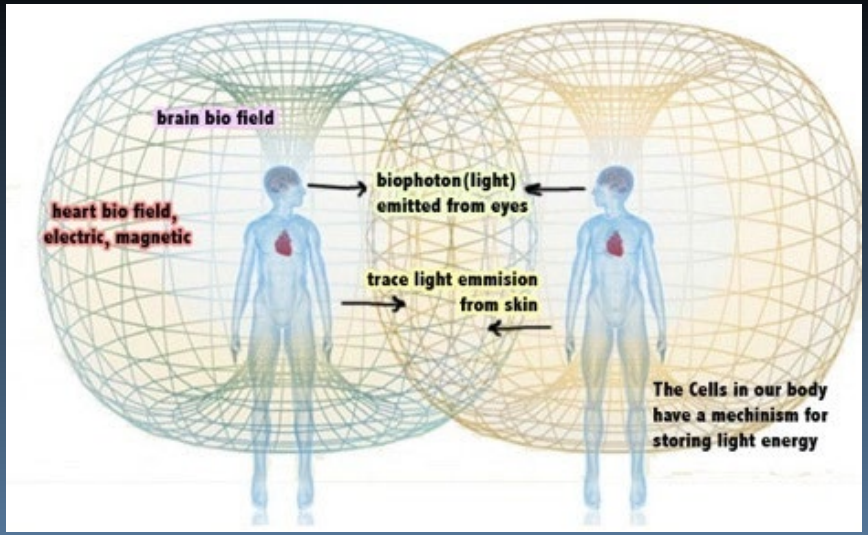
The Syntonic Field
Functional/Kinetic

Syntonics 101
June 2022
Nashville, TN
John Pulaski, OD, FCSO

The Syntonic Visual Field



Fritz Popp, a German physicist and inventor of the biophoton theory described the biophoton field that surrounds living organisms as being highly complex, self-tuneable, oscillating fields of energy. This 'field' regulates and controls all our life processes. When we plot colour visual fields, we are measuring information that the brain receives from the eyes and the eyes receive from the 'field'. In the same way as we emit a spectrographic pattern of our electromagnetic field, we can plot colour emanation from the brain. This colour visual field then describes the emergent biophoton field of a human being.

The Visual Field
Types of Measurements

1. Gross awareness to light stimulus
2. Confrontation Fields
3. Form Fields – object awareness
4. Extinction Phenomena
5. Static (Automated)
6. Kinetic (Functional)
7. Frequency Doubler (FDT)

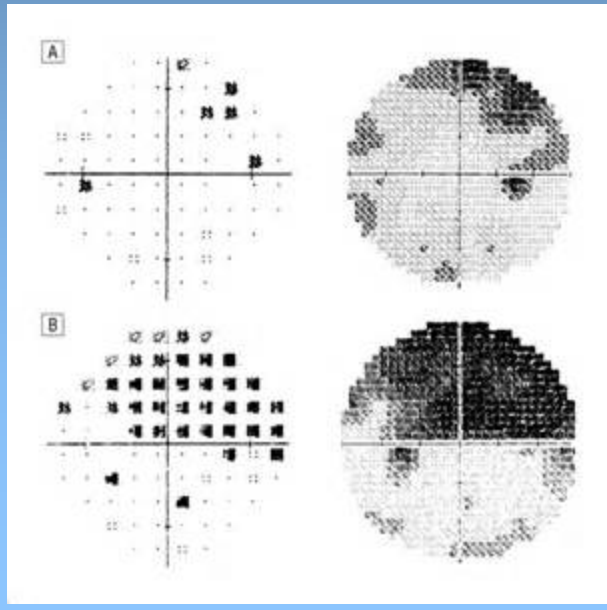
The Visual Field Measurement Techniques

Static (Automated)

Conventional, Computerized, "Gold Standard"

Involves detection of a stationary target

- Generally white light only.
- Threshold of light sensitivity
- Is for detecting pathology
- Relates to the "structural" integrity of the visual pathways in the brain.

