

# Practice Dentistry Pain-Free: Evidence-based Strategies for a Long & Healthy Career

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Presented by

**Dr. Bethany Valachi, PT, DPT, MS, CEAS**  
Doctor of Physical Therapy/Dental Ergonomic Consultant/  
Certified Ergonomic Assessment Specialist

**Author, “*Practice Dentistry Pain-free*”**

**[bvalachi@posturedontics.com](mailto:bvalachi@posturedontics.com)**

(503) 291-5121

[info@posturedontics.com](mailto:info@posturedontics.com)

[www.posturedentals.com](http://www.posturedentals.com)



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## The Problem

- Brief history of dental ergonomics
- Impact of CTDs

## Cumulative Trauma Disorder (CTD) Definition

Work-related pain or injury to the musculoskeletal system resulting from microtrauma which accumulates at a rate faster than the body can repair it.

## Signs & Symptoms of Cumulative Trauma Disorders (CTDs)

- Decreased strength & Range of motion
- Pain, stiffness, swelling or inflammation
- Numbness or tingling in hands or feet
- Shooting or stabbing pain in arms/legs

## Contributing Risk Factors in Dentistry

### Microtrauma resulting from Prolonged, Static Postures

- 1.
- 2.
- 3.
- 4.

## Safe Postural Working Range

- 1) Head posture: 0 – 20 degrees neck flexion
- 2) Forward arm reach: 0-25 degrees ( $\geq 15$  degrees requires armrests)
- 3) Forearms parallel to floor, or angled upward 10 degrees
- 4) Hip angle 105 – 125 degrees

## Positioning Sequence

### 1. Operator Stool Adjustment (dentist & hygienist)

- 1) Adjust backrest height so convex portion aligns with low back curve
- 2) Move backrest away from the back
- 3) Sit all the way back on the seat
- 4) Perform 3-finger test
- 5) Tilt seat slightly forward 5-15 degrees
- 6) Adjust height till thighs slope slightly downward
- 7) Adjust backrest forward to snugly nestle in low back curve



### Safe Postural Working Range

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*“Practice Dentistry Pain-Free”* - Valachi

## 2A. Patient Positioning: (upper arch)

- Supine position
- Double articulating headrest adjustment with \_\_\_\_\_ neck cushion. The occlusal plane of the upper arch should be oriented \_\_\_\_\_.
- Flat headrest adjustment with \_\_\_\_\_ neck cushion. Ask the patient to scoot to end of headrest.
- Adjust patient chair height until forearms are \_\_\_\_\_ above horizontal.
- Rotate or side-bend the head as needed.

## 2B. Patient Positioning: (lower arch)

- Semi-supine position (backrest adjusted \_\_\_\_\_ above horizontal)
- Double-articulating headrest adjustment: \_\_\_\_\_.
- Flat headrest adjustment: Raise backrest until occlusal plane of lower arch is about \_\_\_\_\_ *degrees above horizontal*.
- Adjust patient chair height until forearms are \_\_\_\_\_ above horizontal.
- Rotate or side-bend the head as needed.

## 3. Operator position.

- Clock position that enables a line of sight perpendicular to the tooth surface/quadrant
- Delivery system within easy reach
- Overhead light to parallel operator's line of sight as closely as possible
- Identify finger fulcrums on both hands

## Hygienist Patient Positioning

- Same as above, except leave backrest elevated 10° throughout treatment. Upper arch: occlusal plane angled \_\_\_\_\_. Lower arch: Occlusal plane angled \_\_\_\_\_.

## LOW BACK PAIN

### Primary Risk Factors for Low Back Pain in Dentistry

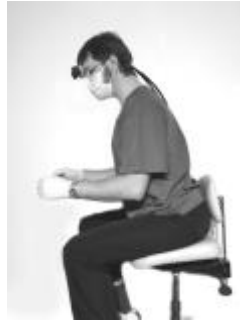
### Postural awareness for low back pain - *Maintain your low back curve*

### Strategies to prevent low back pain & maintain the low back curve

1. Hip angle and stool adjustment
2. Saddle stools - benefits
3. Move patient to end of headrest
4. Change positions frequently
5. Operator weight

### Operator Pivot Exercise

- Scoot all the way back on seat.
- Sit tall, lift chest up.
- Assume operator position of arms
- Exhale, and perform abdominal contraction or ‘bracing’
- Slowly pivot forward from the HIPS. Slowly return.



### Periodic Stretches – *Take frequent breaks & stretch*

#### Delivery Systems

- Rear Delivery \_\_\_\_\_
- Side Delivery \_\_\_\_\_
- Over-the-patient Delivery \_\_\_\_\_
- Over-the-head Delivery \_\_\_\_\_

#### Patient Chair Ergonomic Features

Small, thin headrest

Swivel feature

Adjust up/down

Narrow upper back

Base location/size

Low-profile armrest

### How Traditional Operator Stools vs. Saddle Stools Impact Your Health

- Non-tilting operator stools \_\_\_\_\_
- Tilting operator stools \_\_\_\_\_
- Saddle stools \_\_\_\_\_
- Saddle-style stools with backrest \_\_\_\_\_

#### Saddle Style Stool Features:

Cylinder height (available in short, med or tall)

Places pelvis in the most neutral position to optimize posture

Solves many ergonomic problems/allows closest positioning to the patient

Doctors should consider armrests

## ASSISTANTS

**Stool Types:** Support bar only, Backrest with Support bar and Saddle Stool

### Stool Adjustment:

- Assistant's eye level \_\_\_\_\_ inches above doctor
- Footring supporting feet so thighs slightly sloping downward
- Support bar adjusted to support elbow (Must be re-adjusted for assistants of different heights)
- Support bar only: positioned at side and slightly in front
- Support bar & backrest: adjust backrest forward, seat tilt 5-15 degrees forward and support bar in front.

