

UCSF Health

Red Flags at the Desk - Ergonomics

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Disclosure

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Introduction – Physical Therapists

Wellness @ Work



Dustin Tom, PT, DPT, OCS

Goal:

Address external & internal risk factors to reduce injuries in the workplace and promote better work environment

Who:

Team of Board Certified Orthopedic Physical therapists with an interest in injury prevention

What we Do:

1. Observe body mechanics and ergonomics in the workplace and create lecture series to address body mechanics and risk factors.
2. Propose operational solutions and wellness solutions including exercise, rest and recovery, and movement mechanics.



Maureen Soliman, PT, DPT, OCS

Learning Objectives

- Identify **importance** of Ergonomics related to the office desk environment
- Identify the **benefits** of addressing ergonomics for occupational productivity
- Describe how to **assess** for ergonomic risks
- Implement **solutions** and education to decrease pain and improve function

Ergonomics

What is it?

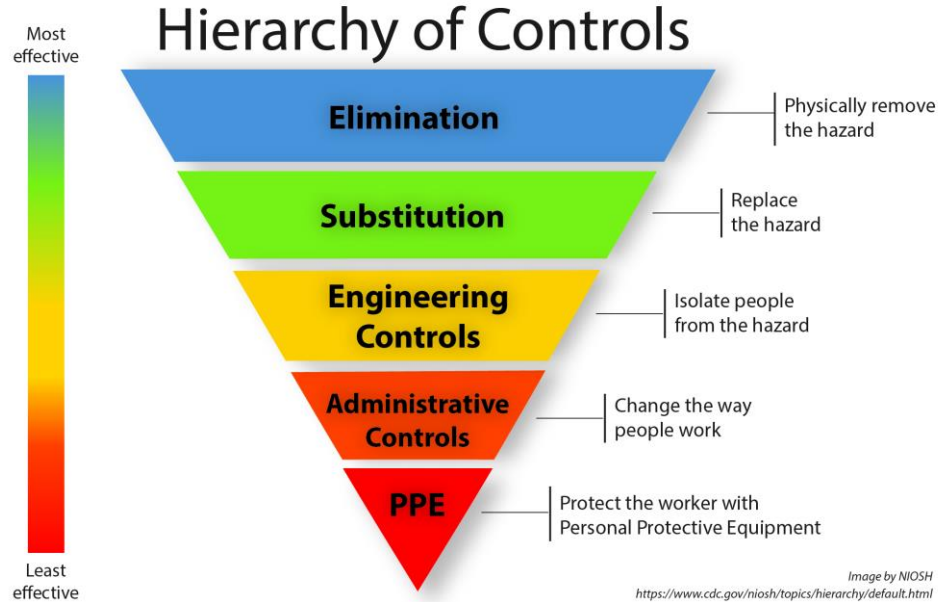
- Ergonomics aka **Human factors** is the applied science concerned with understanding the interaction between humans and elements of a system.
- ***"Fitting the work to the worker"***₁: finding the best match for the worker to allow them to actively and safely participate within the workday.

Ergonomics

Types:

- **Physical:** Repetition, Vibration, Force, Posture
- **Organizational:** Sociotechnical system, Work Design (static or dynamic), Policies , Organizational arrangements (clutter, set up)
- **Cognitive:** memory (cognitive aids), sensory (lights/sound), motor response, perception

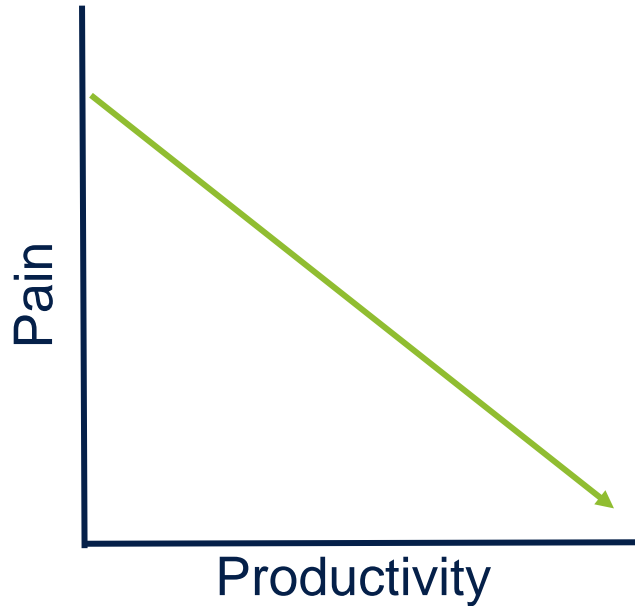
Improving Ergonomics



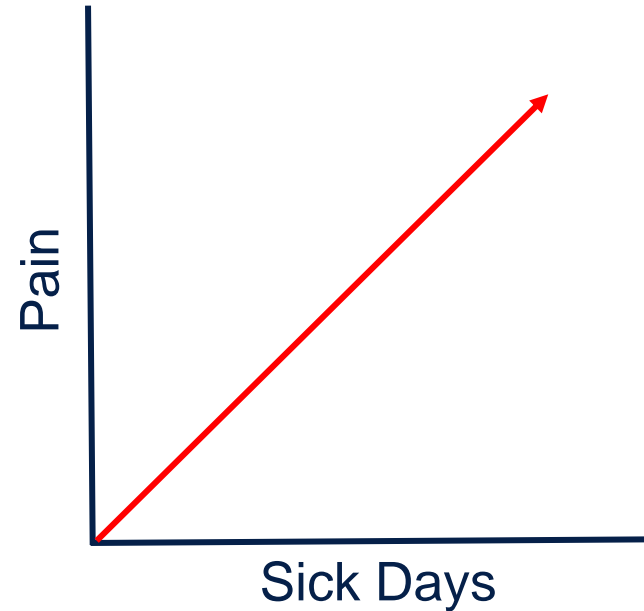
Benefits of Implementing Ergonomics

Increase Morale and Employee Engagement

Less pain = better productivity



Less pain = Less sick days



Office and Desk Ergonomics

Physical Stress

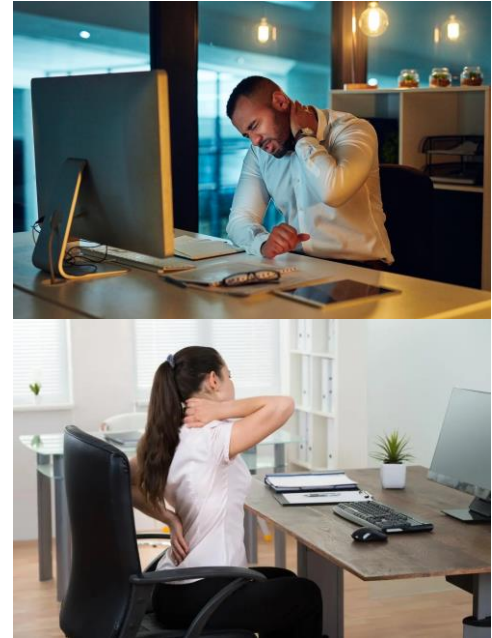
- **Myofascia:** Low load prolonged positions
- **Posture:** Poor movement repetitively
- **Force**
- **Visual:** Blurry vision, sore eyes, itching, too much light/glare, flickering bulb
 - *Computer Vision Syndrome:* Difficult to focus and develop dry eye



Office and Desk Ergonomics

Physical Stress

- **Common Incidence Report:**
 - 62% Cervical Spine
 - Other MSD
 - Low Back
 - Shoulder
 - Elbow/Wrist
 - Others



Office and Desk Ergonomics









Psychosocial Stress ^{2,3}

- Relationship with Employees or Job
- Issues/complaints
- Physiological response to stress
- Organizational: Duration of a tasks
- Environmental:
 - *Gender difference*: Women perform better in warmer conditions



Rapid Office Strain Assessment (ROSA) Ergonomic Assessment Tool ₅

- Quantifies **level of changes** based on risk with work task
 - Range 1-10*: Higher score = higher risk for MSD
- A provider must **observe** the postures from the user's workstation and review components of the ROSA scoresheet.
- 4 Sections**: Office Chair, Monitor, Telephone, and Keyboard/Mouse
 - Picture Based Assessment

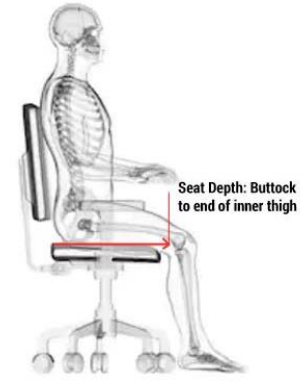
Section B - Chair				
Chair Height				
				
Non-Adjustable (1)				
Knees at 90° (1)	Too low - knee angle < 90° (1)	Too high - knee angle > 90° (2)	No foot contact on ground (1)	Insufficient space under Desk - Ability to Cross Legs (1)
Foot Space				
			Non-Adjustable (1)	
Approximately 2 inches of space between knee and edge of seat (2)	Too long - Less than 2" of space (2)	Too short - More than 2" of space (1)		

Rapid Office Strain Assessment (ROSA)

Ergonomic Assessment Tool - Chair Positioning

- **Office Chair Positioning**

- ❑ Seat Pan Height
- ❑ Seat Pan Depth
- ❑ Back Support
 - Height
 - Width
 - Depth
 - Pivot
- ❑ Arm Supports

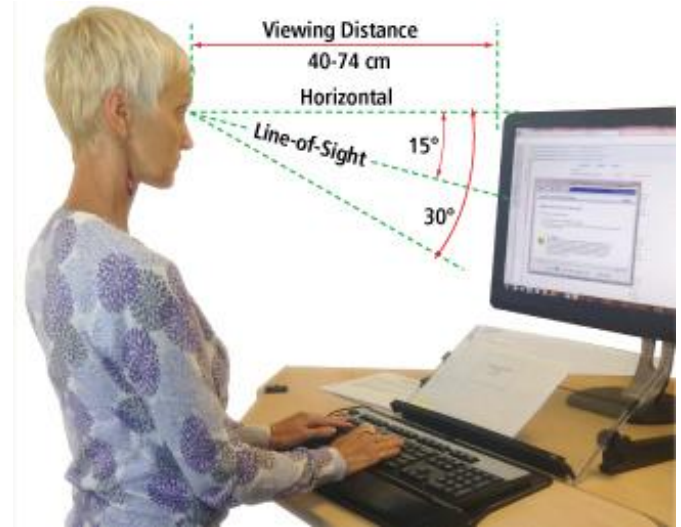


Rapid Office Strain Assessment (ROSA)

Ergonomic Assessment Tool – Head and Neck Position

- **Monitor:** distance

- ❑ 40-75cm away/one arm distance
- ❑ *Height:* just below eye level in seated position but no > 30 degrees eye level
- ❑ *Position:* directly in front versus turned



Rapid Office Strain Assessment (ROSA)

Ergonomic Assessment Tool – Upper Extremity Positioning

- Arms maintain next to trunk
- **Mouse:** neutral wrists, match size of mouse to worker's hand size
- **Keyboard:** elbows at 90 degrees, no hard pressures at palmar wrist

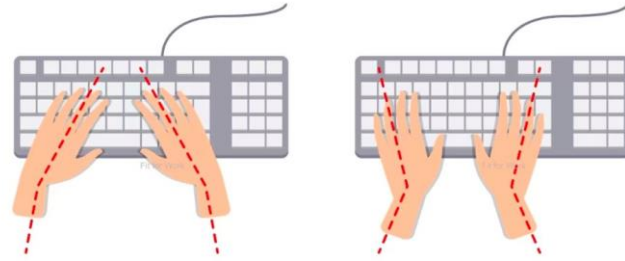
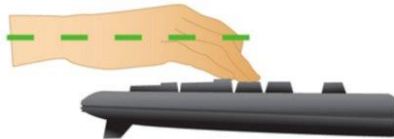
Mouse and Keyboard

Ergonomic Assessment Tool – Upper Extremity Positioning

RIGHT!



RIGHT!



✗ Incorrect Postures ✗



✗ Incorrect Posture ✗

Rapid Office Strain Assessment (ROSA)

Ergonomic Assessment Tool – Upper Extremity Positioning

- **Telephone**

- Within 300mm of subject
- Use of headset versus between shoulder/neck



Rapid Office Strain Assessment (ROSA)

Ergonomic Assessment Tool ₅

- **Other Workstation Scores:**
 - Reaching overhead, Majority UE movement, excessive height of work surface, back support
- **Duration of Use Score**
 - (+1): >1 hour continuous or 4 hours/day
=> Bad
 - (-1): < 30 min continuous work = > Good

Rapid Office Strain Assessment (ROSA)

Ergonomic Assessment Tool 5

Username: _____ Date: _____
 Assessed by: _____ Group: _____
 THE RAPID OFFICE STRAIN ASSESSMENT
 DEVELOPED BY MICHAEL KOZMIN, MBA, M.S.

Section A - Chair		Section B - Monitor and Telephone	
Chair height 	AREA SCORE Non-Adjustable (x1)	Monitor height/depth 	AREA SCORE
Knees at 90° (1) / Too low - knee angle >100° (2) / Too high - knee angle <100° (2) / No foot contact on ground (3) / Inappropriate Space Under Desk - Ankle/Heel/Thighs Cross legs (x1)	AREA SCORE	Arm's length Distance (HP) / Point 1 Screen at eye level (1) / Too High (Pain/ Awkward) (2) / Too Low (Below SP) (2) / Too Far (x1) / Neck Tilted Greater than 30° (x1) / Glare on Screen (x1) / Documents - Not Holder (x1)	AREA SCORE
Hand/feet 	AREA SCORE Non-Adjustable (x-1)	Duration 	MONITOR SCORE
Approximately 3 inches of space between knees and outer edge of seat (1) / Too Long - Less than 2" of space (2) / Too Short - More than 3" of knee (2)	AREA SCORE	Headset / One Hand on Phone & Neutral/Back Position (3) / Too Far of Reach (outside of SP) (2) / Neck and Shoulder (Not) (x1)	AREA SCORE
Ancests 	AREA SCORE Non-Adjustable (x-1)	Duration 	MONITOR SCORE
Elbows supported in line with shoulders, wrist/dors relaxed (1) / Too High (if shoulders slumped) / Arm (flexion unsupported) (2) / Hand/Anchored surface (x1) / Too Wide (x-1)	AREA SCORE	Mouse in Line with Shoulder (1) / Reaching to Mouse (2) / Mouse/Keyboard on Different Surface (x2) / Pencil Grip on Mouse (x1) / Palmrest in Front of Mouse (x1)	AREA SCORE
Back Support 	AREA SCORE Back Rest Non-Adjustable (x-1)	Duration 	MONITOR SCORE
Adequate Lumbar Support - Chair reclines between 90°-100° (1) / No Lumbar Support OR Lumbar Support not Positioned in Line of Back (2) / Angled Too Far Back (Greater than 100° OR Angled Too Far Forward (Less than 90°) (2) / No Back Support (or Small OR Worker Leaning (Shoulder Slumped) (x1) / Work Surface too High (Shoulder Slumped) (x1)	AREA SCORE	Wrist Straight/Shoulders Relaxed (1) / Wrist Extended/ Awkward on Flexion/Angle (>30° Wrist extension) (x1) / Duration with Torque (x1) / Excessive Torq High (Shoulder Slumped) (x1) / Reaching to Overhead Item (x1)	AREA SCORE
Chair Monitor and Telephone Mouse and Keyboard Area Final Score	DURATION CHAIR FINAL SCORE	DURATION INSTRUCTIONS INTERNAL SCORE AREA SCORE Peripherals and Monitor Score	DURATION INSTRUCTIONS INTERNAL SCORE AREA SCORE Peripherals and Monitor Score

If less than 10 minutes continuously, or less than 1 hour per day, mark as 0.
 If between 10 minutes and 1 hour continuously, or between 1 and 1 hour per day, mark as 1.
 If greater than 1 hour continuously, or more than 1 hour per day, mark as 2.

RAPID OFFICE STRAIN ASSESSMENT

EMPLOYEE NAME: _____
 DATE: _____
 ASSESSED BY: _____

ROSA SCORING INSTRUCTIONS

1. Add Seat Pan and Seat Depth scores together to receive Section A vertical Axis Score. Add Arm Rest and Back Rest scores together to receive the vertical axis score. Using these scores, follow the scoring chart to receive the Chair Score. Add the appropriate duration score based on the amount of time the worker spends in the chair per day.
2. Add the score for the Monitor with the appropriate duration score to receive the value for the horizontal axis in Section B. Add the telephone score together plus the appropriate duration scores to receive the vertical axis for Section B. Using these scores, follow the scoring chart to receive the Section B score.
3. Add the score for the keyboard to the appropriate duration score to receive the value for the horizontal axis in Section C. Add the score of the mouse to the appropriate duration score to receive the vertical axis for Section C. Using these scores, follow the scoring chart to receive the Section C score.
4. Use the score from step 3 to receive the score for the vertical axis in the peripheral and monitor section. Use the score from step 3 to receive the score for the horizontal axis in the peripheral and monitor section.
5. Use the score from Step 1 (Section A) to receive the value for the vertical axis in the grand score chart. Use the score from step 4 to receive the score for the horizontal axis in the grand score chart. Using these two scores, find the corresponding Grand ROSA score.

		SECTION A SCORE									
		0	1	2	3	4	5	6	7	8	9
Area Final Score	2	2	2	3	4	5	6	7	8	9	10
	3	3	3	3	4	5	6	7	8	9	10
	4	4	4	4	4	5	6	7	8	9	10
	5	5	5	5	5	6	7	8	9	10	10
	6	6	6	6	7	7	8	9	9	9	10
	7	7	7	7	7	8	8	9	9	9	10
	8	8	8	8	8	8	9	9	9	9	10
	9	9	9	9	9	9	9	9	9	9	10

		SECTION B SCORE								
		0	1	2	3	4	5	6	7	
Phone	0	0	1	1	1	2	3	4	5	6
	1	1	1	2	2	3	4	5	6	7
	2	2	2	3	3	4	5	6	7	8
	3	3	3	3	3	4	5	6	7	8
	4	4	4	4	4	5	6	7	8	9
	5	5 <td>5<td>5<td>5<td>6<td>7<td>8<td>9</td><td>10</td> </td></td></td></td></td></td>	5 <td>5<td>5<td>6<td>7<td>8<td>9</td><td>10</td> </td></td></td></td></td>	5 <td>5<td>6<td>7<td>8<td>9</td><td>10</td> </td></td></td></td>	5 <td>6<td>7<td>8<td>9</td><td>10</td> </td></td></td>	6 <td>7<td>8<td>9</td><td>10</td> </td></td>	7 <td>8<td>9</td><td>10</td> </td>	8 <td>9</td> <td>10</td>	9	10
	6	6 <td>6<td>6<td>6<td>7<td>8<td>9</td><td>9</td><td>10</td> </td></td></td></td></td>	6 <td>6<td>6<td>7<td>8<td>9</td><td>9</td><td>10</td> </td></td></td></td>	6 <td>6<td>7<td>8<td>9</td><td>9</td><td>10</td> </td></td></td>	6 <td>7<td>8<td>9</td><td>9</td><td>10</td> </td></td>	7 <td>8<td>9</td><td>9</td><td>10</td> </td>	8 <td>9</td> <td>9</td> <td>10</td>	9	9	10
	7	7 <td>7<td>7<td>7<td>8<td>9</td><td>9</td><td>9</td><td>10</td> </td></td></td></td>	7 <td>7<td>7<td>8<td>9</td><td>9</td><td>9</td><td>10</td> </td></td></td>	7 <td>7<td>8<td>9</td><td>9</td><td>9</td><td>10</td> </td></td>	7 <td>8<td>9</td><td>9</td><td>9</td><td>10</td> </td>	8 <td>9</td> <td>9</td> <td>9</td> <td>10</td>	9	9	9	10

		SECTION C SCORE								
		0	1	2	3	4	5	6	7	
Mouse	0	0	1	1	1	2	3	4	5	6
	1	1	1	1	2	3	4	5	6	7
	2	2	2	3	3	4	5	6	7	8
	3	3	3	3	3	4	5	6	7	8
	4	4	4	4	4	5	6	7	8	9
	5	5 <td>5<td>5<td>5<td>6<td>7<td>8</td><td>9</td><td>10</td> </td></td></td></td></td>	5 <td>5<td>5<td>6<td>7<td>8</td><td>9</td><td>10</td> </td></td></td></td>	5 <td>5<td>6<td>7<td>8</td><td>9</td><td>10</td> </td></td></td>	5 <td>6<td>7<td>8</td><td>9</td><td>10</td> </td></td>	6 <td>7<td>8</td><td>9</td><td>10</td> </td>	7 <td>8</td> <td>9</td> <td>10</td>	8	9	10
	6	6 <td>6<td>6<td>7<td>7<td>8</td><td>9</td><td>9</td><td>10</td> </td></td></td></td>	6 <td>6<td>7<td>7<td>8</td><td>9</td><td>9</td><td>10</td> </td></td></td>	6 <td>7<td>7<td>8</td><td>9</td><td>9</td><td>10</td> </td></td>	7 <td>7<td>8</td><td>9</td><td>9</td><td>10</td> </td>	7 <td>8</td> <td>9</td> <td>9</td> <td>10</td>	8	9	9	10
	7	7 <td>7<td>7<td>7<td>8</td><td>9</td><td>9</td><td>9</td><td>10</td> </td></td></td>	7 <td>7<td>7<td>8</td><td>9</td><td>9</td><td>9</td><td>10</td> </td></td>	7 <td>7<td>8</td><td>9</td><td>9</td><td>9</td><td>10</td> </td>	7 <td>8</td> <td>9</td> <td>9</td> <td>9</td> <td>10</td>	8	9	9	9	10

		Peripheral and Monitor									
		1	2	3	4	5	6	7	8	9	10
Chair	1	1	2	3	4	5	6	7	8	9	10
	2	2	2	3	4	5	6	7	8	9	10
	3	3	3	3	4	5	6	7	8	9	10
	4	4	4	4	4	5	6	7	8	9	10
	5	5	5	5	5	6	7	8	9	10	10
	6	6	6	6	6	6	7	8	9	10	10
	7	7 <td>7<td>7<td>7<td>7<td>8</td><td>9</td><td>10</td><td>10</td><td>10</td> </td></td></td></td>	7 <td>7<td>7<td>7<td>8</td><td>9</td><td>10</td><td>10</td><td>10</td> </td></td></td>	7 <td>7<td>7<td>8</td><td>9</td><td>10</td><td>10</td><td>10</td> </td></td>	7 <td>7<td>8</td><td>9</td><td>10</td><td>10</td><td>10</td> </td>	7 <td>8</td> <td>9</td> <td>10</td> <td>10</td> <td>10</td>	8	9	10	10	10
	8	8 <td>8<td>8<td>8<td>8<td>8</td><td>9</td><td>10</td><td>10</td><td>10</td> </td></td></td></td>	8 <td>8<td>8<td>8<td>8</td><td>9</td><td>10</td><td>10</td><td>10</td> </td></td></td>	8 <td>8<td>8<td>8</td><td>9</td><td>10</td><td>10</td><td>10</td> </td></td>	8 <td>8<td>8</td><td>9</td><td>10</td><td>10</td><td>10</td> </td>	8 <td>8</td> <td>9</td> <td>10</td> <td>10</td> <td>10</td>	8	9	10	10	10
	9	9 <td>9<td>9<td>9<td>9<td>9<td>9<td>9<td>10</td><td>10</td> </td></td></td></td></td></td></td>	9 <td>9<td>9<td>9<td>9<td>9<td>9<td>10</td><td>10</td> </td></td></td></td></td></td>	9 <td>9<td>9<td>9<td>9<td>9<td>10</td><td>10</td> </td></td></td></td></td>	9 <td>9<td>9<td>9<td>9<td>10</td><td>10</td> </td></td></td></td>	9 <td>9<td>9<td>9<td>10</td><td>10</td> </td></td></td>	9 <td>9<td>9<td>10</td><td>10</td> </td></td>	9 <td>9<td>10</td><td>10</td> </td>	9 <td>10</td> <td>10</td>	10	10
	10	10	10	10	10	10	10	10	10	10	10

