SYNTONIC PHOTOTHERAPY
Basics and Use in the Vision Therapy Practice

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Wisconsin Paraoptometric Assn 2024

College of Syntonic Optometry

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

Robert Fox – Past President

2025 Annual Meeting

Tuscon, AZ May 14-17

I have no disclosures

Course Learning Objectives

1. To learn the history of light therapy and syntonic phototherapy.
2. To learn about light action on the visual system.
3. To learn alpha-omega pupil and functional visual field measurement.

Course Learning Objectives

4. To become familiar with syntonic syndromes and their treatment.
5. To become familiar with light therapy as a tool in the treatment of the vision therapy patient
6. To be able to assist your doctor in implementing syntonics into your practices

History of Light Therapy

1876 – General Augustus Pleasanton

Blue and Sun-Lights

blue light increased plant growth and stimulated glands of the body

At this time it was also found that UV light could kill bacteria

History of Light Therapy

1877 – Dr. Seth Pancoast

Blue and Red Lights

he used sunlight through red or blue glass to accelerate or relax the nervous system

History of Light Therapy

1878 – Dr. Edwin Babbitt

The Principles of Light and Color

he made the ChromoDisk that combined colored filters and placed the light on different parts of the body (he used all colors)

7

History of Light Therapy

1878 – Dr. Edwin Babbitt

The Principles of Light and Color

he used solar charged water and filtered it through colored glass to create an elixir to cure disease

(blue water for a sore throat)

8

History of Light Therapy

1890 – sunlight was necessary for the body to produce vitamin D which was necessary for calcium absorption

1903 – Niels Finsen won the Nobel Prize in Medicine for treating lupus vulgaris (a skin form of tuberculosis) with light

9

History of Light Therapy

1920- Dinshah Ghadiali

SpectroChrome program

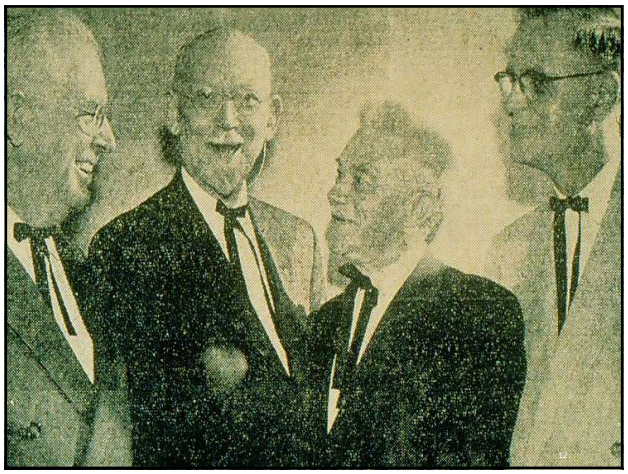
12 color filter combinations applied to the body

1941- Harry Riley Spitler, DOS, MD

The Syntonic Principle

10

11



12

History of Syntonic Phototherapy

Harry Riley Spitler, DOS, MD

The Syntonic Principle

Colored light through the eyes

3 body types - Pyknic, Syntonic, and Asthenic

13

Syntonic Theory

Dr. Spitler developed 21 principles about the effect of light on the body and mind

- The select application of visible light to the eye
- Frequencies to balance the sensory motor systems
- Reaching the endocrine system via the pituitary, pineal and hypothalamus

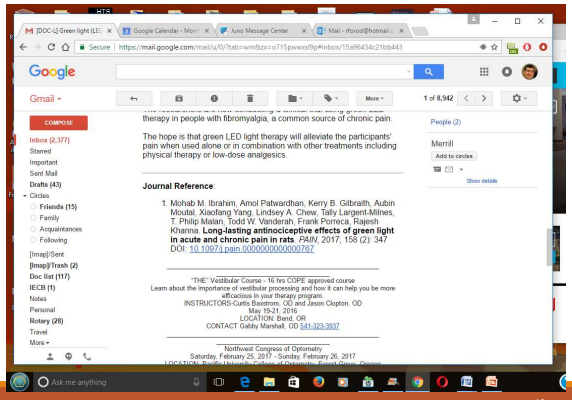
14

History of Syntonics

Charlie Butts, OD

- Realized need for syntonics to fit within optometric theories of diagnosis and treatment
- Worked with Larry Wallace OD to develop the basic syntonic syndrome approach

