The Digital Eye Strain Explosion

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The Vision Council 2015 Report
Compared Digital Device use from 2012-2014

- Adult Smart Phone usage
  - 45% in 2012
  - 69% in 2014
  - 85% in 2016

- Tablet/E-reader usage
  - 26% in 2012
  - 42.5% in 2014

Digital Device usage

- 30% of all adults are High users spending 9+ hrs/day
- 61% use 5+ hrs/day
- 93% use at least 2 hrs/day

Digital Device Sources

- 77% TV
- 69% Smart Phone
- 58% Laptop
- 52% Desktop
- 43% Tablet/e-reader
- 17% Video game console

Very often using ALL at once

Activities using Digital Devices

- 38% “Alarm clock”
- 44% Work
- 43% Recreational Reading
- 26% Meal Preparation/Recipes
- 32% Travel/Flight/Ticketing
- Operate appliances, garage doors, lights, etc.
- Unlimited Apps

Digital Device Impact

Gen. Z (Born between 1997-2012)

- Born using technology before walking
- Continually “Connected”...
  - Snap chat, Instagram, Twitter, FB, others???
AOA’s 2014 American Eye-Q Survey

- Kids connected longer than parents think
  - 83% use electronic devices 3+ hrs./day
    - Only 40% of parents realize
  - 42% report 5+ hrs./day
    - Only 10% of parents realize

Risks of Digital Device Usage in Children

- Increased Myopia
  - Prolonged Near range activities
  - Decreased exposure to Natural Outdoor light
- Long term Blue Light exposure
  - High Energy visible UV penetrates deeper into the eye
  - Macular Degeneration
  - Cataracts

Kids and Digital Eye Strain

- Between 75-90% of ALL Learning is Visual!
- 80% report Digital Eye Strain symptoms
  - Tired
  - Burning
  - Itchy
  - Blurred vision

The Digital Disconnect

Okay, so you’re 10 years old, you have a laptop, iPod, Facebook and a Blackberry...
Dude, when I was 10 I only had 1 thing to play with. It was called “OUTSIDE.”


- 37.4% spend at least nine hours on digital devices each day
- 68% report symptoms of digital eye strain
- 85% own a smartphone
- 66% less likely than other generations to own a television
- 57% take their smartphones to bed and use them as alarm clocks

Gen X (Born 1965-1976):

- 32% spend 9+ hours on digital devices each day
- 63% report symptoms of digital eye strain
- 74% report not knowing about blue light damage
- 48% more likely to own tablets or e-readers
Boomers (Born 1946-1964):

- 26% spend 9 hours on digital devices each day
- 40% say they would wear computer eyewear if an eye care provider informed them of the potential danger of blue light emitted from digital devices
- 57% experience digital eye strain
- 81% are more likely to own a TV compared to other age groups

So...What is Digital Eye Strain?

- Complex of symptoms associated with Digital device usage
- 60 – 90% of ALL American users:
  - Eye Strain 33%
  - Neck, Shoulder, Back pain 33%
  - Headache 24%
  - Dry Eye 23% (Reduced Blinking)
  - Blurred Vision

2014 Tear Physiology Study

- Office workers who experience eye strain undergo physiological changes in tear fluid similar to people with dry eye disease.
- Normal Blink Rate = 18X/min.
- Digital use reduces blink rate by half = 9X/min.

What they don’t know can hurt them!

- 72.5% of adults are unaware of the potential dangers of blue light to eyes
- 31.9% of adults do not take any action to reduce symptoms of digital eye strain

DES: Causes/Solutions

1. Text on a Screen
   - Constant refocusing in front and behind screen causing blur, eyestrain and HA
   - Solution
     - Increase text size
     - Enhance contrast and brightness
     - Glare filter
     - Dust and keep screen cleaned

2. Excessive Usage Time
   - 61% usage of 5+ hrs/day resulting in dry tired eyes
   - Solution
     - Follow the 20/20/20 Rule (Only 14% take breaks)
     - Remind yourself to blink
3. Workstation Distance and Setup
   - Close and Intermediate range
   - Solution
     - Adjust distance to arms length (Palm to screen)
     - Decrease overhead and surrounding light
     - Drop screen height to just below eye level

4. Pre-existing Vision Issues
   - Refractive issues
   - Near/Intermediate correction required?
   - Dry Eye
   - Solution
     - Correct refractive issues
     - Treat Dry Eye - keep drops by computer

5. Glare and Blue Light
   - Reflection off walls and screens
   - Solution
     - Front and Back surface AR
     - Anti-Glare screen monitor
     - Adjust Room Lighting (Lamps vs. Overhead lights)

So what is Blue Light anyway?
- HEV light that appears white but has a large blue light component
  - Exposes the eye to hidden spikes in intensity at wavelengths within the blue portion of the spectrum (400 to 450nm)
  - Emitted by digital devices and modern day lighting

Blue Light Research
- Cumulative and constant exposure to blue light can damage retinal cells
  - Age-related macular degeneration
  - Cataracts
**Benefits of Blue Light?**

- Color vision and perception
- Establishes natural circadian rhythms and sleep-wake cycles in the human body by aiding in cognitive functions
  - Alertness
  - Memory
  - Emotion Regulation

