

Ergonomics for the dental assistant

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Recently, ergonomics has become a popular term. The term has been used with most professions, but increasingly in the dental profession. When you hear ergonomics, many meanings may come to mind. According to Pollack (1989), ergonomics is a discipline that studies workers and their relationship to their occupational environment. This could include many different concepts such as how we position ourselves, how we position our patients, how we utilize equipment, how our work areas are designed and how all of these impact our health (Hodges, 1998).

As a dental assistant, ergonomics is important to your health and longevity in the profession. How often does your back ache at the end of the workday? How many days of work are missed due to work-related illnesses? Let me explain how starting with the basics can prevent these.

What is the best sitting position for you? Neutral-sitting position is ideal. This is sitting upright with your back straight and weight evenly distributed over the seat. Legs should be slightly separated with feet flat on the ring around the base of the chair. Your thighs should be parallel to the floor and front edge of the chair even with the patient's mouth. Position your chair close to the side of the patient with knees facing toward the patient's head. The height of the chair should be such that your eye level is 4 to 6 inches above the operator. This will give you a good line of vision into all areas of the patient's mouth.

If your chair has an arm support, it should be at the level of your abdomen and be used for reaching and leaning forward. The position of the mobile cart or cabinet top should be over your thighs and as close as possible (Phinney & Halstead, 2002).

Range of motion of all movements made by chairside or expanded functions dental assistant can be stressful to your back, neck, arms and wrists. Body movements are categorized by the amount of motion needed by bones and muscles to produce the movement.

There are five categories of motion. Class I is using fingers only such as flipping ends of the instrument. Class II is using fingers and wrist. This could be transferring an instrument to the operator. Movement of fingers, wrist and arm are Class III. Oral evacuation is in this classification. Mixing of dental materials involves movement of the entire arm and shoulder. This is classified as Class IV. Class V is movement of the arm and twisting of the body. Twisting behind you to adjust the dental light would be this classification. Which motions are the best ergonomically? They would be classes I, II, and III (Bird & Robinson, 2005).

The work area around the patient is arranged into zones representing hours on a clock. The activity zone for the operator is 7 o'clock to 12 o'clock. All activities of the operator at the chairside are performed in this zone. The assisting zone is 2 o'clock to 4 o'clock.

In this zone, the assistant is positioned. The assistant transfers materials and instruments in the transfer zone, which is 4 o'clock to 7 o'clock (Bird & Robinson, 2005).

Ergonomically, the design of the work area is a 20-inch radius. Keep frequently used items such as air-water syringe, high volume evacuator and saliva ejector within easy reach. All equipment and instruments should be within maximum vertical and horizontal reach. This is the sweep of your forearm in a reach of vertical and horizontal direction. Front delivery systems are best. Avoid rear delivery systems because they require twisting of the body. You should keep everything approximately waist high, not above shoulder level or below the waist. Those levels require twisting, turning of your back and shoulders. If a side delivery system is utilized, make it your dominant side. Again, this will require less overextending of your arm and shoulder (Bird & Robinson, 2005).

Do not overlook patient positioning. The position of the patient can greatly affect your posture. When reclining the patient, place his or her head in the same plane as their feet. Many dental practitioners try to perform procedures with the patient in an upright position. This causes practitioners to compensate by twisting their neck and back in order to see. Do not be afraid to ask patients to turn their heads or tilt their chins up or down. Patients are willing to comply if asked. This will allow better access and vision in the oral cavity. Try using indirect vision for those hard to access areas such as buccal of the left side of the mouth and lingual of the right side.

Now that you know the basics, let me discuss specifics. The use of optical loupes can assist vision while maintaining proper posture. Loupes allow your back to remain straight with less bending forward to see properly. When considering the purchase of loupes, there are several facts to consider other than cost. There are two types of loupes: through-the-lens or flip-up. Through-the-lens are fixed on the lens of the glasses. Flip-up devices are movable. There are advantages and disadvantages to both types, so selection is the preference of the clinician.

Through-the-lens are closer to the eyes, more evenly weight balanced on the nose, offer a wider field of vision and are less heavy. But this type is more expensive and needs to be returned to the manufacturer for any prescription changes. Flip-up devices are movable, making it easier to write in the chart or talk to the patient. This type is lightweight, easier to replace and adjustable to multiple users. The disadvantages of this type are: heavier, larger blind spot and easier contamination from flipping up (Vision by Design promotional information).