15

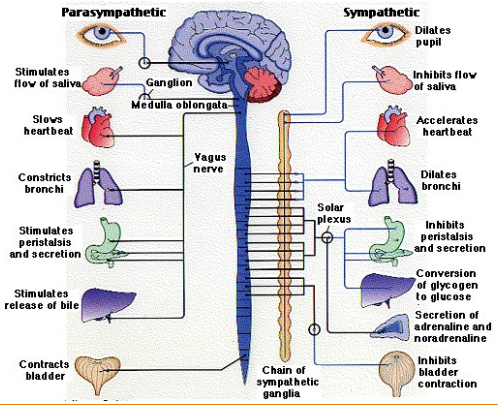


16

The Autonomic Nervous System

Sympathetic and Parasympathetic

17



18

Sympathetic Actions

- Dilates the pupil
- Increases tearing
- Increases intraocular pressure
- Decreases accommodation
- Turns eye outward

19

Sympathetic Activation

- Thyroid
- Adrenal Medulla
- Pituitary
- Gonads
- Muscles

20

Post-Traumatic Vision Syndrome

- Exophoria/exotropia
- Reduced accommodation
- Reduced convergence
- Poor blink rate / poor tearing
- Photophobia

21

Parasympathetic Actions

- Pupil constriction
- Decreases tearing
- Decreases intraocular pressure
- Increases accommodation
- Turns eye inward

22

Parasympathetic Activation

- Parathyroids
- Adrenal cortex
- Digestive tract
- Liver
- Pancreas
- Spleen

23

Light Action on the Visual System

- Light Pathways
- Effect on Autonomic Nervous System
- Frequencies of light and how they affect the visual system

24

Light Pathways

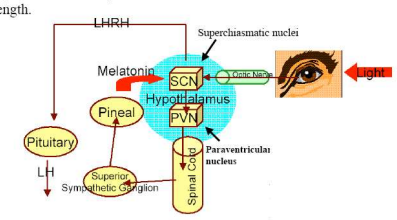
- Nonvisual photoreceptors of the deep brain, pineal gland and retina
- Hypothalamus: suprachiasmatic nucleus>pituitary
- Pituitary: ACTH to adrenal gland
- >cortisol/stress hormone
- Pineal: melatonin production
- Retina: influences suprachiasmatic nucleus
- **Intrinsically photosensitive retinal ganglion cells**

25

Intrinsically photosensitive Retinal Ganglion Cells(ipRGCs), also called **photosensitive Retinal Ganglion Cells** (pRGC), or **melanopsin-containing retinal ganglion cells**, are a type of neuron (nerve cell) in the retina of the mammalian eye. While responses to light in mice lacking rods and cone cells were first noted in 1923,[1] they were forgotten, then rediscovered in the early 1990s.[2] The source of these responses was shown to be a special type of retinal ganglion cell, which, unlike other retinal ganglion cells, is intrinsically photosensitive. This means that they are a third class of retinal photoreceptors, excited by light even when all influences from classical photoreceptors (rods and cones) are blocked (either by applying pharmacological agents or by dissociating the ganglion cell from the retina). Photosensitive ganglion cells contain the photopigment melanopsin. The giant retinal ganglion cells of the primate retina are examples of photosensitive ganglion cells.

26

The pineal gland secretes melatonin and is a representation of day length.



High [melatonin] = short day length
Low [melatonin] = long day length

27

History, History, History!!

