

Lesson Plan #1: Ergonomics

Course: Dental Office #101

Topic: Ergonomics

Audience: Dental Assistants, Dentists, Dental Hygienists, and Administrative Staff

Time: 50 minutes total

- Anticipatory set= 5 minutes
- Lesson content= 40 minutes
- Summary = 5 minutes

Materials: Computer, Projector, PowerPoint slides, Rolling Chair/Stool

Instructional Objectives:

Upon completion of the lecture, the student should be able to:

1. Define ergonomics and its relevance to dental and administrative professionals.
2. Describe the history and prevalence of MSDs in the dental office.
3. Discuss risk factors for musculoskeletal injuries in the dental office.
4. Determine signs of poor posture and improper sitting positions.
5. Apply correct ergonomic practices for dentists, dental assistants, dental hygienists, and administrative staff.
6. Indicate a commitment to injury prevention and career longevity.

References:

American Dental Association. (2022). *Workplace ergonomics*.

<https://www.ada.org/resources/practice/wellness/workplace-ergonomics>

Galla, A., Chowdhry, A., Bagga, A., Moradia, L., Tadikonda, A. N., Pentapati, K. C., & Mysore, N. K. (2022). Dental practitioners' knowledge, attitudes, and practices of ergonomics – a cross-sectional web-based survey. *Acta Biomedica*, 93(Suppl 2), e2022048. <https://doi.org/10.23750/abm.v93iS2.12908>

Kashmiri, R. (2026). *Four-handed dentistry* [PowerPoint slides]. SlideShare.

<https://www.slideshare.net/slideshow/four-handed-dentistry/87361077>

Santos, W., Rojas, C., Isidoro, R., Lorente, A., Dias, A., Mariscal, G., Benloch, M., & Lorente, R. (2025). Efficacy of ergonomic interventions on work-related musculoskeletal pain: A systematic review and meta-analysis. *Journal of Clinical Medicine*, 14(9), 3034. <https://doi.org/10.3390/jcm14093034>

University of North Carolina at Chapel Hill Environment, Health and Safety. (2026).
Musculoskeletal disorders.
<https://ehs.unc.edu/topics/ergonomics/musculoskeletal-disorders>

LESSON CONTENT	NOTES – MEDIA - Q/A
<p>I. ANTICIPATORY SET</p> <p>A. Introduction <i>Interesting personal experience, I was diagnosed with herniated discs in my lumbar spine before I even started my dental hygiene career. In dental hygiene school, the pain started with what felt like an internal pain that I couldn't pinpoint because I had never had the pain before. I was prescribed pain relievers, muscle relaxers, and many rounds of physical therapy. One day, I sneezed (allergies), and afterward, I couldn't stand up straight. At the ER, I found out that I had a herniated disc, but unfortunately, not much could be done because I also found out a week prior that I was pregnant. The only thing they could do was give me a shot of Toradol to relieve the pain, and from that day and months following, I walked with a limp. This was only the beginning of my journey with work-associated musculoskeletal disorders.</i></p> <p>B. Gain Knowledge/Motivate How many of you in the office suffer from some type of musculoskeletal disorder, whether this is your neck, back, wrists, or shoulders? Of course, this is not exhaustive, but just the most common. Is anyone willing to share?</p> <p>C. Activate Prior Knowledge Does anyone know what may or may not have caused and/or may aggravate their injury?</p> <p>D. Establish Rationale Today, we will learn about ergonomics in the dental office, including dentists, dental hygienists, dental assistants, and administrative staff. Learning the risk factors associated with musculoskeletal injuries and how to prevent them will allow for longevity in the field.</p>	<p>PP Slide #1: Title slide: Ergonomics Introduce & Thank</p> <p>PP Slide #2: True Story</p> <p>Note: My MRI & x-ray showing herniated disc, decreased disc space</p> <p>PP Slide 3# Introduction</p> <p>Note: Correlate the type of injury to the type of employee. RDH, Assts, Admin</p> <p>Note: Can provide personal examples of what may have caused my own.</p>

E. Present Instructional Objectives

1. Define ergonomics and explain its relevance
2. Describe the history and prevalence of MSDs
3. Discuss risk factors (posture, repetition, static positioning)
4. Determine signs of poor posture and improper sitting
5. Apply correct ergonomic practices
6. Indicate a commitment to injury prevention and career longevity

