A Career in Dentistry Leads to Pilates

Maintaining a Healthy Back and Posture

Cindi Stone
August 2016
Santa Barbara, CA
Abstract

The prolonged seated position, imposed upon those in the dental field, causes muscle fatigue and muscle imbalance, which can cause physical discomfort. Adding to that the twisting and turning of the head, shoulders and trunk, in one direction, leads to muscular and joint asymmetry, that in turn can lead to pain of the upper and/or lower back.

Even using ergonomic equipment, the dental professional frequently finds themselves leaning forward and to the right. This study will look at the spine, in particular, and how the BASI Block system can help prevent musculoskeletal disorders caused by the daily contortions of a Dental Hygienist.
Table of Contents

Abstract……………………………….2

Table of Contents…………………….3

Anatomical Description………………4

Introduction……………………………8

Case Study…………………………..10

Conclusion……………………………14

Bibliography…………………………..15
Anatomical Description

A normal stable spine is composed of 3 natural curves: the cervical lordosis, the thoracic kyphosis and the lumbar lordosis. Each of these curves measures 30-40 degrees and are necessary to provide a structurally stable and strong weight-bearing spine. A spine that has significantly less, or more, curvature causes surrounding tissues to become weight-bearing structures, and with time can lead to pain and pathology.
The spinal column is made up of many parts and spaces. A spinal segment has 2 vertebral bodies with an intervertebral disc between them. Normal discs provide shock absorption for the spine, and provide nutrition to the vertebral bodies above and below it. Every effort should be made to keep discs healthy. Disc degeneration can result from many factors such as, prolonged altered posture, age, trauma and repetitive improper body mechanics, including sitting, lifting and bending with rotation.

Excessive prolonged lumbar flexion may also result in other pathologies, such as bulging disc and disc herniation.

The muscular system plays a major role in spine stabilization. The two categories of lumbar stabilizing muscles are- the primary stabilizers and the secondary stabilizers.
The primary stabilizers, which are the multifidus and the transverse abdominis. When the transverse abdominis fires, the multifidus fires working together to stabilize the spine. The multifidi connect 1-3 vertebral bodies to control their gliding motion, while the transverse abdominis wraps around and supports the anterior of the trunk. These two muscles in combination, provide a protective corset to the spine.

The secondary stabilizers don’t connect directly to the spinal column. They include the internal obliques, external obliques, gluteus maximus and the gluteus medius. These muscles provide a strong supportive base for the spine. The hips should be used in standing and bending to minimize compression of the spine itself.
Secondary Stabilizers

Internal Obliques

External Obliques

Gluteus Maximus

Gluteus Medius
Introduction

Those who work in dentistry are at particular risk for work-related musculoskeletal disorders (MSDs). The care of our patients requires us to work in awkward positions, and use repetitive motions daily.

The prolonged position, coupled with the twisting and turning of the head, shoulders and trunk in one direction, leads to muscular fatigue and imbalances, that in turn can lead to pain of the upper and lower back. While sitting day after day in unbalanced positions can cause MSDs in many areas of the body- including the hands, wrists, arms and shoulders- I am choosing to focus on the axial skeleton.

Prolonged sitting results in low level muscle activity. This can cause an increase in intra-discal pressure, which in turn can contribute to disc degeneration and disc herniation of cervical and lumbar spines. Prolonged slouched sitting, along with the awkward positioning factor, causes even more risk. If the thoracic spine is flexed, you get increased muscular tension. Thoracic flexion, in turn, causes cervical flexion. This puts pressure on the spinal cord and brain stem possibly causing pain and pathology.

Also, in a slouching position, the pelvis is rotated posteriorly causing flexion of the spine. It is impossible to maintain lumbar lordosis with a posteriorly rotated pelvis. This results in a widening of lumbar discs and strains the lumbar region of the spine. The muscles running along side the spine are elongated and can be rendered inactive. The deep muscle stabilizers, the multifidis, can become close to inactive as well.

Over time, along with the strained muscles and ligaments, the intravertebral discs can be effected. The flexion of the lumbar spine causes forces across the disc, weakening their
outer layer. This makes the discs vulnerable to injury while performing simple tasks such as tying our shoes. Once injured, discs do not heal easily and start to degenerate in the form of bulging, herniation or extrusion.