- Cause of stress – chronic, toxic, injury
- Time of onset
- Medications
- Previous treatments
- Surgeries – what were they before?
- Symptoms

28

Autonomic Imbalance

- Alpha Omega Pupil

-the inability to sustain constriction under direct light (greater sympathetic activation)

-the faster the dilation, the smaller the field

- Oculomotor imbalance

-poorly controlled pursuits and saccades

-head movement vs. eye movement

-sign of constricted fields

29

Searfoss, 1991

It is the rebounding response of the pupil to a penlight beamed approximately 4" away into the individual eye and left on about 5 seconds. The reaction is a closing down with a rebound as large or larger than before the light was shown into the eye. The suddenness and the size of the rebound has been correlated to the size of the visual field. The "worse" an alpha-omega pupil the smaller and more constricted the field. A sloppy, unusual, or little change is a signal of a possible problem. It is not fully understood but the symptom is believed to be fatigue of the adrenal system which is under continual stress. Whatever the cause of the symptom, it is an imbalance relating to and affecting the biochemistry. Expect the pupil of a balanced system to go down and stay with little or no change in size.

30

Pupil Testing Lab

Pulaski lecture

Normal pupil testing
- Constriction holds several seconds

Alpha-omega pupil – can't sustain constriction long at all

Grading
- 1+ to 4+
- 4+ pupil releases immediately

Grading Pupils

Grade	Time to Release
1+	8 – 10 seconds
2+	5 – 7 seconds
3+	2 – 4 seconds
4+	0 – 1 seconds

- Almost immediate

Let's Look at Pupils!!

Effect on Autonomic Nervous System

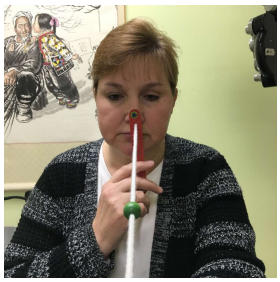
- Color Vision
  -reduced color discrimination on Ishihara plates
  -reduced figure/ground perception
- Accommodation and Binocular Dysfunction
- ANS imbalance in head trauma

The Brock/Butts String Test

Evaluates the convergence facility along Z axis as well as eight other quadrants

The inverse proportion applies, the farther out the convergence along the string, the more constricted the functional visual field will be

Brock/Butts String



Difference Between Brock and Butts Strings

The Brock String uses a bead on the string

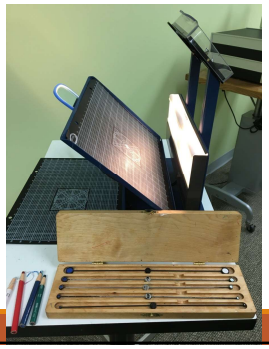
The Butts String utilizes examiner's thumb and forefinger along the string as the target

The Butts String Test examines eight other quadrants rather than just along the Z axis

Functional Visual Field Measurement

- Reduced Visual Performance in the absence of organic cause
- What you see:
  - Generalized constriction of form and color
  - Enlarged blind spot

C & J Field Charter



Functional Visual Field Measurement

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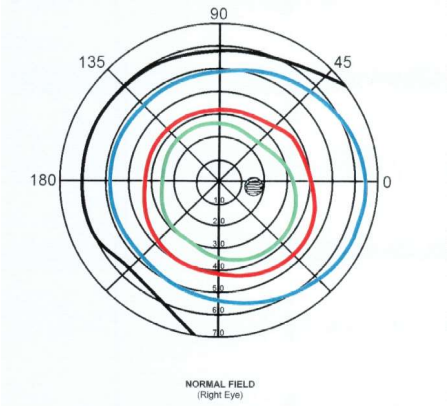
43

44



45

The Interpretation of Visual Fields

- Motion Field

the extreme periphery of the retina capable of receiving sensations of motion without recognition of contour

[motion is first form of vision – R. Melillo]

- Form Field

recognition of contours of an object

extent is when the patient can retain the perception of white in a stationary position

46

The Interpretation of Visual Fields

- Color Fields

test green, blue, red (smallest to largest)

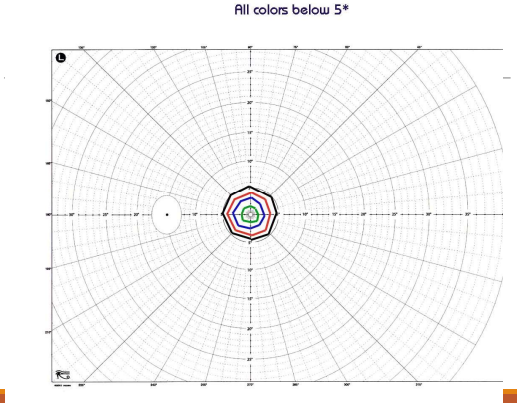
there should be no interlacing or overlapping

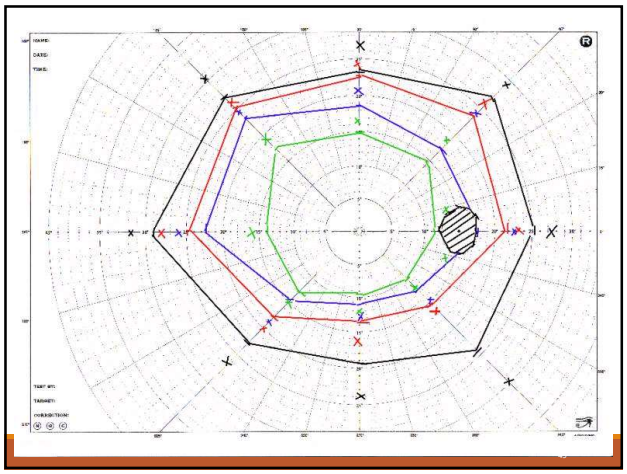
- Blind Spot

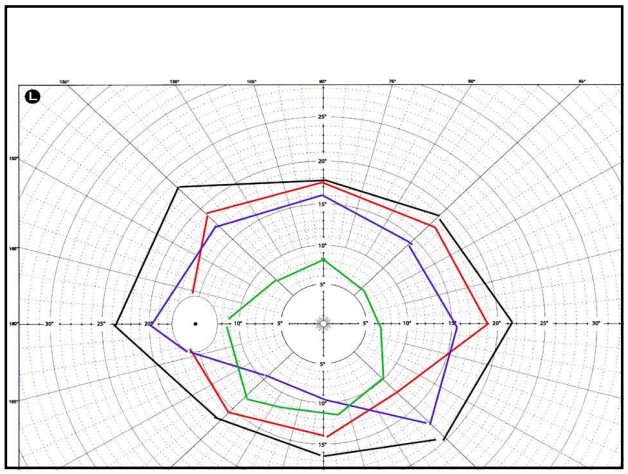
enlarged blind spot – questionable swelling

