

Cornell Digital Reading Room Ergonomics Checklist

The Cornell Digital Reading Room Ergonomics Checklist is intended as a quick evaluation of the working environment for radiologists who work with digital medical images. The checklist can be used to document the conditions for one radiologist or several radiologists.

The checklist is divided into five sections:

- * *Display Screens,*
- * *Input devices,*
- * *Workstation and Workstation accessories,*
- * *Chair, and*
- * *Ambient Environment.*

Each section asks questions about the physical environment (such as the height of the desk or the temperature of the room) and the users (such as the posture of the radiologist and how s/he uses the equipment).

When using the checklist, please read the question carefully as well as the answer options. Each item can be answered with a checkmark in an accompanying checkbox. Some items will have "Continue to item X" depending on the answer given or clarifying questions that will follow directly below the answer.

If an item marked as an "*Ergonomic Issue*" is checked, this indicates a problem area within the workstation. Upon completion of the checklist, please refer to the accompanying guidelines on what steps to take.

To complete the Display Screens and Workstation sections, you will need a tape measure. For the Input device and Chair sections, you will need a goniometer. For the ambient environment section you will need a sound level meter, a light level reader and instruments to measure temperature, humidity and velocity. It is also possible that the ambient environment of the facility is electronically monitored; in that case archival readings are fine.

NOTE: *It is assumed that each workstation will have a three-screen setup. If your workstation has fewer screens, you can leave extra screen answers options blank. If your workstation set up has more than three screens, you can print out an extra copy of pages 2-3 "Display Screens" to accommodate for this.*

DISPLAY SCREENS

Arm/Wall mounted

Freestanding

| | | | | | | |
|-----------------------------|-----------------------------------|-------------------------------------|------------------------------------|-----------------------------------|-------------------------------------|------------------------------------|
| 1. The display screens are: | Left (L) <input type="radio"/> | Middle (M) <input type="radio"/> | Right (R) <input type="radio"/> | Left (L) <input type="radio"/> | Middle (M) <input type="radio"/> | Right (R) <input type="radio"/> |
|-----------------------------|-----------------------------------|-------------------------------------|------------------------------------|-----------------------------------|-------------------------------------|------------------------------------|

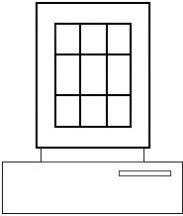
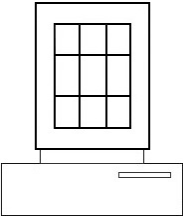
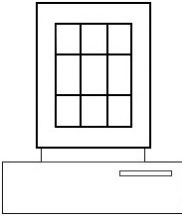
Monochrome

Color

| | | | | | | |
|-----------------------------|-----------------------------------|-------------------------------------|------------------------------------|-----------------------------------|-------------------------------------|------------------------------------|
| 2. The display screens are: | Left (L) <input type="radio"/> | Middle (M) <input type="radio"/> | Right (R) <input type="radio"/> | Left (L) <input type="radio"/> | Middle (M) <input type="radio"/> | Right (R) <input type="radio"/> |
|-----------------------------|-----------------------------------|-------------------------------------|------------------------------------|-----------------------------------|-------------------------------------|------------------------------------|

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| 3. What is the display screen size? LEFT: _____ inches/cm MIDDLE: _____ inches/cm RIGHT: _____ inches/cm |
|---|

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|--|----------------------|--------------------------------|----------------------------------|---------------------------------|
| 4. The display screens are easily adjustable in: | Height | <input type="radio"/> Left (L) | <input type="radio"/> Middle (M) | <input type="radio"/> Right (R) |
| | Distance from person | <input type="radio"/> Left (L) | <input type="radio"/> Middle (M) | <input type="radio"/> Right (R) |
| | Angle/Tilt | <input type="radio"/> Left (L) | <input type="radio"/> Middle (M) | <input type="radio"/> Right (R) |
| | Twist/Rotation | <input type="radio"/> Left (L) | <input type="radio"/> Middle (M) | <input type="radio"/> Right (R) |