The forward head position caused by thoracic flexion, can cause headaches, muscle spasms and over time, possible degeneration of facet joints in the neck.
Study
(Self Study)

Name: Cindi S.
Age: 59

Having spent the last 40 years in Dentistry, and seeing the declining posture of my employer, I decided (about 4 years ago) to try Pilates, both mat and reformer, as a means to strengthen and straighten my body. I can honestly say that Pilates has forever changed my life. I have become more aware of the way I hold myself and the way I move in general. The introduction of the additional apparatus, through this course, is a welcomed new chapter to explore. I have no major injuries or limitations. Along with the following conditioning program, I intend to incorporate stretching in my daily routine at the office.

Stretching offers numerous benefits. It elongates a muscle, allowing freedom of movement, reducing imbalanced muscle forces that can cause dysfunction. It improves flexibility, which helps with balance. Also, stretching improves blood flow and promotes relaxation.

Dental professionals should adopt a simple daily stretching regime, targeting areas that can potentially trigger pain of musculoskeletal origin. The Doorway Stretch is an ideal
way to open up the front of the chest and straighten the spine. It can easily be done between patients.

**Stretch: Doorway Stretch**

**Target:** Pectoralis major muscle; clavicular and sternal portions

**Position A:** Stand in a doorway and place your arms along the frame. Keep the elbows at shoulder height. Attempt to step through until a stretch is felt in the chest.

**Position B:** Repeat position 1, except place the elbows higher than the shoulders. Hold each stretch for 30 seconds and perform 2x.
Conditioning Program Utilizing the BASI Block System

**Warm up:** MAT -
Roll up, Spine Twist Supine, Double Leg Stretch, Single Leg Stretch, Criss Cross

**Foot Work:** WUNDA CHAIR -
Parallel Heels, Parallel Toes, V Position Toes, Open V Heels, Open V Toes,
Calf Raises, Single Leg Heels, Single Leg Toes

I chose the Wunda Chair for foot work due to the fact that I must engage my back extensor muscles to keep a neutral spine, while executing the foot movements.

**Abdominal Work:** REFORMER -
Hundred Prep, Hundred, Coordination
These movements will allow me to focus on core strength, shoulder extensor control, and lumbar stabilization.

**Hip Work:** REFORMER -

Frog, Down Circles, Up Circles, Openings, Extended Frog, Extended Frog Reverse

Focusing on hip extensor strength, and lumbar stabilization.

**Spinal Articulation:** REFORMER -

Short Spine, Long Spine

Because it feels good

**Stretches:** CADILLAC -

Shoulder Stretch

Excellent stretch of the shoulder muscles to increase mobility.

**Full Body Integration 1:** CADILLAC -

Sitting Forward, Side Reach, Sitting Back - *Push Through Group*

This group works on Abdominal control, Oblique stretch and Shoulder stretch.

The shoulder stretch is particularly good for me, in that it is the opposite of my day to day shoulder positioning.

**Arm Work:** REFORMER -

Chest Expansion, Up Circles, Down Circles, Triceps, Biceps - *Arms Kneeling Series*

This series is challenging and requires me to utilize my back extensors to maintain a neutral spine in the upright position.

**Full Body Integration 2:** REFORMER -

Balance Control Back
Requires the co-contraction of the back extensors and abdominals, while opening through the chest.

**Leg Work:** WUNDA CHAIR -

Backward Step Down, Hamstring Curl, Hip Opener

Each of these exercises strengthens different parts of the leg, while maintaining a stable pelvis.

**Lateral Flexion/Rotation:** WUNDA CHAIR -

Side Kneeling Stretch

I must stabilize the upper back and shoulders, while stretching laterally.

**Back Extension:** WUNDA CHAIR

Swan Basic

This exercise requires the entire back to engage, supporting not only the upper body, but the lower body as well.

**Conclusion**

The human body was designed for movement. The sedentary nature and twisted body positioning required by my career, poses a risk for injury and/or chronic pain. By incorporating regular Pilates and daily stretching, I may be able to reduce my susceptibility to
musculoskeletal disorders, caused by poor ergonomics and repetitive motions. In short, the body must move - and move properly - to stay healthy.