		MONITOR AND PERIPHERALS SCORE							
		1	2	3	4	5	6	7	8
Monitor and Telephone	1	1	2	3	4	5	6	7	8
	2	2	2	3	4	5	6	7	8
	3	3	3	3	4	5	6	7	8
	4	4	4	4	4	5	6	7	8
	5	5 <td>5<td>5<td>5<td>5</td><td>6</td><td>7</td><td>8</td> </td></td></td>	5 <td>5<td>5<td>5</td><td>6</td><td>7</td><td>8</td> </td></td>	5 <td>5<td>5</td><td>6</td><td>7</td><td>8</td> </td>	5 <td>5</td> <td>6</td> <td>7</td> <td>8</td>	5	6	7	8
	6	6 <td>6<td>6<td>6<td>6</td><td>6</td><td>7</td><td>8</td> </td></td></td>	6 <td>6<td>6<td>6</td><td>6</td><td>7</td><td>8</td> </td></td>	6 <td>6<td>6</td><td>6</td><td>7</td><td>8</td> </td>	6 <td>6</td> <td>6</td> <td>7</td> <td>8</td>	6	6	7	8
	7	7 <td>7<td>7<td>7<td>7</td><td>7</td><td>7</td><td>8</td> </td></td></td>	7 <td>7<td>7<td>7</td><td>7</td><td>7</td><td>8</td> </td></td>	7 <td>7<td>7</td><td>7</td><td>7</td><td>8</td> </td>	7 <td>7</td> <td>7</td> <td>7</td> <td>8</td>	7	7	7	8
	8	8 <td>8<td>8<td>8<td>8<td>8<td>8</td><td>8</td> </td></td></td></td></td>	8 <td>8<td>8<td>8<td>8<td>8</td><td>8</td> </td></td></td></td>	8 <td>8<td>8<td>8<td>8</td><td>8</td> </td></td></td>	8 <td>8<td>8<td>8</td><td>8</td> </td></td>	8 <td>8<td>8</td><td>8</td> </td>	8 <td>8</td> <td>8</td>	8	8

ROSA FINAL SCORE

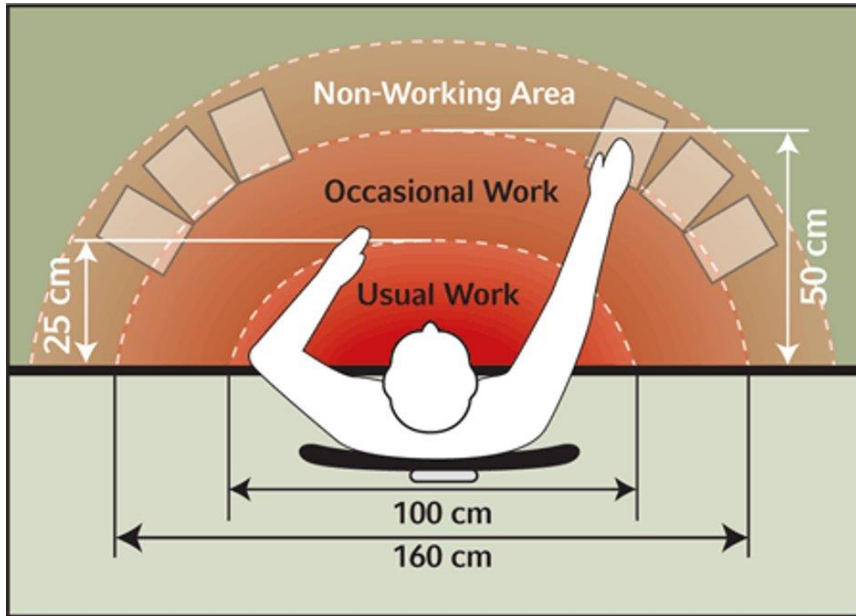
Other Clinical Observations

- **Physical Stress:**
 - Visual Glares, Flickering Lights
- **Organizational:**
 - Clutter



