

# Harmonious Correspondence?

## Harmonious Correspondence? Exploring Technology: How you practice & In your practice

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## Financial Disclosures

- Paul:
  - None
- Samantha:
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## Course Description

- This course presents a meaningful discussion on telehealthcare and the evolution of healthcare delivery.
- It discusses technology's role in delivering healthcare, eyecare and vision care, and in expanding our therapeutic toolbox.
- "Healthcare delivery disruptors" are identified, impacting general medicine, primary care optometry, and vision therapy. These include: Diagnostic systems which remove the geographic barrier to patient access, as well as patient-interface diagnostics conducted without a monitoring physician. These also include remote treatment systems for vision therapy.
- The course identifies the current technology-driven solutions for delivering vision therapy, in and out of the office environment.

## Objectives

- To present relevant information on the current and evolving state of technology in the healthcare, eyecare and vision care arenas.
- To stimulate thought and discussion on adapting to "healthcare delivery disruptors" as we weigh risks and benefits of incorporating technology into our practices.
- To identify the current technology-driven solutions for delivering vision therapy, in and out of an office-based environment.
- To determine how we can mitigate perceived risks with careful placement of the technology within our offices, as well as parental guidance.
- To consider our responsibilities, professionally, socially and ethically, as we employ (and thus endorse) the use of technologies in our office.
- To consider the impact of our professional decisions on child and visual development in children.

## Outline – Part I

- Introduction
  - How are we defining technology
- Technology and HOW you practice: The macro-perspective
  - Technology is the great business disruptor
  - Technology is the great business opportunity
  - Technology cannot be ignored, it must be harnessed in a way that both expands one's business and protects it
- Technology IN your practice: The micro-perspective
  - Practice Management – EHR, Remote Record Access, Patient Communication
  - Examination & Treatment – Systems and Equipment Currently are Available; What is on the horizon?
  - Remote Access to Care – Telemedicine and VT

## Outline – Part II

- Macro- and micro- implications are discussed with each of the following technology topics:
  - Tech and human integrations
  - Impact of technology on our patients' visual function/efficiency
  - Screen time guidelines... Discussing use and limit considerations
  - EMF emissions
  - Bioharmonic EMF applications, general and eye-health
  - Tech Advantages for visual stimulation
  - Case/studies exploring *behavioral* impacts
  - Case/studies indicating physical impacts

## Technology Defined

Merriam-Webster defines technology as follows:

- 1a. The practical application of knowledge especially in a particular area: *medical technology*
- 1b. A capability given by the practical application of knowledge: a car's fuel-saving *technology*
2. A manner of accomplishing a task especially using technical processes, methods, or knowledge: new *technologies* for information storage
3. The specialized aspects of a particular field of endeavor: educational *technology*

## Technology – Working Definition

For the purpose of this lecture we will define technology as all electronic devices tools instruments and modalities which are used by the population at large, and those which can be used in the delivery of healthcare, specifically vision therapy

## Integration of Technology in Daily Life

- Cell phones and accessories (ex.: Bluetooth devices, wireless chargers, etc.)
- Tablets, Laptops, etc.
- Google glasses, Meta Pro Smart Glasses, Vuzix Smart Glasses M100, etc.
- Apple watch, ASUS ZenWatch 3 WI503Q-GL-DB, Huawei Watch Stainless Steel, Pebble Time Smartwatch, etc.
- Fit bit, Xiaomi MI band, Samsung Gear Fit, etc.
- Microchipping
- DNA / genetic testing
  - Medical purposes
  - "Fun"/ curiosity
- Other?

## Technology and HOW you practice: The macro-perspective

- Technology is the great business disrupter
- Technology is the great business opportunity
  - Tools available to expand patients' access to care
  - Tools available to expand doctors' access to patients
  - Treatment equipment/tools
- Technology cannot be ignored, it must be harnessed in a way that both expands ones business and protects it – "One must integrate or you will certainly Evaporate." The days of sticking one's head in the sand and ignoring what is happening around us are gone forever!

## Technology is the Great Business Disrupter

As defined in the Harvard Business Review...

"Disruption" describes a process whereby a smaller company with fewer resources is able to successfully challenge established incumbent businesses.

Specifically, as incumbents focus on improving their products and services for their most demanding (and usually most profitable) customers, they exceed the needs of some segments and ignore the needs of others.

Entrants that prove disruptive begin by successfully targeting those overlooked segments, gaining a foothold by delivering more-suitable functionality—frequently at a lower price. Incumbents, chasing higher profitability in more-demanding segments, tend not to respond vigorously.

Entrants then move upmarket, delivering the performance that incumbents' mainstream customers require, while preserving the advantages that drove their early success. When mainstream customers start adopting the entrants' offerings in volume, disruption has occurred.

## Technology is the Great Business Opportunity

Impact of Technology on Our Patients' Visual Function/Efficiency

- **Visual fatigue**, Headaches, Decreased Productivity, etc.
- **Binocular and Accommodative Dysfunction**
- **Retinal Impact** - PEMF and AMD
  - Enhances micro-circulation
  - Enhances availability of oxygen, nutrients
  - Up-regulates removal of toxins, CO<sub>2</sub>
- **Blue light** issues related to **CNS**, pulse, respiration and sleep
- Short neural pathway between screen and fingertip elevates neural intensity, and should be monitored very carefully in small children
- Radiation effect on the brain ([Emissions data](#))
  - What is known?
    - [Pediatric guidelines for screen time](#)
    - [Enlarged occipital "horns"](#)
  - What is hypothesized?

## Technology is the Great Business Opportunity

### Tools Available to Expand Patients' Access to Care

- Skype, Facetime, etc.
- DigitalOptometrics
- Eyecare Live, PeerMed
- Others?

## Technology is the Great Business Opportunity

### Tools Available to Expand Doctors' Access to Patients

- Eyecare Live, PeerMed
- Binovi
- RightEye – EyeQ Trainer
- King-Devick
- Optics Trainer
- Others?

## Technology is the Great Business Opportunity

### Treatment Equipment/Tools

- RightEye – EyeQ Trainer, Sports Vision Trainer
- Eyecarrot - Binovi Saccadic Fixator,
- Visual Cognitive Technologies, LLC – AMP System
- Senaptec
- NeuroTracker
- Vivid Vision
- Oculus Rift
- Reflexion
- Balance Tracking Systems
- BrainTap
- Others?
  - Guitar Hero

## Technology is the Great Business Opportunity

### Treatment Equipment/Tools – Virtual Reality (VR)

- Virtual Reality (VR) technology has provided a new means of arranging conditions for visual exploration.
- Individuals are sharing experiences with VR on social media.
- Individuals even seek out VR providers in order to access the technology as an aspect of therapy.
- With or without the oversight of an optometrist, people will purchase and utilize VR. They may ask us (providing optometrists) for our opinions on the technology for efficacy and safety.
- These and other digital/ electronic technologies have found their way into our therapy environment.
- Given this environment, we thought it would be valuable to present relevant information on the current state of technology in the VT arena.

## Technology is the Great Business Opportunity

### Bioharmonic Technology – “Electroceuticals”

- Bioharmonic protections
  - Diodes, effects on blood clumping
  - Water-harmonics
  - Grounding EMF
- Red Light therapies
  - Connective tissue, mitochondrial activity
  - Ocular Psoriasis, Rosacea, etc
- PEMF: Pulsed ElectroMagnetic Frequency
  - General health/ circulation
  - Eye Health, AMD, RP, Diabetic eye disease, etc

## Technology and HOW you practice: The micro-perspective

- Practice Management – EHR, Remote Record Access, Patient Communication
- Examination & Treatment – Systems and Equipment Currently are Available: What is on the horizon?
- Remote Access to Care – Telemedicine and VT

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## Technology and HOW you practice: Practice Management

- EHR
- Remote Record Access
- Patient Communication
- Patient Education

## Technology and HOW you practice: Examination & Treatment

- Systems and Equipment that are Currently Available
- What is on the horizon?

## Technology and HOW you practice: Remote Access to Care/Treatment

- Tele-Optometry and Vision Therapy
- What is on the horizon?

## Technology and HOW you practice: Remote Access to Care/Treatment

- Telemedicine: Facilitates Remote VT
  - Need to see patients in practice.
  - Can continue care remotely by conducting a consult.
- Expand geographical range...
- Individual or Group coaching...
  - Can provide educational services/ remotely for non-patients.

## Technology IN your practice

### Outline – Part II

- Macro- and micro- implications are discussed with each of the following technology topics:
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## Technology & Human Integration

- Cell phones
- Tablets
- Google glasses
- Smart watches
- Fit bit
- Microchipping
- DNA / genetic testing
  - Medical purposes
  - "Fun"/ curiosity

## Impact of Technology on Our Patients' Visual Function/Efficiency

- **Visual fatigue**, Headaches, Decreased productivity, etc.
- **Binocular and Accommodative Dysfunction**
- **Retinal Impact** - PEMF and AMD
  - Enhances micro-circulation
  - Enhances availability of oxygen, nutrients
  - Up-regulates removal of toxins, CO<sub>2</sub>
- **Blue light** issues related to **CNS**, pulse, respiration and sleep
- Radiation effect on the brain (Emissions data)
  - What is known?
    - Pediatric guidelines for screen time
    - Enlarged occipital "horns"
  - What is hypothesized?

## Screen Time Limits

- Age "floor"?
- Duration?
  - In VT room: proportion of time (Cook suggests 4-6 min of 45 min session, just to stimulate periph vision for real space)
  - At home, cap?
- Flux-based?
  - Reports of irritability increase with children following extended game play
  - Electrical emissions greater when touching screen
  - Emissions/ proximity to brain and eyes
- "Text neck"

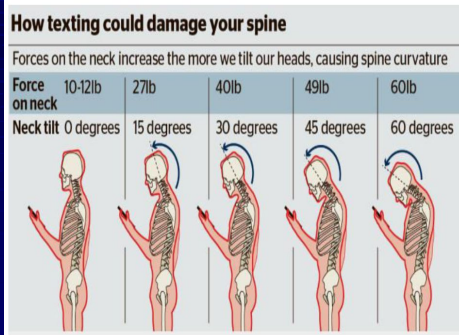
## Screen Time Limits

AAP: American Academy of Pediatrics recommendations:

- **< 18 months:**
  - Avoid use of screen media other than video-chatting.
- **18 - 24 months:**
  - Choose high-quality programming. Watch with child to discuss/ explain.
- **2 to 5 years:**
  - Limit screens, 1 hr/ day, high-quality.
  - Co-view with children. Apply it to the world around them.
- **6 + years:**
  - Place consistent limits: Time: Type.
  - Assure adequate sleep, physical activity and other behaviors essential to health.
- Designate media-free times together (e.g., dinner, driving)
- Designate media-free locations at home (e.g., bedrooms).
- Have ongoing communication about online citizenship and safety, including treating others with respect online and offline.

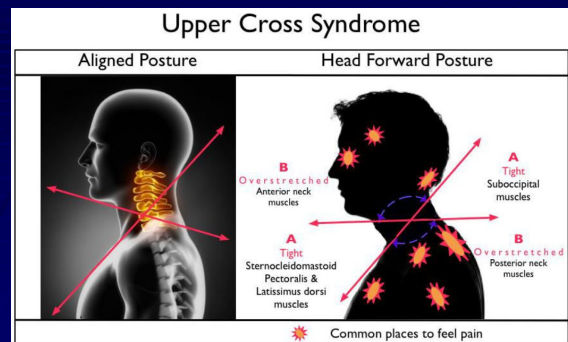
Media and Young Minds. Council on Communications and Media. Pediatrics Nov 2016, 138(5) e20162591; DOI: 10.1542/peds.2016-2591.  
Media and Young Minds. Council on Communications and Media. Pediatrics Nov 2016, 138(5) e20162592; DOI: 10.1542/peds.2016-2592.

## Text Neck



Neupane S, Ali U, Mathew A. Text Neck Syndrome-Systematic Review. Imperial J Interdiscipl Res. 2017;3(7):141-8.

## Text Neck

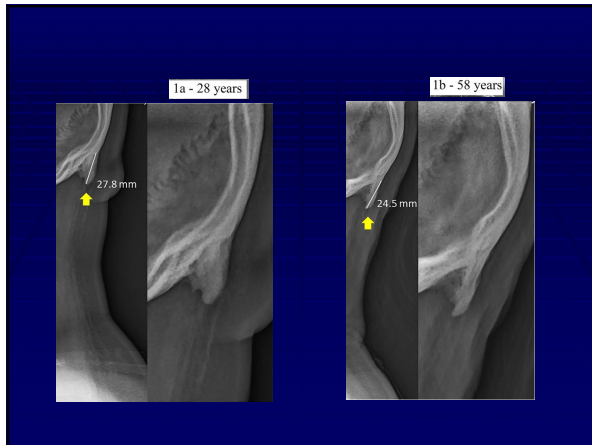
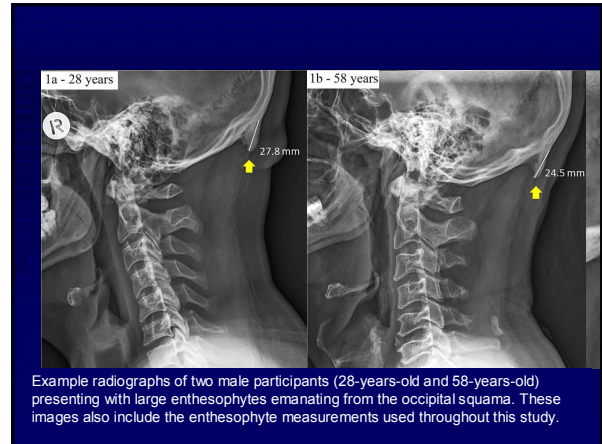


Neupane S, Ali U, Mathew A. Text Neck Syndrome-Systematic Review. Imperial J Interdiscipl Res. 2017;3(7):141-8.