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|--|---|
| 5. Is there glare on the display screens that affects image reading? _____ | |
| NO <input type="radio"/> <i>Continue to item 6</i> | YES <input type="radio"/> What are the sources of the glare? <input type="radio"/> Overhead lighting <input type="radio"/> Paper <input type="radio"/> Task lights <input type="radio"/> Windows <input type="radio"/> Clothing <input type="radio"/> Other, please specify: _____ |
| | <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> LEFT (L)  </div> <div style="text-align: center;"> MIDDLE (M)  </div> <div style="text-align: center;"> RIGHT (R)  </div> </div> <p>Please mark or fill in the screen areas affected by glare:</p> |


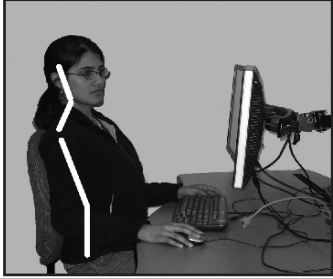



1

DISPLAY SCREENS

ERGONOMIC ISSUES

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|--|---------------------------|--------------------------|---------------------------|--------------------------|---------------------------|--------------------------|
| 6. Is the screen character luminance adjustable? | LEFT (L) | | MIDDLE (M) | | RIGHT (R) | |
| | <input type="radio"/> YES | <input type="radio"/> NO | <input type="radio"/> YES | <input type="radio"/> NO | <input type="radio"/> YES | <input type="radio"/> NO |

7. Please check the image that best describes the posture of the radiologist while (s)he is viewing the screens:
INSTRUCTIONS: Ask the radiologist to sit directly in front of and facing the left screen while evaluating the posture.
Repeat for the right screen.

| L <input type="radio"/> | M <input type="radio"/> | R <input type="radio"/> | L <input type="radio"/> | M <input type="radio"/> | R <input type="radio"/> | L <input type="radio"/> | M <input type="radio"/> | R <input type="radio"/> | L <input type="radio"/> | M <input type="radio"/> | R <input type="radio"/> | L <input type="radio"/> | M <input type="radio"/> | R <input type="radio"/> |
|---|----------------------------|----------------------------|---|----------------------------|----------------------------|--|----------------------------|----------------------------|---|----------------------------|----------------------------|---|----------------------------|----------------------------|
|  | | |  | | |  | | |  | | |  | | |
| Correct distance/height | | | Screen too close | | | Screen too far away | | | Screen too low | | | Screen too high | | |

2

8. Please check the circle if the displayed images on the screen are:

| | | | | | | | | | | | |
|----------------------------|----------------------------|----------------------------|-------|----------------------------|----------------------------|----------------------------|--------------|----------------------------|----------------------------|----------------------------|-----------------------------|
| L <input type="radio"/> | M <input type="radio"/> | R <input type="radio"/> | Fuzzy | L <input type="radio"/> | M <input type="radio"/> | R <input type="radio"/> | Hard to read | L <input type="radio"/> | M <input type="radio"/> | R <input type="radio"/> | With visible flicker/jitter |
|----------------------------|----------------------------|----------------------------|-------|----------------------------|----------------------------|----------------------------|--------------|----------------------------|----------------------------|----------------------------|-----------------------------|

3

INPUT DEVICES

ERGONOMIC ISSUES

9. What is the wrist angle? Please check the image that fits the posture:

If the workstation has a keyboard tray:

If the workstation keyboard is placed on the desk:

☐

☐

☐

☐

☐

☐



Neutral wrist angle

Wrist Flexion

Wrist Extension

Neutral wrist angle

Wrist Flexion

Wrist Extension

4

10. Check the circle if the mouse designed for: ☐ Right handed use only ☐ Left handed use only ☐ Use with either hand

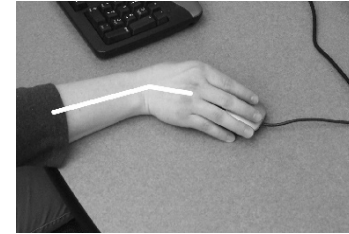
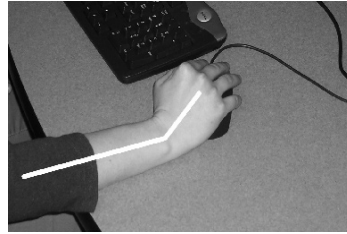
11. Where is the mouse used? ☐ On platform over keyboard ☐ Platform adjacent to keyboard ☐ On desk

12. What is the wrist position? Please check the image that fits the posture:

☐

☐

☐



Neutral wrist

Radial Deviation

Ulnar deviation

5

13. Please check any other hand operated input devices used at the workstation that put the hand or arm in an awkward posture:

☐ Trackball ☐ Touchpad ☐ Touchpoint ☐ Joystick ☐ Lightpen ☐ Other: _____

6

14. Is voice recognition used?

☐ NO

☐ A hands-free headset

☐ A free standing microphone

☐ A hand-held microphone

WORKSTATION & WORKSTATION ACCESSORIES

ERGONOMIC ISSUES

| | | | | |
|--|--|---|---|--|
| 15. Does the work surface look cluttered? <input type="radio"/> NO <input type="radio"/> YES Desktop size: Width: _____ inches. Depth: _____ inches | | | | 7 |
| 16. Does the workstation have any sharp edges that could cause compression to either hands or arms? <input type="radio"/> NO <input type="radio"/> YES | | | | 8 |
| 17. Does the radiologist have sufficient clearance underneath the desk? <input type="radio"/> YES <input type="radio"/> NO _____ | | | | 9 |
| 18. Can the angle of the workstation surface be changed? <input type="radio"/> YES <input type="radio"/> NO | | | | |
| 19. Can the desk height be adjusted to accommodated for seated work as well as standing work? <input type="radio"/> YES <input type="radio"/> NO | | | | |
| Depth at knee level: _____ inches | | Desk width: _____ inches | | |
| Depth at foot level: _____ inches | | Desk height: _____ inches | | |
| 20. Does the work require a document holder for paper? | | | | |
| <input type="radio"/> NO <i>Continue to item 21</i> | <input type="radio"/> YES Is there a stable document holder at the workstation? <input type="radio"/> YES <input type="radio"/> NO _____ | | | 10 |
| | Is the document placed at the same height as the screen? <input type="radio"/> YES <input type="radio"/> NO _____ | | | 11 |
| | Is the document placed at the same distance as the screen? <input type="radio"/> YES <input type="radio"/> NO _____ | | | |
| | Height of document holder: _____ Distance from person: _____ | | | |
| 21. Does the radiologist need to use a telephone while reading images? | | | | |
| <input type="radio"/> NO <i>Continue to item 22</i> | <input type="radio"/> YES Is the telephone used with the head upright and shoulders relaxed? <input type="radio"/> YES <input type="radio"/> NO _____ | | | 12 |
| Please check the circle that best describes the phone usage | | | | |
| | <input type="radio"/> Hands free / Headset (cell/regular phone) | <input type="radio"/> Shoulder cradle (regular phone) | <input type="radio"/> Regular phone w/o accessories | <input type="radio"/> Cell phone w/o accessories |
| 22. Does the workstation have a footrest? <input type="radio"/> YES <input type="radio"/> NO | | | | |
| | | | | 13 |

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|--|------------------------------|----------------------------------|-----------------------------|
| 23. Chair seat pan can be adjusted in: | <input type="radio"/> Height | <input type="radio"/> Angle/Tilt | <input type="radio"/> Depth |
|--|------------------------------|----------------------------------|-----------------------------|

