Description:

There have been numerous articles written supporting the relationship between dental office postures and musculoskeletal disorders. These musculoskeletal disorders are not a result of a single event, but rather the consequence of cumulative, repetitive, forceful and awkward movements or postures at home and at work. In 1992 OSHA issued an advanced order that proposed a rulemaking which concerned ergonomic standards that addressed such areas as risk assessment, workstation design, and employer training to alleviate ergonomic problems in the workforce. Although standards were never implemented by OSHA, the Bureau of Labor Statistics and OSHA estimate between 45 and 60 billion dollars are spent every year in worker compensation, medical claims and lost productivity due to musculoskeletal disorders. This seminar is designed to review the most common MSDs, their symptoms, treatment and prevention.
## Most Common Musculoskeletal Disorders (MSDs) in Dentistry

<table>
<thead>
<tr>
<th>Area</th>
<th>Disorder</th>
<th>Symptoms</th>
<th>Causes</th>
<th>Possible Treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand</td>
<td>Carpal Tunnel Syndrome</td>
<td>Numbness, tingling, pain (particularly at night), loss of strength and dexterity</td>
<td>Entrapment of median nerve in the wrist</td>
<td>Surgery, anti-inflammatories, change in work habits, splints, diuretics, steroids</td>
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<tr>
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<td>Cubital Tunnel Syndrome</td>
<td>Pain, numbness, tingling in 4th and 5th fingers and hand, reduced dexterity</td>
<td>Compressed ulnar nerve in the elbow</td>
<td>Physical therapy, surgery, altered movement patterns</td>
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<td>De Quervain’s Disease</td>
<td>Pain and swelling around the backside of the thumb when pinching, grabbing and twisting</td>
<td>Repetitive grasping, Rheumatoid arthritis, thickening of tendons along wrist and backside of thumb</td>
<td>Splint, surgery, anti-inflammatory drugs</td>
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<tr>
<td>Hand and Arm</td>
<td>Tenosynovitis</td>
<td>Pain, stiffness, swelling in areas such as wrist, elbow, shoulder, hand or fingers when grasping, difficult to straighten</td>
<td>Thickening and swelling of tendons</td>
<td>Physical therapy, steroids, anti-inflammatories, alteration of work habits</td>
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<tr>
<td>Arm</td>
<td>Epicondylitis (Tennis Elbow, Golfer’s Elbow)</td>
<td>Pain or tenderness in the elbow, increases with movement</td>
<td>Tearing of the tendons because of overuse</td>
<td>Physical therapy, steroids, anti-inflammatories, alteration of work habits</td>
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<td>Radial Nerve Syndrome</td>
<td>Pain below elbow, outside upper forearm, hand painj</td>
<td>Compressed radial nerve</td>
<td>Physical therapy, steroids, anti-inflammatories, alteration of work habits</td>
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<tr>
<td>Shoulder</td>
<td>Rotator Cuff</td>
<td>Pain, stiffness in shoulder, weakness of muscles</td>
<td>Swelling, tearing of rotator cuff, bone spurs, abnormalities</td>
<td>Steroids, anti-inflammatories, surgery, alteration of work habits</td>
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<tr>
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<td>Thoracic Outlet Syndrome</td>
<td>Pain in shoulder, arm, hand; numbness, tingling; muscle weakness fatigue; cold arm or hand</td>
<td>Compressed nerves or blood supply; Woking with elbow higher than shoulder</td>
<td>Alteration of work habits, avoid working with hands above chest</td>
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<tr>
<td>Hand, Arm, Shoulder</td>
<td>Tendonitis</td>
<td>Localized and/or diffuse pain, loss of strength and motion</td>
<td>Inflammation of tendons</td>
<td>Physical therapy, steroids, anti-inflammatories, alteration of work habits, surgery</td>
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<tr>
<td>Neck, Back</td>
<td>Myofascial Pain Syndrome</td>
<td>Pain in neck, shoulder, arm; restricted movement</td>
<td>Overworked or overloaded neck and shoulder muscles</td>
<td>Mechanical, thermal and drug treatments to reduce pain and restore function; muscle strengthening exercises</td>
</tr>
</tbody>
</table>

Risks Associated with Musculoskeletal Disorders:

Medical:
- Diabetes
- Gout
- Arthritis
- Hormonal changes
- Pregnancy
- Obesity
- Female
- Smoking
- Trauma
- Cysts or tumors
- Auto immune diseases
- Increased age
- Genetics
- Other

Psychological:
- Fearful or Stressful patients
- Perceived stress
- Lack of peer support
- High demand in job
- Fear of loss of income due to pain

Occupational:
- Number of hours worked
- Difficulty of patients
- Forceful movements
- Posture
- Stagnant positions
- Hand, wrist and arm positions
- Equipment restrictions
- Poorly fitting gloves
- Instrument vibrations
- Patient positioning
- Chair and equipment positioning

Personal:
- Physical fitness
- Sports activities: Golf
  - Tennis
  - Weight Lifting
  - Racquetball
  - Exercising
- Arts and Crafting
- Computer use
- Gardening and mowing
- Video gaming
- Sewing and needlework
Tips for Preventing Musculoskeletal Disorders

1. Maintain correct posture while seated and standing.
2. Work with arms close to the body and your body close to the patient.
3. Use chairs with lumbar, thoracic and arm supports.
4. Avoid excessive finger movements.
5. Do not overextend or over flex the wrist.
6. Alternate your position during the work day. Do not stay in a stagnant position.
7. Adjust operator and patient chair to a comfortable position. Do not work with your patient too high.
8. Work in a seated position if possible.
9. Check the position of the equipment and light to minimize stressful reaching and awkward bending.
10. Do not work in a cold room. Cold temperatures decrease circulation to extremities.
11. Stretch throughout the day to maintain flexibility.
**Thoughts on Exercise and Stretching:**

1. Flexibility and range of motion can be altered (shortened) as a result of poor postures and short ranges of motion which place muscles and tendons in shorten positions for extended periods of time.

2. Providing rest and recovery time during the work week is the best preventative action.

3. Exercise sessions should begin with warm-up activities. It is recommended that warm-up activities be performed before beginning dental activities.

4. Hand warm-ups provide for the distribution of synovial fluids which lubricate the tendons.

5. It is recommended that dental workers stretch before work and periodically throughout the day.

6. Holding a stretch for 30-60 seconds is thought to be most effective in lengthening soft tissue structures. This allows the muscles to contract more effectively and accommodate loads better.

7. Stretches should be performed gently, without bouncing. Stretching should not be painful.

8. Stretches to the upper extremities and neck should be performed 3-4 times per day.

9. Cardio and resistance training are ideal for maintaining fitness. Flexibility training helps to further address range of motions issues.
Anatomy of the Hand:
Anatomy of the Spine:

- Cervical (C1 through C7)
- Thoracic (T1 through T12)
- Lumbar (L1 through L5)
- Sacral (S1 through S5)
- Coccygeal or Coccyx (Tailbone)
References:


2. Rucker L, Sunell S. Musculoskeletal health status in B.C. Dentists and dental hygienists:


