Other Lighting Applications

- Neonatal Jaundice or Hyper-Bilirubinemia
- Bactericidal Applications
- Myopia and sunlight
- Blue Light Key Concepts

**Neonatal Jaundice or Hyper- Bilirubinemia**

- Bilirubin is a normal component of RBCs
  - Removed from the liver
  - Excess moves to the skin, sclera and organs
- Physiological
  - Occurs in 60-70% of infants at gestational age of 35 – 38 weeks
- Pathological
  - Brain damage (keratitis), hearing loss, growth delay & death
- Phototherapy
  - Historically “Sunning Infants” early morning or late day
  - Bilirubin absorption spectrum is 400 nm – 520 nm where it is converted to the isomers photo-bilirubin and lumobilirubin.
  - Fluorescent light induces (10-30%) degradation over ½ - 3 hours

**Bactericidal Applications**

Is ultraviolet within sunlight impinging upon the skin, eyes and conjunctival vessels important for reducing pathogen load?

**Myopia and sunlight**

Spectral distribution, intensity, Bandwidth and Temporal frequency of Ambient Light

- An environment that deprives the eye of blue light stimulation, either from low color temperature tungsten bulbs, dim illumination, spectral filtering by spectacles, or reduced sunlight exposure, will tend to make the eye vulnerable to myopia at low temporal flicker frequencies.
- Without blue light, the compensatory changes in choroidal thickness (moving the retina anteriorly) are insufficient to compensate for the associated ocular elongation of the eye.
  

- Long wavelength light is known to induce a myopic shift.
  

**Blue Light Key Concepts**

1. Our sun, modern Indoor LED lighting, cell phone / Pads / computer displays all emit “bad blue” radiation.
2. Ophthalamic Lens Manufacturers Have embraced blue light protection with new spectacle products, especially Zeiss.
3. Dietary Ocular Carotenoids (lutein / Zeaxanthin) also protect against “bad blue”.
4. Dietary Ocular Carotenoids, uniquely improve visual performance thru non-optical biological mechanisms while protecting the desirable circadian rhythm mediated “good blue”.
5. Synergy with external “sunglasses”
SAD (Seasonal Affective Disorder)

- 10,000 lux x 20 minutes
- Morning only
- Blue Light Best except for patients with AMD or Migraine

Lumie ARABICA SAD lamp

10% of neurons from the retina are ipRGCs and help entrain the circadian rhythm.

https://blogs.hopkinsinteractive.com/guest/2011/03/i-am-not-a-comp-sci-major/

Human Biological Functions are controlled by our circadian biological clock (blue-green turquoise light = 480nm)

Vision Institute in Paris (IPMC, Inserm, CNRS)

BLUE MORNING LIGHT is desirable to set biological clock

NATURAL LIGHT x 15 minutes preferable for additional near IR enhancement. Viewing a 5000 – 6500 Kelvin Daylight or High Luminance BLUE LIGHT BOX for 20 minutes. However, OUTDOOR best.

https://c1.staticflickr.com/3/2550/4140731938_3625586dd9_b.jpg

NATURE IS BEST
UV + VISIBLE BLUE + IR
https://doi:10.1371/journal.pbio.0060166.g002

Light and Fertility

- Arctic Eskimo women cease ovulating during the winter.
- Summer Solstice Conception
  - 2X as many babies born in Spring compared to Autumn
  - Sunlight stimulates the ovaries for follicle growth with abundant
    production of estrogen, progesterone

  Equalitarian climates have high fertility, but twin births are rare
  - The farther north or south latitude, the more frequent twin births

  Japanese research shows irradiating face and breast with red light
  stimulates milk production.

  Doubling the 24 hr light cycle for Hens doubles egg production.

  Chinchillas and Mice conceived under red light produce more males
  Chinchillas and Mice conceived under blue light produce more females

Sunlight improves cardiac output, Mb oxygen carrying capacity
And sex hormones (an aphrodisiac)
BLUE LIGHT INVASION
Compromising our natural Circadian Rhythm with LED & Digital Screen Device Overload depressing melatonin and raising body temperature.

Modern “Bad Blue” Light is ubiquitous

IPAD & SMARTPHONES
Both quantity and intensity of blue light exposure matter – emit up to 30% blue light.

The Ophthalmic Lens Market Has Embraced protection against this “Bad Blue”

Excessive and ill timed blue light exposure
➢ The average American spends 4 1/2 hours a day watching television and using screens at an early age at all times of day.