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|-----------------------------------|------------------------------|--|--------------------------------------|
| 24. Does the chair have armrests? | | | |
| <input type="radio"/> NO | <input type="radio"/> YES | Please check the circle that best describes the adjustability for the armrests, if applicable: | |
| <i>Continue to item 25</i> | <input type="radio"/> Height | <input type="radio"/> Width | <input type="radio"/> Can be removed |

| | | |
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| 25. Do the chair armrests restrict workstation access? | <input type="radio"/> YES | <input type="radio"/> NO |
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14

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| 26. Does the chair have a five (5) legged base with casters that are appropriate for the flooring material? | <input type="radio"/> YES | <input type="radio"/> NO |
|---|---------------------------|--------------------------|

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| 27. Does the chair swivel? | <input type="radio"/> YES | <input type="radio"/> NO |
|----------------------------|---------------------------|--------------------------|

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| 28. Does the chair have: a height adjustable lumbar support? | <input type="radio"/> YES | <input type="radio"/> NO | 15 |
| lumbar support that matches the curve of the lower back? | <input type="radio"/> YES | <input type="radio"/> NO | |

16

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| 29. Can the backrest height be adjusted to a comfortable height? | |
| <input type="radio"/> NO | <input type="radio"/> YES |
| <i>Continue to item 29</i> | Backrest height: _____ inches Backrest adjustment range: _____ inches |

17

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| 30. Can the backrest recline angle be adjusted? | |
| <input type="radio"/> NO | <input type="radio"/> YES Recline range: _____ degrees from 90° angle (upright) |
| <i>Continue to item 31</i> | Does the chair have a headrest? <input type="radio"/> YES <input type="radio"/> NO |

18

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| 31. If known from the chair specifications, how much weight can the chair support? _____ pounds |
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AMBIENT CONDITIONS

ERGONOMIC ISSUES

| | | | | | |
|---|---------------------------|--------------------------|--------------------------------|----|----|
| 32. Is the light level satisfactory for the type of work performed there? | <input type="radio"/> YES | <input type="radio"/> NO | Illuminance level: _____fc/lux | 19 | |
| 33. Is there a task light at the workstation? | | | | | |
| <input type="radio"/> NO <input type="radio"/> Incandescent <input type="radio"/> Fluorescent <input type="radio"/> LED <input type="radio"/> Other: _____ | | | | | |
| 34. Are there natural light sources? | | | | | |
| <input type="radio"/> NO <input type="radio"/> Interior window without blinds <input type="radio"/> Exterior window without blinds <input type="radio"/> Interior window with blinds <input type="radio"/> Exterior window with blinds | | | | | |
| 35. How does the quality of the light source affect the display screen images? | | | | | |
| <input type="radio"/> Not at all <input type="radio"/> Washes out image <input type="radio"/> Distorts image <input type="radio"/> Brightens image contrast | | | | | 20 |
| 36. Does the reading room noise level interfere with reading performance or verbal communication? | | | | | 21 |
| <input type="radio"/> NO <input type="radio"/> YES Noise level _____db (A) | | | | | |
| 37. How does the room feel? | | | | | 22 |
| <input type="radio"/> Comfortable <input type="radio"/> Hot <input type="radio"/> Warm <input type="radio"/> Cool <input type="radio"/> Cold Measured temperature: _____ °C/°F | | | | | |
| 38. Is the room drafty? | | | | | 23 |
| <input type="radio"/> NO <input type="radio"/> YES Air velocity: _____ft/min. | | | | | |
| 39. Does the air feel too dry or too humid? | | | | | 24 |
| <input type="radio"/> NO <input type="radio"/> YES Relative humidity: _____ % | | | | | |
| 40. Does the air smell or feel stuffy or stale? | | | | | 25 |
| <input type="radio"/> NO <input type="radio"/> YES | | | | | |
| 42. Are individual controls for <i>heat</i> available? | | | | | 26 |
| <input type="radio"/> YES <input type="radio"/> NO | | | | | |
| 43. Are individual controls for <i>lighting</i> available? | | | | | 27 |
| <input type="radio"/> YES <input type="radio"/> NO | | | | | |