Journal of Optometric Phototherapy

April 2011

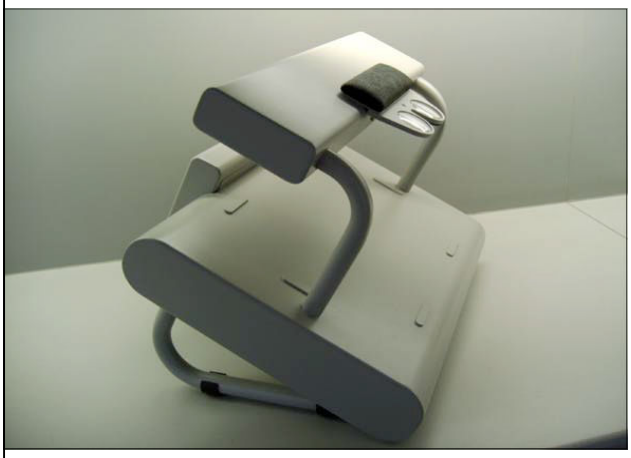
Homeopathic Syntonic Light Therapy in the Treatment of Glaucoma

Colour Fields, Cognitive Styles and Confidence

Marketing Optometric Syntonic Phototherapy

Case Study: Lighting Up Lives

OPTOMATTERS — SYNTONICS — EQUIPMENT— 2011



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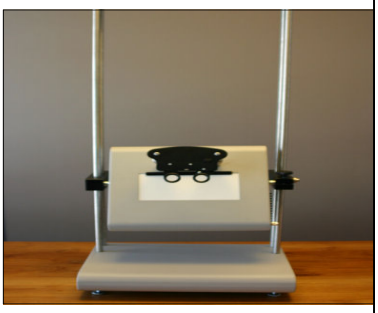

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THE THERAPEUTIC APPLICATION OF LIGHT TO THE VISUAL SYSTEM

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The President's Message

Don Barniske, O.D. FCSO

These are exciting times for the College of Syntonic Optometry. This year, we have offered our Curriculum One Classes in locations as varied as Western University of Health Sciences College of Optometry (WUHSCO) in Pomona, California to Optometrists' offices in Illinois and Michigan. The classes were taught by Stefan Collier, a functional optometrist from Belgium living in Switzerland. He is the recipient of the Skeffington-Alexander International Award from OEPF in 2010 and the Armand Bastien Awards in 2002 & 2004. Stefan has brought international enthusiasm for the wider implementation of light therapy in both Europe and the United States. (See the article under International News on pages 20)

Syntonic Phototherapy is practiced worldwide with providers in North America, Europe, Africa, New Zealand, Australia and Japan. Personally communicating with those in other countries about how light and filters are utilized relative to their specific cultures has been most enlightening.

The College is working with the leaders of Western University of Health Sciences School of Optometry to integrate Syntonic Phototherapy into their curriculum. In order to assist in these endeavors, equipment has been donated to WUHSCO by Rex Cross of C&J Instruments and Sonja Vanhimbeeck of Optomatters. These instruments will play an integral role in the initial and ongoing program of research and development.

Our officers, trustees and members have been actively involved with other light therapy organizations and in performing research that has been accepted and published in other journals. These include our immediate Past President, Dr. Larry Wallace, Dr. Ray Gottlieb and Dr. Ed Kondrot. Dr. Wallace lectured in Mexico, is actively involved in the International Light Association and co-authored an article for the Journal of Photo Medicine and Laser Surgery. Dr. Gottlieb has published articles in the Journal of the Society of Photoillumination and Engineering, and given lectures. Dr. Kondrot is expanding research into glaucoma utilizing Syntonic filters to change intraocular pressure. (See details beginning on page 6.)

By the time the Journal is published, our new website will be up & operational thanks to Dr. Tom Cunningham. His intense and ongoing dedication to getting this site up and operational will result in a web site that will better represent the college, encourage patients to seek therapy, include ongoing updates of current research and give members additional benefits.
http://www.collegeofsyntonicoptometry.com

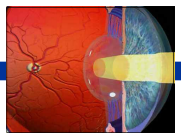
Australia and New Zealand will have their annual conference in September due to Dr. Simon Grbevski and his efforts.

Special thanks to Sarah Cobb for her many years of editing and producing our Journal. Thanks also to Dr. Stan Levine who has been instrumental in encouraging several board members to lend their expertise to write and publish a new pocket sized manual on basic Syntonic Phototherapy Procedures.

Our annual conference has an outstanding group of speakers scheduled. I encourage each of our members to invite a colleague to learn about Syntonics. San Diego, California is a wonderful city for a conference with many opportunities for family outings. See you in San Diego.

San Diego, California

Homeopathic Syntonic Light Therapy in the Treatment of Glaucoma



Edward C. Kondrot, MD, MD(H), CCH, DHt, FCSO

Glaucoma Effective Treatment lacking

Glaucoma affects over 2.000,000 Americans and is the leading cause of blindness in developed countries. According to the National Eye Institute, glaucoma is the third leading cause of blindness in the USA behind cataracts (1) and macular degeneration (2) There are an estimated 2,218,000 patients who suffer from this disease. (approximately 1 in 136 or 0.74% or 2 million people in USA [Source statistic for calculation: "2,000,000 people are visually impaired by glaucoma in the US (Research to Prevent Blindness, NISE, NSF)")

Incidence

The overall prevalence of glaucoma in the USA population 40 years and older is estimated to be 1.86% (95% confidence interval, 1.75% -1.96%), with 1.57 million Caucasian and 398,000 African American persons affected. After applying race-, age-, and gender-specific rates to the USA population as determined in the 2000 USA census, we estimated that glaucoma affects 2.22 million USA citizens. Owing to the rapidly aging population, the number with glaucoma will increase by 50% to 3.6 million in 2020. African American subjects had almost 3 times the age-adjusted prevalence of glaucoma than white subjects. Open-angle glaucoma affects more than 2 million individuals in the United States. This number will increase to more than 3 million by 2020 according to Archives of Ophthalmology 2004; 122:532-538

Types of glaucoma

There are many types of glaucoma but the two main classifications are open angle and closed angle. Closed angle glaucoma is felt to be a structural problem of the eye resulting in an acute attack of glaucoma with a marked elevation of pressure. Surgical intervention is considered the treatment of choice for this type of glaucoma and this paper will deal only with the treatment of open angle glaucoma.

Diagnosis

It is a complex disease often difficult to diagnose in the early stages. Typically there is 3 components to make a diagnosis. According to George L. Spaeth, when the definition of glaucoma was a condition in which the intraocular pressure is above 21 mm Hg (millimeters of mercury, units in which pressure is measured), the diagnosis of glaucoma was easy. One simply measured the pressure and that determined whether or not glaucoma was present. But that method of defining glaucoma was wrong. It was seriously wrong! Ninety percent of the people diagnosed with glaucoma by that method didn't have ocular damage related to intraocular pressure, and one-third of those who had pressure-related damage were excluded because their intraocular pressure was below the magic number of 21 mm Hg.
http://www.willsglaucoma.org/edudiagnosis.htm

An elevation of intraocular pressure, changes in the optic nerve and peripheral field loss are all needed before making the diagnosis of glaucoma. Most eye specialists consider changes in the optic nerve as the hallmark of the earliest signs of glaucoma. These changes consist of loss of the nerve fiber layer and increase in size of the physiological cup of the optic nerve. The measurement of intraocular pressure is unreliable in most cases in making the diagnosis of glaucoma. Several methods of measuring the intraocular pressure are inaccurate and often many cases of glaucoma are inaccurately diagnosed. Glaucoma is a disease of the optic nerve consisting of ischemic changes in the nerve with resulting loss of optic nerve fiber and loss of peripheral vision.

Glaucoma, if untreated, can lead to blindness. It is much different than macular degeneration. In macular degeneration even in the end stages of the disease complete visual loss does not occur and most cases retain functioning peripheral vision. However in glaucoma the end stages can lead to total blindness with no functioning vision. Because of this, glaucoma needs very aggressive treatment consisting of medication and surgery to preserve visual acuity.

Current Medical and Surgical Treatment consist of methods to lower the intraocular pressure. Lowering the intraocular pressure results in an increase in perfusion of the optic nerve based on basic concepts of hemodynamic flow of blood. A lower pressure permits a greater blood

flow to the nerve and an elevated pressure lowers the optic nerve profusion. Most medications target the ciliary body to decrease the aqueous production, other medications will increase the outflow of aqueous.

It is the authors observation that the conventional treatment of lowering the pressure of glaucoma is very unphysiological and should not be primary treatment modality in the treatment of glaucoma. It is much like the analogy of a patient with hypertension taking medications to decrease the production of red blood cells to reduce the blood pressure! Or taking medications to increase the removal of blood to lower the pressure. Aqueous production and circulation in the eye has an important physiological function and decreasing its production might have an adverse affect on the functioning of the eye.

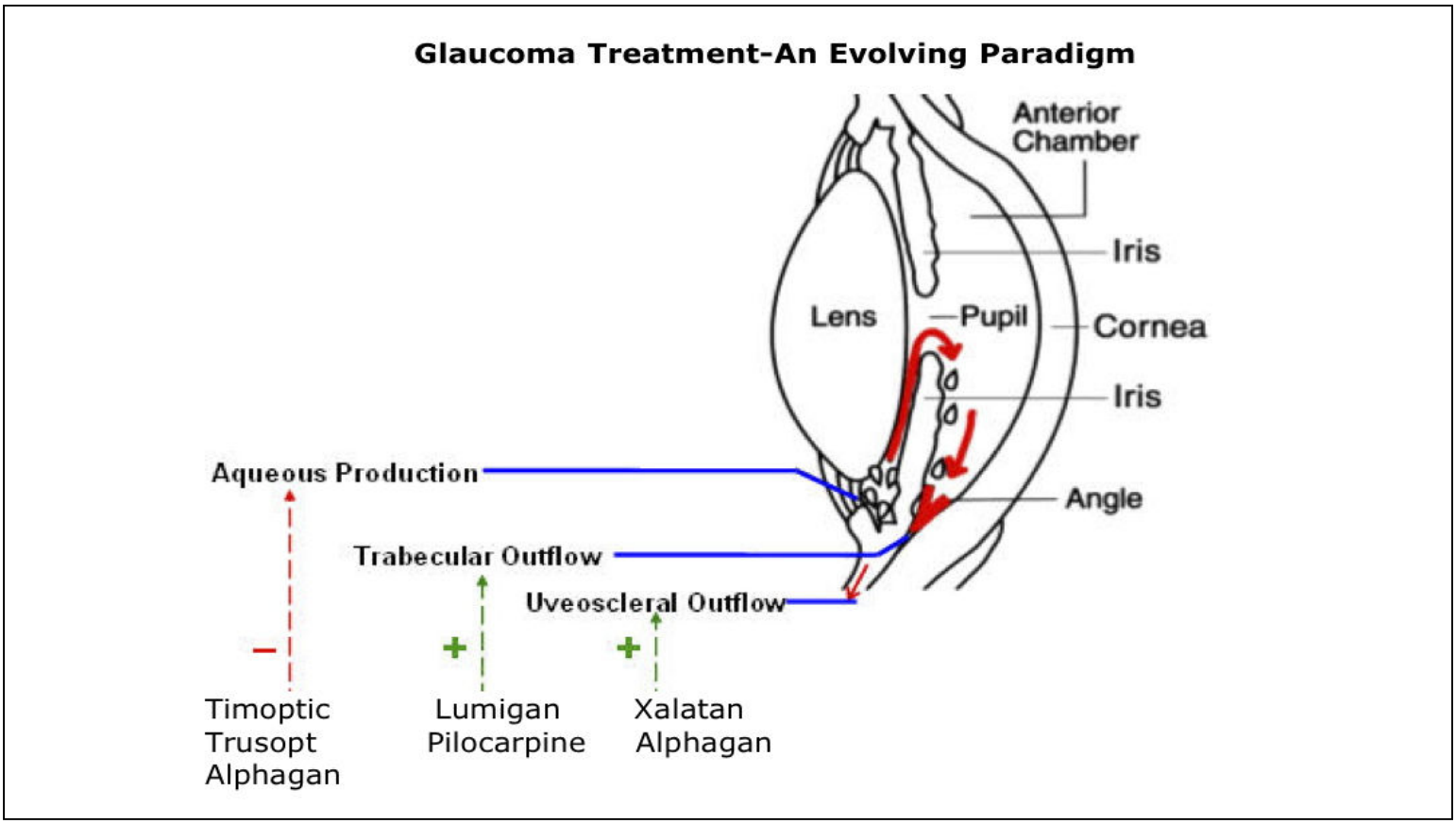
The aqueous Humor is very important since it maintains the intraocular pressure and inflates the globe of the eye. It also provides nutrition for the avascular ocular tissues, posterior cornea, trabecular meshwork, lens, and anterior vitreous. It carries away waste products from metabolism of the above avascular ocular tissues. It may also serve to transport ascorbate in the anterior segment to act as an anti-oxidant agent. The presence of immunoglobulins in the aqueous indicates a role in immune response to defend against pathogens.

Proper holistic treatment of glaucoma should be two fold. First, to improve the circulation of the optic nerve and provide a neuro-protective effect of the optic nerve. The second line of treatment should be methods of reducing intraocular pressure without an adverse affect on the aqueous production. One theory of accomplishing all of the above is to balance the autonomic nervous system.

I became interested in using light to treat glaucoma after Dr. Don Barniske, the current president of the College of Syntonics, gave me 2 articles from the American Journal of Ophthalmology which studied the effects of light on the intraocular pressure.

The first article I studied was Intraocular Pressure of Normal and Glaucomatous Eyes as Affected by Accessory Light Stimuli, by R. B. Zaretskaya, MD, published in American Journal of Ophthalmology 1948 – 31-721-727.

The first part of this experiment was with white light. 35 patients, 14 normal eyes and 21 glaucomatous eyes where first adapted to dark light for one hour. The left eye was illuminated with white light from a 75 watt frosted bulb (16 foot candles) for 30 minutes (the right eye was covered) Tensions in the right eye were measured every 5 minutes and for 20 minutes after the 30 minute application of light.



Reduction of the intraocular pressure with light was measured with different intensity to see if the pressure lower affect was intensity dependent. Average intraocular pressure lowering, depending on the brightness of light, is as follows:

- 16 foot candles (712 Lux) 9 mm Hg
- 3.3 foot candles (35.5 Lux) 5mm Hg
- 0.28 foot candles (3 Lux) 2.7mm Hg
- 1 foot candle = 10.76 Lux

The experiment was repeated by using Homatropine. This medication dilates the pupil. The author wanted to study the effect of pupil reaction to light. He questioned whether it was the pupillary reaction to light or pupil size that was responsible for the drop in pressure or just the affect of light? (Homatropine paralyses the pupil into a fully dilated position.)