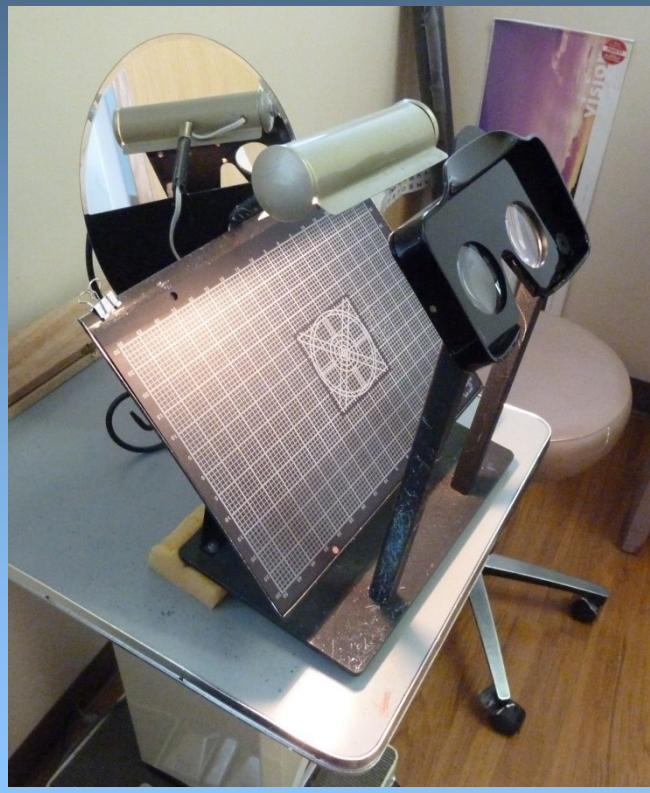


The Visual Field Measurement Techniques

Kinetic (Functional)

- Campimetric, Goldmann, Tangent Screen
- Used with stereo campimeter in Syntonics
- Detection of a moving target from non-seeing to seeing – Magnocellular plus color recognition.
- Reveals pathologic as well as perceptual deficits
- Can be improved and used to monitor effectiveness of any treatment modality
- Test multiple levels of function

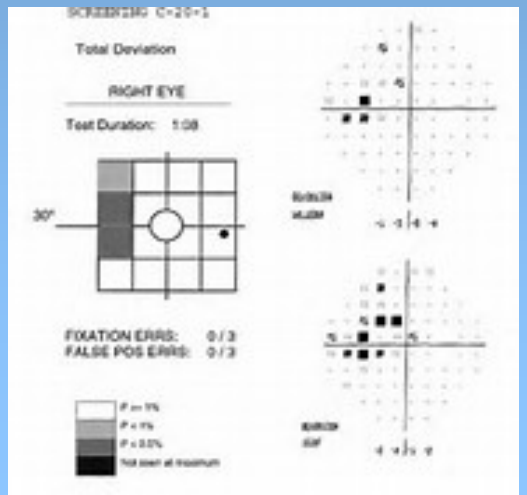
  Motion, white and 3 colored targets



The Visual Field Measurement Techniques

Frequency Doubler (FDT)

- High Temporal Frequency Flicker Rate
- Flicker Sensitivity involves interpretation by retinal periphery
- Magnocellular or cortical pathways
- Correlates well with the kinetic field we measure in Syntonics



The Visual Field
Static vs Kinetic Field

LOW SPATIAL RESOLUTION WITH STATIC PERIMETRY

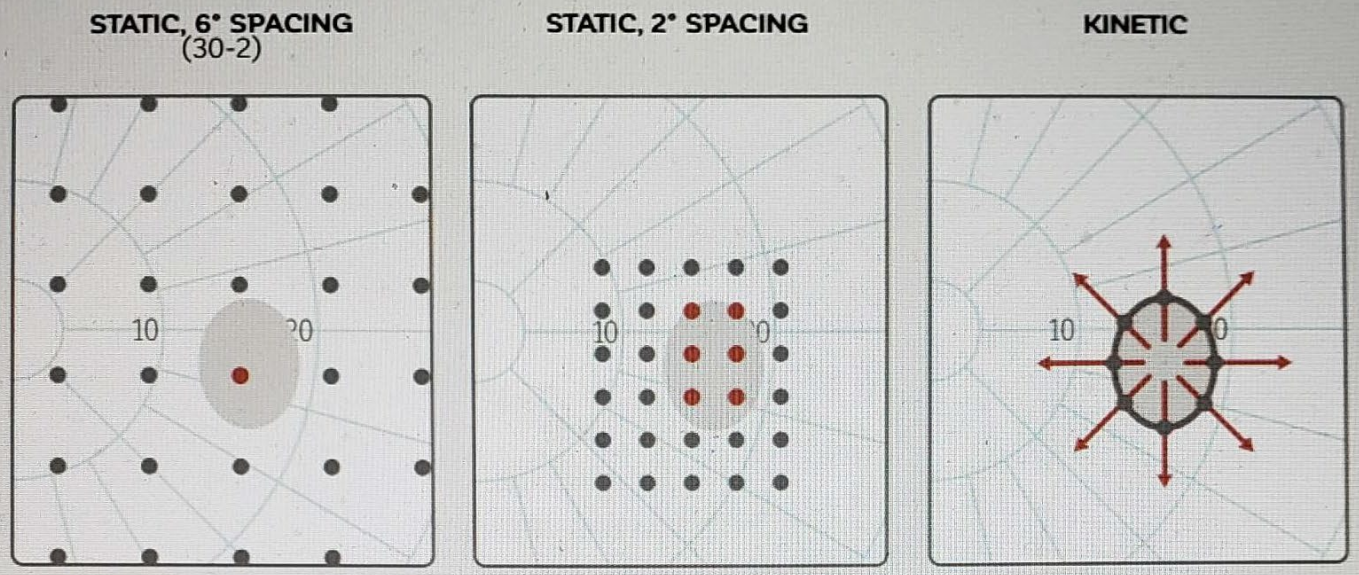


FIGURE 11-1 Static perimetry has relatively low spatial resolution as demonstrated in this example in which the blind spot is tested. Using a 30-2 pattern with 6°spacing, only one or two locations are tested within the blind spot, providing no details about its size. Using a customized test pattern with 2°spacing provides higher, but not optimal resolution, while increasing test duration. Kinetic perimetry in this situation provides much higher spatial resolution with similar or lower test duration.

