

Dental Career Sustainability

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Objectives

- Career goals
- Define Ergonomics
 - Causes
 - Effect on Dentists
 - Risk factors
 - Individual Behaviors
 - Stress

Objectives

- Preventive measures for sustainability
 - Clinical
 - Professional
 - Personal
 - Application
- Preventive Strategies
 - Four Handed Dentistry
 - Personal Prevention

Career Goals

- Longevity
- Prosperity
- Pain free
- Contribution

Career Goals

- Physical well being
 - Almost more important than clinical efficiency
 - Contributes greatly to dental practice enjoyment and clinical excellence
 - Improves overall quality of life

How long do you want
to practice?

How can you prolong
your career?

Be the **healthiest** dentist you can be!

- Awareness
- Ergonomics
- Exercise
- Nutrition

ERGONOMICS

DEFINITION

- ar-gə-ˈnī-mīk\ *adjective*
- Derived from Greek
 - "ergo" = work
 - "nomos" = the study of...
- THE STUDY OF WORK
 - Tasks, technology, environment
 - As it relates to human capabilities
 - Leads to improved productivity, reduced injuries and greater worker satisfaction

DEFINITION

- The science of fitting the work environment to the worker
- The study of people's efficiency in their work environment
- an applied science concerned with designing and arranging things people use so that the people and things interact most efficiently and safely —
- Also known as *biotechnology, human engineering, human factors*
- The parts or qualities of something's design that make it easy to use

Why **ERGONOMICS**?

- May not seem as important as performing a root canal, prepping a cavity or delivering a crown
- Does not directly put money into bank account
- Approximately 81% of dental professionals exhibit symptoms

Why **ERGONOMICS**?

- Dentistry is physically stressful
- Multiple patient appointments daily
- Precision focused
- Intimate encounter

Ergonomic Risk Factors for Dentists

BAD AND PROPER ERGONOMIC POSITIONING

Ergonomic Risk Factors for Dentists

- Occupational
 - Static awkward postures
 - Repetitive motions
 - Prolonged vibration
 - Grasping small instruments for prolonged periods
 - Use of excessive force for certain procedures
 - Poor lighting and visual acuity
 - Noise exposure
 - Stress

Ergonomic Risk Factors for Dentists

- Musculoskeletal
 - Back
 - Neck
 - Shoulder
 - Arms

Consequences of Poor Ergonomics

- Discomfort – chronic pain
- Accidents – injuries
- Fatigues – increased errors
- Musculoskeletal Disorders – low back pain, tendonitis, epicondylitis, carpal tunnel syndrome

The Affect of Proper Ergonomics

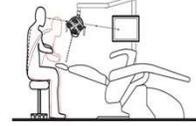
- Awareness early in career is key
- Reduce potential over exertion injury
- Minimize mental/physical fatigue
- Preventive measures ensure long, prosperous, relatively pain free career
- Improve performance process by eliminating unnecessary tasks, steps, effort

Clinical Ergonomics

- Instruments
 - Equally balanced within hand to decrease wrist deviation
 - Sharp tool decrease force needed
 - Easy identification decrease stress

Clinical Ergonomics

- Equipment
 - Location allows for a neutral working posture
 - Comfortable reach distance with upper arm held at side
 - Lighting produces even, shadow free illumination on the operating field
 - Patient – heels higher than nose
 - Use of loupes encourage upright posture



Musculoskeletal Influences

- Tipped shoulders
- Raised elbows
- Light positioned away from sightline
- Hands close to face
- Posture

Consider:

- Magnification
- 4 handed dentistry
- Elbows resting level
- Light position
- Equipment utilized



Personal awareness

- Recognize and identify own posture and position
- Practice proactive postures
- Equipment modification
- Work patterns

Occupational Patterns

- Excessive use of small muscles
- Repetitive motions
- Tight grips
- Fixed working positions
- Raised arms
- Limited movements
- Long term static load on muscles
- Poor visual acuity

Improve Usage Patterns

- Increased time with legs directly beneath patient chair can decrease upper back pain
- Operating lights positioned closer to sightlines can decrease lower back pain
- Loupe magnification associated with decrease in lower back pain
- Lumbar supports in operating stool can decrease leg pain
- Raised elbows contribute to pain in hands, neck, upper back

