

*Look for this article in the Feb. issue of RDH Magazine!*

## **Ergonomics: Pain Management Versus Pain Elimination for The Dental Professional**

The longevity of a pain free dental career is based on proper ergonomics within each dental team member's job description.

It has been said "It's not a matter of if you will have pain during your dental career, but when!" If you already experience pain, why would you want to just manage your pain if there is a possibility that you could totally prevent and eliminate it?

Over the 25 years of working with thousands of hygienists, The JP Institute understands that dental hygienist duties can result in occupational pain, and often the pain can be debilitating. We have researched many possible solutions to this problem, such as acupuncture and different styles of physical therapy and reflexology that may assist dental hygienists with pain management. While these are all great resources to manage pain and to provide some healing, an even better solution would be to avoid pain altogether. Is there a way for the dental hygienist to avoid pain?

The first revolutionary prospect of pain reduction for the dental hygienist came with the technology of microultrasonic therapy. Obviously the clinical benefits were exciting, and moreover, just the thought that we could reduce the time spent with repetitive motions, as well as reduce the amount of the strength needed to properly root plane teeth, made most hygienists jump for joy! We were excited to think that pain related to the services we provide within our workday could be eliminated.

Unfortunately, complete eradication of pain did not occur. What other options could there be? Throughout The JP Institute's history of working with hygienists in numerous clinical capacities, many different professional colleagues told us of Dr. Harold Meador and how he has produced amazing results for pain prevention and elimination for the dental team. Dr. Harold Meador, DDS, BSD, is a retired Periodontist in San Antonio, Texas. He is the founder of the Wedgewood Periodontal Group in San Antonio, and since 1978 he has been a clinical associate professor in the Department of Periodontics, UTHSCA. For the last 20 years he has focused his research on the subject of occupational pain. Recently, we had the fortunate opportunity to talk with Dr. Meador regarding his work on pain prevention and elimination for the dental team:

PS Dr. Meador, why did you become interested in pain prevention and elimination for the dental team?

HM *My personal interest in coping with pain began when I experienced career-threatening symptoms as a young periodontist. Neuromusculoskeletal pain is common in many occupations, including*

*dental hygiene, that involve repetitive motions. It has become a matter of concern because of its impact on work loss and job security. Among dental hygienists, it is actually back problems that occur more frequently than problems of the wrist and hand, but painful syndromes of the upper extremity have been frequently documented in orthopedic journals. Carpel Tunnel syndrome (CTS) has received the most attention in the literature and research. CTS is probably the most dreaded condition of all nerve entrapment syndromes of the upper extremity.*

PS Would you please describe your theory, and how it is different from other approaches?

HM *Suggestions for pain alleviation are usually limited to improving posture and biomedical interventions such as strengthening exercises. A different approach is to look at how neuromuscular pain could be related to presently accepted instrumentation techniques, and how new instrumentation theories and principles may help to correct the problem. Also, I have become aware of a new dimension in this issue. Due to the long-standing history of pain with the dental team, pain has been accepted as inevitable. Many dentists and hygienists suffer needlessly because they have no hope. My message is simple. There is hope. In reality no one bats a thousand, however, our track record is very respectable.*

*Based on evidential research of orthopedic literature, many years of clinical observation, and from the positive feedback I have received from continuing education classes that I have taught since 1985, I believe that there is a cause/effect relationship between instrumentation technique and neuromusculoskeletal pain. It is my opinion, with concurrence from orthopedists, that exacerbations of the neuromusculoskeletal problems in dental hygienists are likely to occur for two reasons...one, violations of the neutral position of joints, and two, excessive use of a few small muscles.*

PS Could you describe your approach to teaching pain elimination?

HM *My course consists of a lecture which establishes ergonomic and orthopedic principles, followed by a hands-on, one on one session utilizing a mannequin mounted on a dental chair, which is essential to create the skill transfer of work motions.*

PS What do you consider to be the most crucial point in creating this skill transfer?

HM *I'm glad that you asked that. The basis of my teaching starts with establishing the pain profile of every individual in the class. I believe that a person learns best when his/her individual needs are addressed. This is accomplished with the "Ergonomics in Pain Management for Dental Professionals" questionnaire (see below), which is a valuable tool that helps individuals comprehend how these principles apply to them personally. It has been used for fourteen years.*

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**ERGONOMICS IN PAIN MANAGEMENT FOR DENTAL PROFESSIONALS  
INCLUDING CARPAL TUNNEL SYNDROME**

Date: \_\_\_\_\_

Name: \_\_\_\_\_

Address: \_\_\_\_\_ City/State/Zip: \_\_\_\_\_

Home Telephone: \_\_\_\_\_ Office Telephone: \_\_\_\_\_

Graduation/School: \_\_\_\_\_ Date of Graduation: \_\_\_\_\_

Work/History: \_\_\_\_\_

Years Full Time: \_\_\_\_\_ Years Off: \_\_\_\_\_ Total Years on Job: \_\_\_\_\_

Pain History	Tingling	Numbness	Fatigue	Swelling	Loss of Strength	Work Pain	Night Pain	CTS Symptoms	Severity	
									(Light, Med., Severe)	Length of Time in Years
Fingers										
Thumb										
Hand										
Wrist										
Arm										
Shoulder										
Neck										
Back										
Hip										