Sources of blue light

BENEFICIAL EFFECTS
➢ Helps regulate the circadian rhythm
➢ Helps stabilize melatonin levels
➢ Reduces sleep latency and improves sleep quality
➢ May reduce the risk of diabetes, heart disease, and obesity
➢ May improve visual performance

HARMFUL EFFECTS
➢ Inhibits the production of melatonin
➢ Disrupts the circadian rhythm
➢ Causes dry eyes and eye strain
➢ May increase the risk of certain types of cancers
➢ Excessive use of electronic devices may lead to vision problems
➢ May cause temporary or permanent damage to the retina

VSP TechShield®
Essilor
Crizal Prevencia®
& Transitions 7

http://eyeworldoptics.blogspot.com
Why should I care about inappropriate blue light?

- 67% of adults spend 7 or more hours a day using a computer or handheld device
- 56% use a smartphone, computer, or handheld device when reading a book
- 64% of Americans sleep with their cell phones

EVENING / SLEEP LIGHTING

- Tungsten / Halogen lighting
- Candle light - quaint
- UV task lights - modern
- Warmer Color Temperature
- Smart Device in “night mode”
- Yellow / Red night lights
- Pitch Black quiet, EM free, sleep environment
  - Consistent sleep time 10:30 PM – wake early
  - Avoid too much sleep
  - or too little sleep w/o naps
- Journal of Psychiatric Research, 2017 – wearing amber lenses at night provides 30 minutes additional sleep time.

Practical Strategies For Reducing Harmful Endocrine Effects of Blue Light

- Turn off devices ≥ 1 hour before bed time
- Reduce screen blue light emission at night
  - www.f.lux.com

- Wear spectacle lenses that filter both blue-violet and blue-turquoise light at night (415-520 nm)
- Wear spectacle lenses that filter blue-violet light at day (415-450 nm)

Blue Light Protection www.lowbluelights.com

Circadian rhythm enhancement

Macular Pigment Protects

By absorbing stray Blue and UV A photons ESCAPING the Cornea and Ocular Lens

In the retina “Blue” light absorption means better image quality, but
Photochemical Induced Retinal Injury
"Excess Bad Blue" = 415 - 455 nm

Research Supported by Essilor, Paris

Beaver Dam Results
young adult behavior matters for AMD risk
Leisure time spent outdoors as teenagers and in their 30s significantly associated with the risk of early AMD (OR 2.09; 95% CI, 1.19-3.65).
Slight protective effect for use of hats and sunglasses while teenagers and in their 30s (OR, 0.72; 95% CI, 0.50-1.03).
Red or blond hair slightly more likely to develop early ARM than people with darker hair (OR 1.33; 95% CI, 0.97-1.83).
There were no associations between estimated ambient UV-B exposure or markers of sun sensitivity and the incidence of early AMD.

Dietary Carotenoids
Provide Both Protection & Performance
1. Building Higher Macular Pigment Protects Against Blue Light
   A. Provides robust internal protection, complimenting immediate external blue light lens protection
   B. Maintains our circadian rhythms
   C. Does not limit light transmission
2. Dietary Zeaxanthin and Lutein
   A. Protection against AMD
   B. Protection against Cataract
   C. Superior Visual Performance
3. Additional unique benefit of Dietary Zeaxanthin / Lutein
   A. Protection against skin cancer
   B. Protection against cardiovascular disease
   C. Superior Cognitive function (emerging)

Night Driving Challenges
(worse for 15% + drivers > 65 years)

Lutein and Zeaxanthin influence visual function through biological as well as optical mechanisms
- Optical mechanisms
  - Glare Disability
  - Glare Recovery
  - Color Contrast
  - VISUAL RANGE
  - Contrast Sensitivity
- * Biological mechanisms
“Vision Impairment due to glare is the #1 source of vehicular accidents both in the day due to the SUN and at night due to BRIGHT HEADLIGHTS.”

GLARE Disability

SUMMARY: Carotenoids are Superior Internal Sunglasses with Vision & Emerging Cognitive Benefits

- Improvement in responses to dark and light adaptation (i.e. Tunnels)
- Decreased Glare disability (GD) and better Glare recovery (PR)
- Up to 5 seconds in a 60mph car = 440 ft. faster stopping
- Better Color Contrast (CC) and Mesopic Twilight vision
- Contrast sensitivity (CSF) - improvement up to 75%
- Can see up to 30% more on a hazy day (CC)
- Better Temporal processing speed (CFF)
  - means quicker decisions at intersections
- Expect overall daylight and night driving improvement.

