mouth when executing an instrument transfer to the dental assistant. When exchanging a double-handed instrument such as dental pliers, scissors or rubber dam forceps, the operator must give up the finger rest to receive the new instrument in his/her palm.

When the instrument transfer method is performed properly, the dentist should not have to wait more than 1-2 seconds for any needed instrument. If the dentist is required to wait as long as 4 seconds for each exchange, the time utilized is the same as the dentist is working alone without the help of dental assistant. Since an average of 150 instrument exchanges are performed during a routine class II amalgam restoration, the time wasted by poor exchange techniques may significantly reduce production.

Note: When working with a right-handed dentist, the assistant will use his/her left hand to exchange instruments. When working with a left-handed dentist, the assistant will use his/her right hand to exchange instruments.