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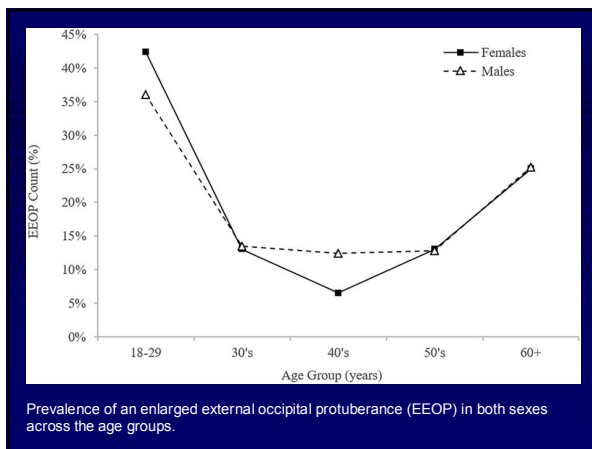
## Extended screen time/ "horns" at occiput

- Shahar D, Sayers MG. Prominent exostosis projecting from the occipital squama more substantial and prevalent in young adult than older age groups. *Scientific reports*. 2018 Feb 20;8(1):3354. <https://www.nature.com/articles/s41598-018-21625-1>
- Shahar D, Sayers MG. A morphological adaptation? The prevalence of enlarged external occipital protuberance in young adults. *Journal of anatomy*. 2016 Aug;229(2):286-91. <https://onlinelibrary.wiley.com/doi/epdf/10.1111/joa.12466>
- Abstract (2018):**
- Recently we reported the development of prominent exostosis young adults' skulls (41%; 10–31 mm) emanating from the external occipital protuberance (EOP).** These findings contrast existing reports that large enthesophytes are not seen in young adults. Here we show that a combination sex, the degree of forward head protraction (FHP) and age predicted the presence of enlarged EOP (EEOP) (n = 1200, age 18–86). While being a male and increased FHP had a positive effect on prominent exostosis, paradoxically, increase in age was linked to a decrease in enthesophyte size.



## Extended screen time/ "horns" at occiput

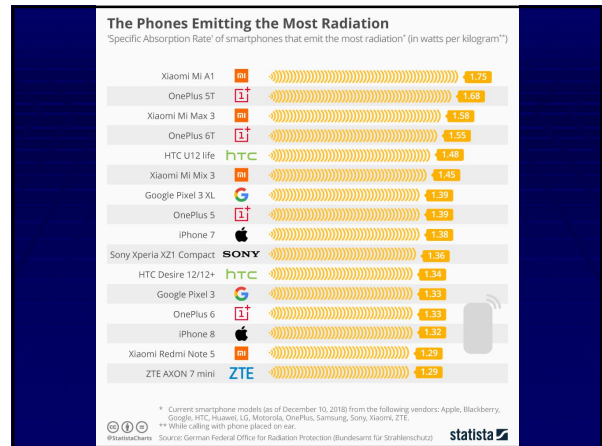
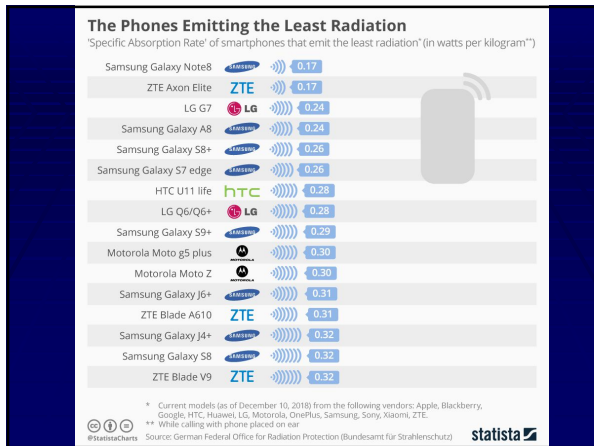
- Shahar D, Sayers MG.
- Our latter findings provide a conundrum, as the frequency and severity of degenerative skeletal features in humans are associated typically with aging.
- Our findings and the literature provide evidence that **mechanical load plays a vital role in the development and maintenance of the enthesis (insertion)** and draws a direct link between aberrant loading of the enthesis and related pathologies.
- We hypothesize EEOP may be linked to **sustained aberrant postures associated with the emergence and extensive use of hand-held contemporary technologies, such as smartphones and tablets.**
- Our findings raise a concern about the future musculoskeletal health of the young adult population and reinforce the need for prevention intervention through posture improvement education.



