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THE EYESTRAIN EPIDEMIC

I. Components of vision

Each eye is responsible for capturing a light images and focusing it on the retina. The two eyes work together to superimpose the two images, yielding fusion. Meanwhile, *the brain is decoding and categorizing the light images and using this feedback to drive eye alignment and focus.*

II. The computer user is subject to inherent visual stress

- Image flicker
- Image location causing operator mismatch between focusing and aiming of the eye muscles
- Blink rate and dry eye
- Environment: lighting, image quality, heat/air drafts

III. Typical responses and manifestations

- Varying degrees of eyestrain, headaches and blurred vision caused by over-focusing
- Jumping or shifting of the screen characters, eye pain, depleted energy and/or errors in mental processing due to inaccurate eye alignment
- Loss of distance vision at the end of the day due to eye muscle spasm
- Burning or stinging sensation of the eyes caused by dryness

IV. Treatment

A. Workstation set-up

1) Lighting/glare

- distribution more important than quantity
- room illumination should balance light bouncing off your screen
- tilt monitor to avoid reflections
- do not face windows or bright light sources
- use baseball cap or visor
- use adjustable shaded lamp

- ❑ use a high-quality glass anti-glare screen (AOA)
 - ❑ partially close drapes or blinds
 - ❑ focus lighting on document you are working with, without directly shining into your eyes
 - ❑ wear dark clothing (light-colored clothing reflects off the screen)
- 2) Quality of the image
- ❑ decrease brightness and increase contrast
 - ❑ screen at or below eye level and 20-26" from face
 - ❑ good resolution, at least 75 dpi
 - ❑ less than 0.28 dot pitch
 - ❑ size of text 3x the size of smallest readable text
 - ❑ refresh rate greater than 60 hertz
 - ❑ keep screen free of dust
 - ❑ double check physical ergonomics and posture
 - ❑ visual line should be 4-6" below your eyes

B. Glasses

- 1) glare protection: anti-reflective coating (+ and -), or rose #1
- 2) eye relaxants help to avoid over focus
 - **important to bring distance to monitor in to exam
 - may need to adjust the distance of reference documents
 - 20:20:20 rule
- 3) presbyopia (affects those over 40 years old)
 - many types of multi-focal lenses: AO technica, Sola Access
- 4) often used in conjunction with contact lenses

C. Binocular evaluation

Established norms exist for eye muscle function, deficiencies are treatable with "physical therapy" for the ocular muscles

D. Eye lubricants (preservative free only!), punctal plugs, importance of blink

V. Web sites

- ◆ www.allaboutvision.com general eye info
- ◆ www.surgicaleyes.org unhappy lasik patients
- ◆ www.vision3d.com explains binocular vision
- ◆ www.optometrists.org general optometry info