The Visual Field
Static vs Kinetic Field

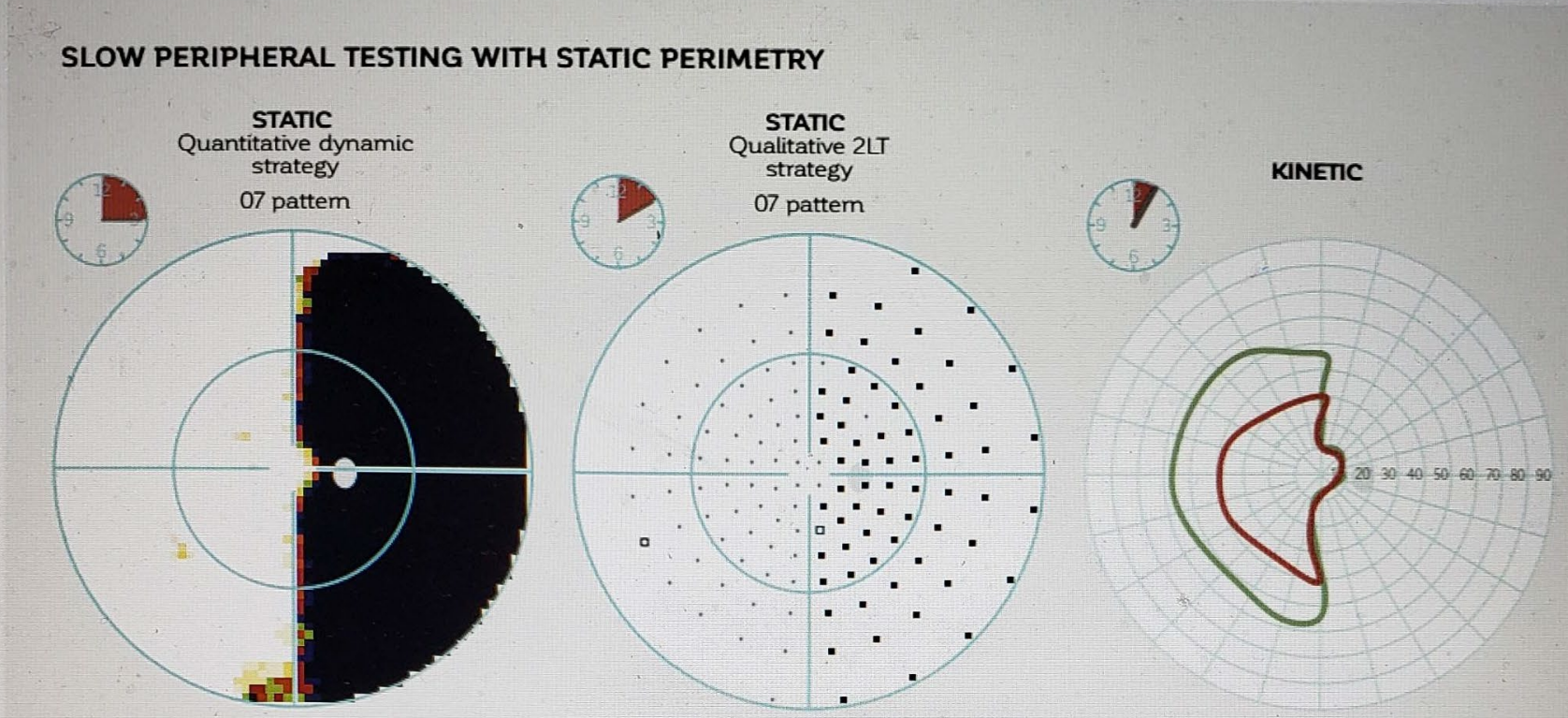
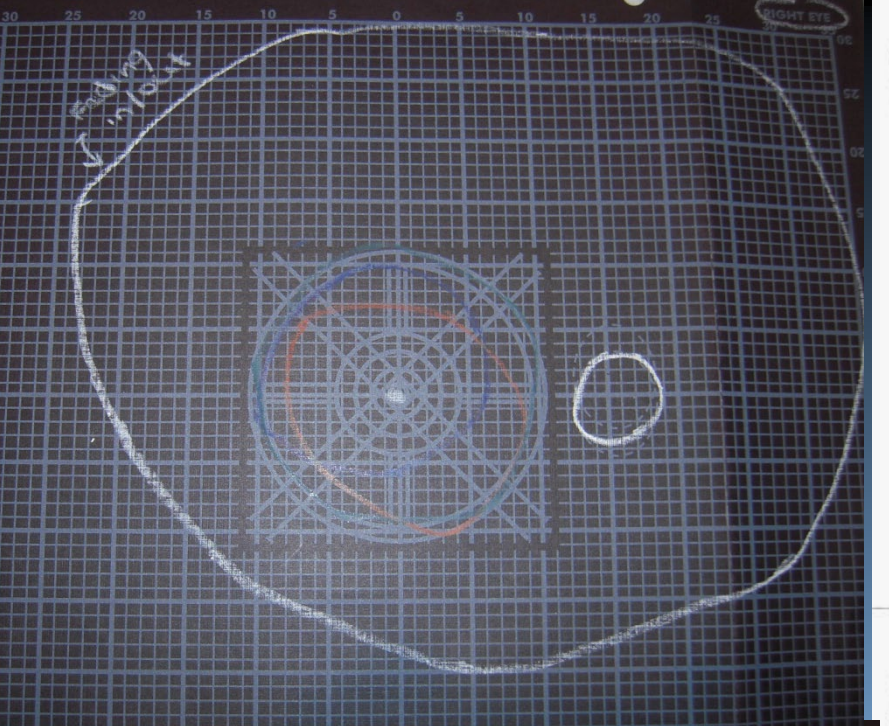