or new theory of anomalous projection

47







Syntonic Blind Spot

Different from glaucomatous field

Can be double or even triple normal size

Often associated with reading problems

Often associated with brain trauma

51

Syntonic Blind Spot

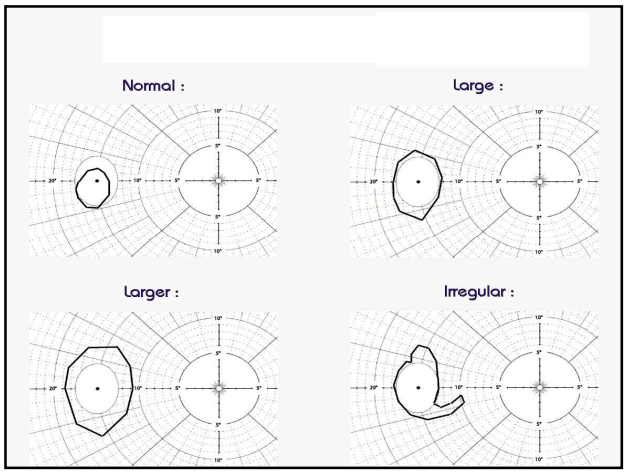
Dural torque

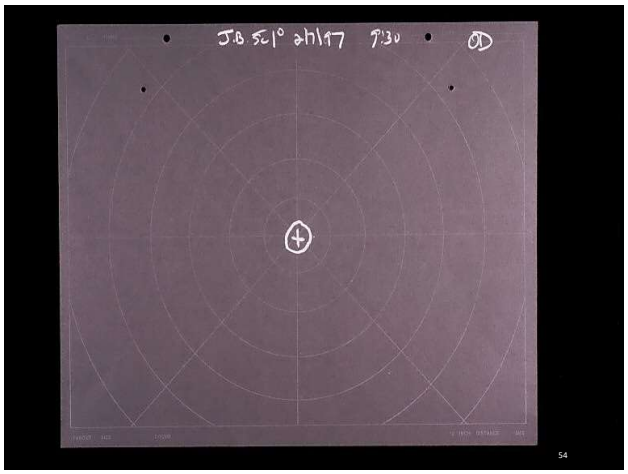
Difficult to measure if color fields are less than 15 deg

Swelling vs projection

Helps determine end of syntonic therapy

52





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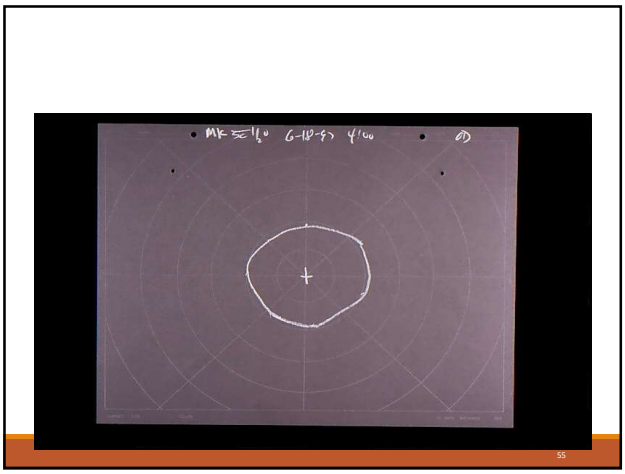

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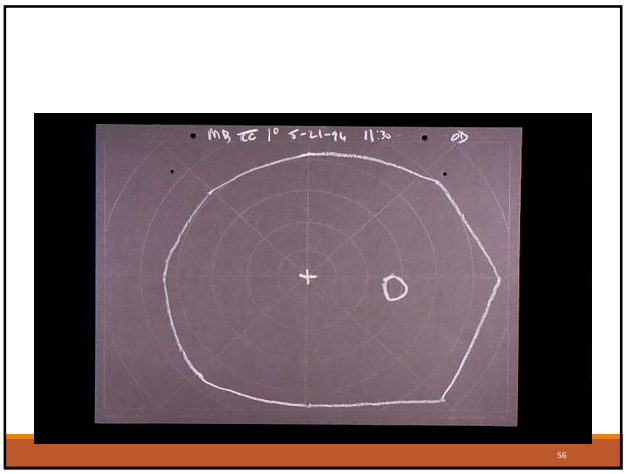


56

Balance Board – general considerations

NEUTRALIZATION KEY

Stimulate Sympathetic						Syntony			Stimulate Parasympathetic				
αδ	αθ	α	δ	θ	μθ	μδ	μ	μυ	μπ	π	ω	ν	πω	υω

Add "S" to augment this side
Flash

L

Add "D" to augment this side
No Flash

Red end of spectrum= sympathetic stimulation

Blue end of spectrum= parasympathetic stimulation

57

Balance Board – general considerations

NEUTRALIZATION KEY

Stimulate Sympathetic						Syntony			Stimulate Parasympathetic				
αδ	αθ	α	δ	θ	μθ	μδ	μ	μυ	μπ	π	ω	ν	πω	υω