The results of this initial study were as follows:

- Pupil size does not have an effect on changes in intraocular pressure with application of light.

- Light has vasomotor reaction due to the effects through the pituitary body and vegetative centers. (autonomic nervous system control centers)

- There is an increase in intraocular pressures in the dark and a decrease in pressures in light.

The second part of the study was to study the experiments of S. V. Kravkov who stated that red and green light affect the vegetative system similarly as adrenalin and pilocarpine.

This study looked at 17 normal eyes and 25 glaucomatous eyes. The eyes were illuminated with a 150 watt light bulb using either a green filter – 433-586 nm or a red filter 578- 720nm. The eyes were treated 30 minutes with red one day and then 30 minutes with green the following day.

The results of this study indicated that red light has a pressure raising effect and green light has a pressure lowering effect. All eyes showed a pressure lower effect after green light; the hypotonic effect with glaucomatous eyes was much stronger. The hypotonic effects of green light are greater than white light even at a higher brightness.

Conclusion of this study was that lowering of intraocular pressure by vegetative reactions due to accessory stimuli is less in normal eyes than glaucomatous eyes. Fluctuations in IOP by darkness and light are greater in glaucomatous eyes. The pupillary reflex has no affect on intraocular pressure. The reduction in IOP is dependent on the brightness of the stimulus. There is an opposite effect on IOP brought about by red and green light.

Glaucomatous eyes do not show the usual increase in IOP in response to red stimuli. (red light might become a diagnostic tool) Green light should be considered a therapy for the reduction of IOP in glaucoma.

The second article was, “Some Experiments with Green Spectacles Prescribed to Glaucomatous Patients”, by R. B. Zaretskaya, MD, which was published in the American Journal of Ophthalmology 1948 31: 985-989.

Nineteen patients were studied and pressures were determined 3 times a day. Once at 7:00 AM (still in bed), 1:00 PM and then between 7:00 and 8:00 PM. Medications were withheld for a day or two and then green spectacles were given on the second day for full time wear. The spectacles were a hue corresponding to 511 nm and a daylight transparency of 21%. In a certain number of cases, the green spectacles were combined with a greatly reduced strength of pilocarpine. One group had a combination of green glasses and adrenaline (1:1,000) which was also made to test Kravkov’s statement that the installation of adrenalin might increase the eyes sensitivity to green.

Results of this study showed that IOP showed a statistically significant decrease in patients wearing the green spectacles. The fluctuation of IOP during the day was also found to decrease in patients wearing green glasses. There was an appreciable effect when the use of green spectacles was combined with very small dosages of pilocarpine (0.5 percent). 20 out of 25 eyes had an expressed decrease in IOP as well as a decrease in fluctuations. The pressures decreased by 6.0 mm Hg in 8 cases, 10 mm Hg in 9 cases and 10 mm Hg and more in 3 cases. The results were more striking when combined with small dosages of adrenalin.

Conclusions:

- Green spectacles prescribed with a total withdrawal from Pilocarpine produces a decrease in IOP.

- The affects are most pronounced when used with the administration of small doses of adrenalin .

- Mechanism of action is proposed to be on the color receptors of the human eye.

- Green light brings about a definite arrangement in the autonomic nervous system and thus affects the neurovascular system of the eye.

Background of the Homeopathic Syntonic light study

My interest was to use light therapy based on homeopathic laws of healing. The basic tenants of homeopathy are that the body has a wisdom and disease is an attempt to help maintain a homeostasis. Homeopathic treatment is to support this mechanism to achieve homeostasis. This is called the "Law of Similars" A substance which produces symptoms in a healthy individual will treat these symptoms. This is much different than traditional allopathic medicine that treats disease with opposites. For example in homeopathy a patient with a fever will be given a medicine that produces a fever, in allopathic medicine a medicine will be given to cool the body.

Another important tenant of homeopathy is that of dilution. The body needs to be gently stimulated with a small amount of a medication to act as a catalyst. This approach is supported by the Arndt-Schulz law. It is the pharmacologic principle of homeopathy and more recently in light therapy. It was discovered by 19th century scientists, Hugo Schulz and Rudolf Arndt. It states that weak stimuli accelerate physiologic activity, medium stimuli inhibit physiologic activity, and strong stimuli halt physiologic activity. This law is frequently quoted as a suitable model to describe the dose dependent effects of Low Level Laser Light Therapy (LLLT). This LLLT has been used clinically for numerous ailments in Europe for over thirty years and has been the subject of many scientific papers, published worldwide.

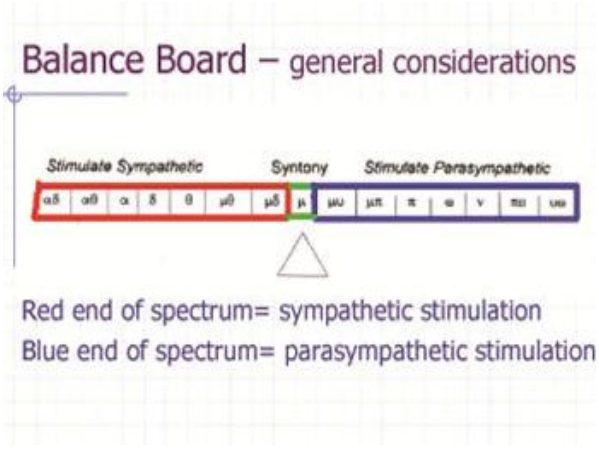
It was decided to utilize the "Law of Similars" and the "Arndt-Schultz Law" in developing this study design. Based on the published research of Dr. Zaretskaya who has demonstrated that red light will raise the intraocular pressure in a dose (intensity) related manner. Higher intensity will cause a greater pressure elevation.

Studies have shown and clinical observation supports the relationship between glaucoma and the sympathetic state. Spitler, Babbitt, Dinshah and others have shown that red light has also been shown to stimulate the autonomic nervous system into the sympathetic state.

The approach in this study could have been to look at light in the allopathic or the homeopathic mechanism of action. The allopathic or opposite method would be to treat intraocular pressure with green or blue light using a high intensity, the homeopathic method would be to use low levels of light that cause an elevation of pressure.

It is hypothesized based on the homeopathic Law of Similars and the Arndt-Schultz law that low levels of red light should lower intraocular pressure not increase the pressure.

The Syntonic Balance Beam illustrates wavelengths of light from the red end to the blue end of the spectrum. A requirement of this study was to chose a wavelength that represented a sympathetic stimulating property but one that only slightly stimulated the system in a homeopathic manner. Syntonic Mu delta was selected as wavelength in this study based on several reasons:



(Courtesy of Cathy Stern, O.D., FCOVD, FNORA, FCSO, from her basic course.)

This illustration shows the relationship of mu delta to the center of the balance beam. Mu Delta is the first wavelength to the left of center mildly stimulating the sympathetic system.

Mu delta is also used to treat chronic conditions and to detox the body. Most cases of glaucoma are chronic and related to a metabolic imbalance or a toxic state.

It was determined to use an intensity of 1.4 Lux. This is the light intensity that was measured at the level of the facial and ocular plane when using the Syntonic Photosynthesizer. In the Zaretskaya study he used measurements of 312, 35.5 and 3 Lux. We felt that to have a true homeopathic effect the light source should be 1/10 the average therapeutic range. Since this was not accurately available, a good starting intensity would be that of the Syntonic Photosynthesizer.

This study, that I am reporting, was conducted over the last year to look at the effects of homeopathic mu delta on the intraocular pressure in a series of glaucoma patients. These patients were recruited from my practice and from readers of the Healing the Eye Newsletters. Patients involved in the study were instructed to continue all glaucoma medications and were required to be in the office all day after a 10 minute exposure of green light.

Method of Study

There were 11 patients in the study. The Average age 72.6. Range was between 55-84 years of age. There was only one patient not using any glaucoma medications, 7 patients were using at least one medication and 3 patients with one or more medications.

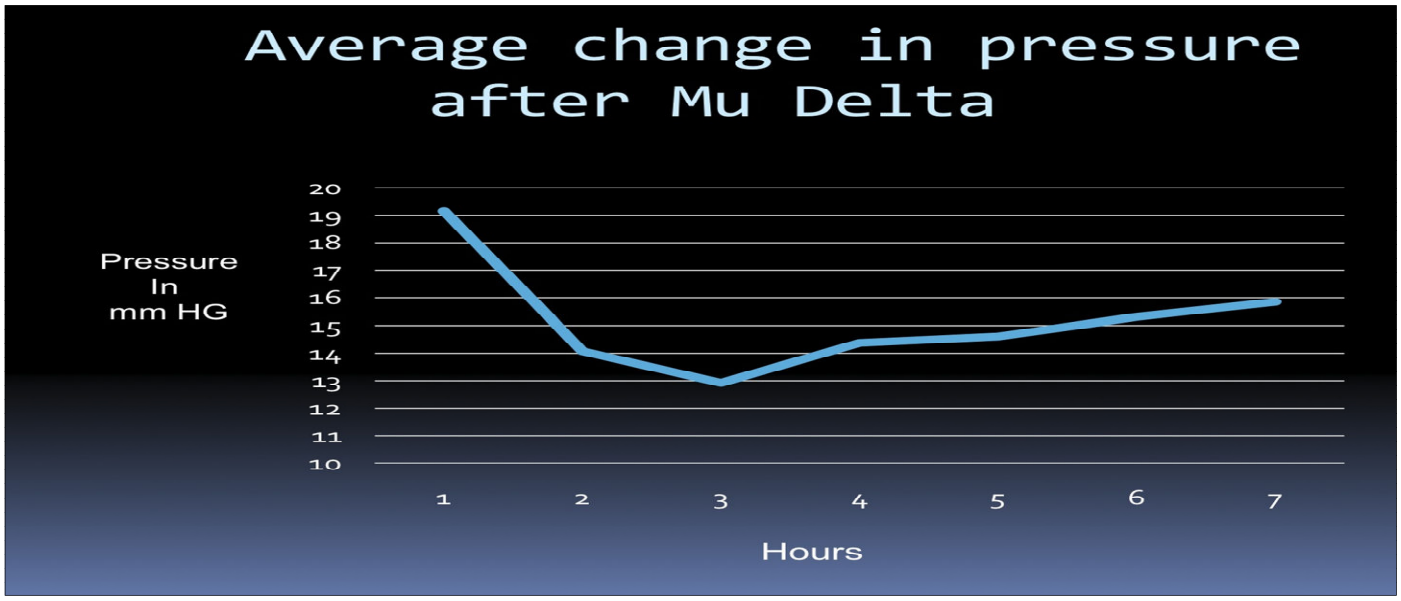
Testing

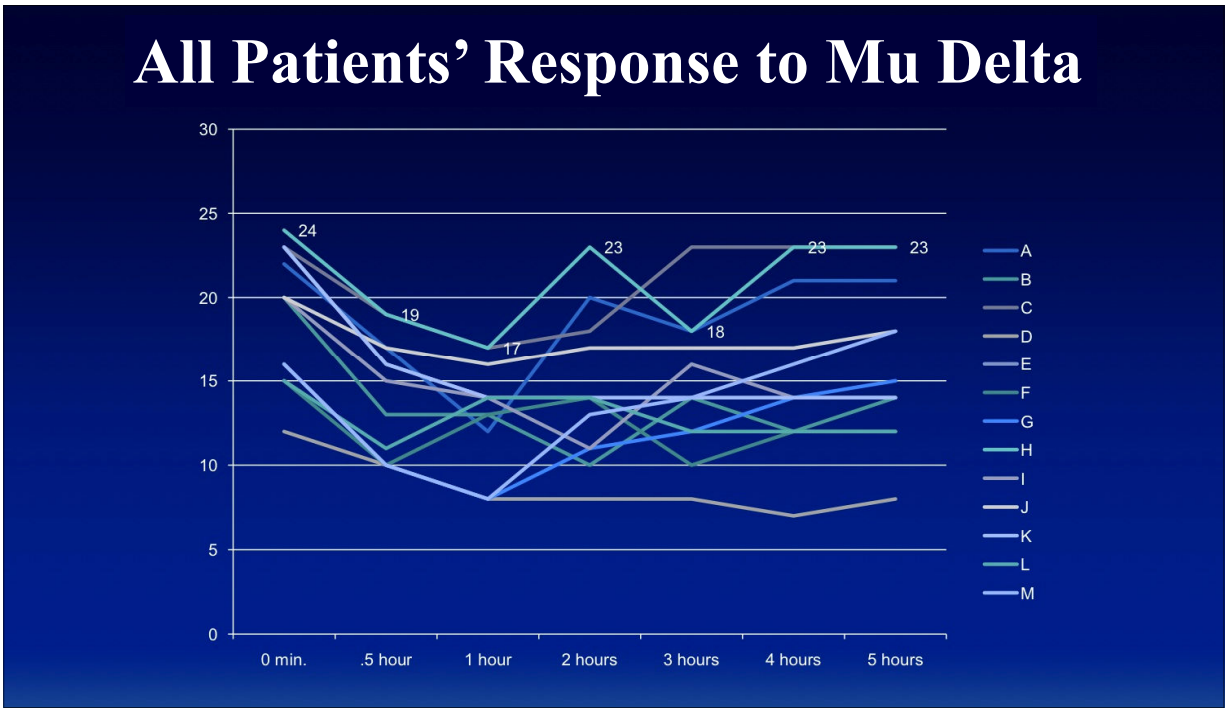
Before application of light, the intraocular pressure was measured using a Goldman tonometer. 10 minutes of light treatment with Syntonic Light of mu delta at an intensity of 1.4 lux was administered. Pressures were then measured at 30 minutes and then every hour until pressures returned to baseline.

Results

- Average pre-light pressures 19.8 (15-34)
- 30 minutes 15.5 (10-20)
- 1 hour 13.8 (8-19)
- 2 hours 16.1 (8-21)
- 3 hours 15.2 (8-23)
- 4 hours 14.9 (7-23)

5 hours (only 3 patients) 13.7 (8-18)





Conclusion

Mu Delta has a pressure lower affect in the majority of patients 9 out of 11 patients or 82%. The average lowering of pressure using mu delta was 5 mm Hg and this effect persisted for 4 hours after a brief 10 minute exposure. These results confirmed the study reported by Zaretskaya in the American Journal of Ophthalmology in 1948.

The intensity of 1.4 Lux is considered to be a homeopathic level. Typically in homeopathic pharmacology physical substances are reduced 10, 100 and 1000 fold to achieve a homeopathic therapeutic affect. The predicted decimal homeopathic range based on Zaretskaya study was 3.55 to .3 Lux (1/10 of 35.5 = 3.55. 1/0 of 3 = .3) We chose 1.4 Lux based on the light levels measured at the facial plane of the Syntonic Photosynthesizer. It is interesting that our results using a homeopathic approach at this level of light equaled his results using an allopathic model at 35.5 Lux. Thus 4% of light in a homeopathic manner had the same effect of 100% light in an allopathic manner.