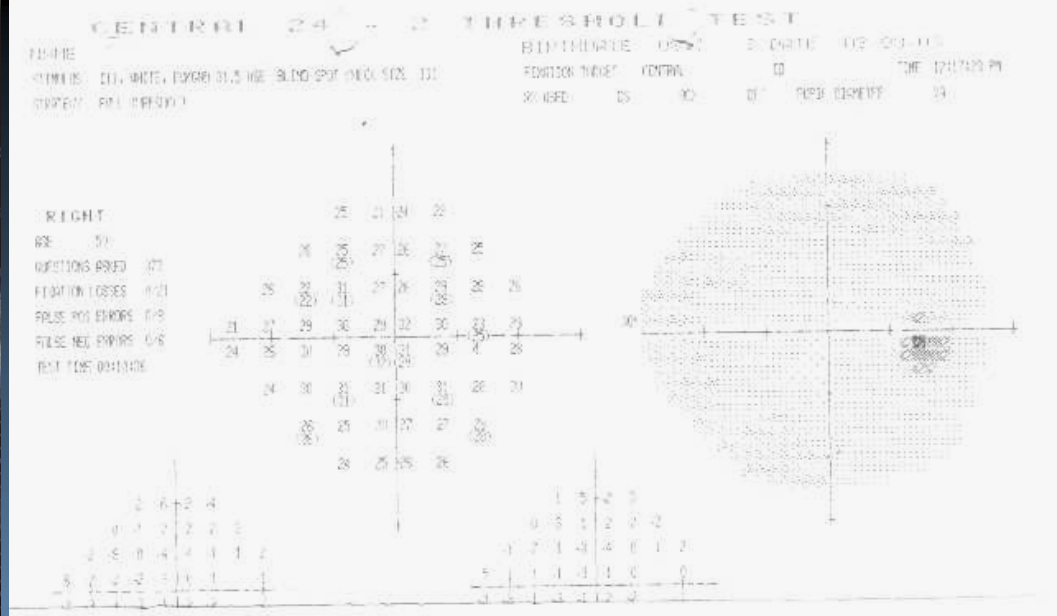
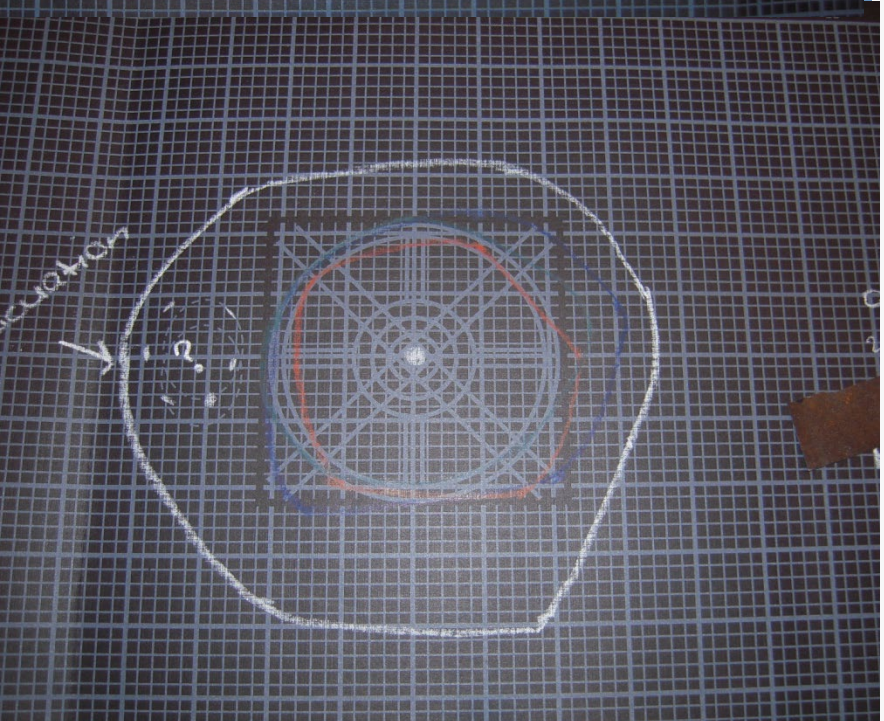
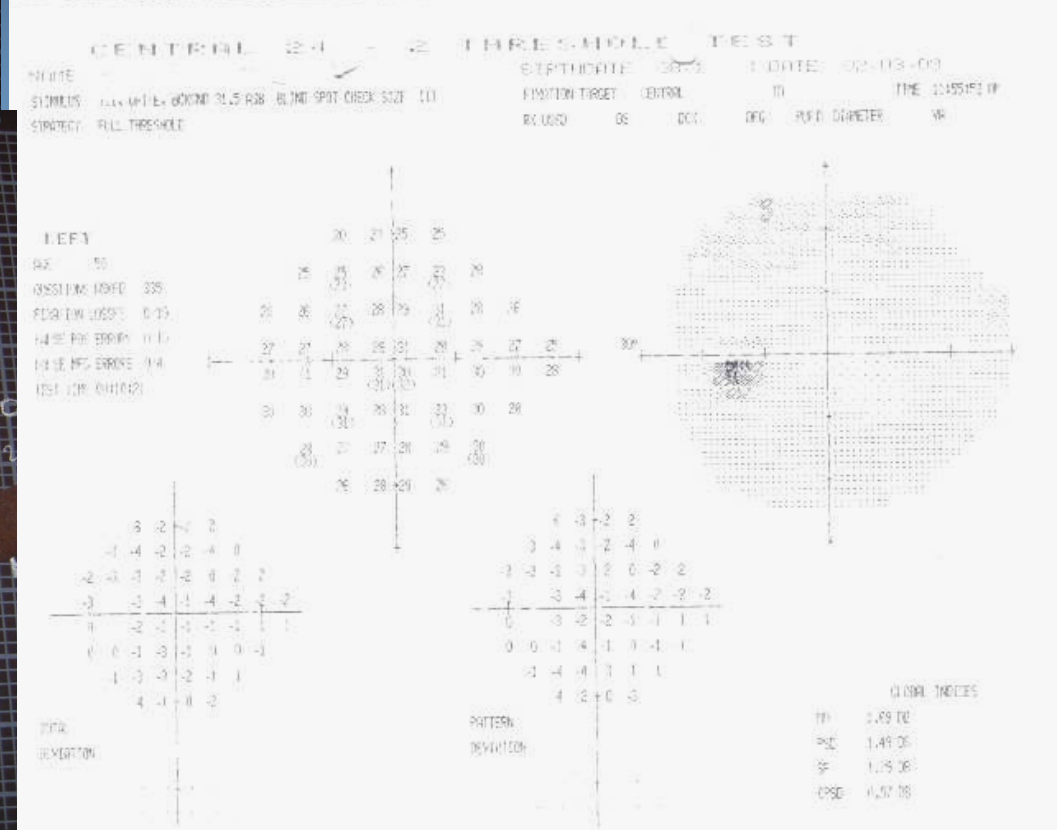


FIGURE 11-2 Peripheral testing with static perimetry is time-consuming under both quantitative and qualitative strategies, as this example of a postchiasmal lesion resulting in hemianopia with macular sparing demonstrates. Note that a kinetic test can be up to three times faster than a quantitative static test.


RIGHT EYE
Fading in/out


CENTRAL 24 - 2 THRESHOLD TEST
RIGHT


fluctuation


CENTRAL 24 - 2 THRESHOLD TEST
LEFT
GLOBAL INDICES

The Kinetic Visual Field

Why do it?

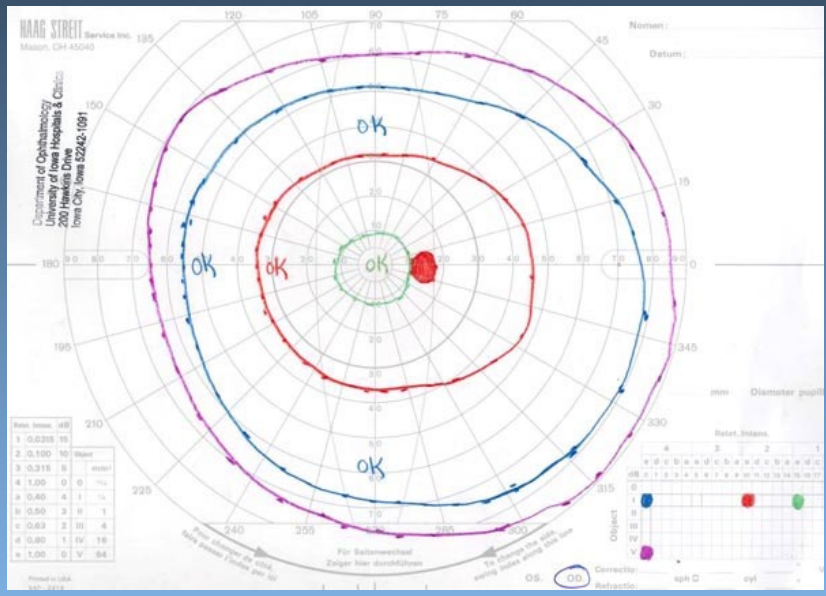
What is so unique and valuable about this field?

