

**Quarterly CONNECTIONS:**  
**Light for Aging Vision & Health**

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# My experience growing up in Bend, Oregon

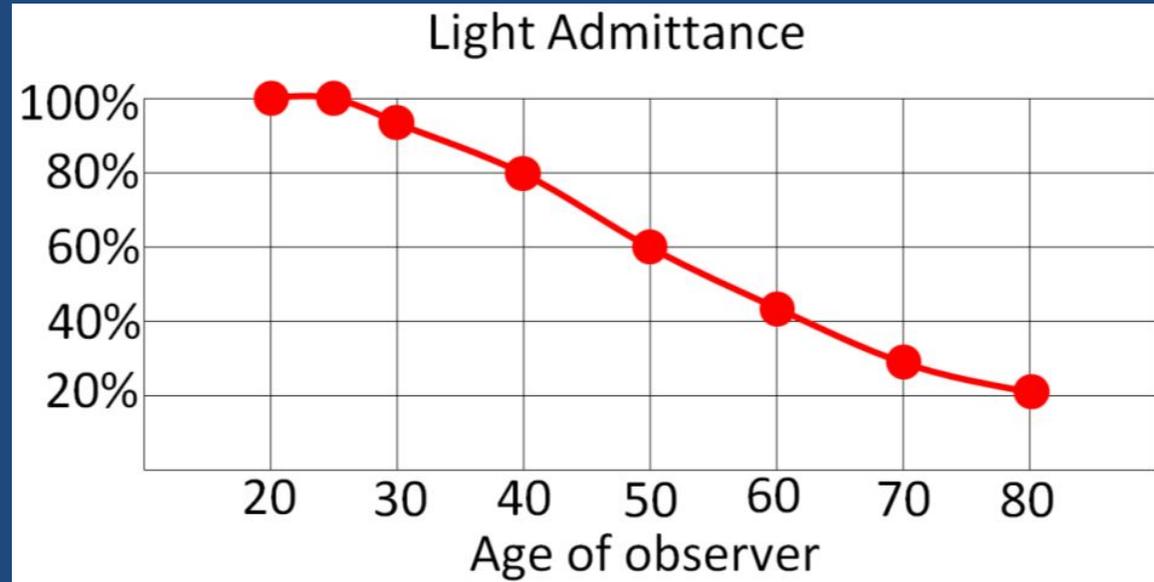








# Quantity of Light

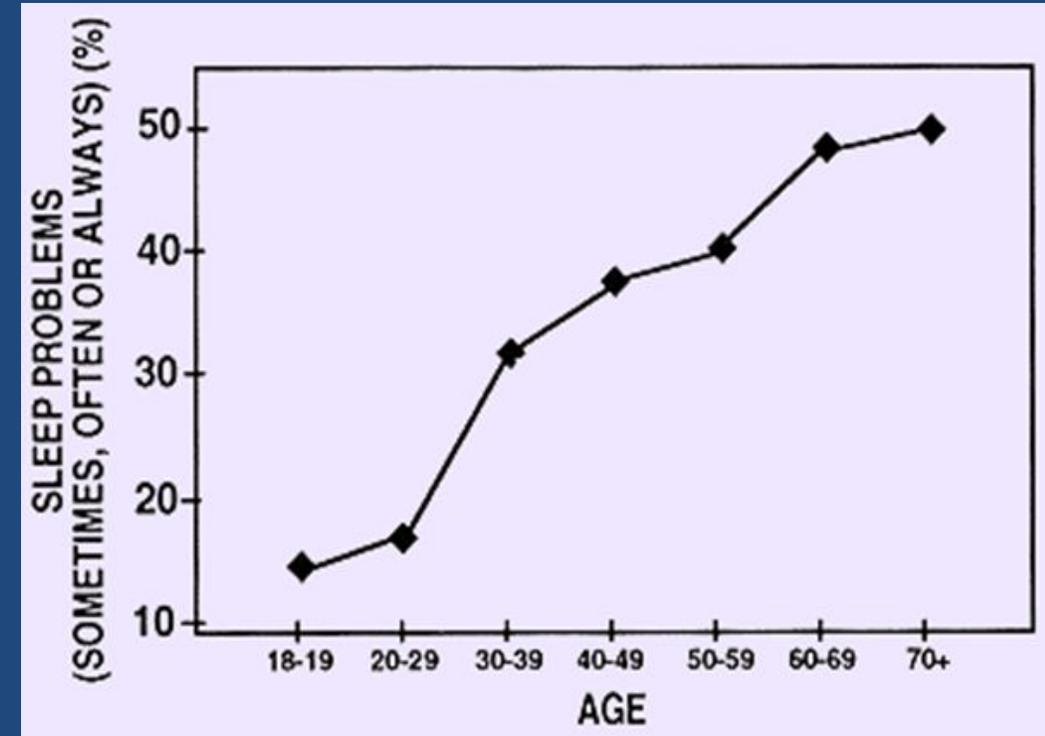


Compared to people 20-years of age, those 80-years of age receive only 1/5 the amount of light on the retina, impacting vision & health.