The homeopathic approach in light therapy should be considered by all practitioners. It is based on established laws of healing the acting as a catalyst for the body to heal.

Mu delta should be considered a safe alternative in the treatment of glaucoma. More research needs to done regarding varying the intensity and duration of the light to see if there is an additional effect. It is this author's belief that greater results might be achieved by decreasing the light intensity lower than 1.4 Lux in a homeopathic manner.

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Colour Fields, Cognitive Styles and Confidence

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Abstract

Incorporating the raw results of three perceptual tests - spatial, sequential and closure and the size of a colour visual field with optometric test results reveals the information processing style of a patient. Treatment of these patients, both children and adults, is a combination of vision therapy and syntonics, along with the new awareness that the patient obtains concerning his personal style of learning. What emerged from this work was a new capacity in the patient for self-respect and confidence. In addition, it became a powerful aid to family relationship dynamics and seemed to engender a greater awareness and support of the treatment process from the entire family.

Raising confidence is a vital aspect in the treatment of learning challenged children and is an expected end result in syntonic treatments. Unraveling the reasons why this is so, has led to the development of a very simple clinical method of analysis. By educating the patient on his own personal learning style and integrating an understanding of how his visual awareness affects this style, a positive and stronger sense of self emerges. It is in the domain of looking at visual efficiency and cognition in a different way that has the power to create change at a very deep level.

Incorporating the raw results of three perceptual tests-spatial, sequential and closure and the size of a colour visual field with optometric test results reveals the information processing style of a patient. Treatment of these patients, both children and adults, is a combination of vision and light therapy along with the new awareness that the patient obtains concerning his personal style of learning. What emerged from this work was a new capacity in the patient for self-respect and confidence. In addition, it became a powerful aid to family relationship dynamics and seemed to engender a greater awareness and support of the treatment process from the entire family.

Cognitive Processing Styles

There appear to be two types of cognitive processing styles that fit into the optometric format of testing. We can assess these styles without embarking on the use of psychological or psychometric testing or even ECG recordings. Joseph Trachtman has presented numerous papers on the connection between vision, learning problems and central information processing. He found during electroencephalographic recordings that the beta wave is related to central visual processing and the theta wave to peripheral processing. He concluded that the optimal state for effective reading and learning was when the Parvo and Magno systems were processing information simultaneously. In order for efficient visual processing to take place, there must be an effective interaction between the Parvo and Magno systems. [Trachtman, J. 1990]. The more effortless the visual processing is the more impressive the cognitive performance.

Elliott Forrest was of the first to explore mental efficiency. He identified it as two specific types of concentration: exclusive and inclusive. Exclusive being a highly focused, goal-oriented functional form of tunnel vision that when too focused, encourages perceptual inflexibility and limits simultaneous processing of stimuli from the entire visual field. Forrest felt that inclusive concentration is an expansive form of effortless vision and achieves a level of focused flexible awareness.

Discovering which style is your preferred method of cognitive processing is fairly simple to assess from Trachtman and Forrest's work. In fact visual testing alone reveals the tendency to be inwardly or outwardly focused. Completing Visual Spatial and Auditory Sequential perceptual tests presents an even clearer picture. Additionally, Visual Closure results seem to indicate the emotional maturity/immaturity of the patient. Cognitive processing may be more clearly defined as our preferred cognitive uptake [PCU]. This specifically describes whether we are more creatively gifted or more logically gifted and encompasses the qualities of vision, brain frequency and personality within it.

A sequential person's preferred method of cognitive uptake is via the Parvo system of central field, beta wave processing and verbal proficiency. These individuals tend to be more analytical, left brained, logical and esophoric. They are highly focused thinkers. Sequential children gather information in a structured and focused way primarily using their central vision. They are not concerned about the loss of peripheral vision, as it does not impact

on their scholastic performance. This is also typical of autistic spectrum people. However, their severely diminished colour field impacts on their sport and social development and creates increasing stress due to their ever higher need to achieve.

A spatial person's preferred method of cognitive uptake is via the Magno system of peripheral field, theta wave processing. These individuals tend to be more creative, right brained, inventive and exophoric. They are 'big picture' thinkers. Spatial children gather information on a global level primarily amassing peripheral information. If their peripheral awareness is reduced, they suffer greatly. Their self-esteem diminishes and they lose all confidence in themselves. They are left having to learn with only their central vision – which requires them to use verbal skills. As their verbal skills are poor, they lose interest and concentration and will only attend if it relates to a subject that interests them. Increasing their colour fields dramatically improves their attentional ability, performance anxiety and increases self-esteem. The True Intelligence Line Intelligence is generally seen as a vertical line with the highest verbal IQ at the top and the lowest at the bottom of that line. Viewing this line horizontally, showing a continuum of ability from highly creative to highly logical, allows us to see that we all are intelligent. Wherever on the line we lie, defines the strengths in all our giftedness, rather than if we are gifted. Either parent will display the same or similar characteristics to their child. When parents are shown an image of a horizontal creative / focused line and asked to mark on which side of centre they fall, a powerful moment of recognition occurs. We see each other through ourselves.

Creative----------/-----^----------Focused

Understanding that your reduced visual awareness and flexibility is impacting your ability to access the way your brain best likes to think, is enormously empowering for these children. It allows them to understand where their difficulty lies and more importantly how they can change or manage it. The parents of these children had an immediate sense of understanding on hearing this information. They related to it completely and began describing themselves and how their way of learning matched their child's difficulties. It created a domino effect by developing into a tool for understanding members in the family who were 'Spatial' or 'Sequential' and the ensuing causes underlying difficult communications. I was even asked if it would help in marital counseling!

Colour Field Connections

I was curious about the size of the colour fields that I was seeing in patients. What was intriguing was that there seemed to be two sizes of field that appeared more consistently - some were very clearly diminished - to below 5 degrees, and others were between 10 and 12 degrees.I noticed that those who were highly gifted in music or the creative arts revealed higher scores in the Visual Spatial Perceptual tests and contrary to what I expected [I expected 5 degree fields because their confidence and concentration levels were so diminished], had fields of between 10 – 12 degrees. The children who were gifted in logical academic subjects showed higher Visual Sequential Perceptual scores and often a field size of 2 – 5 degrees.

It became evident that certain raw perceptual scores were higher and seemed to match with the child's personality, as presented by the parents, and eventually with the educational psychologists MBTI assessment as well.

These children had primarily been referred for visual assessment because the Block Designs test had indicated Visual Perceptual delays. The Block Designs test is a subtest that measures the ability to apply non-verbal logical reasoning to spatial relationship problems. These children were mostly superiorly gifted and were struggling to the degree that I expected a significant diminishment of peripheral awareness in all of them. In learning disabled children who are not gifted and whose perceptual scoring is low, I have found the colour fields to be consistently and significantly diminished. It seemed that the majority of 'Spatial' children had larger fields than the 'Sequential' children. It also appeared that if a 'Spatial' child presented with a <5 degree field, he was more seriously under-achieving than those with 10 degree fields. I had a horizontal linear image of two highly specific types of intelligence with a continuum in between. The Spatial liked learning with image and the Sequential liked learning with words. The Spatial child used a global learning technique and the Sequential preferred a more focused approach. Looking at the full field chart as a porthole into the brain, I realized that the central field relates to the 'word' and accesses verbal ability, and the peripheral field relates to 'image' and allows access to global thinking

Myers Briggs Type Indicator

A fascinating addition to understanding cognitive processing styles was looking at the Myers-Briggs Type Indicator [MBTI] - a psychological assessment that reveals how people's attitudes and functions define the way they act. It was developed to improve the dynamics of com-

munication and relationships. It is based on preferences, not absolutes and presents guidelines on four vital aspects of living - focus, preferences, attention and decisions. These scales resonate with optometric thinking in how we assess focus ability.

- Is your focus external or internal?
- Is your preference to be structured or spontaneous?
- Is your attention realistic or inventive?
- Do you make decisions with your head or your heart?

In taking the True Intelligence Line, a horizontal line with Creative at one end and Logical at the other end, we are able to superimpose the MBTI and somewhat loosely define the different types from most creative to most balanced to most logical. It is not a vertical line that dictates who is better, but indicates a much wider approach to intelligence / personality and the many different aspects of superior intellectual functioning.

Analysis

The results required in describing how to create meaning and understanding from the patient's functioning are specifically:

1. The optical results: are they esophoric or exophoric?
2. The colour fields; is it below 5 degrees or below 12 degrees?
3. the raw scores of Visual Spatial, Audiory Sequencing and Visual Closure perceptual results using the Morrison Gariner TVPS-R.

The raw perceptual scores are the three separate totals of each section. The cognitive indicator is seen in the higher score of the spatial and sequential scores. This is the indicator of the brain's most preferred way of taking in information. If this is balanced, then there is an ability to be creative and focus. Higher sequencing scores indicate a highly logical, organized person. High spatial scores indicate a highly creative intuitive thinker. High closure scores reveal a high level of emotional intelligence.

Reaching a conclusion on cognitive style is a combination of the entire history and health of the child. Severe illness or traumatic brain injury will have an effect on the results. Significant imbalances in oculomotor and accommodative function require vision therapy. Knowing that you are training a global thinker allows you to structure your therapy program differently. Fluidity and spontaneity are better styles to use with a creative individual.

Creating structure and logic is going to get you more positive results with a sequential thinker. Giving the patient an inspired view of how his vision functions, creates new perspectives and harmonious communication.

Maintaining or achieving self-confidence is what we search for all our lives. We know as children when we have lost it and as adults we yearn for the days when we exuded it unconsciously. More than any other personality trait, we want to have a high and comfortable regard for ourselves that rings true for us. Many children have a significantly lowered self-esteem and struggle with this throughout their lives. Of great interest is the often devastatingly low self-esteem of some superiorly gifted children.

What is the recipe that allows us to acknowledge our giftedness, realize our value and help us to maintain a strong sense of self throughout vulnerable times? Our skewed perceptions and belief systems hold us hostage to a series of untruths. Many children who are highly gifted have little belief in their true abilities. Presenting a different and plausible picture to a child, which reveals their cognitive likes and dislikes, has the capacity to change a distorted and negative assumption into a believable truth. Profound and positive changes in people are what optometry and syntonic optometry is capable of and our over-riding aim in therapy is to help people realise that they have more potential to achieve than they ever dreamed possible.

Modern Human Behaviour - Confidence

Many thought leaders have studied human behavior in an effort to enhance the development of confidence, wisdom and creativity. Linda Kreger Silverman has produced a large body of work on Twice Exceptional children [Gifted With Learning Disabilities] and discovered that 60% of students tested on two schools were visual spatial learners. Combining colour field results in this study would have been illuminating!

This discovery tied up with various future-forecast writings on education in the 21st century and beyond which suggested that 'unless the right hemisphere is activated and engaged, attention is low and learning is poor. [Daniel Pink]. Patterns, intuition, imaginative vision and original approaches are the visual/mental skills required by employees of the future. Sue Thompson, author of 'The Source for Non-Verbal Learning Disorders' has said that there is no question that most scholastic accomplishments are measured and defined through language-based communication. Yet is it known that more than 65% of all communication is actually conveyed non-verbally. Daphna Oyserman, Professor of Psychology at Ann Ar-

bor, Michigan describes modern human behavior as having the advantages of using both holistic and analytic perception. Encouraging the emergence of peak performances is not just an individual process, but involves the cultivation of cognitive flexibility systemically. It requires us to look beyond the boundaries of our limited vision and discover that our points of view are better seen as expanded and flexible areas of awareness.

The possibility of determining cognitive processing skills using easily available tools and within a clinical setting has far reaching implications. Research psychologists such as Richard Nisbett and Daphna Oyserman already know that differences in visual attention influence the way in which people think about their world. How this affects behavior and performance potential is intimately connected with our optometric thinking. Increasing performance potential in underachieving children and adults is intertwined with the regulation of cognitive flexibility. No matter how we encourage the emergence of academic achievement, it is in the conscious awareness and understanding of self that motivates success.

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Syntonics Case Study: Lighting up lives

Denise Hadden, Registered Optometrist, B.Sc. Hons, FBOA, FSMC, FOA [SA], FCSO

Retired, seventy-nine year old Professor W had just failed his driving license eye test. He was told that his peripheral vision was too reduced for him to pass the test. Luckily Professor W's grandchild had undergone a very successful course of syntonics and vision therapy with us for her reading and concentration difficulties as well as for her severely reduced peripheral awareness.

Professor W was a little sceptical, but very courteously asked whether I could explain how looking at a coloured light would enable him to obtain a legal licensed to drive.

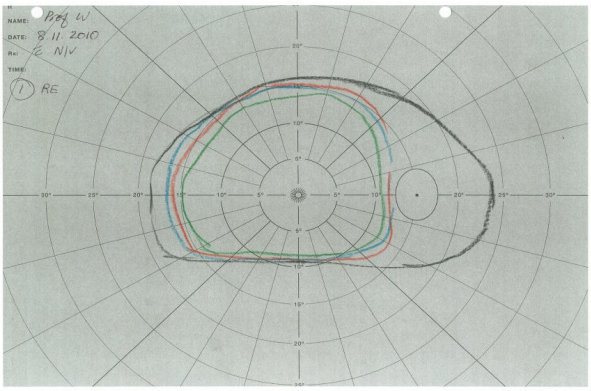
He listened intently as I explained that syntonic phototherapy affected the autonomic nervous system, which in turn affected our capacity to see peripherally. It took the Prof about two weeks of deliberation before he decided that understanding the reasoning or scientific basis was not of importance. He realized that doing nothing meant that he would never be able to drive again. It also kept him dependant on his family and friends for transport. Trying the therapy, albeit with a tongue in cheek attitude, might just get him back in his car again and living a more independent life.

Professor W decided to commit fully to the process and diligently maintained the program set for him. For a 7week period between 18th November 2010 and 5th January 2011 Professor W did 5 sessions per week of 20mins duration. He apologetically admitted that he had skipped the Christmas week. On the 26th January 2011, Professor W's daughter in law arrived at my practice with a box of the best cake in town. She conveyed Prof W and her thanks and gratitude for what we had done. He had just passed his driving license eye test and was now legal on the roads!