One of the most overlooked ergonomic items used every day is gloves. Most offices use ambidextrous gloves. These are gloves that are not hand specific but can be worn on either left or right hand. Ambidextrous gloves place the thumb in the same plane as the fingers. This causes strain on the thumb, which can cause your hand to ache. Hand-specific gloves allow the thumb to be in a more natural position. Another consideration is the size of the glove. Since there is no standardization of glove sizes, sizes vary drastically from one manufacturer to another. When deciding on a proper glove size, make sure the glove is not too tight across the palm or too constricting at the wrist. Also, the finger length should be adequate to allow for comfortable finger movement (Guignon, 2003).

What about instruments, handpieces and other equipment? How are they involved in ergonomics? Handpieces and air/water syringes have hoses that are coiled and can be heavy. Their coiled cord places resistance against the wrist and hand. If the cord is long enough, place it in your lap so the excess is not dangling down. Swiveling devices can be placed on a handpiece. These devices reduce handpiece torque. Newer handpieces are much lighter than the older models. If your air/water syringe has a tightly coiled cord, consider replacing it with a lightweight hose (Guignon, 2003).

Instruments are another consideration. When using instruments, choose the proper one for the task at hand and use it the proper way. Instruments with large, hollow and textured handles require less gripping force, thus they are easier on the fingers and wrist. Choose instruments designed with well-balanced weight. You should keep instruments sharp. This includes hatchets and chisels, not just scalers (Rethman, 2003).

Scheduling of procedures should be considered as well. If all your difficult procedures are scheduled back-to-back, it doesn't allow your body any relaxation time. You want your day to be productive, but not backbreaking. Try to place easier procedures such as sealants or impressions between crown preparations or long restorative procedures. This will allow your body some relaxation during the day.

Climate control of the workplace is important too. Exposure to cold air or drafts can cause muscles to constrict leading to fatigue or overworking of the muscles. This affects muscles of the neck, shoulders and back in particular. Always wash your hands in warm water to decrease hand fatigue.

Routine stretching exercises for your neck, shoulders, back, arms and fingers can prevent some work-related injuries and relax the body. Stretching should be performed every hour and slowly while exhaling into the stretch. Some exercises are described in the sidebar above (Michalek-Turcotte & Atwood-Sanders, 2000). All of these exercises can be performed in between patients, after updating the medical history or while preparing the operatory for the next patient.

If we remember to utilize ergonomics in the workplace, we can have a long and pain-free professional career.

References

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Neck Rotation Exercises

1. Head rotation

- * Drop your head forward
- * Rotate your head to the right shoulder
- * To left shoulder
- * Then return to front
- * Repeat this 3-5 times

Shoulder & Upper Back Exercises

1. Shoulder rotation

- * Rotate your right shoulder
- * Then rotate your left shoulder
- * Repeat this series 3-5 times

2. Shoulder shrug

- * Shrug your shoulders by raising them
- * Hold this position for 5 seconds
- * Repeat 3-5 times

3. Overhead reach

- * Place your hands and arms straight over your head and stretch
- * Hold for 5 seconds
- * Repeat 3-5 times

4. Elbow spread

- * Interlock fingers behind head
- * Move elbows backward
- * Hold for 5 seconds
- * Repeat 3-5 times

5. Arm straightening

* Interlock fingers behind your back and straighten arms

* Hold for 5 seconds

* Repeat 3-5 times

Lower Back Exercises

1. Backward lean

* Place hands on buttocks and lean backward

* Hold for 5 seconds

* Repeat 3-5 times

2. Spine rotation

* While sitting, place your left hand on right knee

* Look over the right shoulder causing spine rotation

* Repeat other side

* Repeat series 3-5 times

3. Forward bend

* Bend forward at waist

* Try to touch your toes

* Hold for 5 seconds

* Repeat 3-5 times

Wrist & Finger Exercises

1. Finger curl

* Stretch fingers out

* Curl them toward palm of hand

* Repeat 3-5 times

2. Finger pull

* Pull fingertips of one hand back with the other

* Repeat with other hand

* Repeat 3-5 times

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