Why can it be used to monitor any therapies?

The Kinetic Visual Field
Why do it?

- Colour visual field analysis, among the most important biological visual tests known to science.'

T.A.Brombach, 1936



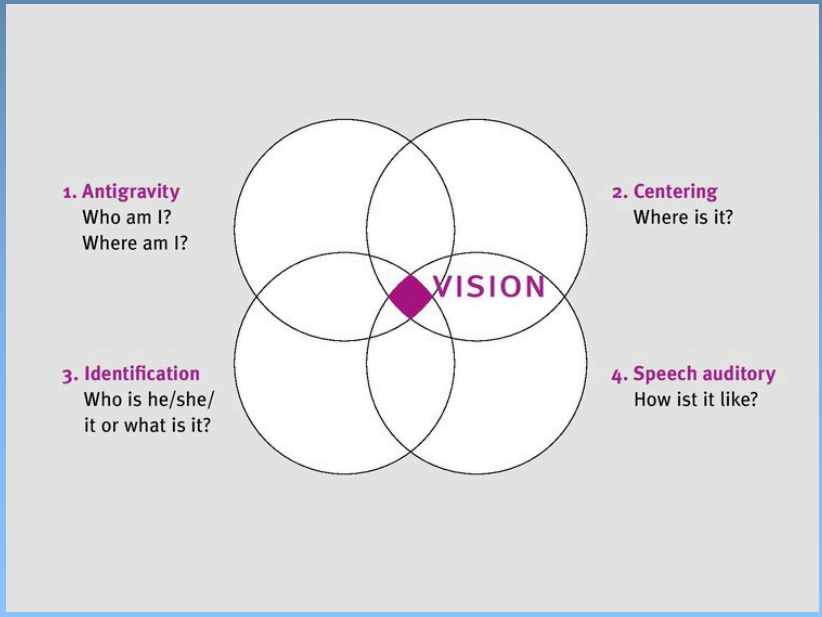
The Kinetic Visual Field
Why do it?

- Imbalances of the extraocular muscles are reflected in visual field charts.
- Early changes in the peripheral limits of the colour field are the first sign of impending pathology
- Fatigue appears to produce shrinkage of the fields, with one eye consistently presenting a greater amount of collapse.

Brombach 1928

The Kinetic Visual Field
Process of Projection
Skeffington – The Emergent

- Vison involves a projection into and interaction with the world around us.
- It includes both Input and Output as an ongoing process.
- This interaction is on ALL levels of perception that includes integration of movement through Visual, Cortical and Vestibular processes.



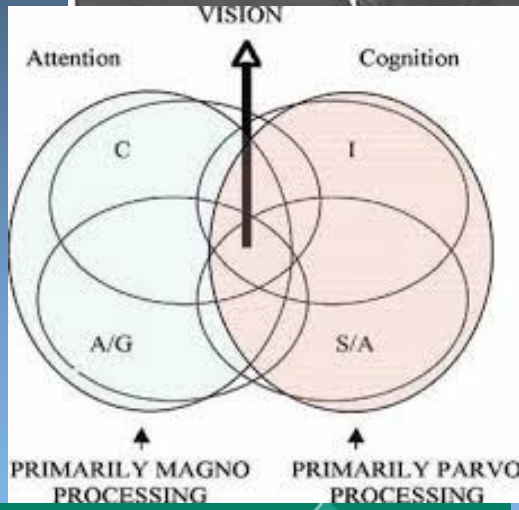
The Kinetic Visual Field

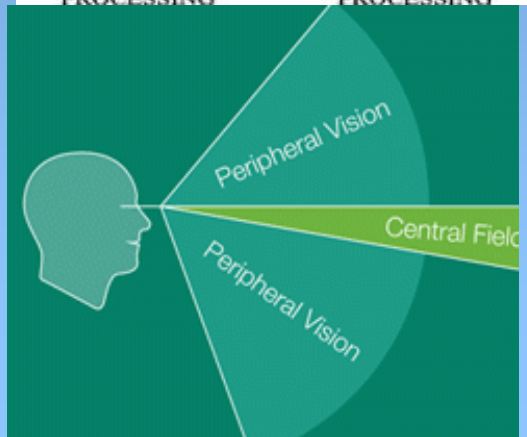
Process of Projection

Skeffington – The Emergent

"The "What to do" is compounded out of the experiences from ALL of the inputs of the WHOLE body … and organism.