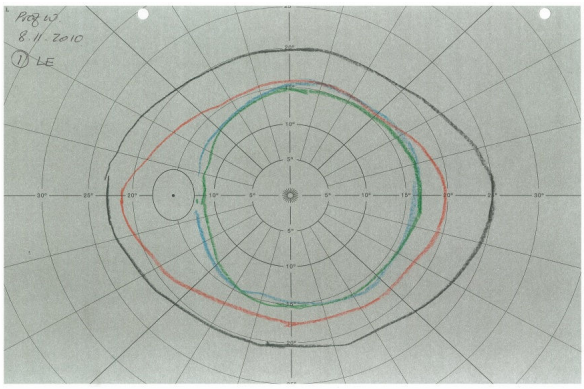
Professor W had a relatively healthy pair of eyes when I examined him. His vision was fluctuating and he had some floaters and mild cataract. His retinas were clear and optic discs healthy. Eye pressures were normal at R14 and L11. His colour fields were reduced, more especially on the right eye. His prescription was:
R + 1.00 / - 1.00 x 90 v/a 0.63 -
L + 1.25 / - 1.25 x 90 v/a 0.63 -
Add +2.75

He was suffering from Diverticulitis, High Blood Pressure, and Gout and was taking sleeping pills nightly. He had hip and back problems, disc degeneration and he walked with a limp. He had also been in a coma and very nearly died during surgery in the early months of 2010. He was somewhat deaf and so we had difficulty doing his colour fields, as he kept moving back to say 'I beg your pardon'!

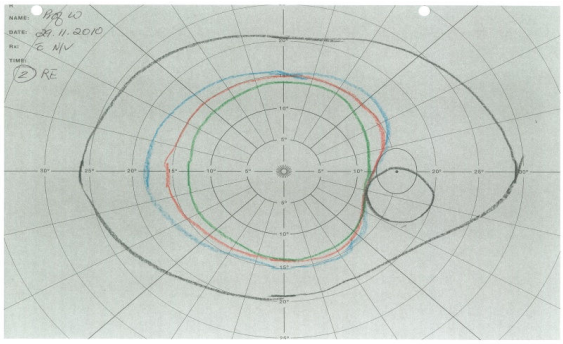
I did 3 fields during the 7week period. I had intended to keep a closer watch on him during the therapy, however, the festive season created some challenges that did not



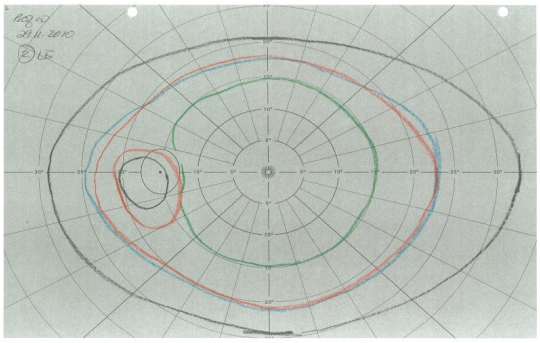
Colour Fields 1-Right Eye
November 8, 2010



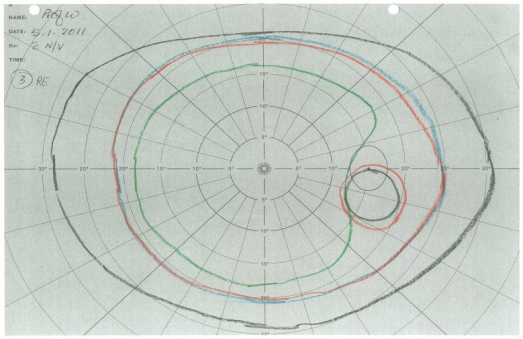
Colour Fields 1-Left Eye
November 8, 2010



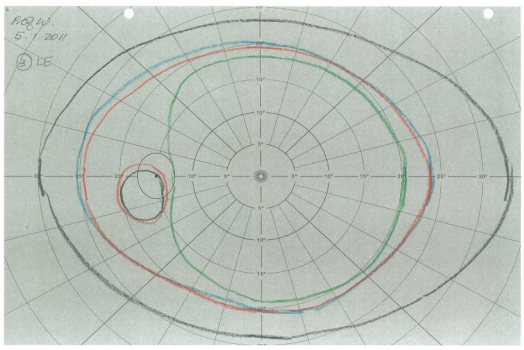
Colour Field 2-Right Eye
November 29, 2010



Colour Field 2-Left Eye
November 29, 2010



Colour Field 3-Right Eye
January 5, 2011



Colour Field 3-Left Eye
January 5, 2011

allow more intense monitoring.

We began with a program that I use regularly with patients who have had any brain trauma or have been in a coma. Eleven days later he attended for his second colour field. His visions had improved to R1.0 - and L 0.8part and his colour field had improved dramatically.

His final colour field was done on 5th January 2011 and had expanded significantly. His final visions were steady at R 0.8-1 and L0.8-1.

8th November 2010
Colour Field 1
Visions R 0.63 L 0.63
Field Charter Used: Wim Boykens, Belgium
RE: Significant loss in the lower right field.
Blind Spot impossible to map

LE: 20 degree form field.
Blind Spot impossible to map.
15-20 degree monocular colour field

Considering the patient's history and age, the left field was not as reduced as I expected. The right field is significantly reduced in the lower half and the form fields are very reduced.

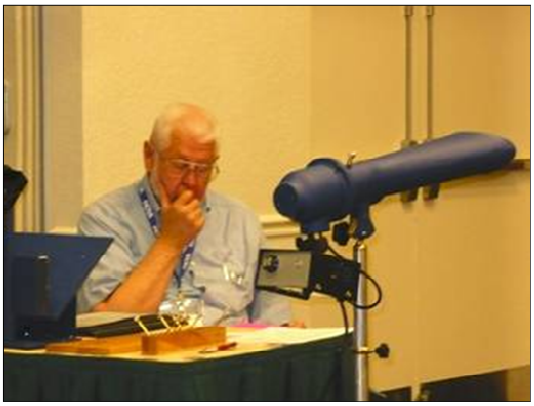
18th November 2010
Light program: Light Instrument: Simon Grebvski, Australia
Day 1: Violet 10 Mins / Indigo 10 Mins
Day 2: Indigo 10 Mins/ Blue 10 Mins
Day 3: Blue 10 Mins/ Blue Green 10 Mins
Day 4: Blue Green 20 Mins
Day 5: Blue Green 20 Mins
Day 6 Blue Green 20 Mins
Day 7: Blue Green 20 Mins

29th November 2010
Colour Field 2
Visions R 1.0- L 0.8 part
RE:Form Field increased to 20-25 degrees. Lower half of field regained.
Blind spot displaced down.
Colour Field 15 degrees and lower half regained.
LE:20-25 degree form field.
Blind spot displaced.
Colour field green still 15 degrees, but red and blue Significantly larger
Light Program: Continue with only Blue Green-20 minutes each day [5 times per week]

5th January 2011
Colour Field 3
Visions R 0.8-1.0 L 0.8-1.0
RE: Form field 30 degrees,
Green 18 degrees,
red & blue 20-25 degrees.
Blind spot same displaced position

LE: Form Field 30 degrees.
Green 18-20 degrees,
red & Blue 20-25 degrees.
Blind spot same displaced position, red normalized.

Professor W's humor had returned. There was a faint smile playing around his lips as he looked at the results. 'Could you guarantee that I will pass my drivers test now?' His face expressed his sudden fear that he had gone through all of this process and may still not be able to drive. 'If they do not pass you now, I will be very surprised' said I. The smile returned and off he went, limping in the jauntiest way I have ever seen!



Rex Cross
2010 Spitler Award Winner

With Great Appreciation and Gratitude for Advancing, Producing and Providing C&J Syntonics Equipment for CSO – A huge achievement done with caring and generosity for many decades.

(Ed-Rex is the owner and CEO of C & J Instruments.)

International News

Syntonic Optometry Boom in Europe

Stefan Collier, Trustee,
CSO-European Liaison, General Secretary SOE

For many years Syntonic Optometry was unknown, ignored and /or rejected by optometric educators, organizations and almost all optometrists throughout Europe. There were a few brave optometrists who did practice syntonics but they did so in secret to avoid problems with their colleagues who might challenge them because of lack of scientific studies proving the theoretical basis and clinical effectiveness of phototherapy.

At the 4th International Congress on Behavioral Optometry in 2002 held in Versailles, France, a lecture on Syntonics was presented that peaked the interest of many of the European optometrists in attendance. Some of these were moved to attend a CSO Conference on Light and Vision in the US and others found European colleagues who would reveal their syntonic secrets. A little light began leaking through cracks in the wall.

I remember when a German colleague who worked in Switzerland came to visit the practice in the Netherlands. She asked me what the odd-looking instrument in that dark room was. I answered with a timid voice; "It's a syntonizer". To my surprise, she was intrigued, so I measured her fields and gave her a therapy session on the College syntonizer. She was amazed and so convinced about the power of this optometric tool, that she asked me to present a seminar to the German speaking colleagues in her office in Switzerland. I accepted her invitation, designed a course and , in March 2003, forty optometrists attended my first seminar in syntonic optometry on European soil.

And than the unexpected happened…

Syntonic Boom
The avalanche started

Two weeks after the seminar in Switzerland, the German scientific society in Eye Optics and optometry (WVAO) asked me to put an official curriculum together on this topic. Curriculum I & II in syntonic optometry was presented in collaboration with the European Society of Optometrists (SOE), CSO and WVAO to German speaking Optometrists.

The curriculum was so successful that it ended with a waiting list of attendees for this curriculum. Two to three courses have been planned each year to fulfill the demand. Almost all the 300+ curriculum participants have already integrated Syntonic optometry in their daily practice. With the approval and support of CSO in the US, SOE and WVAO created an official program for certification in the practice of Syntonic Optometry. We knew that the requirements and examination for certification had to be at a very high level in order to achieve respect and approval by these organizations for Syntonics. At this time only a few colleagues have taken and passed the exam. I think that this was due to the difficulty of the exam and the anxiety, stress, frustration and many hours of study required to pass it. I expect this to increase.

This success is not only limited to our German-speaking colleagues. Interest in Spain, Italy, the Netherlands and the UK followed. In Spain a large group of behavioral optome-

Germany WVAO
1sr Optometrists to receive certificate in syntonic optometry.

trists has also organized these curriculums. So syntonic optometry could add another 60 Spanish, 15 Italian and 40 Dutch Syntonic colleagues to their list. In the UK there are only 10, but our friend and CSO fellow Geoff Shayler is working on it. I hope that all of this will grow. Actually I know that it is growing, because the demand is there. The beautiful thing in all of this, is that the colleagues are communicating with others, and the word is spreading by itself about this wonderful part of optometry, thanks to the results they obtain with their patients.
Thanks to this success, a very nice collaboration and deep friendship between SOE and CSO has been established since 2007. A mutual exchange of knowledge and education between members on both sides of the Atlantic is enhancing the impact and strength of both organizations. The purpose of this is to get a worldwide unification of syntonic optometry.

We are not satisfied with less!

Fellowship
SOE - CSO

For many years CSO has provided Fellowship by examination and case study presentation for their members. In addition some European Optometrists have also gone down this road, however, due to the language barrier, many Europeans have been unable to do this.

Left to Right: Don Barniske, Joseph Thiel, Yvonne Frei, Stefan Collier, Larry Wallace, Danlo Lazzeri, and Benoit Lombaerts.

Collaboration between SOE and CSO is now providing a solution to this problem.

Beginning in September of 2010, SOE started their Fellowship Program. SOE Full Membership also includes CSO membership.

An active full member in SOE can participate in the Fellowship Program of both organizations, If they have been full members for at least three years and followed the required educational programs of SOE—CSO. These SOE Fellows are accepted as Fellows of CSO after the CSO Board validates their credentials. The qualified Fellows can use the abbreviation F.S.O.E. - F.C.S.O..

Thanks to this CSO/SOE partnership, the English Language barrier has been broken. It not only gives the opportunity to have more Fellows in Europe, but also more professional acceptance for Syntonic Optometry world wide.

United Kingdom
Geoff Shayler, BSc, FCOptom, FCSO
Email: kinoptom@lineone.net

A fast change can be a bit of a shock.

Some years ago we saw a 75 year old lady who had previously be diagnose with AMD (minimal) and cataract (mild) and registered blind by her Ophthalmologist. Her right eye was finger counting at one metre, the left was hand movement. Visual field was less than 2 deg. She was treated with syntonics and TBI (Translid binocular interactor) with no other OVT. After 3 weeks her fields completely normalized and VAs were recorded at 20/30 and 20/40!!

This was a bit too much for her and the fields close back to about 15 degrees with 20/60 VAs, with which she was happier and these visual improvements were retained.

Photobiomodulation Research Review

Ray Gottlieb, O.D., Ph.D. Dean, CSO

After Spitler published his *Syntonic Principle* in 1941 there were only a smattering of research articles about light therapy until the 1970's when Russian and eastern European researchers began investigating the healing effects of low intensity lasers. Since then a whole new field, now called photobiomodulation, and several new journals have sprung up like wild flowers in the springtime sun. Clinical and theoretical research articles have been piling up a mountain of evidence that supports and extends what syntonic practitioners have been doing for 80 years. While not precisely researching the syntonic use of multichromatic, incoherent visible light delivered through the eyes, the current research is full of good news that brings a strong, undeniable scientific basis to syntonic phototherapy that will guide our evolution. Many of the articles are from the journal, *Photomedicine and Laser Surgery* (PMLS). If you'd like to support PLMS and be able to download their current and past articles, you might want to join the American Society for Photobiology – http://www.photobiology.org. Following is a review of some articles from my files that point to a brighter future for photomedicine and optometric phototherapy.

Time to appreciate light as a drug

This article, about light hygiene, makes a strong case that it's high time for light to be thought of as a drug equivalent. The timing, wavelength, dose and disruption of light exposure have a critical impact on health and disease in man. Light determines biological rhythmicity by setting internal clocks that allow us to adjust to continually changing environmental conditions that occur from day to night and throughout the seasons of the year. It does this mainly via recently discovered light sensitive retinal ganglion cells that connect via the optic nerve to suprachiasmic nuclei (the master clock in the brain). Without this ocular input, "*chronodisruption*" of physiologic, endocrinologic, metabolic and behavioral biorhythms can be detrimental for human health. We must pay more attention to "light hygiene," to improve the public health. We must educate health professionals and the public by specifically providing appropriate information light exposures to prevent disruption, regain phase synchronization of biological clocks, and optimize coordination with other timing (Zeitgeber) cues including physical and social activities, stress and food intake. "Light possesses a rather unique and exclusive Zeitgeber role and in view of its ubiquitous nature, a specific, preventative focus on ''light hygiene", as a contribution to a general ''Zeitgeber hygiene", is warranted.

Light Hygiene: Time to make preventive use of insights – old and new – into the nexus of the drug light, melatonin, clocks, chronodisruption and public health

Erren, TC & Reiter, RJ, *Medical Hypotheses*. (2009) 73: 537–541

Light researchers call for FDA approval to begin human photobiomodulation trials to prevent retinal injury

Recent studies have shown that retinal injury, retinal toxicity and retinal disease, triggered by mitochondrial dysfunction and oxidative stress, can be reversed by photobiomodulation using low-energy red and/or infrared light. The light activates cytochrome oxidase, a photosensitive molecule in mitochondria, and this leads to increases in mitochondrial metabolism, ATP and retinal antioxidant production, and retinal circulation and nutrition. This improves the vitality and survival of retinal tissue and preserves visual function. These actions occur both locally and via gene expression pathways. Many in-depth investigations have shown that light applications to the eye using low-intensity light, even coherent laser light, in these energy and wavelength ranges is safe and harmless. Daily application of phototherapy (760 nm) in rodent subjects has been shown to prevent retinal injury following high-intensity laser burns, retinal toxicity due to methyl alcohol, and retinitis pigmentosa when administered during the critical period of photoreceptor development. The authors of this article cite this research as sufficient grounds to begin clinical trials of photobiomodulation in human disease and call for comprehensive FDA approval for the use of photobiomodulation in the treatment of retinal diseases.

Photobiomodulation for the Treatment of Retinal Injury and Retinal Degenerative Diseases

Eells JT, et. al. *Proceedings of Light-Activated Tissue Regeneration and Therapy Conference*. eds R.W. Waynant and D.B. Tata pp 39-51, Springer, New York, 2008.

Bright light preconditioning protects retina against subsequent bright light damage

William H. Bates, MD, of 'Perfect sight without glasses' fame, has been ridiculed for a century because he advised his patients to "sun" their eyes. This practice, called

"sunning" consists of exposing the closed eyes to direct sunlight for at least three-minutes daily. On dark days, early Bates practitioners used an infrared light source for "sunning" indoors. Sunning was recommended for helping refractive and accommodative conditions and also for glaucoma, cataract, macular degeneration and other ocular pathologies. His medical and optometric naysayers frightened interested patients who might have benefitted from Bates' approach by telling them not to trust Bates because looking at the sun would burn their retinas and make them blind. I've never heard of anyone going blind from sunning. Over the last few decades several studies suggest that Bates was on to something real and important for eye health.

This experiment showed that exposing mice to a dose of bright light prevented retinal damage from later exposure to toxic levels of illumination. Preconditioning with light also protected their retinas from hyperoxic conditions (too much oxygen in the retina). All the mice were initially raised in a normal light environment: 12 hours of light (3lux) and 12 hours of dark. Mice in the experimental group were preconditioned with bright light (300 lux for 24 hours). Mice in the control group were not. All mice were then exposed to retina-damaging levels of high illumination (1000 lux for two weeks) or plunged into air with raised levels of oxygen (hyperoxia).

There are three possible ways that the preconditioning light protects the retinal photoreceptors: by stimulating healthy growth of rod and cone outer segments, by increasing antioxidant function, and by stimulating greater complexity of outer plexiform layer synapses. The preconditioning light also protected against the damaging effects of chronic retinal hyperoxia. The rapid loss of vision in the later stages of retinal diseases such as macular degeneration is due to increasing levels of hyperoxia. As rod and cone cells continue to die, the need for less and less oxygen causes more and more hyperoxia and the resulting spiral of accelerated damage.

Environmental Damage to the Retina and Preconditioning: Contrasting Effects of Light and Hyperoxic Stress. Zhu Y, Valter, K, Stone, J; *Invest Ophthalmol Vis Sci. (*2010) 51:4821–4830

<u>Green light during sleep prevents diabetic retinopathy</u>

After recent studies that suggest sleeping in the light may cause cancer, myopia and other negative outcomes, comes this positive report: a unique experiment showing that diabetic retinopathy in humans might be prevented or reduced by green light stimulation through closed eyelids during nighttime sleep. The rational for this is explained below but as a syntonist I wonder if the green (mu delta) they used was the key ingredient and whether syntonic mu delta treatments would also be effective. Most important is that light therapy may be an inexpensive, noninvasive approach for preventing a particularly debilitating type of low vision blindness that devastates millions of patients.

Trans-lid retinal illumination was used to prevent dark adaptation that occurs at night. Because rods are metabolically most active in the dark, they gobble up oxygen. This starves the rest of the retina through the night. Diabetes is a disease that targets microcirculation making the tiny blood vessels of the retina particularly vulnerable to hypoxic damage and causes micro aneurysms, dot hemorrhages, and small areas of constriction in the retinal capillary network. These appear as dark spots in the retina and are the first clinical signs of diabetic retinopathy in humans.

Twelve human patients took part in the study. All had been diagnosed with type 1 or chronic type 2 diabetes and with mild to moderate non-proliferative diabetic retinopathy. All measured 20/20 corrected acuity. Their diabetes was well-controlled with medication that continued through the experiment.

The light source used was a 'glowpatch,' a thin 2" oval plastic disk filled with chemicals that when manually compressed, mix together to generate green light. At the retina, the wavelength measured 550nm (mu delta) after passing through the closed eyelid. The disk, held in place by a comfortable headband, was mounted over one eye as patients slept in the dark. The fellow eyes served as controls. Some patients slept with the light for three months and others for a year. Two of the patients did not complete the experiment.

Retinal photos were taken and color contrast discrimination (ChromaTest) was tested before and after the treatment. These measures showed significant increases in contrast discrimination for blue/yellow targets in the treated relative to the fellow eye, and the micro aneurysms and dot hemorrhages decreased in treated eye but increased in untreated eye. The patients showed no adverse effects due to the light. Phase II studies are planned.

A Preliminary Trial to Determine Whether Prevention of Dark Adaptation Affects the Course of Early Diabetic Retinopathy. GB Arden, et. al., (2010) *Eye.* 24, 1149–1155

Infrared Lasers Reverse Senile Cataracts

Danish Ophthalmologists used infrared light to reverse age-related cataract in nine lenses donated from recently deceased people. The donors, who ranged from 53 to 78 years old, had been diagnosed with mild to moderate senile cataract. Spectral transmission curves of the nine lenses were measured before and after being treated with an 800 nm, infrared laser pulsed at femtosecond frequencies (a quadrillion, 10^{15}, flashes per second). A 1 mm^2 area of lenses was treated by multiple scanning's with the laser. In a matter of seconds, the yellowish haze disappeared from the treated area. The blue-green wavelengths, the ones most responsible for the senile haze, were reduced the most by the treatment. The more advanced the cataract, the greater the improvement in transmission. The researchers predict that this non-invasive treatment over the whole cataract in living patients will reverse lens aging and cataract by several decades.

The technique was borrowed from the field of multiphoton microscopy where a similar laser technique is used to bleach synthetic fluorescent dyes. Multiphoton refers to the simultaneous absorption of two or more photons in a single molecule causing, causing the damaged lens proteins responsible for the cataract, to reassume their original shape and transparency. Infrared light at this wavelength and intensity have been shown in earlier studies to be safe for retinal and other ocular tissue, however, the authors intend do extensive testing to verify this before applying the light to living subjects. Lead author, Line Kessell and his team are looking for a safe and inexpensive alternative to cataract surgery to service the expected huge increase in cataract related blindness due to the aging population explosion.

Non-Invasive Bleaching of the Human Lens by Femtosecond Laser Photolysis Kessel1, L, et. al. *PLoS ONE* (published on line at http://www.plosone.org) 1 March 2010 | Volume 5 | Issue 3 | e9711

Light, Pain and Dural Pathways

Migraine headache is a neurological disorder causing recurring episodes of intense, throbbing pain on one side of the head, often accompanied by nausea, vomiting, irritability or fatigue. Most migraine sufferers report that light increases the pain and darkness relieves it. The neural mechanism for the photic exacerbation of migraine headache is unknown.

Migraine pain comes from specialized pain receptors (nociceptive cells) located in the cranial dura mater. Nociceptive cells are sensitive to chemical imbalance and to temperature, stretch, pressure, sound and light input that exceeds normal thresholds. Photo-exacerbation of migraine pain occurs even in blind patients, but only for those with rod/cone pathology who retain the recently discovered intrinsically photosensitive retinal ganglion cells (ipRGCs). These are the ones that signal changes in circadian photoregulation, pineal melatonin release, and pupil size. The research discovered that pain signals from Dura nociceptive cells connect to neurons in the posterior thalamus and that they also receive light input from the ipRGCs. These same thalamic neurons, the trigeminovascular thalamic neurons, are part of a neural network that projects to multiple areas in the motor, sensory and associative cortices and to vascular and sub-cortical nerve centers. The authors propose that this may be the source of common migraine symptoms such as loss of short-term memory, muscle weakness and impaired motor coordination, attention deficits, and visual disturbances.

These findings have special meaning for syntonic practitioners. The ipRGCs are most sensitive to the blue and blue/green wavelengths the same ones we use for pain and headache. This may explain the astounding results we often get using blue and blue/green filter combinations we use for eye pain and headache and why attention, memory, motor and visual functions also improve from just looking at upsilon/omega and mu/upsilon.

A Neural Mechanism for Exacerbation of Headache by Light, Noseda R, et. al.**.** *Nature Neuroscience.* 2010, 13 |(2): 239

Infrared Light Improves Acuity and Retinal Signs of Macular Degeneration

In this German study, 193 patients (328 eyes) diagnosed with age related macular degeneration (AMD) of all forms, stages, and with varying degrees of central field and acuity loss took part in the study. An infrared laser (780 nm) was used to irradiate a 3 mm^2 spot on the conjunctiva. One eye was treated at a time as patients turned their treated eye toward their nose. This allowed the light to be directed toward the macula, Each eye received a total of four 40 second light treatments, twice a week over a two-week period.

The patients' eyes were examined, visual acuity measured and subjective responses recorded before and after each treatment session and for months and years following treatment. Visual acuity improved in more than 95% of the treated eyes. In addition, retinal pigment accumulations and cystic drusen diminished, metamorphopsia, acquired impairments of color vision, and scotomas decreased, and retinal edema and bleeding reduced the 86 eyes with wet AMD, These improvements lasted for

3–36 mo. An additional 20 eyes that received only sham treatments did not improve.

Visual acuity improved in 97.3% of patients without cataracts (146 eyes) — 20% by one line, 37.0% by two lines, 19.2% by three lines, 8.2% by five lines, 4.1% by six lines, and .7% by seven lines. Visual acuity remained unchanged in just four eyes (2.7%).

Visual acuity improved in 94.5% of the eyes (182 eyes) with cataracts — 25% by one line of letters, 41% by two lines, 14% by three lines, 9% by four lines, 4% by five lines, 1.6% by six lines, and one eye (0.5%) increased acuity by seven lines. Visual acuity remained unchanged in ten eyes (5.5%).

The improvements caused after just four short light treatments are very encouraging, especially given the poor long-term prognosis for AMD. The authors recommend that more experiments using light alone or combined with other AMD therapies should follow. (See articles about saffron and green tea.)

Low-Level Laser Therapy Improves Vision in Patients with Age-Related Macular Degeneration Boris Ivandic, BT & Ivandic. *Photomedicine and Laser Surgery.* (2008) 26(3): 241–245

Infrared transcranial light therapy improves cognition of 2 chronic TBI patients

This is the first report of light delivered through the skull for improving cognitive and behavioral functioning in humans suffering from long-term traumatic brain injury (TBI).

The article describes detailed case histories of two patients who received red (633 nm) and near-infrared (870 nm) LED treatments applied to various areas on the scalp.

Before her traumatic brain injury (TBI), the first patient was a very high-functioning director of marketing. She had earned two masters degrees, knew three languages, had written three books and taught part-time at a major university. The car crash occurred when she was age 59 years. She did not lose consciousness after the accident and initial X-ray and MRI scans taken at the time were normal. Initially she noticed no loss of function until five months later when post-concussive syndrome symptoms began that eventually forced her to stop working. Two years post-TBI further evaluations showed severe impairment in verbal cognitive and executive functioning. She could not concentrate for more than a few minutes. During the next two years she completed 100 days of cognitive training. The training increased her sustained attention for 20 minutes (at the computer).

Seven years post-TBI, at age 66, she started light therapy. An infrared laser diode was directed to places on the head, traversing through the skin, skull and Dura to radiate areas of the brain cortex likely to have been damaged by the accident. The intensity of the light reaching the brain was miniscule (13.3 J/cm2 at scalp, estimated 0.4 J/cm^2 to cortex). The total treatment time of the first session was 5 minutes, 10 seconds for each area treated. After the first treatment, the patient slept through dinner that evening and most of the next day. Two days later, her attention span had doubled from 20 to 40 minutes. The second treatment one week later was the same as the first but without subsequent sleepiness. The treatment time was increased gradually over the next 8 weeks (to 12 minutes total and 54 seconds at each point), and the light intensity was increased by 2.5 times. By the 8th session her attention span had increased to three hours.

After five more months of weekly treatments she received a home phototherapy device that she still uses to self-administer home treatments more than five years later. She prefers to treat at bedtime because this "improves her sleep." After 3.5 years, she added light treatment on acupuncture point on the sole of the foot, Kidney-1, a point used historically to reverse coma and improve mentation. Six areas are treated for 10 minutes each. These change from night to night and include the "bilateral forehead, temples, posterior-superior to the ears (likely angular gyrus areas, which she reports helped her to ''remember what she read''), base of occiput (which "removed the extreme sensitivity that had bothered her when her hair was being cut"), midline at front hairline, and the center, vertex of her head (which ''improved her ability to do math''). When she stops treating for more than 2 weeks, she regresses.

After 6 years of transcranial light treatments, she continues to perform computer work for 3 hours at a time. She reports ''improved self-awareness of both limitations and successes, as well as improved inhibition of inappropriate behavior and angry outbursts.'' She also uses the LED unit to help manage her osteoarthritis knee pain. She notes there are some remaining cognitive problems; she cannot multi-task as well as she would like. She still needs to make notes to be sure that all tasks are accomplished; her overall quality of life, however, is much improved (now age 72, and 13 years post-MVA). She continues to take the drug, Concerta, which she had begun several years before starting the transcranial phototherapy.

The second patient, a 52 year-old female, referred herself for neuropsychological evaluation due to an increasing loss of cognitive functioning over the preceding 2 years, particularly in the last 4–5 months. A college graduate, she had been a high-ranking officer in the military. She retired after 20 years of service and was working full-time as an executive consultant until a year before when she was forced to take medical disability leave due to cognitive dysfunction. She had a history of several sports and military TBI's, and suffered a TBI two years before, when she fell backwards from a swing, hit the back of her head on concrete, and was rendered unconscious for a short period. Soon after she noticed a significant loss in her capacity to concentrate, multitask and complete tasks. Neurological and psychological tests showed abnormal EEGs, anatomical shifts, high toxic metal readings and psychophysical deficits in executive abilities related to frontal lobe dysfunction. She also showed symptoms of post-traumatic stress disorder.