# Aging Eyes Impact Circadian Rhythm – Sleep!

- **Age Related Issues**

- Less bright blue daylight exposure due to mobility issues.
- Cataracts (yellow/orange) cancel the blue range of light, needed to synchronize circadian rhythm. - SCN
- Sleep problems increase as people age.
- Sleep time becomes earlier and shorter in duration.
- Exposure to blue light at night from electronic devices shuts down the flow of melatonin.



# Day and Night Repeat Nature's Color Rhythm



Cool in the Morning



Warm at Night

# Support for Improved Sleep

**Healthy Circadian Rhythm requires:**

## **Bright Days and Dark Nights**

- Window covering to block light
- Dim lights prior to bedtime
- Sleep in the dark
- Research: Improved nocturnal sleep:
  - Lights were dimmed to 20% of light during the day
  - Spectrum change from cool bluish /white (6500K) to warm buttery orange (2600K)

**Light Outdoors**

- Daylight at Noon 100,000
- Cloudy day 25,000
- Overcast day 10,000
- Therapy Light Box 2,500
- Nursing Homes 50
- Sunset 100

Measured in lux.

# Aging Eyes Impact Vision & Safety

## Overview of Normal Age-Related Changes to the eyes

- Older eyes require higher levels of light .
- Have an increased sensitivity to GLARE! (Contributes to loss of contrast sensitivity)
- Slower adaptation to changes in light levels
- Less sensitive to blue light (cataracts)
- Reduced contrast sensitivity

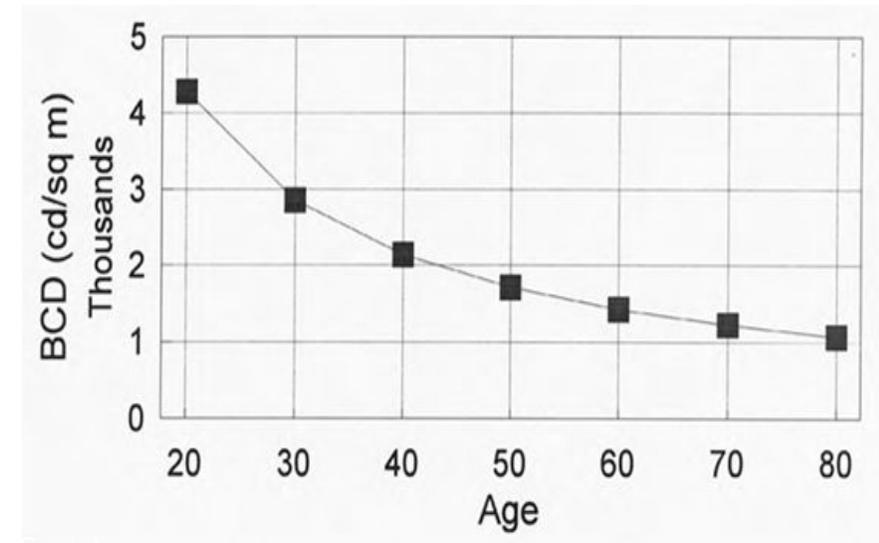
## Control Brightness & Glare

### GLARE: Increased Sensitivity with Age

Border between:

“Just Comfortable” and “Extremely Uncomfortable”

Bennett, The demographic variables of discomfort glare, LD+A Jan 1977



# Safety Consideration for Older Adults

Require higher light levels, but  
GLARE is a huge Problem



Use indirect lighting: Bouncing light  
sources off walls & ceiling to light the  
space and shield the light source from  
view..



# Safety Considerations for Older Adults, Cont.

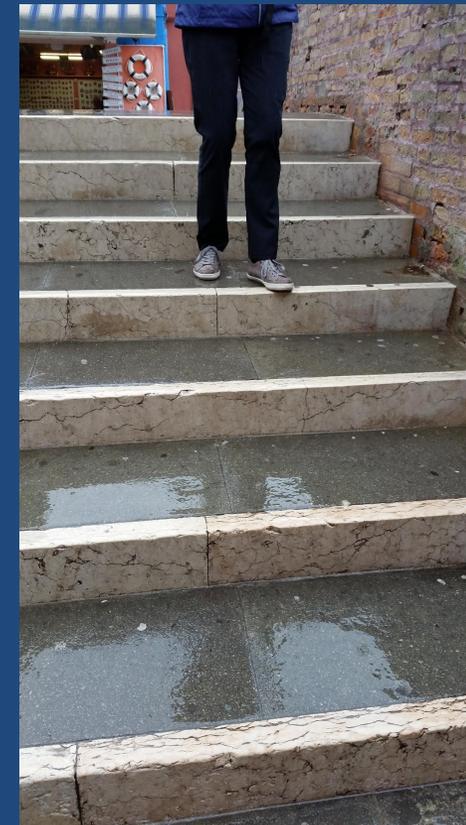
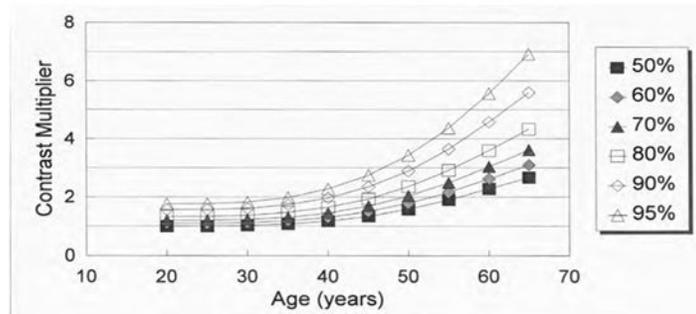
We see by CONTRAST, but older people experience a LOSS of CONTRAST SENSITIVITY!