"Stresses bring a constriction of the movement patterns. The constriction IS the visual problem."





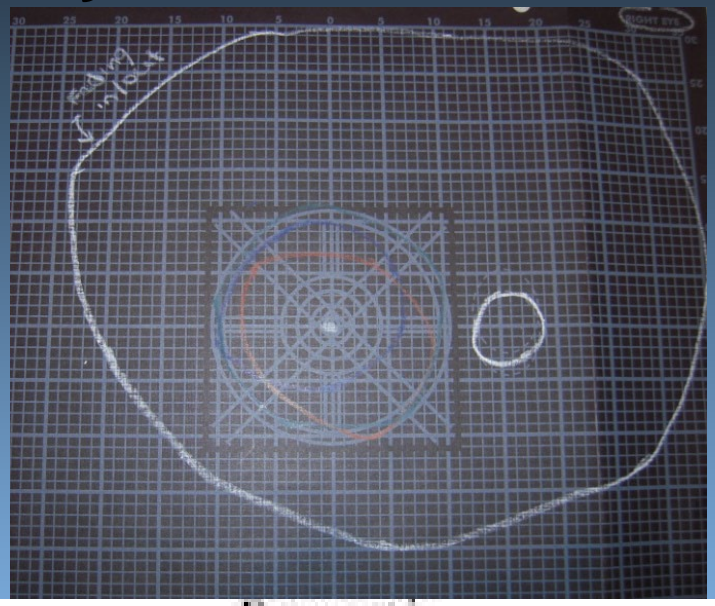
Practical Applied Optometry

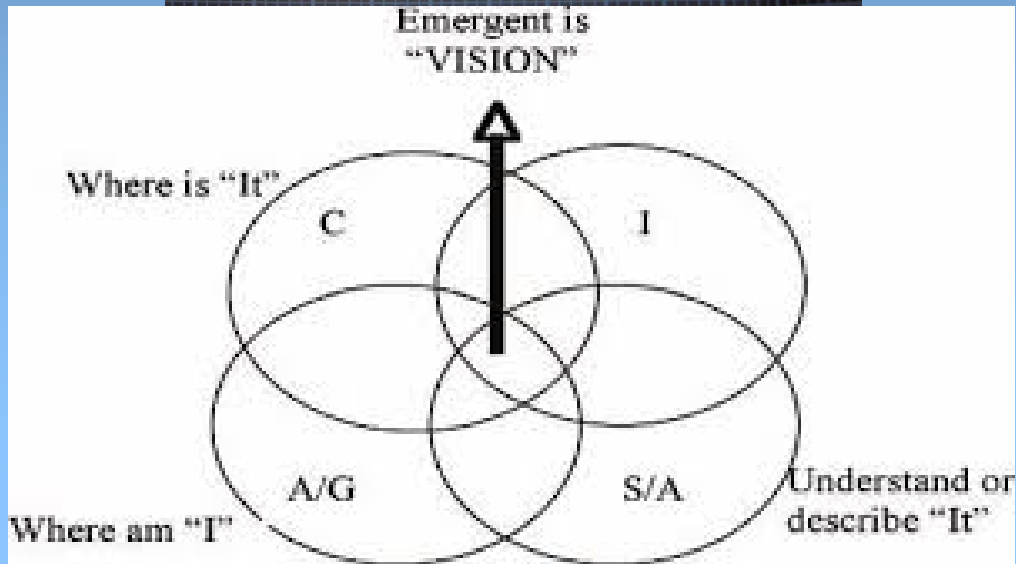
The Kinetic Visual Field
Process of Projection

Vision is an Emergent.

- It is Projection
- It is my belief that this is what we are measuring with the Campimetric field.
- "The whole cookie" Abe Shapiro
- The emergent biophoton field of the human being