Transcranial infrared therapy began with an afternoon treatment after which she was sleepy for several hours. Subsequent treatments were self-administered at home. During the first week, each night, the light was placed on bilateral forehead, high-frontal, high-parietal, and temporoparietal areas. Initial treatments were 7 min/area and increased to 8 min/area on week two, 9 min/area on week three and 10 min/area from then on. Acupuncture point Kidney-1 was also treated.

After 4 months she was able to resume her old position, was able to resume her former job, working full-time as an executive consultant. When she was reevaluated after 9 months of nightly home treatments, her executive function and memory scores increases above pre-therapy results by two standard deviations. Her post-traumatic stress disorder symptoms had also reduced. She continues nightly treatments at home. If she stops for more than a week, she regresses.

At the time of this report (March 2010), both patients continue to self-treat. The article concludes: "Transcranial LED may improve cognition, reduce costs in TBI treatment, and be applied at home. Controlled studies are warranted.

These are the first chronic TBI patients reported in the low-level laser therapy literature. I included details of the case histories because their stories are similar to many of our syntonic TBI patients. Syntonic results can be as robust and swift even though we use incoherent broadband light in the visible spectrum (usually blue and blue/green for TBI) rather than non-visible infrared narrowband, we deliver light through the eye's pupil rather than through the skin and skull bones, and we treat for different time periods. Syntonic therapy generally ends after twenty or forty sessions but these two patients been self-treating for years and regress after a week or two if they stop. These results here are exciting and in agreement with earlier LLLT studies done using animals and human stroke patients.

Improved Cognitive Function After Transcranial, Light-Emitting Diode Treatments in Chronic, Traumatic Brain Injury: Two Case Reports

Naeser, MA, et. al. *Photomedicine and Laser Surgery*. Published on line December 2010, ahead of print

Glaucoma: Infrared Light Treatments Reduce Intraocular Pressure (IOP)

Infrared light shined on the sclera significantly reduced IOP in the majority of patients tested in a German phototherapy experiment. The study looked at the difference between IOP measured just before the light treatment and thirty minutes later.

The 30-second treatment reduced IOP in some patients by 50%, others by less and some patients had little or no decrease in either eye or a decrease in just one eye. The authors suggest that the IOP reading before the light treatment measures the level of their ocular hypertension and the IOP reading following the light treatment is the normal, physiological level for that individual.

According to this, the relative decrease in pressure following the light treatment might be used for distinguishing which normal-tension patients might be at high risk of developing glaucoma and whether patients with >22 mm Hg. readings have glaucoma or are likely to develop glaucoma. Thus, *assuming no other indications of glaucoma*, eyes with identical IOP readings before and after light treatment are at low risk for glaucoma even if their IOP is above normal. Those with a <20% drop have little glaucoma risk and not medicated even if their initial readings were >22mm. An eye with 20%-30% drop has a mild, 30%-40% a moderate, and patients with a >40% have a high risk for having or developing glaucoma.

For example, a patient with an initial IOP of 18mm who drops 40% to 11mm following infrared treatment would be considered a definite glaucoma suspect and a strong candidate for early treatment and a patient with IOP of 24 mm Hg who drops to 23 mm would be at low risk and watched but not necessarily treated.

The study group included 123 healthy subjects with normal vision and no obvious ocular or systemic pathology. About 20% of these eyes were hypertensive (IOP >21mm Hg) and the rest were in normal range. IOP was measured before and 30 minutes after treatment. The sclera of the probe eyes was irradiated for just 30 seconds with near-infrared (760 nm) laser light. The treatment beam was a 6 mm^2 spot moved in a circular pattern near the limbus. The average IOP in the hypertensive eyes taken a half hour after treatment decreased by 6.2 mm Hg, from 24.1 to 17.9 mm Hg or 26%. The average IOP of the normotensive eyes decreased by 2.9 mm or 17%.

A control group who received sham treatment (light shined on forehead) had identical pre and post readings. A separate group of 35 patients received treatment in one eye only. The IOP did decrease in the treated eyes but the untreated eyes' IOP did not change.

The major result of this study is that the IOP can be lowered after just 40 seconds of transscleral low-intensity infrared light. The authors offer several potential applications: 1) to help detect latent normal tension glaucoma before it leads to glaucomatous damage, 2) to determine an individual's target IOP for antiglaucoma therapy, and 3) to distinguish glaucomatous from non-glaucomatous atrophy. The authors conclude: "Moreover, Low Intensity Laser Irradiation itself may be an additional tool to treat ocular hypertension and glaucoma. On the basis of this pilot study, multi-center clinical trials are now required to confirm these data."

Early Diagnosis of Ocular Hypertension Using a Low-Intensity Laser Irradiation Test

Ivandic, BT, Hoque, NN, Ivandic, T. *Photomedicine and Laser Surgery.* (2009) 27 (4): 571–575

Green light effects on biological systems

'Water is H_2O, hydrogen two parts, oxygen one, but there is also a third thing, that makes it water and nobody knows what it is. ' D H Lawrence (1885-1930)

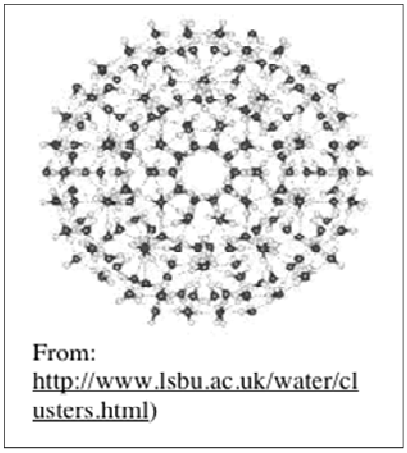
Syntonic practitioners prescribe green filters more than all of the other colors. We see and marvel at the effects of blue-green and yellow-green, the gains that increase our patients' vision and their quality of life. Yet, green is barely mentioned in the clinical and scientific photobiomodulation literature. This article by Sorin Comorosan and his colleagues in Romania provides evidence of green light's protective effects from the dangers of free radical excess and the DNA damage caused by lethal levels of ultraviolet light irradiation. It also offers a unique model of how green light works and why so little light therapy research has been focused on green frequencies. It offers a new theoretical base that connects biology to the domain of modern physics.

Green glass has been used in the food industry since 1935, when it was discovered that oil-bearing foods don't become rancid if protected by green glass or wrapping.
In spite of this, articles about the healing effects of infrared, red, blue and ultraviolet (UV) low-intensity light therapy dominate and next-to nothing is published about green light. Why? It's because biological theories are still based in classical physics that holds that only light wavelengths that are absorbed by chromophores — the colored, light absorbing parts of proteins, nucleic acids, lipids, and membranes components in biological cell systems — can light modulate biological function. No green chromophores have been discovered (except in retinal components involved with color vision and in specialized cells used for flight orientation in some exotic birds). No green chromophores, no green photons absorbed, no reason to investigate green light therapy.

In the 1970's Comorosan studied the effects that different wavelengths visible light (400-600 nm) had on pharmaceutical enzymes. He found that green light (~540 nm) stimulated a much stronger maximum yield than blue or yellow wavelengths. And green light does have a significant effect on living cells according to Comorosan's current work published more than three decades later. Strong UV is known to generate high levels of reactive oxygen species causing cell death and DNA damage. These recent experiments investigated the survival rates and biological changes in living cells that were irradiated under green light for 24 hours before irradiation with lethal levels of ultraviolet (UV) light compared to cells exposed to the UV but not the green and cells that received neither green nor UV. The result was that cells not pre-exposed to green were killed by the UV but the green-treated cells survived at rates similar to that of the control cells not irradiated with the lethal UV. There was clear evidence that green ~530-550 nm (Mu Delta) preconditioning had a strong antioxidant impact on the cells and also prevented DNA damage from the UV.

There can be no doubt that effects are significant, but if green photons are not absorbed in the conventional meaning, how can this happen? The authors explain that biological systems are a mixture of classical and quantum effects. They suggest that the biological effects from green light occur as a result of energetic quantum phenomena described in the new science of macroscopic quantum coherence.

The authors' main hypothesis is that the green light acts on water, a major ingredient of biological function and structure. Green photon interactions modify the topology of individual water H_2O molecules to generate large-scale complex water clusters, a type of quantum "atom", with extreme sensitivity to the influences of external fields, collisions, reactivity, and microwave radiation. These water clusters can fluctuate between an expanded (ES) and a collapsed (CS) form and the green photon interactions act to push the $[ES] \rightleftarrows [CS]$ equilibrium toward the expanded configuration, that, with its larger cavities, can grab up the UV-induced hydroxyl radical (H_1O_1), fix it into the network cluster, and thereby block the typical free radical and DNA damage caused by the UV. (For a detailed explanation of water clusters see http://www.lsbu.ac.uk/water/clusters.html)


From: http://www.lsbu.ac.uk/water/clusters.html)

Hurray for Mu Delta. Maybe these findings and theoretical model will generate a new interest in green light photobiomodulation.

Green light radiation effects on free radicals inhibition in cellular and chemical systems
Sorin Comorosan A, Silviu Polosan B, Silviu Jipa C, Irinel Popescu D, George Marton E, Elena Ionescu F, Ligia Cristache F, Dumitru Badila A, Radu Mitrica A
Journal of Photochemistry and Photobiology B: Biology (2011) 102 :39–44

Green light effects on biological systems: a new biophysical phenomenon
Sorin Comorosan, et.al.,*Journal of Biological Physics*. (2009) 35(3): 265–277.

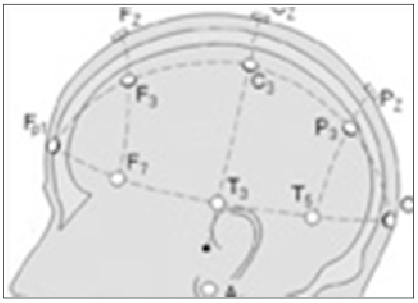
Red light and green tea

This article suggests that using phototherapy in conjunction with nutritional supplementation may get better results than using either by itself. In this study live cancer cells were treated with a combination of red light and epigallocatechin gallate, a major component of green tea. Human HeLa cells, the oldest continuous line of cancer cells (cervical), have long been the predominant model in cancer research. Green tea has been shown to inhibit the growth of HeLa cells. Eradiating them with red laser light does the opposite. Both effects are individually documented in the literature. In this experiment, HeLa cells were supplemented with green tea and then irradiated with moderately intense laser light (670 nm) for 1 min, and incubated for 52 h. This resulted in an extraordinary inhibition of HeLa cells by 1,460% compared with green tea only. Recent research showing that epigallocatechin gallate from green tea suppressed the growth of melanoma in vivo makes this red light effect highly clinically relevant and provides a stimulus for syntonists to explore combining syntonic phototherapy with nutritional and other complimentary approaches.

Extraordinary Anticancer Effect of Green Tea and Red Light Andrei P. Sommer, Dan Zhu, and Tim Scharnweber *Photomedicine and Laser Surgery.* 2010 28 (3) 429–430

Near-infrared forehead treatments reverse major depression and anxiety

Ten patients diagnosed with major depression were given four 4-minute near-infrared treatments to left forehead at F-3 (see picture), right forehead at F-4 or placebo treatment to the same forehead sites. Each subject was given psychological evaluation and interview before, immediately after and 2 and 4 weeks post-treatment. During treatment the cerebral blood flow was also measured using infrared sensors over the right and left forehead poles of the brain. In addition depression, most patients had been diagnosed with a second or more condition: nine with anxiety disorder, eight with substance and alcohol abuse history, and three with post traumatic stress disorder)



At 2-weeks post treatment, 6 of 10 patients had significant lower depression scores, 7 of 10 had significant reduction of anxiety symptoms and increased cerebral blood flow measured at the frontal poles. Patients reported no negative side effects. The authors conclude: "This small feasibility study suggests that near-infrared phototherapy may have utility for the treatment of depression and other psychiatric disorders and that double blind randomized placebo-controlled trials are indicated."

One thing that especially intrigued me in this article was the "hemispheric emotional valence" which means that one side of our brain sees the world in a more positive light while the other side has a more negative expectation

and interpretation. Some peoples' right brain is optimistic relative to their more pessimistic left hemisphere and for other people it's the opposite. To test this, emotions were assessed after patients viewed a photo of a face with an emotionally ambiguous expression with the right half of their retina (left hemi-field occluded). This procedure was repeated on the opposite side. Emotional reactions looking with right vs. left field were recorded and analyzed. This is called "lateral visual field stimulation". Using measures of left vs. right cerebral blood flow in the frontal cortex (measured on the forehead) showed that near-infrared treatment had a greater effect when it was applied to the side of the forehead of the hemisphere with more positive hemispheric emotional valence. This suggested that hemispheric emotional valence might be used to guide the application transcranial light treatments.

Psychological benefits 2 and 4 weeks after a single treatment with near infrared light to the forehead: a pilot study of 10 patients with major depression and anxiety

Fredric Schiffer, et.al.; *Behavioral and Brain Functions* 2009, 5:46
http://www.behavioralandbrainfunctions.com/content/5/1/46.

Light directly stimulates adrenal glucocorticoid release

Abstract: Light is a powerful synchronizer of the circadian rhythms, and bright light therapy is known to improve metabolic and hormonal status of circadian rhythm sleep disorders, although its mechanism is poorly understood. In the present study, we revealed that light induces gene expression in the adrenal gland via the suprachiasmatic nucleus (SCN)-sympathetic nervous system. Moreover, this gene expression accompanies the surge of plasma and brain corticosterone levels without accompanying activation of the hypothalamo-adenohypophysial axis. The abolishment after SCN lesioning, and the day-night difference of light-induced adrenal gene expression and corticosterone release, clearly indicate that this phenomenon is closely linked to the circadian clock. The magnitude of corticostereone response is dose dependently correlated with the light intensity. The light-induced clock-dependent secretion of glucocorticoids adjusts cellular metabolisms to the new light-on environment.

The secretion of glucocorticoid hormones is tightly regulated by the circadian clock and by negative humoral feedback loops, both acting on the hypothalamic-pituitary gland-adrenal axis. However, a new study (Ishida et al., 2005 this issue of Cell Metabolism]) shows that light can influence the adrenal's glucocorticoid output by a more direct pathway.