Leisure Activities Affected? \_\_\_\_\_ Yes \_\_\_\_\_ No

Which Ones? \_\_\_\_\_

Medical (other) Treatment: \_\_\_\_\_

Loss of Time: \_\_\_\_\_

Other Comments: \_\_\_\_\_

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PS **Could you tell us about the techniques that you utilize to prevent and eliminate pain for the dental hygienist?**

HM *In 1960 I developed and self taught a full arm motion technique. After years of research and refinement, it was named the BioCentric Technique (BT), which is based on a three-part strategy for dealing with the fundamental causes of occupational pain:*

- ✧ *Violating the neutral position of joints*
- ✧ *Exhausting vital muscle groups*
- ✧ *Working in an ergonomically negative work environment*

*The first strategy involves keeping the joints in a neutral position as much as possible during instrumentation. This includes the shoulder, elbow, and wrist joints. The next strategy entails maintaining flexibility for shifting the workload to different muscle groups. Transferring the workload to various muscle groups allows the operator to work indefinitely without fatigue because each muscle group has fresh energy to continue the task. This is called the work/rest mode, which includes combinations of instrument grasp, finger rests, chair position, and power strokes. BT employs three instrument grasps. The standard/modified grasp has been used for many years. It was imperative to add two more instrument grasps: conventional and extended. In the conventional grasp, the instrument is held between the pads of the first two fingers at a 90 degree angle to the long axis of the forearm (LAOF), whereas, the extended grasp uses the pad of the middle finger and the "notch" at the base of the forefinger, with the instrument held at a 30 degree angle to the LAOF. The ideal grasp is within this 60-degree zone between the two positions which allows for a great deal of flexibility for the operator. The third strategy involves establishing an ergonomically friendly work environment, because over time it became apparent to me that it was impossible to establish proper posture and work motions in the average dental operatory.*

PS *Why is the position, or the attitude, of the hand important?*

HM *Current positioning methods compromise both the elbow and the wrist joints. BT places the back of the hand in a vertical plane with the palm to the side, which is the neutral position for the rotational motion of the elbow. As to the fingers, in the past external finger rests were often discouraged. BT endorses both internal and external finger rests.*

PS *What do you suggest as to chair positioning?*

HM *The 7, 9, and 12 o'clock chair positions. The 7 o'clock position places the operator in front of the patient and as close to the chair as possible. In the 9 o'clock position, the operator is even with the patient's head and in the 12 o'clock position; the operator is above the patient's head. It is important to constantly use different chair positions just to keep the body geometry flexible.*

PS Based on your work with hygienists over the years, what have you observed about power strokes? How does it relate to the BioCentric Technique?

HM *Most dental hygienists employ two basic power strokes, one being a rotary motion of the wrist and arm, and the other is a waving motion of the wrist. Both entail wrist movement that violates the neutrality of the joints. This is a wrist activation instrumentation system. The BioCentric Technique is a full arm motion technique. The goal of power strokes which includes rocking, pumping, swing, and push-pull, is to use the large and durable muscle groups of the arm and shoulder rather than those of the forearm and the hand only. This is the work/rest mode that I mentioned earlier.*

PS Very intriguing. Dr. Meador, could you summarize the features of the BioCentric Technique.

HM *Absolutely. The system is based on sound ergonomic and orthopedic principles and centers on using the pain profile of individuals to aid them in dealing with the three main dynamics of occupational pain:*

- *The core of the BioCentric Technique is to prevent the violation of the neutral positions of the joints with proper posture and by keeping the joints in neutral.*
- *The work/rest mode is designed to keep fresh muscle groups in use, thus avoiding exhaustion of vital muscle groups and the resulting fatigue. This applies to having multiple options for instrument grasps, finger rests, chair positions, and power strokes.*
- *Creating an ergonomically friendly work environment involves taking a close look at the floor plan, instrument locations, and the equipment in the operatory.*

*BioCentric Seminars came into being as a direct result of having helped several hygienists with the work related pain they were experiencing. The positive feedback that we have received regarding improved self-image and quality of life is the sustaining force and the reason for our ongoing efforts.*

PS Dr. Meador, thank you for your time and on behalf of dental hygienists everywhere we thank you for the significant contribution that you have made to the likelihood that we will experience long, happy, pain free careers!

HM It has been my pleasure. For further information on ergonomics and pain prevention/elimination, please visit my website at [www.biocentric.uthscsa.edu](http://www.biocentric.uthscsa.edu) (the site is currently in the process of being updated). For those who are interested in our pain questionnaire and the pain questionnaire analysis (the analysis contains helpful suggestions), please contact The JP Institute at 800-946-4944, or email [amy@jpconsultants.com](mailto:amy@jpconsultants.com).

The JP Institute commends Dr. Meador for his pioneering efforts in Ergonomics, which continue to make a positive impact on both individual dental team members and the dental practice itself. In the same spirit of dental team health and hope as Dr. Meador's valuable contributions to the dental profession, The JP Institute utilizes the latest evidence-based science to coach dental teams in advanced clinical protocols and technologies combined with successful case presentation skills to achieve clinical excellence and exceptional profit margins.

*Peggy Sprague, RDH, is a Co-Founder of The JP Institute. The JP curriculum emphasizes team support for comprehensive dentistry. JP specializes in analyzing and refining practice philosophies, strategies and business systems, hands-on implementation of clinical skills, and technology and product integration. Call The JP Institute for a complementary Practice or Career Profile to analyze your professional development, clinical protocols, technology and product integration, management systems, and profit potential.*



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