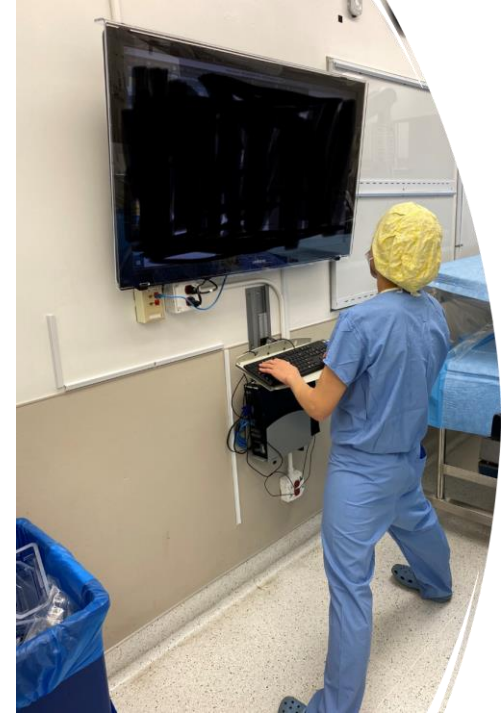
Organizational Ergonomics

Organized Arrangement of the Desk: Reducing the Clutter



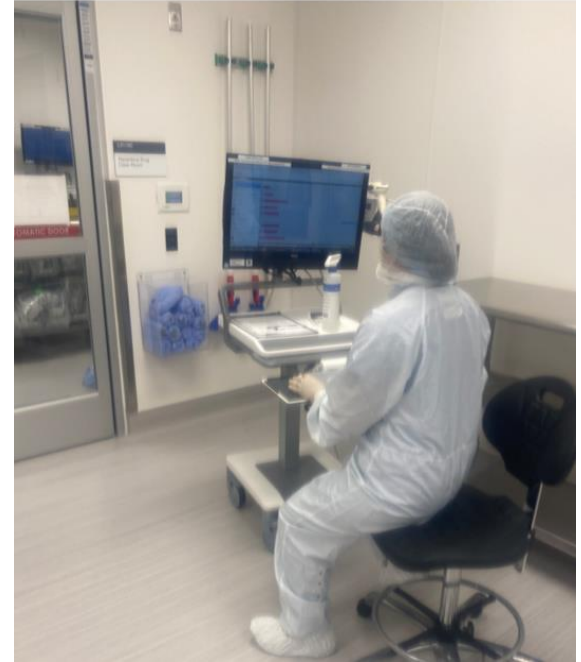
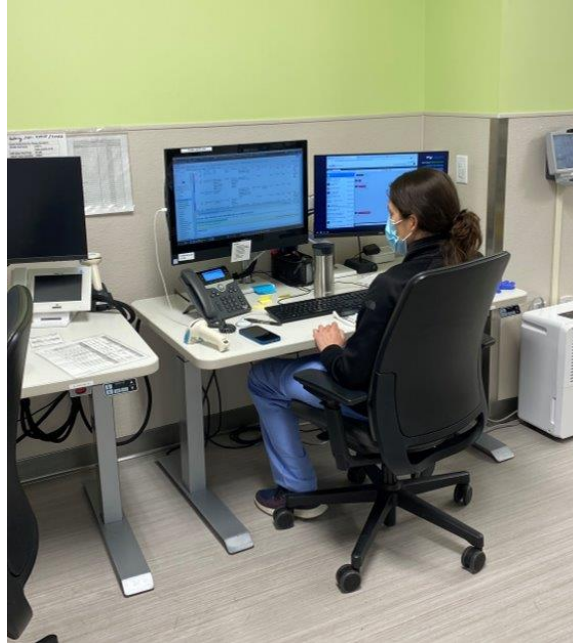
Physical Ergonomics: Workstations

Different desks across various fields



Physical Ergonomics: Workstations

Different desks across various fields



Physical Ergonomics: Workstations

Different desks across various fields



Setting up the desk

Sitting Posture

Step 1: Chair Height

Raise seat height so that knees are slightly lower than hips and feet touching floor

Step 2: Backrest

Adjust lumbar back support as needed

Step 3: Trunk Position

Maintain a relaxed upright neck and chest.

Step 4: Raise monitor so that eye level is at the upper 2/3 of the screen

Step 5: Keyboard Tray/Desk Height: Adjust until elbows are bent at 90 degrees

Step 6: Chair Placement: Move chair forward to maintain 90 degrees elbow flexion

Setting up the desk

Standing Posture

Step 1: Desk or Keyboard Tray

Adjust height so that elbows are bent no greater than 90 deg for keyboard

Step 2: Body Position

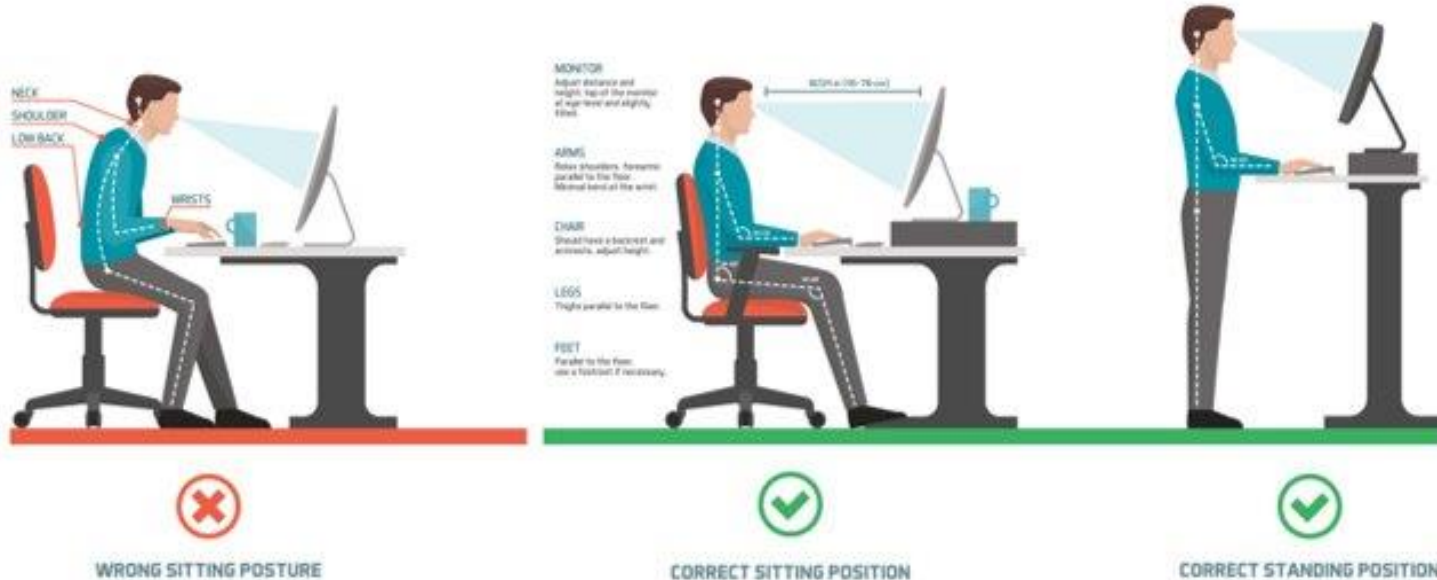
Feet should touch floor but allowed to switch feet in staggered stance