Enlightening the adrenal gland. Ueli Schibler and Steven A. Brown; *Cell Metabolism*. (2005) 2(5): November: 278-281

Light activates the adrenal gland: Timing of gene expression and glucocorticoid release Atsushi Ishida, et. al. *Cell Metabolism*. (2005) 2(5): 297-307
http://www.cellmetabolism.org/

Red light prevents dopamine loss in Parkinson's disease experiment

Parkinson's disease symptoms: rigidity, loss of movement, and tremors are due to loss of dopaminergic cells in substantia nigra and other subcortical brain areas. Dopamine loss from oxidative stress appears to be due to mitochondria dysfunction resulting from toxic environments and/or defective genes. Neuroprotective treatment using red and near-infrared light has been shown to prevent mitochondrial dysfunction by stimulating mitochondrial metabolism and ATP synthesis. This research looked at red light's potential impact on loss of dopaminergic cells in mice treated with a neurotoxin that causes Parkinson's signs in mice.

An experimental group of mice were given simultaneous administration of a known Parkinsonian toxin and red phototherapy. Outcomes for these mice were compared to results of other groups of mice given just saline, just the toxin or saline with light treatment. Outcomes compared the number of dopaminergic cells in the substantia nigra and the zona incerta in the hypothalamus to determine red light's neuroprotective effects.

The mice received a 90-second exposure to red light (670-nm) just prior to an injection of toxin. Another 90-s treatment with the red light only was given every 8 hours for a total of four treatments. The light source, an LED array, was large enough to irradiate the entire mouse head. The mice appeared to relax during the exposure and resumed feeding and grooming behavior immediately after. The major finding was that the mice in the toxin plus red light group had 40% more substantia nigra dopaminergic cells compared to the mice who received the toxin only. Dopamine cells in the zona incerta of the hypothalamus were not as significantly protected by the light. This finding has clear clinical relevance regarding the survival of cells in Parkinson cases.

Neuroprotection of midbrain dopaminergic cells in MPTP-treated mice after near-infrared light treat-

ment Shaw, VE, et. al., *The Journal of Comparative Neurology* (2010) 518:25–40
The locations of mitochondria in mammalian photoreceptors: relation to retinal vasculature Stone, J, van Driel, D, Valter-Kocsi, K, Rees, S, Provis, J M. *Brain Research.* (2008) 1189:58–69
Optimizing the structure and function of the adult P23H-3 retina by light management in the juvenile and adult. Valter, K., Kirk, D. K., & Stone, J. *Experimental Eye* Research (2009) 89:1003–1011

Giving Old Eyes a Tune-Up

The following is a media release from The Vision Centre, ARC Centre of Excellence in Vision Science — http://www.vision.edu.au/news/acevs%20improving%20vision-1.pdf

For the first time, it may soon be possible to improve or prevent failing eyesight in old age using a combination of simple and painless treatments. With most people now outliving their eyeballs and many going blind in later life, the need to protect or 'tune up' the visual system is becoming acute, says Professor Jonathan Stone of Sydney University and the Australian National University, and the ARC Centre of Excellence in Vision Science (The Vision Centre). The Vision Centre is reporting significant success in a major collaborative research program which seeks to protect and possibly restore functional vision using simple therapies based on light, diet and oxygen.

These therapies include light management, anti-oxidant dietary supplements, healing of damaged eye cells using near-infra-red light and short-term oxygen therapy, and are all based on a deepening understanding of the cellular and genetic processes within the eye.
Recent research results in animal models show these therapies offer great promise for treating vision loss in conditions such as age-related macular degeneration (AMD – the most common cause of blindness in old age), age-related degeneration of the retina and retinitis pigmentosa which causes permanent blindness in much younger people (and affects about 5000 Australians). All of the techniques work by manipulating the genetic responses in the eye's vision cells in ways that improve their resilience, boost healing and reduce damage. "Best of all they are all harmless and easy to use, which means we should be able to achieve high compliance," Prof Stone says.

A Vision Centre team headed by Dr Krisztina Valter has produced world-first evidence that eyesight damage caused by exposure to very bright light can be repaired or even prevented using doses of near-infra-red light. "When an eye cell has been damaged by overexposure to light it usually dies from stress caused by free radicals – but when the cells are stimulated with IR light, they appear to recover significantly and to withstand future damage much better," she says. The team plans to move to clinical trials shortly.

A second form of treatment is simply to restrict the amount of light entering the eye, using dark glasses or other means. "We have shown that restricting light in young eyes in animal models of retinal degeneration greatly reduces the amount of damage they sustain from ordinary bright daylight," Dr Valter says. "In some forms of retinal degenerations, vision cells are particularly sensitive to light and become stressed or die from normally non-damaging intensity of light. We have shown that protecting these retinas from light from birth can slow the degeneration. Now we are addressing the question if it is worth limiting light exposure later in life even if the eyes were unprotected during childhood. And the answer, so far, appears to be yes, it definitely is. Sunglasses are as important for protecting children as well as young adults from the full sun as a shirt or hat." For younger people suffering retinitis pigmentosa, controlling the amount of light that enters the eye may slow the progression of the disease, or perhaps enable them to save one good eye for when the first has lost all sight, Prof. Stone adds.

In a third development at the Vision Centre, Professor Silvia Bisti of the University of L'Aquila in Italy has discovered that a dietary supplement of the herb saffron offers potentially major benefits for protecting and repairing damaged vision. Saffron appears to work not only as an anti-oxidant but also to regulate genes in the vision cells of the eye which can improve their resilience and possibly slow down diseases such as retinititis pigmentosa and age-related macular degeneration (AMD). "We have some encouraging results which suggest it may be possible to reverse the damage of AMD – but it is very early in the research and we will know more later this year," she says.

A fourth development concerns the possible use of oxygen as a short-term therapy to improve vision. While oxidative damage is a major cause of the loss of our vision cells, it has been observed that saturating the eyes with oxygen for a very short time in a hyperbaric chamber can cause vision to improve, Prof. Stone says. "For short periods of time oxygen acts as a tonic for the photoreceptors in the eye, but for longer periods it is a toxin. We are

investigating this."

Prof. Stone says that the combination of several of these mild treatments may for the first time offer a way to restore or prevent failing eyesight in age. "They are all easy and painless to administer, especially the light restriction and dietary approaches which can be applied all through life. We've learned to take care of our teeth so we still have them in old age – now it's time to do the same for our vision." The Vision Centre team plans to take the various techniques into clinical trials in Sydney and Rome in the coming year.

Environmental Damage to the Retina and Preconditioning: Contrasting Effects of Light and Hyperoxic Stress *Yuan Zhu, Krisztina Valter, and Jonathan Stone Investigative Ophthalmology & Visual Science*, September 2010, Vol. 51, No. 9.

Gene and Noncoding RNA Regulation Underlying Photoreceptor Protection: Microarray Study of Dietary Antioxidant Saffron and Photobiomodulation in Rat Retina
Riccardo Natoli, Yuan Zhu, Krisztina Valter, Silvia Bisti, Janis Eells, Jonathan Stone
Molecular Vision 2010; 16:1801-1822 <http://www.molvis.org/molvis/v16/a196>

Saffron supplement maintains morphology and function after exposure to damaging light in mammalian retina. Maccarone R, Di Marco S, Bisti S. *Investigative Ophthalmology & Visual Science* (2008) 49:1254-61.

Saffron Supplementation Improves Retinal Flicker Sensitivity in Early Age-Related Macular Degeneration. Falsini B, et.al. *Investigative Ophthalmology & Visual Science*. (2010) 51(12) 6118-24

Dr. Larry Wallace, O.D., Ph.D., FCSO was recognized at the 78th International on Light and Vision in 2010, St. Petersburg, Florida

In Recoginition of His Devotion & Service:

President of the College of Syntonic Optometry 1996-2010
Giving CSO an International Presence
Expanding the Scope & Tools of Phototherapy
Raising the Stature and Professional Respect for CSO
& It's Light Therapy Practitioners
Establishing an International Network of Light Workers,
Scientists, Inventors, Clinicians & Visionaries

Dr. Wallace is truly leading the College of Syntonic Optometry and the Optometric practice of Light Therapy into the 21st Century

Congratulations and thank you for your service Dr. Wallace!

Practice Notes

Ellis Edelman, O.D., FCSO

Dr. Edelman has been in practice for over 60 years and offers these notes on Syntonic Phototherapy and how to enhance it's effects by using the proper bifocals and yoked prisms.

Bifocal Lenses Yoked Prisms and Phototherapy

Working with various visual problems will determine which type of bifocal segment should be incorporated into the therapeutic RX. There are three basic types:

- Ultex
- Executive
- Flat top

The Ultex when added to both lenses because of its convex spherical structure acts as Base-Down yoked prisms. The Base-Down prism effect will be greater if the patient is myopic and for stronger dioptric add powers.

Besides considering the vertical height of the Ultex bifocal segments, this type of add can also be placed nasally-vertically into both lenses, so that an individual with a bilateral esotropia will be "forced" to fixate through both the right and left eye segments when looking at near.

The Executive bifocal when added to both right and left lenses of the Rx acts as a Base-Up yoked prism. Consider the Executive bifocal as a "wedge prism" with its base at the top of the bifocal and the apex at the bottom of the segment. The Base-Up prism effect will be greater if the patient is hyperopic and for stronger dioptric add powers.

The Flat Top bifocal when added to both right and left lenses of the Rx will act as a Base-Up yoked prism. Again the Base-Up prism effect will be greater if the patient is hyperopic and for stronger dioptric add powers.

The various types of visual-motoric-perceptual problems including the many behavioral characteristics which may be considered as a secondary overlay will determine which type of bifocal should be prescribed as well as its power.

Below are listed some of the many diagnosed conditions we may encounter in our everyday practice:

- Developmentally Delayed
- Esotropia-Monocular Alternating
- Exotropia-Monocular-Alternating
- Myopia-Early Adaptations-Embedded Type
- Introverted-Extroverted Type of Personality
- Amblyopia
- Near Point Problems
- Autism

SELECTING THE BIFOCAL

Developmentally Delayed with reduced Visual fields

Select the Ultex bifocal for the Base-Down effect in order to enlarge the fields and for the individual to develop a greater rapport with their environment.

You may also wish to use the Executive bifocal therapeutically (Base-Up yoked) in order to reduce the stress of a visually demanding near point task such as reading, drawing or copying.

Both the Ultex and the Executive bifocals can be used alternately in order to "rock/change" the sensory/motor processing.

Esotropia:
With either the monocular or alternating type, the optimal therapeutic approach should be to use the Ultex bifocal with its Base-Down effect upon the habitual mode of visual processing.

Exotropia:
With either the monocular, binocular or alternating type, the optimal approach should be to use either the Executive or wide Flat Top bifocal (35 mm) for its Base-Up yoked effect.

Keep in mind, yoked prisms can be used to either compress or expand the habitual spatial volume. There is also another important fact to remember, that is, the

value of the yoked prisms in changing the processing style of the individual is measured by the amount of "awareness" during the visual processing or during a "self directed movement".

Myopia:
The optimal therapeutic approach should be to use the Ultex for its Base-Down yoked affect. Expanding the spatial volume with the yoked prisms encourages the individual to "look beyond" the habitual spatial volume. The patient begins to become more aware of the peripheral information thus expanding their visual field processing.

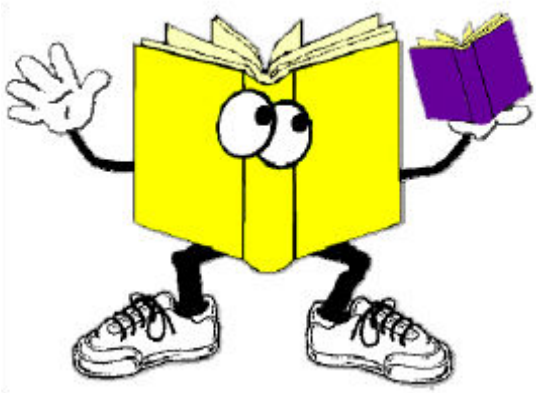
Introverted-Extroverted Types of Personality:
For the chronic introverted behavioral type of individual, Base-Down yoked prisms are indicated to encourage a change in their style of thinking, motoric movements through space becoming less restricted and to expand their personal relationship with others.

For the extroverted behavioral type of individual, Base-Up yoked prisms are indicated in an attempt to increase their central attention, span, reduce distractibility and to lessen their inappropriate motoric movements.

For the child who has been diagnosed as being autistic, your choice of bifocals, yoked prisms and phototherapy for the therapeutic remediation will depend on their visual problem and the behavioral characteristics as well.

You might prescribe two Rx's, one for distance using base-down yoked prisms and the second Rx for near using base-up yoked prisms. The different yoked prisms encourage the development of their ability to "change" both their visual processing as well as movements through space.

Amblyopia and Near Point problems can also benefit from the use of different yoked prisms and bifocals.



BOOK REVIEW

Vision Rehabilitation: Multidisciplinary Care of the Patient Following Brain Injury

Congratulations to our members Drs. Penelope Suter and Lisa Harvey for this multidisciplinary resource written for you, the doctor or therapist, to achieve the best success for the patient in vision rehabilitation.

This book bridges the gap between theory and practice because it is written by clinicians and is filled with the necessary information to both understand and provide vision rehabilitative care following brain injury through a multi-disciplinary approach. Syntonic Phototherapy is covered along with eye movements, binocular dysfunction, visual field loss, visual-spatial neglect, visual-vestibular interactions, visual attention, visual information processing, the use of lenses, and practice management.

Our colleague contributors include: Drs. Allen Cohen, Kenneth Ciuffreda, Sydney Groffman, Paul Harris, Lynn Hellerstein, Neil Margolis, Thomas Politzer, Leonard Press, Robert Sanet, Cathy Stern, and Nancy Torgerson.

Whether you are a new or experienced practitioner and whether or not your patient's symptoms range from difficulty concentrating when reading to problems with spatial judgment while walking or driving, this book will surely take a prominent place in your vision therapy library.

Note: Copies of the book are available from the College at a 10% discount plus $5 S/H. Please email us at Syntonics@q.com for more details.

Marketing Optometric Syntonic Phototherapy

Mary W. VanHoy, O.D., FCOVD, FCSO

In traveling around the country to various optometric meetings and seminars, the one question that seems to surface in conversations related to Optometric Syntonic Phototherapy is how do I sell it to my patients?! Most of my colleagues will sheepishly admit that they feel as though this is somehow akin to voodoo or snake oil!

You've Got To Believe

First, there is a need for an attitude adjustment. You cannot possibly "sell" anything you do not fully believe in nor feel has value to the consumer. So, if you don't fully believe in the therapeutic value or scientific basis behind Optometric Syntonic Phototherapy, perhaps additional course work and readings are in order. Patients are more influenced by "the depths of your convictions than the height of your logic," as the saying goes. Patients may not fully understand all your words or explanations but they can "read" your non-verbal language loud and clear! Mentoring with a trusted and respected optometric colleague experienced in the clinical application of syntonics would be a good starting point to gaining conviction in the therapeutic value of this treatment modality. Administering optometric syntonic phototherapy to yourself, family, and staff members is another first-hand way to deepen your experience and confidence. Look at the alpha omega pupils, the Butts String measurements, and the functional visual fields before and after eight to ten syntonic phototherapy sessions. These changes should start breaking down your skepticism and excite you with the clinical possibilities for those patients seeking non-invasive, non-pharmaceutical health treatments for their visual issues.