## EMF Device Emissions

- Difficult to find specifics!
- Age concerns
- Electro Hyper-Sensitivity (EHS), "Electrosmog", behavioral & physical impacts on people near cell towers
- Heat levels/ thermal profiles
- Technology to counteract EMF impacts
  - Bioharmonics: Harmonious correspondence

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## Emissions Data

Phones Emitting Least Radiations	Absorption rate (in watts per kilogram)	Phones Emitting Most Radiations	Absorption rate (in watts per kilogram)
Samsung Galaxy Note8	0.17	Xiaomi Mi A1	1.75
ZTE Axon Elite	0.17	OnePlus 5T	1.68
LG G7	0.24	Xiaomi Mi Max 3	1.58
Samsung Galaxy A8	0.24	OnePlus 6T	1.55
Samsung Galaxy S8+	0.26	HTC U12 life	1.48
Samsung Galaxy S7 edge	0.26	Xiaomi Mi Mix 3	1.45
HTC U11 life	0.28	Google Pixel 3 XL	1.39
LG Q6/Q6+	0.28	OnePlus 5	1.39
Samsung Galaxy S9+	0.29	iPhone 7	1.38
Motorola Moto g5 plus	0.30	Sony Xperia XZ1 Compact	1.36
Motorola Moto Z	0.30	HTC Desire 12/12+	1.34
Samsung Galaxy J6+	0.31	Google Pixel 3	1.33
ZTE Blade A610	0.31	OnePlus 6	1.33
Samsung Galaxy J4+	0.32	iPhone 8	1.32
Samsung Galaxy S8	0.32	Xiaomi Redmi Note 5	1.29
ZTE Blade V9	0.32	ZTE AXON 7 mini	1.29

## EMF/ Stress Response Studies conclude:

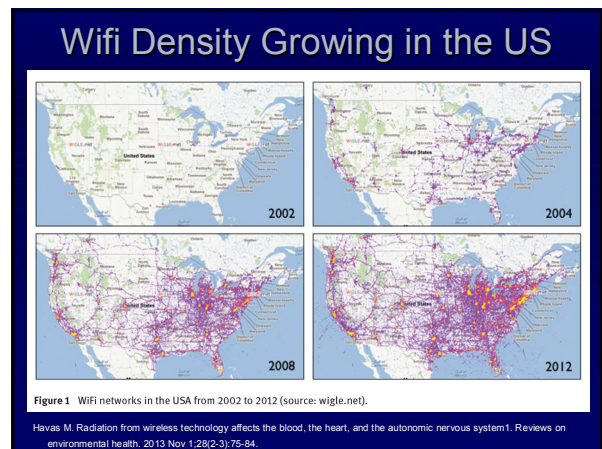
- Oxidative stress is an underlying mechanism broadly affecting health.
- RF-electromagnetic waves generated by cell phones have the potential to damage the brain. (Kesari et al)
- RF-EMW May also trigger infertility (Desai et al)
- The maximum acceptable SAR (specific absorption rate) limit should be lowered for cell phones, as exposures in intensity or duration exceeding the SAR can cause a variety of defects at a cellular level, including WBCs, sperm, chromosomes. (Desai+)

Desai NR, Kesari KK, Agarwal A. Pathophysiology of cell phone radiation: oxidative stress and carcinogenesis with focus on male reproductive system. Reproductive Biology and Endocrinology. 2009 Dec; 17(1):114.  
Hardell L, Sage C. Biological effects from electromagnetic field exposure and public exposure standards. Biomed Pharmacother (2008). doi:10.1016/j.biopha.2007.12.004  
Kesari, K.K., Siddiqui, M., Meena, R., Verma, H.N. and Kumar, S., 2013. Cell phone radiation exposure on brain and associated biological systems.

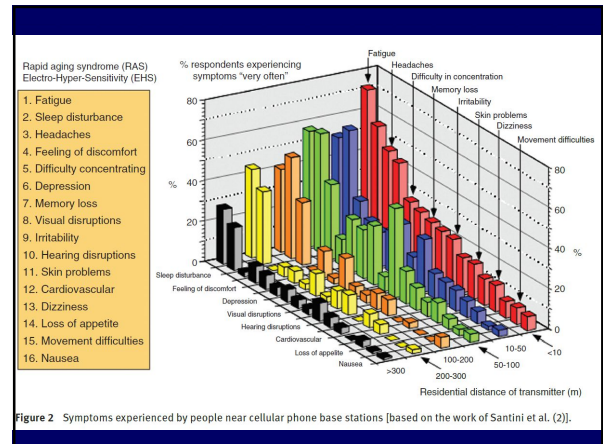
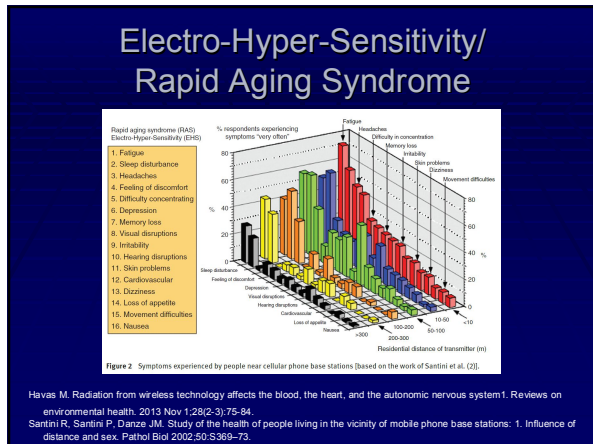
## EMF/ Stress Response Studies conclude:

- Study performed on rabbits showed that radiation from a standard cellular telephone affected their brain electrical activity when exposed to radiation conditions that simulated normal human use of the telephone. (Marino+)
- "There is evidence indicating that acute (1– 4 hours) and chronic GSM 900 EMF exposure (ranging from 30 minutes to 1 hour for 7–10 days) may slightly modify the cellular oxidative status." (Ferreri et al)
- There is adequate epidemiologic evidence to suggest a link between prolonged cell phone usage and the development of an ipsilateral brain tumor. (Khurana et al)

Ferreri F, Curcio G, Pasqualetti P, De Gennaro L, Frii R, Rossini PM. Mobile phone emissions and human brain excitability. Annals of Neurology Official Journal of the American Neurological Association and the Child Neurology Society. 2006 Aug;60(2):188-96.  
Khurana VG, Teo C, Kundt M, Hardell L, Carlberg M. Cell phones and brain tumors: a review including the long-term epidemiologic data. Surgical neurology. 2009 Sep; 17(2-3):205-14.  
Marino AA, Nilsen E, Frioli C. Nonlinear changes in brain electrical activity due to cell phone radiation. Bioelectromagnetics. 2003 Jul;24(5):339-46.



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## Bioharmonic protections

- **Diodes/ EMF Protections**
  - Neutralize/ alter electrical emissions and impact on biofield
  - <https://www.energopolarit.com/>
  - <http://shieldite.com/>
  - <https://quwave.com/>
- **Water-harmonics**
  - Chickens study/ Trivedi Effect
- **Grounding**
  - Reduce EMF in the room when sleeping
- **Blood clumping**

Kefalos et al. Biofield Science: Current Physics Perspectives. Global Adv Health Med. 2015;4(suppl):25-34. DOI: 10.7453/gahmj.2015.0111.suppl  
Cosic I, Cosic D. Influence of Tuning Element Relief Patches on Pain as Analyzed by the Resonant Recognition Model. IEEE transactions on nanobioscience. 2017 Nov 20;16(8):822-7.  
Havas M. Radiation from wireless technology affects the blood, the heart, and the autonomic nervous system 1. Reviews on environmental health. 2013 Nov 1;28(2-3):75-84.

## Related resources on the Biofield

Hufford DJ, Sprengel M, Ives JA, Jonas W. Barriers to the entry of biofield healing into 'Mainstream' healthcare. Global advances in health and medicine. 2015 Jan;4(1\_suppl):gahmj-2015.

Jain S, Daubenmier J, Muehsam D, Rapgay L, Chopra D. Indo-Tibetan philosophical and medical systems: perspectives on the biofield. Global advances in health and medicine. 2015 Jan;4(1\_suppl):gahmj-2015.

Jain S, Hammerschlag R, Mills P, Cohen L, Krieger R, Vieten C, Lutgendorf S. Clinical studies of biofield therapies: Summary, methodological challenges, and recommendations. Global advances in health and medicine. 2015 Jan;4(1\_suppl):gahmj-2015.

Muehsam D, Chevalier G, Barsotti T, Gurfein BT. An overview of biofield devices. Global advances in health and medicine. 2015 Jan;4(1\_suppl):gahmj-2015.

Rubik B, Muehsam D, Hammerschlag R, Jain S. Biofield science and healing: history, terminology, and concepts. Global advances in health and medicine. 2015 Jan;4(1\_suppl):gahmj-2015.

## Biofield Treated Energized Water

Effect of Biofield Treated Energized Water on the Growth and Health Status in Chicken, Trivedi et al, Poult Fish Wildl Sci, 2015,3:2.

- The current study was attempted to investigate the effect of Mr. Trivedi's biofield energy treated energized water on chicken. The total 4200 chicks were equally divided into two groups i.e. control and treated. The biofield treated energized water was provided to the treated chicks, while the control chicks were drunk with standard drinking water.
- During the experiment the parameters such as mortality, body weight, food intake etc. were assessed in both control and energized water treated birds.
- **The mortality rate was reduced in the energized water treated chicks as 54.55% in week 1, 42.11% in week 6, and 39.13% in week 4, as compared to the control chicks.**
- Moreover, the average body weight was increased by 12.50% in week 1 as compared to the control chicks.
- The feed conversion ratio was gradually decreased which indicated that the energized water treated chicks took less feeds while the body weight was increased in comparison to the control chicks. Besides, the energized water treated birds showed statistically significant (p<0.007) with 15.47% increase in the edible meat weight as compared to the control chicks.
- Moreover, the feather, skin and internal organ weight were significantly reduced by 21.22% (p<0.001) of energized water treated chicks as compared to the untreated chicks. ... Altogether, the results suggest that Mr. Trivedi's biofield treated energized water could be a cost effective feeding approach in chicken production.