### Proper Assisting Posture

- Thighs angled toward head of patient, or (better) interlocking knees with doctor
- Asst. tray should extend over assistant's lap.
- Assistant should consider standing for up to half of treatment time if possible.



## TENSION NECK SYNDROME

Symptoms include pain and tenderness in the neck and trapezius muscles, between the shoulder blades, and often accompanied by painful muscle spasms or trigger points.

### Risk Factors for Neck Pain in Dentistry

#### Strategies to prevent Neck Pain

- Ergonomic magnification
- Armrests
- Target muscle imbalances with specific neck and shoulder girdle endurance exercises
- Use indirect vision

#### Magnification Systems

- **Flip-up loupes (must be vertically adjustable)**



- **Through-the-lens (TTL) loupes**

## **Criteria to determine if loupes will benefit or worsen your neck health:**

### **1) Working Distance**

Distance from eye to working surface.

### **2) Declination Angle**

The angle at which the scope is inclined downward toward the work area.

### **3) Frame Size**

Limits how low the scope can sit in relation to the pupil.

- **Microscopes**
- **Procedure Scope**

## **SHOULDER DISORDERS**

- **Rotator Cuff Impingement**

Symptoms include pain with overhead reaching, lifting, dressing or sleeping on the affected arm.

### **Risk factors for Rotator Cuff Impingement**

- **Trapezius Myalgia**

Symptoms include pain, spasms, tenderness or trigger points in the upper trapezius muscles, frequently on the side of the operator's mirror or retracting hand.

### **Risk factors for Trapezius Myalgia**

### **Postural awareness for shoulder pain**

Neutral shoulder posture: Arms relaxed, elbows close to body and at the occlusal plane.

### **Strategies to prevent shoulder pain**

## **REFERENCES**

We are keeping the handout as ‘green’ as possible! Bethany will gladly send you her lecture references upon request.  
Please e-mail her at [bvalachi@posturedontics.com](mailto:bvalachi@posturedontics.com) for the lecture references.

## **RESOURCES**

### **Books, DVDs and Articles**

Dr. Valachi’s books, DVDs and articles - available at [www.posturedontics.com](http://www.posturedontics.com)

### **Operator Stools**

RGP – [www.surgitel.com](http://www.surgitel.com) (select stools only)

BQ Ergonomics – [www.bqe-usa.com](http://www.bqe-usa.com)

Crown Seating – [www.crownseating.com](http://www.crownseating.com) (select stools only)

### **Ergonomic Flip-up Loupes**

Surgitel – [www.surgitel.com](http://www.surgitel.com)

Q-Optics - [www.q-optics.com](http://www.q-optics.com)

### **Delivery System: Over-the-head**

Design Ergonomics: [www.ergonomic-products.com](http://www.ergonomic-products.com)

### **Patient Positioning Aids**

Crescent Dental Neck Cushions: [www.posturedontics.com](http://www.posturedontics.com) (Free DVD and positioning chart with order)

### **Operator Positioning Aids**

*ErgoRest* articulating arm support. Multiple vendors online

### **Ergonomic Skype Consultations**

Customized dental ergonomic Skype consultations – available at [www.posturedontics.com](http://www.posturedontics.com)

### **FREE Ergonomic Product Reviews**

Unbiased reviews of operator stools, loupes, patient chairs, etc... at [www.posturedontics.com](http://www.posturedontics.com)

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503-291-5121

[bvalachi@posturedontics.com](mailto:bvalachi@posturedontics.com)

[www.posturedontics.com](http://www.posturedontics.com)

### **About the Speaker**



**Dr. Bethany Valachi, PT, DPT, MS, CEAS** is a doctor of physical therapy, certified ergonomic assessment specialist and author of the book, *“Practice Dentistry Pain-Free”*. She is CEO of Posturedontics®, a company that provides research-based dental ergonomic education and is clinical instructor of ergonomics at OHSU School of Dentistry in Portland, Oregon. Recognized internationally as an expert in dental ergonomics, she has delivered over 700 lectures worldwide and provided expertise on dental ergonomics to faculty and students at numerous dental universities. Dr. Valachi has published over 60 articles in peer-reviewed dental journals and has developed patient positioning and exercise DVDs specifically for dental professionals. She lives in Portland, Oregon with her husband, Dr. Keith Valachi, who operates a private dental practice. She offers free newsletters, articles and product reviews on her website at [\*\*www.posturedontics.com\*\*](http://www.posturedontics.com)