Upper Extremity Cumulative Trauma (CTD’s) can cut short the careers of dentists and dental hygienists. To combat this threat, dentists may need to make ergonomic adjustments to the work environment.

Upper Extremity Cumulative Trauma’s (CTD’s) are the result of excessive demands on the body from the tip of the fingers to the back of the neck. When the body doesn’t have a chance to heal adequately, the damage is cumulative and can eventually become disabling.

CTDs and Dentistry

Upper extremity cumulative trauma disorders (CTDs) are recognized as an occupational hazard for dentists and their staff. Repetitive hand or wrist movements coupled with prolonged, awkward body positioning can lead to chronic injury. Symptoms include tingling or numbness in the fingers and hands, sharp pains, burning sensations, hand stiffness, thumb weakness, inability to make a fist and diminished grip strength.

The most obvious risks associated with CTDs are dentist and employee injuries, long- and short-term disability claims, and workers’ compensation claims. However, the reduced grip strength and loss of tactile sensitivity and dexterity associated with CTDs can also lead to patient injuries and significantly increase the potential for professional liability claims. CTDs are clearly a significant risk management issue for all dentists.

Reducing the Risk

Experts agree that the key to reducing CTD’s is decreasing stress, adjusting the work environment to the body’s needs and making engineering enhancements. In general, this means:

- Providing engineering changes where appropriate
- Avoiding (as much as possible) repetitive tasks, awkward postures and forceful arm and hand movements
- Taking frequent breaks
- Performing stretching exercises at regular intervals.

Equipment and Procedures

Dentists seeking to minimize CTD’s problems should also pay careful attention to certain equipment and procedure issues.

Gloves: The advent of universal infection control procedures led many practitioners to don ambidextrous latex exam gloves, which were originally intended for brief medical examinations, not prolonged use. These gloves exert a continuous, counteracting force against the thumb when the hand is in a functioning position. This can fatigue the thumb muscles, compress or constrict the blood supply and contribute to CTDs. Right and left-hand gloves are more appropriate for dental personnel who wear latex gloves for extended periods.

Hand pieces: Hand piece design and sterilization protocols also play a role in CTDs. Using a straight-nose cone slow speed hand piece with a disposable prophy-angle results in significant wrist deviation (flexion, extension, radial, and ulnar), awkward wrist posture and increased joint vibration. Autoclavable contra-angle hand pieces and prophy-angle designs are reported to be ergonomically preferable. In addition, using plastic sheath barriers on non-autoclavable hand pieces increases the grip force required to hold and maneuver the instruments because the barriers significantly reduce the coefficient of friction normally found directly between instrument surfaces and latex gloves.

When selecting hand pieces, ergonomic designs should be taken into consideration and the following criteria should be used:

- Angled (16º to 19º) vs. Straight Shank
- Soft cushion handles
- Universal swivel mechanism provided
- Light weight, balanced
- Lightweight hoses with balancers provided.
- Built in light sources
- Sufficient Power
Hygiene procedures: Traditional dental hygiene procedures can cause nerve compression, leading to tendinitis and carpal tunnel syndrome. Researchers have discovered a significant correlation between symptoms (such as nocturnal pain, numbness, paresthesia and clumsiness); the time spent treating patients and the types of patients treated. Using hand instruments with larger, lighter handles can reduce the fatigue and trauma associated with scaling and root planning procedures. Scheduling breaks between appointments, staggering the frequency of scaling and root planning appointments, and limiting the number of patients treated per day may also help reduce these risks.

Dental hygienist risks: Dental hygienist often assume awkward body positions when caring for patients and frequently battle rear delivery system cords and hoses that exert pressure on shoulders, arms, wrists, and fingers. Proper patient positioning, good body mechanics, correct seating and ergonomic operatory design (when ergonomic equipment is provided use it) made available can address these risk factors.

Computer terminals: Office managers and staff members now rely heavily on computer keyboards and pointing devices. They often cradle telephone handsets with their neck and shoulders while juggling phone duties, insurance forms and appointment books. Telephone headsets, workspaces designed around work flow and ergonomically sound work stations can help decrease the incidence and severity of employee injuries and consequent workers' compensation claims. Comfortable employees perform better and project a more professional image.

Many dentists are also incorporating computer terminals into the operatory environment. Both infection control concerns and ergonomic issues need to be addressed when designing a computerized operatory workspace.

Early intervention is crucial to reducing the impact of CTD’s in your dental practice. By implementing appropriate business solutions, dentists can reduce potential pain and discomfort, improve productivity and increase patient satisfaction.