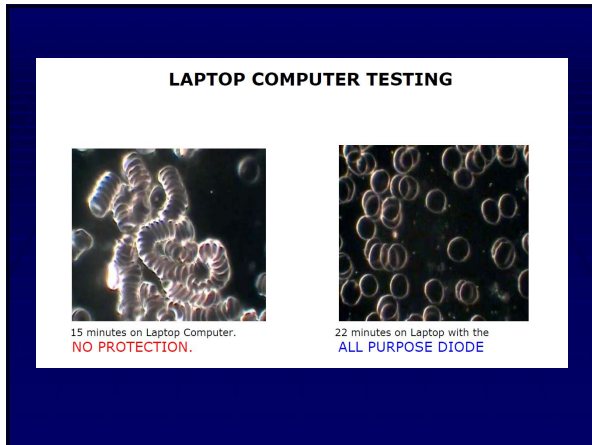
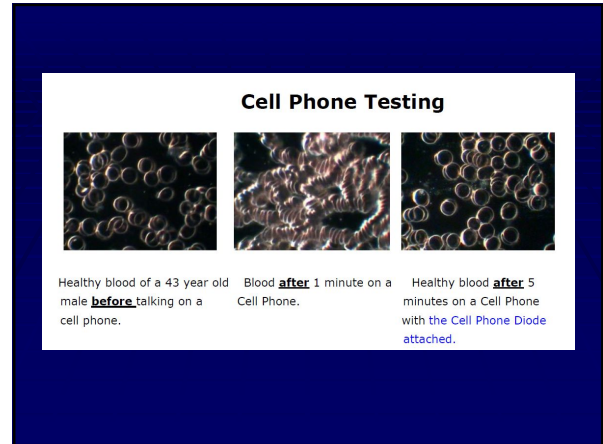
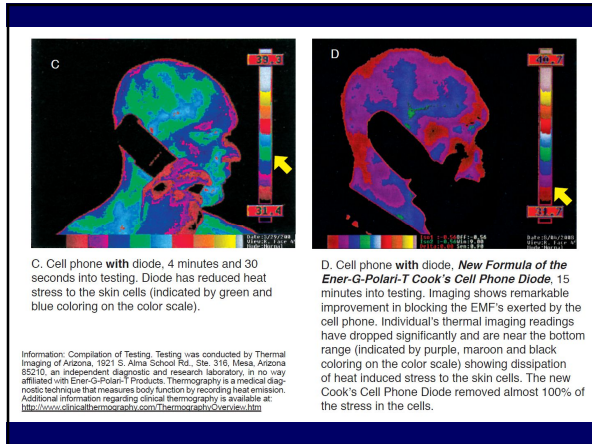
## Thermal Imaging Test

**A.** Acclimatization period to establish base energy and cell phone initially put to ear.

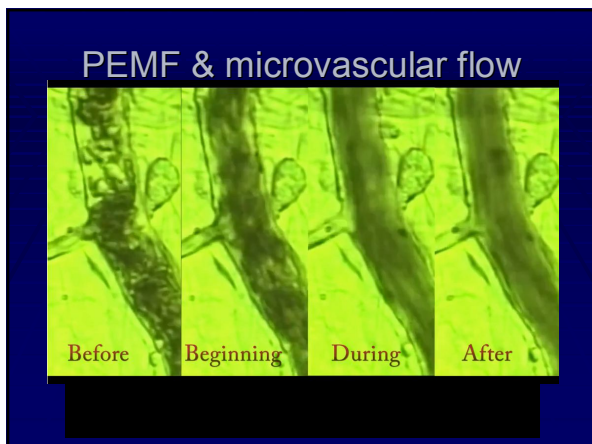
**B.** Cell phone without diode, 4 minutes into testing. The red and yellow coloring indicates heat stress to the skin cells from exposure to EMF's exerted from the use of the cell phone.