Improve Usage Patterns

- Tipped shoulders – arms, hand, neck, shoulders, upper and lower back
- Rotated torso
- Use of dental assistant – decrease shoulder pain
- Working in 7-8:30 and 3:30-5 o'clock positions – increase arms, hands, upper back, legs

Other factors

- Health
- Fitness
 - Moderately paced physical activities
 - Increased frequency of strengthening exercises
- Psychosocial
 - Less control of day to day workload
 - Lack of opportunities to provide input
 - Discomfort in asking for help

Other factors

- Environmental
 - Temperature control
 - Air quality
 - Lighting quality

Self Recognition

- Symptoms
 - Pain/discomfort
- Behavioral motivation to healthier practice patterns
 - Alternatives
 - Negative influencing factor - reduce, modify or eliminate
 - Positive elements learned, encouraged, acquired, incorporated

Cause of Injury

- Not a result of contact injuries
- Cumulative microtrauma and dysfunction from repetitive overuse in awkward positions
 - Decreasing function
 - Range of motion
 - Change in tissue elasticity
 - Diminishing strength
- Develop compensation movement patterns and muscle use
- Body less efficient and prone to pain

Muscle Imbalance

- Dental postures create prolonged, repeated muscle contraction
- Promotes muscle imbalance
- Static muscle contraction decreases circulation
- Forward flexed posture compresses lumbar spine and discs

Muscle Imbalance

- Head tilt diminishes size of intervertebral foramen
- Sitting increases lumbar disc pressure
- Poor patient position affects focal length and increases eye strain
- Excessive grip overuses hand/forearm muscles

POSTURE




FOUR HANDED DENTISTRY

Four Handed Dentistry

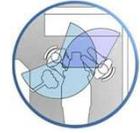
- Reduces stress on dentists
- Practice in clinical and business areas in combination with ergonomics
- 33-75% increase in productivity

Four Handed Dentistry

- Initially described around 1968
 - Dentist and assistant work as a team to perform some planned procedures with an intention to benefit the patient
 - Involves coordinated work with a skilled dental assistant
 - Intention to conserve time and decrease stress
 - Improve productivity
 - Gain better accessibility and visibility

Four Principles of 4HD

- Performing in a seat position
- Utilizing skilled dental assistant
- Proper organization
- Simplifying planned task



4HD Criteria

- Ergonomically designed equipment
- Dentist, assistant and patient seated comfortably
- Practice economy of motion
- Preset instrument trays
- Delegation of duties to a qualified dental assistant
- Advanced planning for logical treatment sequencing

Four Handed Dentistry

- Zones of activity revolve around patient
- Uses patient face as a clock
 - Operator's: 7 to 12 o'clock
 - Assistant's: 2 to 4 o'clock
 - Transfer: 4 to 7 o'clock
 - Static: 12 to 2 o'clock



Four Handed Dentistry

- Effective Strategies
 - Teamwork
 - Individual responsibilities
 - Recognition of need
 - Instrument transfer
 - Patient repositioning
 - Visibility improvement
 - Prepared sequencing
 - Understand procedure
 - Anticipation
 - Recognition of change in procedure
 - Non-verbal communication

Four Handed Dentistry

- Criteria for Operator
 - Operator seating
 - Patient positioning
 - Control of the maxillary plane
 - Operator access in the o'clocks
 - Positioning of the operator light

Operator Seating

- Operator Seating
 - The single most crucial prerequisite to balance is an operating stool (or chair) which can be adjusted to the proper height for each operator.



Patient Position

- Patient Positioning
 - Adjust so that the oral cavity is brought to the balanced operating point of the clinician, not vice versa.
 - Maxillary arch

Light Position

- Positioning of the light
- Have the light-line as close to the same line as possible (i.e., coaxial) to the sight-line in order to have shadow-free intraoral operating sites.
- This implies a light-line which just clears the head of the operator so that no shadow is cast on the oral field. The greater the deviation of light-line from eye-line the greater the shadowing.