As optometrists, we need to start where we are comfortable and grounded. The functional visual fields study is a great starting point. Not only do we understand visual fields, but so do our optometric and ophthalmological colleagues. There is no denying a constricted peripheral and central color field and one that has expanded within a matter of three to four weeks following syntonic phototherapy treatments. If the manually administered functional visual fields appear antiquated by today's high technological measurements, the frequency doubling fields can closely duplicate the same findings as the manually administered fields studies.

Offering Solutions

Once your attitude has been adjusted and you now feel excited about this "new" tool and niche in your practice, it's time to communicate to your patients and potential patients. The easiest way to start is to analyze who among your patients are the most likely to embrace such a concept. In my experience, this population has always been the ones who already seek the healthiest options whether shopping at Whole Foods or local farmer's markets to faithfully taking their supplements and working out. They are the ones who already use acupuncture, get regular therapeutic massages, see their chiropractor, and know all about craniosacral therapy. They are usually well-read and have disposable income to spend regardless of whether insurance will cover it.

Finding a need and filling it is another marketing slogan heard so often in the sales field. As health care practitioners, we don't like to view ourselves as sales people, but rather diagnosticians and providers of health care services. However, to the layperson, they are coming to you in hopes that you can solve their health problem. They are willing to "buy" solutions to their health care needs. Whether that's visual challenges following an acquired brain injury or visual anomalies resulting from being in the autistic disorder spectrum, they are seeking viable solutions to their current visual distress and dysfunction.

Validating Treatment Options

Next, let resources provide the authority while you be the messenger. Start by making the analogy of newborns who become jaundiced shortly after birth and require the bilirubin lights to treat the newborn infant. Another commonly understood analogy is the use of full spectrum lights for the treatment of Seasonal Affective Disorder (SAD). Once the patient can relate to familiar uses of phototherapy, they are much more receptive to reading and learning more about optometric light therapy.

Showing before and after functional visual fields is a simple, direct example that can easily be communicated to patients. Displaying a library of books on the topic of optometric syntonic phototherapy is another subconscious validation of this form of treatment. Finally, giving your patient the College of Syntonic Optometry brochure and website further enhance your presentation as the messenger sending them out to learn for themselves the value and appropriateness of this treatment option.

Dr. VanHoy will be the moderator of a Practice Management Forum on April 29th & 30th at The 79th Annual College of Syntonic Optometry Conference in San Deigo, California.

About the Cover: A Vision Therapy Success Story

In 1998 Susan Houser was in a car accident. She has had continual headaches and eyestrain, bothered by bright lights and difficulty driving at night. Worst of all as a graphic artist, her focusing and ability to draw had declined to a point where she was unable to complete her professional art work. She thought she was going to have to live with all of this. Susan entered a vision therapy program that included Syntonics with Dr. Betsy Hancock. About a month ago, Susan began to draw without headaches. With the encouragement and an idea from Dr. Hancock, the cover is the culmination of a successful vision therapy program. She loved doing Syntonics.

The cover is a tribute to all of the members of the College of Syntonic Optometry who have found the healing power of syntonics.

Layout and design for the Journal was completed by Niki Summers.

Curriculum I & II

The College of Syntonic Optometry (CSO) is now offering two expanded 2-day courses that will provide you with both the practical education and theoretical knowledge to begin or enhance your practice of Syntonic phototherapy. The courses will cover pupil assessment, visual field assessment and syntonic filters and case syndromes. It is taught by Belgian optometrist Stefan Collier, F.O., FCSO to fast track your ability to easily incorporate Syntonic Phototherapy into your practice. These courses are especially helpful for anyone working toward Fellowship in CSO (FCSO).

Curriculum II will be held Wednesday-Thursday, June 8-9, 2011 in the office of Drs. Robert Weingart, Chula Lerdvoratavee and Vasana Lerdvoratavee in Oswego, IL (near Chicago O'Hare or Chicago Midway Airports). The course will integrate 21-point vision analysis, complex color visual fields, advanced syntonic filters and morphological analysis for advanced application. (Prerequisite is prior attendance at Curriculum I or the CSO Basic Course).

C&J Instruments donates Syntonizer to Western University of Health Sciences College of Optometry

The College Syntonizer and Field Charter were donated to the Western University of Health Sciences College of Optometry. Dr. Don Barniske, president of CSO, formally presented the donated instruments on February 27, 2011 to be used for education of optometry students and research in Syntonic phototherapy. European instruments are to be delivered from Optomatters in the near future to supplement research and education at WUHSCO. This will allow University based instruction for student Doctors of Optometry with Syntonic phototherapy in treating visual suppressions and other conditions of the eye and visual system utilizing various frequencies of light. The new doctors will then have the option of providing light therapy in their new practices. In the photograph, Dr Kristi Remick-Waltman, staff, and student doctors are accepting the donated instruments.

Resources for Syntonic Equipment and Related Materials

Syntonic Instruments

College Instrument:

Rex Cross
C & J Instruments
2620 Pawnee
North Platte, NE 69101
O: (308) 534-2537
F: (308) 534-5018
candjins@kdsi.net
In office Syntonizer and visual fields machine

Home Instruments:

Stanley H. Levine, O.D., FCSO, FCOVD
76 Liberty St.
Metuchen, NJ 08840
H: (609) 655-4312
O: (732) 548-3636
F: (732) 548-3636
shlvision@aol.com
www.shlvision@aol.com
Syntonizer for home use and visual fields machine

European Equipment:

Optomatters
Sonja Vanhimbeeck
Dr. Van de Perrelei, 106
2140 Borgerhout/Antwerp
Belgium
Tel: 011-32-3-271-1951
fax:+32 3 271 05 78
optomatters@scarlet.be
www.optomatters.be
In office Syntonizer, home Syntonizer and visual fields machine, vision therapy equipment available

Books:

The College of Syntonic Optometry has the following books and pamphlets for sale:
The Syntonic Principle by Harry Spitler
The Principles of Light and Color by Edwin Babbitt
New Light on Fields by Denise Hadden
In Syntony by Stefan Collier
Vision Rehabilitation Edited by Penelope S. Suter, O.D. and Lisa Harvey, O.D.
Light Therapy brochure
Practical guide for Charting and Interpreting the Visual Color Fields by Dr. Wm Arthur Mendelsohn (on a CD)

Phototherapy Website:

www.collegeofsyntonicoptometry.com

Past recordings of CSO conferences:

Mark Waters
624 S.W. Hill St
Bend, Oregon 97702
720) 560-1178 deroncey@gmail.com

Have used equipment to buy or sell?
Contact the College of Syntonic Optometry
syntonics@q.com 719-547-8177

Books on phototherapy available from book stores:

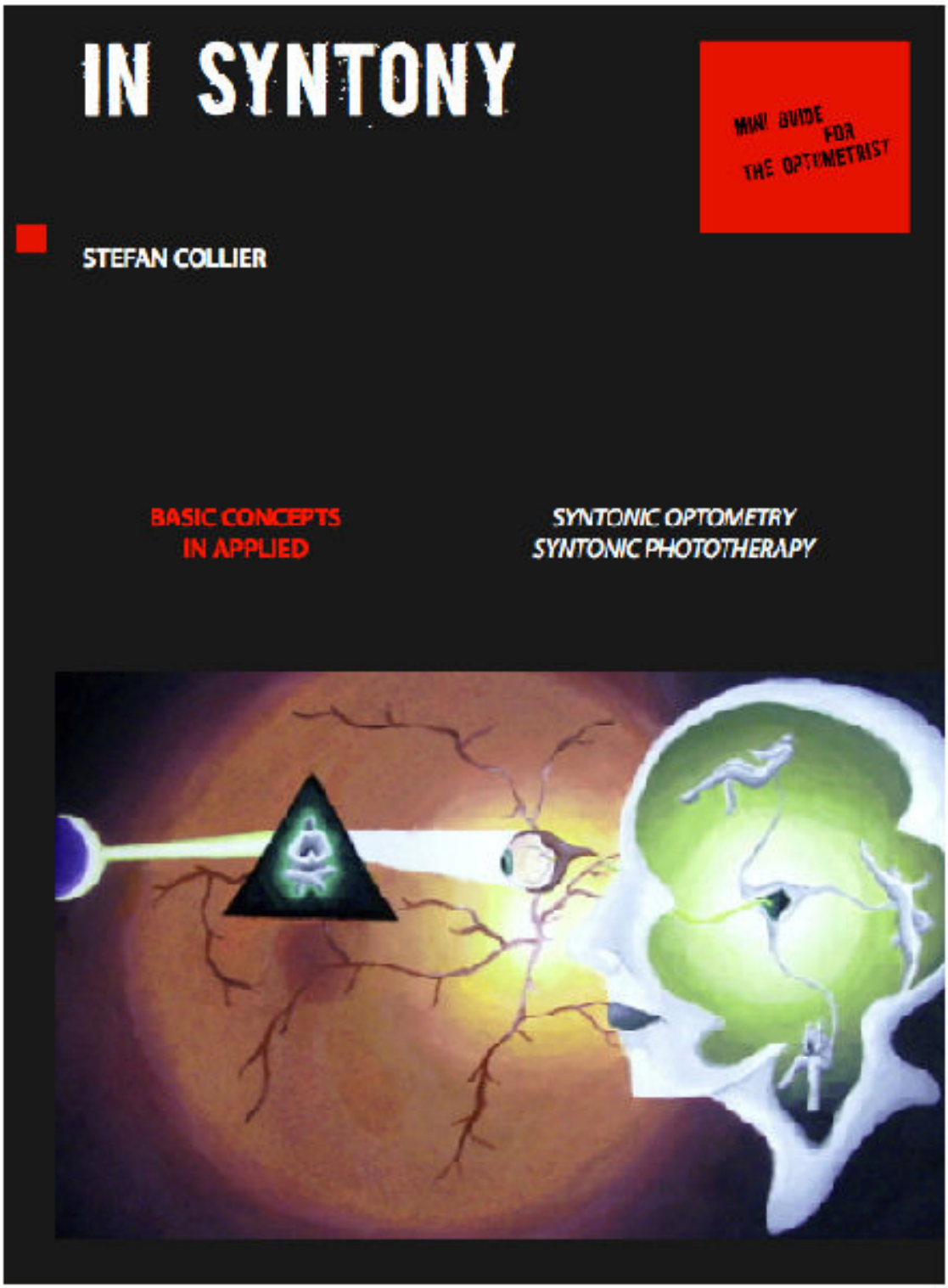
Light Medicine of the Future by Jacob Liberman

Light Years Ahead edited by Brien Brieling

College of Syntonic Optometry
A NONPROFIT CORPORATION DEDICATED TO RESEARCH IN PHOTORETINOLOGY, THE THERAPEUTIC APPLICATION OF LIGHT TO THE VISUAL SYSTEM

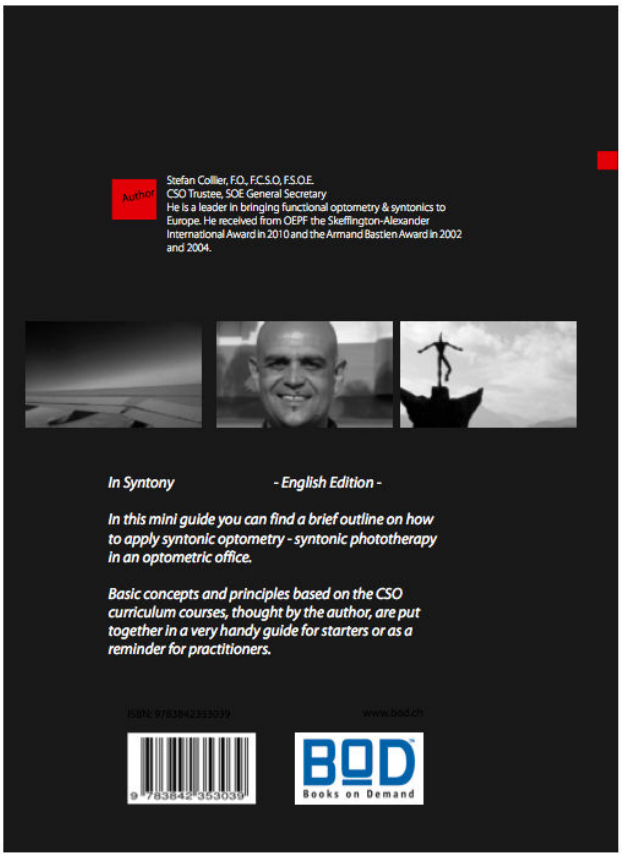
NEW

Release



NEW BOOK

Soon available



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ISBN: 9783842353030

In SYNTONY

MINI GUIDE FOR THE OPTOMETRIST

BASIC CONCEPTS IN APPLIED SYNTONIC OPTOMETRY SYNTONIC PHOTOTHERAPY

From the author

The purpose of this mini guide, is to give a brief outline on how to use Syntonic Optometry within an optometric office. As an introductory guide to syntonics, this mini guide will not include much information on syntonic history, case studies, advanced filters, nascentization, bio-types or influence on the endocrine system. A more extensive guide is in preparation, where all of this is covered in detail, but this would include too much information for the beginner.

This guide is based on the College of Syntonic Optometry publications and the curriculum courses, especially curriculum I, given by the College of Syntonic Optometry (CSO) and European Society of Optometrists (SOE), which was developed by the author. You will find some diagrams, and easy hands on techniques, to make this guide useful as a quick reminder when using syntonic phototherapy.

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College of Syntonic Optometry
79th International Conference on Light & Vision

April 27th-April 30th, 2011

San Diego, California
Catamaran Resort & Spa

Contact:
Ron Wahlmeier, Administrative Director
syntonics@q.com
719-547-8177


San Diego, California

College of Syntonic Optometry
Curriculum II

June 8th-9th, 2011
Oswego, Illinois

Contact:
Ron Wahlmeier, Administrative Director
syntonics@q.com
719-547-8177

International Light Association
8th International Light Association Conference

October 2nd-6th, 2011
St. Sauveur-des-Montes, Quebec, Canada

Contact:
Larry Wallace, O.D.
lbwallace@twcny.rr.com
607-277-4749

Australian College of Syntonics
Light Colour and Vision Conference

September 10th-September 11th, 2011
Sidney, Australia

Contact:
Simon Grbevski
61 2 9597 3030
simon@aivision.com.au

College of Syntonic Optometry
80th International Conference On Light & Vision

May 2nd-5th, 2012
Colorado Springs, Colorado

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Colorado Springs, Colorado