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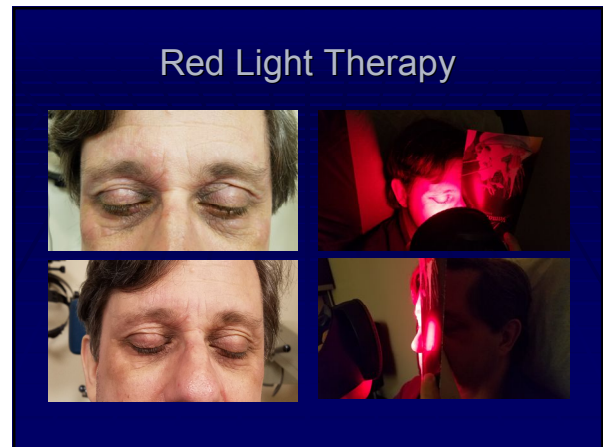
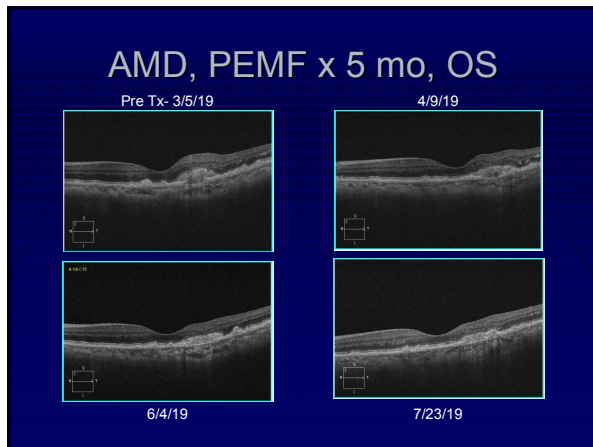
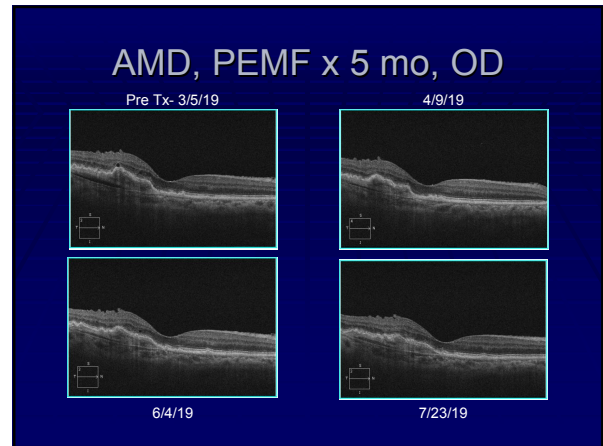
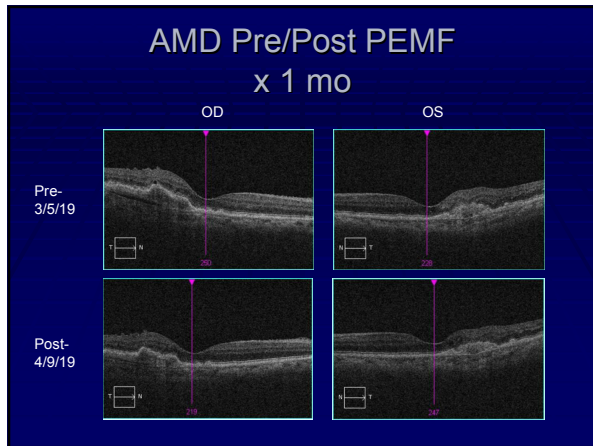


- ### Bioharmonic PEMF
- Magnetic field rapidly turning on and off
  - Water has a dipole moment
  - Reduces red blood cell clumping/ enhances circulatory processes
  - Increases blood flow through microvasculature
  - Enhances oxygen/ nutrient delivery & toxin/ CO<sub>2</sub> removal.
  - Systems include: BEMER, Magneter, Impulser, Terramagnon, Sentiplus, IMRS



- ### PEMF and AMD
- Enhances micro-circulation
  - Enhances availability of oxygen, nutrients
  - Up-regulates removal of toxins, CO<sub>2</sub>.
  - Case example:  
AMD patient pre/post PEMF\* x 1 mo
    - 1 week, B.Body only, Int-1
    - 3 weeks, B.Body Int-1, Int-2... & B.Pad, low, Int-1, eyes.
- \* PEMF was performed with BEMER, BioElectroMagnetic Energy Regulation

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- ### Technology in the VT Room
- iPad-based vision games
    - VisionTap, Osmo, G-Labs...
  - Game console-based
    - Xbox: Neurosage (Vibe plate option; wireless headset)
    - Wii: *discontinuing platform*
  - Eye-tracking technology (measurement & biofeedback)
    - Visagraph/ Readalyzer, RightEye
  - Virtual Reality systems
    - Vivid Vision, Oculus Rift, Optics Trainer...
  - Future: Augmented Reality...

- ### iPad/Tablet advantages
- Kids travel with them
  - Parents use as “babysitters,” often asking about valuable games to “cancel out” the negative impacts.
  - Games have more VMI opportunities than videos/ passive watching
  - *Direct contact between screen and fingertip elevates neural intensity, and should be monitored very carefully in small children.*

## Game-console based advantages

- VMI through an *extension* of the hands
- Often conducted at a distance
- Large screens can simulate optic flow

## VR Advantages

- Virtual Reality (VR) technology has provided a new means of arranging conditions for visual exploration.
- Novel, immersive visual environment
- Can modulate data presented to one eye
  - Suppression checks
  - MFBF
  - "Handicapping" preferred eye

Discussion and Q & A

Thank You!!