Highlight the edge of steps and levels changes

## Contrast Multiplier by Age:

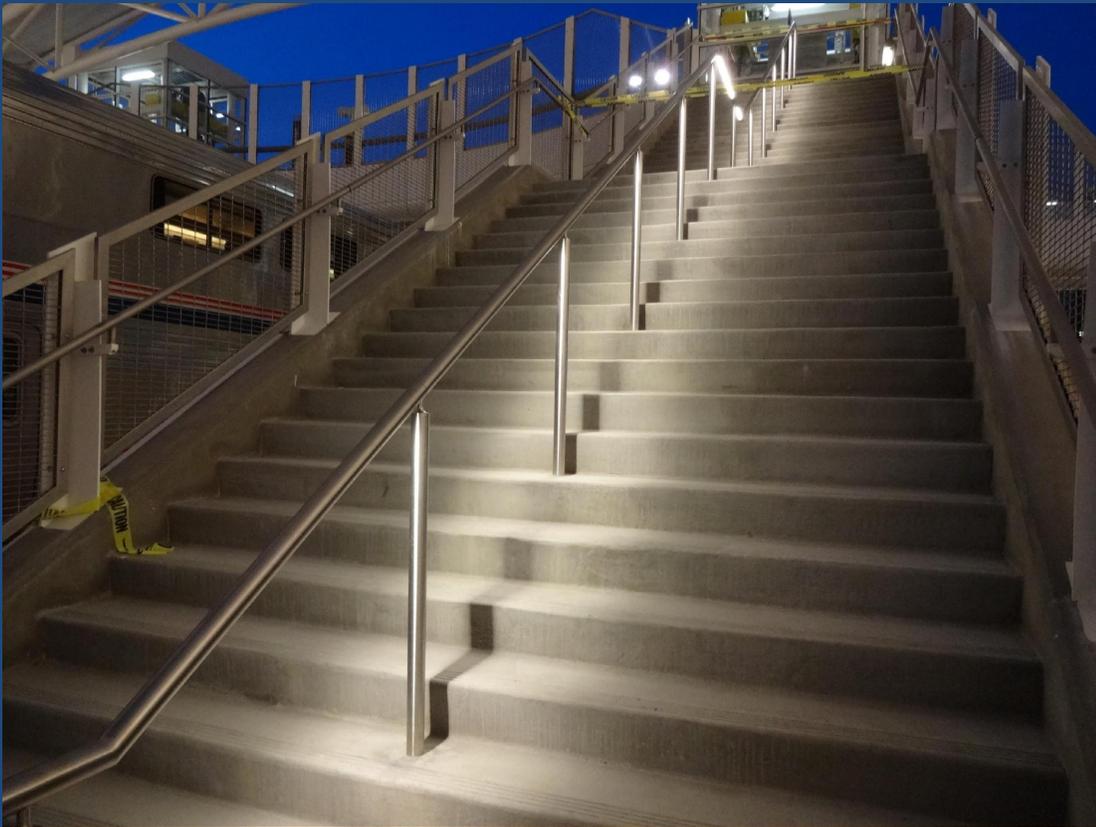
50% of 60 year old require 2.3 times as much contrast as 20 y/o  
To serve 95% of 60 y/o the contrast would need to be 5.5 times

Blackwell and Blackwell, Journal of the IES, 1980



# Safety Considerations for Older Adults, Cont.

Locate Light for Stairs below the line of sight, within the handrail.



Adding both contrast on steps and lighting would benefit seniors.



# Safety Considerations for Older Adults, Cont.

- **Slower Adaptation to Changes in Light Levels.**
- Older eyes adapt much more slowly from Bright to Dim, than from Dim to Bright.
- Gradually change the brightness of the lighted space to the dark outdoors.
- Personal head lamps could be useful after leaving the lighted space.



# Recommended Resource for Aging Eyes

ANSI/IES RP-28-25

**RECOMMENDED PRACTICE:**

**LIGHTING AND THE VISUAL ENVIRONMENT FOR  
OLDER ADULTS AND THE VISUALLY IMPAIRED.**

- AN AMERICAN NATIONAL STANDARD

# Thank you!

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