3 Human Macular Pigments

Lutein (meso–zeaxanthin) and Zeaxanthin

Dietary Zeaxanthin also accumulates in the fovea

Meso-zeaxanthin is rare in nature

Dietary Lutein and Zeaxanthin

220 pounds of fish skin are required to create 2 mg of mesozeaxanthin

Dietary Carotenoids and deposit in the Brain - at any age.
**Simulation of Average Glare Disability improvement from LOW MP to HIGH MP is about 40%**

Image simulation

Increased stray light by 40%

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**MPOD Measurement**

Heterochromic Flicker Photometry (HFP) is the Gold Standard

MPOD instrumentation has improved significantly

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**Zeaxanthin and Lutein**

- Static Visual Performance: "See Better"
- Dynamic Visual Performance: "React Faster"

![MPOD Image](image)

- Optic Effects
  - Glare Disability
  - Photostress Recovery
  - Contrast Enhancement
- Neural Effects
  - Temporal Vision
  - Coincidence Anticipation
  - Reaction Time

- Optical Effects (LZ in Retina)
- Neural Effects (LZ in Brain)

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**www.lumithera.com**

(Photobiomodulation for AMD)

Sep 22, 2016 - The technology— which uses light-emitting diodes of red (670 nm), yellow/orange (590 nm), and infrared (790 nm) - promotes mitochondrial dysfunction and oxidative stress. This leads to an improvement in age-related macular degeneration.

- MitoaChroms produce energy to sustain normal cellular function
- Photobiomodulation treatments for ocular diseases and disorders
Photobiomodulation “FINSEN CLINICS”

- Treatment of psoriasis, eczema, vitiligo, T cell lymphoma w UVA &
- Psoralens - plant PIGMENT that absorbs UV-A
- Treatment of Chickenpox and Smallpox with red light

Niels Ryberg Finsen - Nobel Prize 1903

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Dinshah P Ghadiali
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(856) 692-4686
Email: dinshahhealth@aol.com

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Baker – Miller Paint for Reduced Aggression
P-618, Schauss pink, or Drunk-Tank Pink
1979, Naval Correctional Institute, Seattle

A light red for love & romance - thought to be a calming color associated with love, kindness, and femininity and compassion with the shadow or negative aspect being ‘self criticism’.

While pink’s calming effect has been demonstrated, researchers of color psychology have found that this effect only occurs during the initial exposure to the color. (Purple also considered feminine)

- Sports teams, Iowa Hawkeyes, sometimes paint the opposing team’s locker room pink to keep the players passive and less energetic.
- Inmates become more agitated after long exposure.
- Older fluorescent lights induce cancer in animals (John Ott)

Can past experiences, cultural influences, personal taste, and other factors impact the way a person feels about a particular color, including the color pink?

Hex triplet: #FF91AF
SRGB B (r, g, b): (255, 145, 175)
CMYK H (c, m, y, k): (0, 43, 31, 0)
HSV (h, s, v): (344 °, 43%, 100%)

15 minutes of exposure to reduce violent or aggressive behavior

11/15/19
Max Luscher (1923-2017)
Swiss Psychotherapist

- Lüscher relates to his four fundamental colors to the following fundamental categories:
  - Blue: Contentment
    - Feeling of belonging, the inner connection and the relationship to one’s partner.
    - “How I feel towards a person that is close to me”
  - Green: Self-respect
    - Inner control of willpower and the capacity to enjoy.
    - “The way I want to be”
  - Red: Self-confidence
    - Activity, drive and the reaction to challenges.
    - “How I react to challenges”
  - Yellow: Development
    - Attitude of anticipation, attitude towards future development and towards new encounters.
    - “What I expect for the future”

Prof. Dr. Max Lüscher was the head of the Institute of Psychomedical Diagnostics in Lucern (Switzerland).

What the Lüscher-Color-Diagnostics® and Therapy can do

- Non-verbal, fast method about 5 minutes.
- Objectivity: No subjective factors either when administering the test or during its diagnostic evaluation.
- Direct and differentiated insight into the causes and psychovegetative structure of symptoms or complaints.
- Differentiates between underlying constitution and momentary disposition.
- Provides the physician with information from the patient’s history.
- “Structural therapeutic strategy” for psychotherapy.
- Suggestions for homeopathic remedies.
- Provides the physical therapist with useful information. Underlying cause of the pain in a particular region.
- Suggestions for personal assessment.
- Computer-assisted diagnosis

AtEase Glasses are easy to use and zero-risk. When you feel stress, anxiety, restlessness, or distraction, simply put on your AtEase Glasses. Sit still, read, listen to music, watch a movie, etc. for one to fifteen minutes. By blocking out visual noise, the glasses help your brain relax.