Step 3: Raise monitor so eye level is upper 2/3 of screen

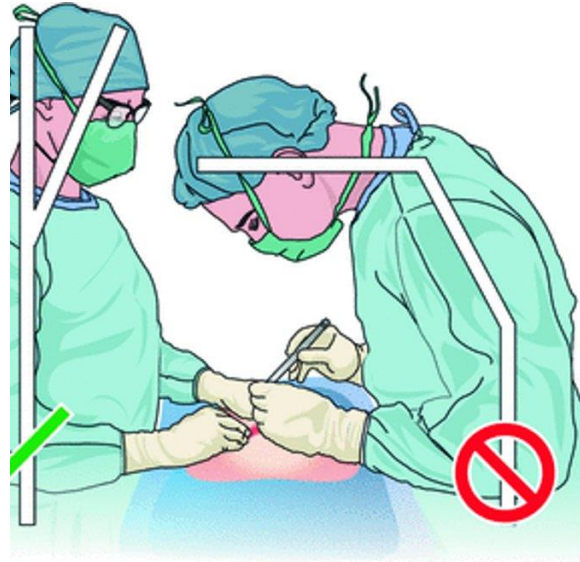
Step 4: Maintain a relaxed upright neck and chest.

The "Perfect" Posture

Is there one?



Correlation to Surgical Ergonomics



Microbreaks

Movement "Snacks"



- **1.** Break up repetitive tasks or static prolonged postures by taking microbreaks (30 seconds-2 minutes) at least every 20-30 minutes or maximum 1 hour.
- **2.** Perform light stretching or simple exercise during longer breaks.
- **3.** Let your eyes relax when working on the computer or performing an activity for long periods of time, implement the 20/20/20 rule
 - Every 20 minutes look at something 20 feet away for 20 seconds
- **4.** Utilizing external devices to offload joints

Microbreaks

Movement "Snacks"



Microbreaks - Demonstration

Movement "Snacks"



Seated	Standing
<ol style="list-style-type: none">1. Neck stretches2. Seated thoracic extension3. Seated thoracic rotation4. Seated Hamstring stretch5. Seated Figure 4 stretch6. Wrist Stretches	<ol style="list-style-type: none">1. Table "L" stretch2. Table Plank with rotations3. Triangle Pose with chair4. Triangle Pose5. Overhead Squat6. Quadricep Stretch7. Hip Flexor Stretch

Microbreak Stretches: hold 5-10 seconds

Upper trapezius stretch



1

Levator Scapulae Stretch



2

Cervical-Thoracic Flexion



3

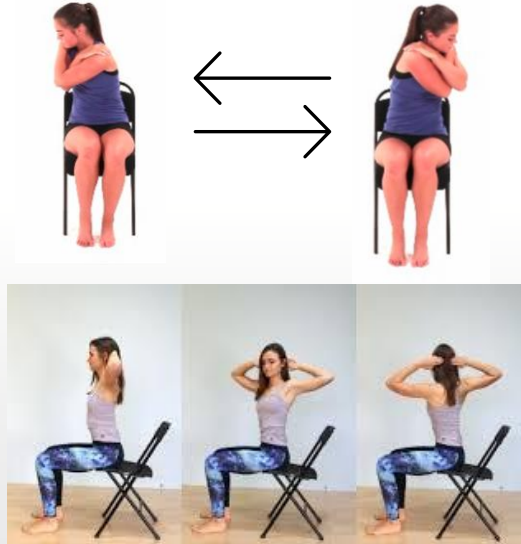
Microbreak Stretches: hold 5-10 seconds

Seated Thoracic Extension



4

Seated Trunk Rotations



5

Triangle Pose
Seated Hamstring Stretch



6

Microbreak Stretches: hold 5-10 seconds

Seated Figure 4 Stretch



7

Seated or Standing "L" Stretch



8

Standing Thread Needle



9

Microbreak Stretches: hold 5-10 seconds

Wrist Extensor
Stretch



10

Wrist Flexor
Stretch



11

Triangle Pose



12

Microbreak Exercise: hold 5-10 seconds

Overhead Squat



13

Quadricep Stretch



14

Hip Flexor Stretch



15

Additional Microbreak Resources

1. [myUSF - Microbreak](#)
2. [myUSF - Ergonomic Stretches](#)
3. [Posturite - Infographic Explores Benefits of Taking Microbreaks](#)
4. [Mayo Clinic OR-Stretch Instructional Video](#)
5. [Mayo Clinic OR-Stretch Between Surgery Stretches Video](#)
6. [NSC 2-Minute Ergo Stretch Video](#)

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A group of office workers in a modern office setting are celebrating. Several people have their hands raised in the air, and one man is standing on a desk. The scene is bright and positive, with large windows in the background. A blue banner is overlaid on the image, containing the text "Thank you!".

Thank you!