Add "S" to augment this side
Flash

L

Add "D" to augment this side
No Flash

α alpha = red
δ delta = amber
μ mu = green

υ upsilon = blue
ω omega = indigo

58

Application of Color

NEUTRALIZATION KEY

Stimulate Sympathetic						Syntony			Stimulate Parasympathetic				
αδ	αθ	α	δ	θ	μθ	μδ	μ	μυ	μπ	π	ω	ν	πω	υω

Add "S" to augment this side
Flash

L

Add "D" to augment this side
No Flash

Red – sympathetic stimulation, stimulates exo response
-chronic conditions

Blue – parasympathetic stimulation, stimulates eso response
- acute conditions

59

Red = sensory stimulant
Orange = motor stimulant
~~Yellow = intense motor stimulant~~

Green equalizes for physiological balance

Blue = sensory depressant
Indigo = motor depressant
Violet = intense sensory depressant

60

α alpha = red
δ delta = amber
μ mu = green
υ upsilon = blue
ω omega = indigo

61

Larry Wallace's Syntonic Syndromes

Chronic/long standing syndrome

Acute / trauma syndrome

Amblyopia / esotropia syndrome

Emotional / adrenal exhaustion syndrome

62

Mu Delta – "Chronic Syndrome"
Lemon physiologic stabilizer

Dx: convergence excess, esophoria/esotropia alpha omega pupil and poor oculomotor constricted visual field for form or color low recovery on ductions (especially BI)

Sx: toxic or neuroendocrine imbalance chronic health problems or past trauma

Tx: stimulate sympathetic, create exo response

63

Alpha Omega – "Emotional Fatigue"
Ruby Syndrome

Dx: alpha omega pupil, fatigue exo, low breaks and recoveries (especially BO), adrenal fatigue

Sx: photophobia, transient blurred vision, fatigue, headache

Tx: balance parasympathetic and sympathetic

64

Treatment Protocol (end at middle of spectrum)

Alpha Omega (10 minutes)
Ruby +
Mu Delta (10 minutes)
Lemon

65

Alpha Delta – "Amblyopia Syndrome"
Red-Orange sensory + motor stimulant

Dx: amblyopia, esotropia, poor accommodation, constricted visual field, reduced vergence ranges

Sx: reduced acuity on one eye, head tilt or turn, poor depth judgment, diplopia
also slow reading speed and poor handwriting

Tx: stimulate sympathetic
especially in long standing strabismus

66

Alpha Delta – "Amblyopia Syndrome"

Red-Orange amblyopia, eso
poor accommodation

Mu Delta – "Chronic Syndrome"

Lemon physiological, toxic,
neuroendocrine

67

Why Red-Orange or Lemon ?

- Sympathetic Activation
- Sensory and Motor Stimulant
- For amblyopia, esotropia
- Stimulates Exo Response

68

Treatment Protocol (end at middle of spectrum)

Alpha Delta (10 minutes)

Red-Orange +

Mu Delta (10 minutes)

Lemon

69

Color Combinations

- Alpha Delta + Mu Delta (esotropia)
- **Alpha Omega + Mu Delta (80% of cases)**
- Alpha Omega (alone)

Always end at the middle of the balance board

70

Mu Upsilon – "Acute Syndrome"

Blue-Green recent head trauma, anoxia, stroke

Dx: exophoria, exotropia, convergence insufficiency (PTVS), alpha omega pupil, enlarged blind spot, poor ocm / accommodation

Sx: headache, motion sickness, vertigo, transient blurred vision, diplopia (monocular)

Tx: stimulate parasympathetic

71

Why Indigo or Blue-Green ?