**Blue Light and Sleep**

- Frequent exposure to Blue Light at bedtime excites the brain and prevents falling into natural restorative sleep.
- Blocks production of Melatonin
  - SleepShield
  - Twilight
  - F. Lux
  - LowBlueLights
  - BioBrite

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**Teenage Boy Sleep Study**

- 13 teens between 15-17 yrs
- 1 week wearing Blue Blocking lenses between 6pm-bed
- 1 week wearing Clear lenses between 6pm-bed

Conclusion:
- Felt sleepier with Blue Blockers
- Higher Melatonin levels (saliva samples) with Blue Blockers

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**Impact of Blue Light on Melatonin Levels**

- Actual melatonin level production was measured.
  - Regular sunglasses - 46% decrease in melatonin
  - Blue-blocking glasses - 6% increase in melatonin

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**Specialized Eyewear...Options to consider...**

- How much Time is spent in front of the computer?
- What other Viewing Distances are required?
- What are the Ambient lighting conditions?
- What is your Distance from the computer?
- What type of computer work is being done?
Digital Lens Types

- SV lenses at computer working distance
- Computer Progressive- wide/intermediate/near w/ limited distance
- High Fitting Bifocals- wide segment made at face to computer distance
- Progressives- Limited function

Digital Lens TECHNOLOGY

- With or Without a prescription
- Different filters, lenses & materials tailored to lifestyle needs
- Allow adults and children's eyes to relax, adjusting to intermediate-distance objects and reducing glare during prolonged use of digital devices
- Allows for relaxation, sharper focus and reduced blurriness and pixilation, which can cause discomfort

Digital Lens TREATMENTS

- Traditional AR
  - Reduces reflection and glare from indoor and outdoor lighting sources and ghost reflections from light sources that can contribute to visual noise and distractions.

- Blue Blocking AR
  - Reduces reflection while blocking out potentially harmful HEV light at blue end of spectrum
  - Provencia
  - Duravision BlueProtect

Crozal PREVENCIA

- Crozal No-Glare Lenses
- Eye-Sun Protection Factor (E-SPF®) of 25
  - Lenses protect your eyes from harmful UV rays 25 times more than if you weren't wearing glasses at all

Digital Lens TREATMENTS

- Colored Filters
  - Filters out harmful blue and violet light
  - Prescribed to reduce harsh office lighting and balance colors.

Blutech LENSES

- "Protection the way Nature Intended"
- Prevention
- Protection
- Performance
  - VA
  - Contrast
  - Night vision
  - Depth perception
  - Color perception
ZEISS Digital SmartLens

"Clear, Relaxed Vision All Day Long"

- Provides "Clear, Relaxed Vision All Day Long"
- Wide clear distance viewing
- Digital power boost which allows for relaxed focusing
- Eyes don't have to focus and converge as they do with a traditional lens – that's what fatigues the eye muscles
- Great for Millennials and Generation X'ers

ZEISS OfficeLens

Puts an end to Digital Eye Strain and get clear, relaxed vision all day long.

Solution: ZEISS OfficeLens

ZEISS OfficeLens

Solution: Wide, ergonomically positioned near and intermediate
Result: Weakened muscle for complete comfort all day long

Gunnar LENSDesign

Lens Design with Highly Wrapped Frame

- Limits air currents near the eyes
- Increases humidity
- Prevents irritation
- Enhances focus on sharpness detail
- Eases eye strain.

THE BENEFIT:

- Reduces DryEye irritation
- Reduces Muscular strain

Gunnar LENSMaterial

- Ultra light material
  - Eliminates distortion from impurities and hazes found in inferior materials
  - The benefit: Stable optics that won't permanently deform when flexed or degrade over time through repeated use. Optically pure viewing experience with ultra-light, ergonomic properties that provide:
    - Low density with lighter lenses
    - Higher light transmission rate that enhances clarity
    - Higher ABBE value for distortion-free viewing
    - Medium index of refraction (1.51) allows for thinner lenses

Gunnar LENS TINTS

- Custom lens tints
  - Filters blue light and block UV
  - Enhances contrast
  - Filters spectrum replicates natural light
  - Minimizes visual stress

THE BENEFIT:

- Tunes artificial blue light to enhance the physiology of the naked eye
- Increases contrast perception
Gunnar LENS TINT Options

- Amber Tint - designed for light that comes off computer screen.
  > Enhances contrast and visual performance while minimizing screen glare and damage from blue UV.
- Crystalline Tint - Coating formula designed specifically for graphic designers, video/film editors, and creative visual artists
  > Creates an equally balanced color spectrum.
- Non-polarized Outdoor - creates a more comfortable and rich visual experience for anyone viewing their digital devices outdoors.

Gunnar LENS COATINGS:

- Anti-reflection coating - Double sided to reduce glare and reflective light to eliminate visual distraction and stress
- External hard coat - provides extended lens durability and resists scratching

NOMOPHobia

- “Digital Addiction... The irrational fear of being without your mobile device” (Between 50-60%)
- Addicted regardless of how much damage phone time may be doing to our eyes, not to mention our relationships and psyche.
- CES 2015 Consumer Electronics Show in Las Vegas, finds Americans look at their mobile phones an average of 100 times each day (What about YOU?)

Thank you for your Attention!!

Now hurry and check your phones...

Dr. Kris Kerestan