The double injection lens with a lens amber viewing window blocks peripheral distractions and creates visual isolation.

By utilizing specific light blocking and visual occlusion technology, AtEase Glasses enhance focus and limit distractions as therapy for neurological function and performance.

Every pair comes packaged in a microfiber pouch and semi-hard case.

Polycarbonate Frames
The Lüscher-Color-Diagnostic® measures a person’s psychophysical state, his or her ability to withstand stress, to perform, and to communicate. It uncovers the cause of psychological stress, which can lead to physical symptoms.

Using 5015 precise definitions, the selections from among these predetermined test colors measure the state of 23 personality traits, some of which lie outside the realm of the conscious.

Because the color selections are guided in an unconscious manner, they reveal the person as he or she really is, and not as he or she perceives him- or herself, or as he she would like to be perceived, which occurs when questions are asked directly or by questionnaires.

The results of the Lüscher-Color-Diagnostic® (ca 5 pages) contains indications pertaining to personal assessment and special, professional recommendations as to how psychological stress and the resulting physical symptoms can be avoided. It also offers additional information for verbal and homeopathic therapy.

Let There Be Light
“Spectrochrome for Every Home”

- 320 diseases
- ULTRA G Colors for Acute Inflammation
- INFRA G Colors for Chronic Disease
- Systemic or Local Skin Tx
- All colors reach skin capillaries
- Why 30 to 60 minute Tx assures whole blood supply treated several times
- Traditional Thermal Source – 25 watt projector w gel filters
- Intensity not important
- Resonance: Informational Toning – important
- Dark Room Best
- "Profound, Inexpensive, Safe”
- Need Tungsten Lamp Projector, Filters, Temp controlled room
- Devices outlawed by FDA since mid 1940s

Visible Light as Therapy

Eylights
- Programmed to 8 different colors
- Lights on 2 seconds / off 8 seconds
- Can blink on non-dominant eye only
- Hemifield, right or left visual fields
- L / R eye only inferior field BRIGHT
- Stimulates magnocellular pathway (parietal cortex)
- L/R eye only superior field BRIGHT
- Stimulates parvocellular pathway (temporal lobe function)
- Blinking Lights (R or L) stimulates both brain sides

WARNING: Wearing Color Therapy Glasses will alter your vision and may impair your ability to see traffic lights or other important visual cues. Do not wear Color Therapy Glasses while driving, operating heavy machinery, or any other hazardous activity. Do not wear for prolonged periods of time. Recommended use is 10-60 Minutes per day. This product can be dangerous if used improperly. Use common sense at all times.

- Violet
  - Assists eye fatigue and may control irritability
  - Can be used for Golfing
- Blue
  - Assists eye fatigue
  - Can be used for Golfing
- Green
  - Assists eye fatigue
  - Can be used for Golfing
- Orange
  - Assists eye fatigue
  - Can be used for Golfing
- Red
  - Assists eye fatigue
  - Can be used for Golfing

Clear Lenses
- Used indoors while reading, studying or watching TV
EXTRA SPECTRAL COLORS

Turquoise (485nm)- a Dinshah ultra green color

- An Aqua Sea Green "Healing & Protective." frequency that activates the iPGC (intrinsically active ganglion cell complex at 485nm) – BEST USED AM
- C# note (565 Hz) or 554 Hz in modern adjusted frequency
- Beethoven Sonata Quasi Luna Fantasia or "Moonlight Sonata"
- John Lennon, "Imagine"
- Applications
  - Optic nerve injury
  - TBI
- Absorbs Red
- Opposite = Dinshah Scarlet (between Dinshah red & magenta) a strong red stimulant, associated w courage, force, passion, heat & joy
- Opposite = TheraSpecs Migraine / Epilepsy protection specs
- RGB (255,36,0) – approximately 616nm- has some orange in it

www.color-meanings.com Dinshah 565 Hz sound equiv.