- Parasympathetic Activation
- Sensory and Motor Depressant
- For Pain and Spasm
- Stimulates Eso Response

72

Upsilon Omega – "Pain Reliever"
not a syndrome

Indigo

headaches, asthenopia

(Violet)

73

Acute Case Treatment Protocol

Mu Upsilon (10 minutes)

Blue-Green

74

Treatment Protocol (end at middle of spectrum)

Upsilon Omega (10 minutes)

Indigo +

Mu Upsilon (10 minutes)

Blue-Green

75

Color Combinations

- Mu Upsilon (alone)
- Upsilon Omega + Mu Upsilon

Always end at the middle of the balance board

76

Treatment Protocol

- Frequency of light into the eye
- 20 minutes per session
- Minimum of 4x per week
- Progress Evaluation every 8 sessions
  repeat history, vision analysis, VF
- Low Risk and Few Side Effects

77

Visual Fields Lab

Signs of small fields
- "Bull in china shop"
- Copying problems
- Poor spacing
- Poor spelling
- Poor oculo-motor skills
- Can't line numbers columns up

78

79

Functional Vision Changes

What To Think (brain injury case)

- Visual Acuity Loss
  - Sx: blurred vision
  - enlarged blind spot
- Strabismus (exotropia)
  - Sx: double vision, loss of depth perception
  - hyperarousal of sympathetic

80

- Oculomotor Dysfunction
  - Sx: skips/rereads lines of print
  - poorly controlled pursuits and saccades
- Convergence Insufficiency
  - Sx: reading difficulty, dizziness/nausea
  - receded NPC and pulls back from target

81

- Accommodative Deficit
  - Sx: blur, headaches
  - reduced amplitude and flexibility
- Decreased Blink Rate
  - Sx: dry eye, photophobia
  - reduced TBUT, filamentary keratitis

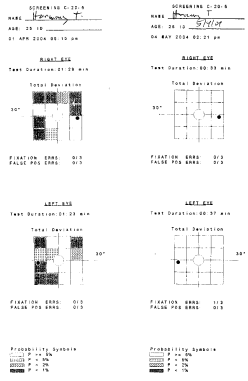
82

Visual Field Constriction

Sx: bumps into things, poor night vision,
spatial disorientation, attention deficit

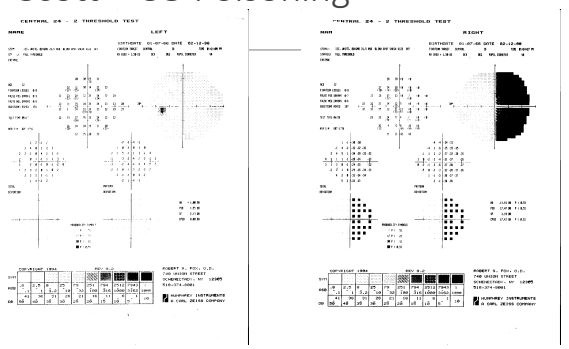
alpha omega pupil, oculomotor dysfunction,
midline shift, information processing disability

83



84

Scott – CO Poisoning



85

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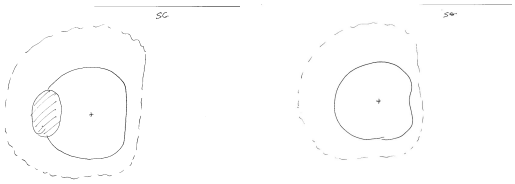

86

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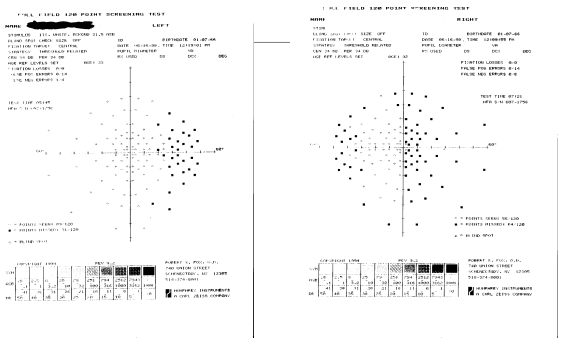

87

Pearls to Remember

- Enlarged blind spot and general constriction of visual field
- Light is a primary tool to rebalance the autonomic nervous and endocrine systems
- Wallace's 4 basic syndromes work 95% of the time
- Low risk with with high rate of success
- Successful syntonic cases handle VT much better than those without syntonics boosting overall success rates

88