- Control of the Maxillary Plane
- The maxilla provides a readily available gauge that you can use to make changes that will let you work in comfortable, balanced postures.
- Even with the correct light position, the angle of the patient's maxillary plane is likely to define the working posture of your spinal column.
- The maxillary plane dictates (and usually parallels) the angle of the operator's spine regardless of where the operator is sitting.

Effective Exercise Regimen

- Awareness
- Athletic preparation
- Increases career sustainability

Effective Exercise Regimen

- Develop a simple routine
 - Before
 - During
 - After
- Easy to repeat at least twice a day
- Does not require equipment

HANDS



- Separate fingers
- Hold for 10 seconds
- Relax



- Bend fingers at knuckles
- Hold for 10 seconds
- Repeat

HANDS



Face



- Raise eyebrows
- Open eyes as wide as possible
- Open mouth
- Stretch around nose and chin
- Stick out tongue
- Hold 5-10 seconds
- Repeat

FACE



SHOULDER

- Shrug
- Raise towards ears
- Hold 3-5 seconds
- Relax downward
- Repeat



Use at first sign of shoulder/neck tightness



SHOULDER



UPPER BACK



- Interlace fingers behind head
- Keep elbows straight out to side
- Pull shoulder blades together
- Hold 8-10 seconds
- Relax
- Repeat

UPPER BACK



Do several times



NECK and SHOULDER

- Head in good aligned position
- Slowly tilt to left side and stretch
- Hold 5-10 seconds
- Then slowly tilt to right side and stretch
- Hold 5-10 seconds
- Repeat 2-3 times



Feel even stretch



Do not over stretch



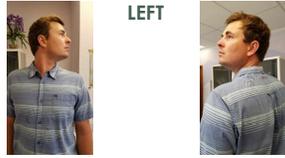
SIDE OF NECK

- Turn chin to left shoulder
- Hold 5-10 seconds
- Return to center
- Turn chin to right shoulder
- Hold 5-10 seconds
- Repeat



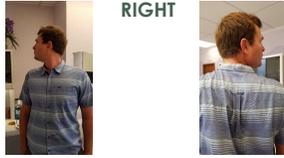
Start in stable position, then turn

LEFT



Return to stable position, then turn

RIGHT



BACK OF NECK

- Gently tilt head forward
- Hold 5-10 seconds
- Repeat



Do not stretch past point of pain



CHEST AND MID-BACK

- Knees slightly bent
- Palms on lower back above hips
- Fingers pointing downward
- Push palms forward to extend
- Hold 1-10 seconds
- Repeat



GOOD AFTER SITTING FOR A LONG TIME



CALVES

- Stand away from wall
- Lean on forearms
- Rest head on hands
- Bend leg with foot flat on floor
- Toes point straight ahead
- Move hips forward
- Heel of straight leg flat
- Hold 10-30 seconds
- Switch to other leg



Keep heel of straight leg flat on floor



ARMS

- Interlace fingers
- Straighten arms in front
- Palms facing away
- Hold 10-20 seconds
- Repeat



ARMS



ARMS and SIDE



- Interlace fingers
- Extend upward
- Straight arms
- Palms up
- Hold 10-20 seconds
- repeat

Feel elongation through arms and side



SIDE AND TRICEP

- Hold right elbow with left hand
- Pull elbow behind head
- Hold 10-15 seconds

• Then...

- Hold left elbow with right hand
- Pull elbow behind head
- Hold 10-15 seconds

- Repeat



Be gentle – do not overstretch



SIDE AND TRICEP

- Be sure to stretch both sides before repeating



SHOUDLERS AND BACK



- Interlace fingers behind back
- Turn elbows in
- Straighten arms
- Hold 5-15 seconds
- Repeat

Helps with shoulder slump



HAMSTRING

- Hold back of leg above knee
- Pull bent leg toward chest
- Hold 10-30 seconds
- Then switch legs
- Repeat



Use gentle pull for easy stretch



SIDE TWIST

- Bend left leg over right
- Right hand on outside of left thigh
- Apply pressure to right with hand
- Look over left shoulder
- Hold 10-15 seconds
- Switch legs
- Repeat



Use gentle controlled pressure



Do both sides before repeating



Earl of Darby (1799-1869)

“Those who do not find time to exercise, sooner or later will have to find time for illness.”