Photosensitive Epilepsy

www.theraspecs.com

TheraSpecs lenses block 80% of the most harmful blue-green light

- 50 million have epilepsy
- Only 3 - 5% are photosensitive
- But 40% w juvenile myoclonic
- Frequencies of about 5 - 30 flashes per second
- More than 4 minutes
- Faulty fluorescent lights
- LED, TV, Computers
- Bright, sudden, camera flashes
- 30 % w striped high contrast patterns
- Close space

Migraine Brains Are Smarter

Migraine
BLUE -- Traumatic Brain Injury
Prescribe w 2 BD OU Yoked Prisms

50 Medical Conditions - Photophobia

Research References

Purple (Secondary Color via Combo of Red + Blue)
- Royal Color
- Depressant
  - Circulatory, Reproduction, Emotions
  - Reverse Musical Polarity to Turquoise at 565 Hz - Plays at A# and E
- Lowers Blood Pressure
- Classic Pain Relief
- Evening Color, Improves Sleep Quality

Opposite = Lime
Indigo (420 - 450 nm) approx. 435 nm

- TONATE for ACUTE ANTI-INFLAMMATION
  - "Ultra Green" DHS color
  - Violet to Indigo to Blue to Turquoise to Green to Lemon
  - Healing after burns and post surgical trauma
  - 5 to 10 minutes, treat until discomfort disappears
  - Passion, Stasis, Decrease hemorrhaging
  - Classic Pain Relief
  - TBI and migraines
  - Few musical pieces
    - (D#) - few musical pieces
    - E (flat)
    - Schubert Impromptu in E flat
    - Hayden / Mozart Sonatas
  - Opposite = Orange

Magenta (531.5 Reverse Polarity)

- Equilibrator
- Circulation
- Reproduction
- Emotions
- "Rose Color Glasses" – calming effect for animals /humans
- Decreased depression (acts like lithium)
- Use with autistic children to calm them down in office and at home
- X –Chrome Lens
- Expands CIE space / Better discrimination of color differences in patients with congenital color blindness
- Evening color
- Opposite = Green

Lemon (Lime)-
TONATE for CHRONIC DISEASES

- "Infra Green" DHS Color (lemon to yellow to orange to red)
- Always take longer to treat
- Type II DM – Alexander Wunsch, MD
  - 1 tonation / day with Lemon
  - 1 tonation / day with Yellow
  - Decrease pancreatic insulin by 30%
- Liver Cirrhosis Alexander Wunsch, MD
  - Subject lived 36 years w lemon / red tonation – not 6 months

SCARLET-STIMULANT

circulation – reproduction -emotions

Applications:
- low diastolic blood pressure,
- low tension glaucoma (LTG),
- positional hypotension / syncope,
- erectile dysfunction (ED),
- chronic kidney disease (CKD),
- congestive heart failure (CHF)

VIDEOS

- Retarded Wound healing in submarines and space station
  - No sunlight, low oxygen, fluorescent lighting
  - Munsch 3rd Degree Burn Healing VIDEO - HEALING IN 14 DAYS

Sensory Learning Therapy

www.brodieoptometry.com

BRODIE OPTOMETRY

Also - Cedar Rapids Vision
in Motion – Dr Fitzgerald

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DINSHAH CLINICAL COLOR APPLICATIONS (1920)

PRIMARY COLORS
• BLUE (VIOLET) = anti-inflammatory i.e. TBI, Migraines, Burn Victims
• GREEN = Antiseptic i.e. hospital walls
• RED = Photo-biomodulation for Increased Blood Flow i.e. kidneys, thyroid, NAFLD, 18% increased mitochondria function

SECONDARY COLOR MIXTURES - examples
Turquoise = healing, optic nerve trauma, TBI
Purple = lower blood pressure (Lime ? – raise BP ?), pain
Indigo = decrease hemorrhaging, pain
Magenta = equilibrator, calming color, X-Chrome lens, pain

spectacle lenses and UV protection

AMD- Controversy – yellow tints are helpful to read but no tints for driving at night!
• AVOID DARK GREY TINTS!
  • Yellows improve edge contrast and visibility
  • Some Eschenbach magnifiers have built-in orange – yellow and diffuser for light sensitivity.
  • But Don’t Promote Yellow Tints for driving as decreases light!
• Expert Dr. Scott Roberson- Milwaukee OD- Medical College of Wisconsin low vision clinic.
• Expert Dr Porter uses for optic nerve diseases and glaucoma.
• 1 hour Webinar
Avoid with low vision patients, as reduces contrast.

- AMBER – IS IDEAL FOR AMD LOW VISION PATIENTS as IMPROVES CONTRAST ONLY FOR DAYLIGHT DRIVING (TOO DARK @ NIGHT)
- PLUM MAY BE EVEN BETTER – MORE CONTRAST, BUT CAN BLOCK LIGHT TRANSMISSION (TOO DARK @ NIGHT)

We need to have a new respect for nature and natural light, and prescribing therapeutic light can heal.