PP Slide #4: Objectives

LESSON CONTENT/BODY	NOTES- MEDIA – Q/A
<p>I. Ergonomics</p> <p>A. Definition: the science of fitting workplace conditions and job demands to the capabilities of the working population.</p> <ol style="list-style-type: none"> 1. relevance to dental clinicians <ol style="list-style-type: none"> a. small spaces b. repetitive movements c. static posture 2. relevance to administrative professionals <ol style="list-style-type: none"> a. prolonged sitting b. computer-based tasks c. repetitive typing and mouse use <p>II. Musculoskeletal Disorders</p> <p>A. Definition</p> <ol style="list-style-type: none"> 1. Prevalence <ol style="list-style-type: none"> a. 64-93% b. rising amongst administrative professionals (working from home) 2. Most commonly affected areas <ol style="list-style-type: none"> a. neck b. shoulders c. lower back <p>III. Risk Factors</p> <p>A. Repetitive movements</p> <ol style="list-style-type: none"> 1. hand/wrist 2. leaning for visibility 3. twisting during procedures <p>B. Static posture</p> <ol style="list-style-type: none"> 1. sustained muscle contraction 2. reduced blood flow 3. increased fatigue 	<p>PP Slide #5: Question</p> <p>Q: What does ergonomics mean to you?</p> <p>A: Collect & thank for answers, give definition</p> <p>PP Slide #6: Definition of ergonomics</p> <p>Note: Make sure there is an understanding of Environment>>>bodies Not Bodies>>>Environment</p> <p>PP Slide #7: Relevance to Dental Professionals</p> <p>PP Slide #8: Relevance to Administrative Professionals</p> <p>PP Slide #9: MSD Definition</p> <p>Note: give DeQuervain's example</p> <p>PP Slide #10: Prevalence</p> <p>PP Slide #11: Risk Factors</p> <p>PP Slide #12: Repetitive Movements</p> <p>PP Slide #13: Static Posture</p>

IV. Poor Posture

A. Signs of Poor Posture

1. forward head
2. rounded shoulders
3. slouching
4. twisting spine

B. Improper Sitting Positions

1. sitting too far
2. leaning instead of repositioning
3. elevated shoulders
4. lack of back support

V. Correct Ergonomics

A. Dentists & Dental Hygienists

1. upright posture
2. feet flat on floor
3. elbows close to body
4. minimal neck flexion

B. Patient Positioning

1. adjust chair height
2. optimize visibility
3. avoid leaning

C. Dental Assistants

1. sit slightly higher than the operator
2. maintain neutral posture
3. avoid twisting
4. keep instruments within reach

D. Four-handed Dentistry

1. explain if needed
2. improves efficiency
3. reduces unnecessary movement
4. supports ergonomic positioning

E. Administrative Professionals

1. monitor at eye level
2. proper lumbar support
3. neutral wrist w/forearms parallel
4. feet flat on the floor

PP Slide #14: Signs of Poor Posture

PP Slide #15: Improper Sitting Positions

PP Slide #16: Principles of Correct Ergonomics
Q: Who can give an example of the correct form for each?
Let students demonstrate and correct as needed.

PP Slide #17: Dental Professionals

PP Slide #18: Patient Positioning

PP Slide #19: Dental Assistants

PP Slide #20: Four-handed Dentistry

PP Slide #21: Administrative

VI. Commitment to Ergonomics**A. Ergonomic Interventions**

1. prevent injury
2. promote long-term career
3. Improve overall well-being

B. Professional Responsibility

1. Recognize signs of strain
2. Make posture adjustments
3. Advocate for ergonomic improvements

Summary:

In summary, ergonomics is essential as it reduces the risk of MSDs. MSDs are highly common in dentistry, and proper posture and positioning can significantly reduce risk and improve career longevity. I encourage all of you to reflect on your own posture habits and correct as needed. Additionally, you can respectfully help to correct your coworkers and advocate for ergonomic improvements in the workplace.

PP Slide #22: Ergonomic Interventions

PP Slide #23: Professional Responsibility

PP Slide #24: Summary

Note: Thank learners for their time, attention, and participation.

Q: Any questions and/or comments?

Test Items

Objective #1: Define Ergonomics and explain its relevance.

Test Item #1: Which of the following definitions best describes ergonomics? By adjusting:

- a. nothing and making the best of the workplace
- b. the worker to fit the workplace
- c. the workplace to fit the worker
- d. the workplace and the worker

Objective #2: Describe the history and prevalence of MSDs.

Test Item #2: What areas of the body are most commonly affected by MSDs?

- a. neck, shoulders, lower back
- b. knees, elbows, ankles
- c. wrists, upper back, thighs
- d. neck, upper back, ankles

Objective #3: Discuss risk factors associated with MSDs.

Test Item #3: Which of the following MSD-associated risk factors would likely cause reduced blood flow?

- a. repetitive movements
- b. static posture
- c. forceful exertion
- d. inadequate workspaces

Objective #4: Determine signs of poor posture and improper sitting positions.

Test Item #4: List 3 of the 4 improper sitting positions discussed in the lesson.

Objective #5: Apply correct ergonomic practices.

Test Item #5: Based on your role within the practice, name 3 of the 4 ergonomic adjustments discussed in the lesson.

Objective #6: Indicate a commitment to injury prevention and career longevity.

Test Item #6: In one paragraph (3-4 sentences), indicate your personal commitment to preventing injury, promoting long-term career sustainability, and improving overall workplace well-being.

Correct Answer Key:

1. C

2. A

3. B

4. Sitting too far from the patient

Leaning instead of repositioning the patient

Elevated shoulders

Lack of back support

5. Dentists/Dental Hygienists

- Upright posture
- Feet flat on floor
- Elbows close to body
- Minimal neck flexion

Dental Assistants

- Sit slightly higher than the operator
- Maintain neutral posture
- Avoid twisting
- Keep instruments within reach

Administrative Staff

- Sit slightly higher than the operator
- Maintain neutral posture
- Avoid twisting
- Keep instruments within reach

4-handed dentistry can also be mentioned for dentists and assistants

6. Learner should mention their commitment to the prevention of MSDs, their knowledge of early signs of strain, recognition of proper ergonomic practices, and their advocacy for ergonomic improvements in the workplace.