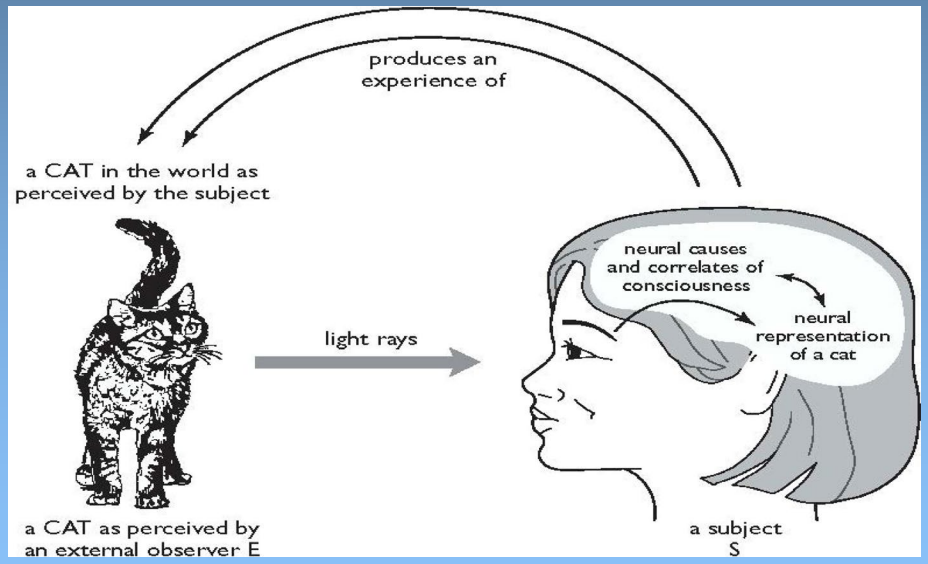
Fritz Popp

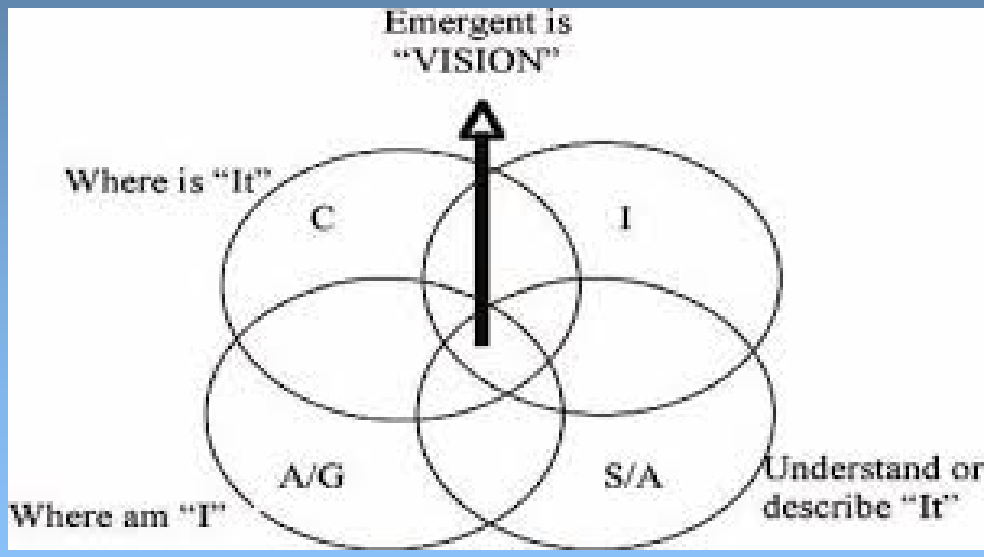




The Kinetic Visual Field
Why do it?

- I believe it is a measure of capacity of the brain to process visual information and then project the image accurately into space.
- It reveals integrity of "Where, What" and the movement or action pathways.

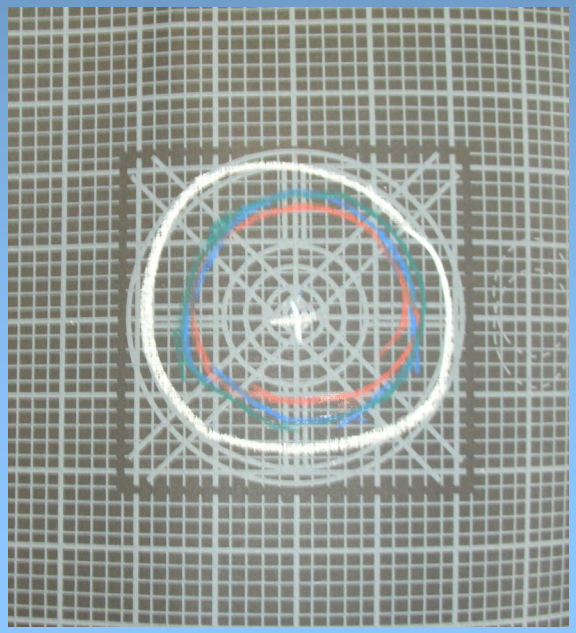




The Kinetic Visual Field
Why do it?

It is an extremely sensitive field measurement of visual performance and efficiency. A compressed field effects such areas as:

- Pursuit and Saccadic fixations
- Reading speed and processing
- Handwriting
- Sports performance
- Spatial perception
- Behavior



The Kinetic Visual Field
Why do it?

Relates to the structural and functional integrity of the visual pathways in the brain with deficits not detectable by other testing.

- Post Concussion Syndrome
- Diffuse Axonal Injury
- Stroke
- Lyme Disease
- Neurological Disease

The Kinetic Visual Field
Why do it?

It can be used in monitoring the success of all modalities of therapy.

- Vision Therapy
- Medical Treatment
- Neuro-chiropractic
- Functional Body therapists – PT
- Psychology

The Kinetic Visual Field
Why do it?

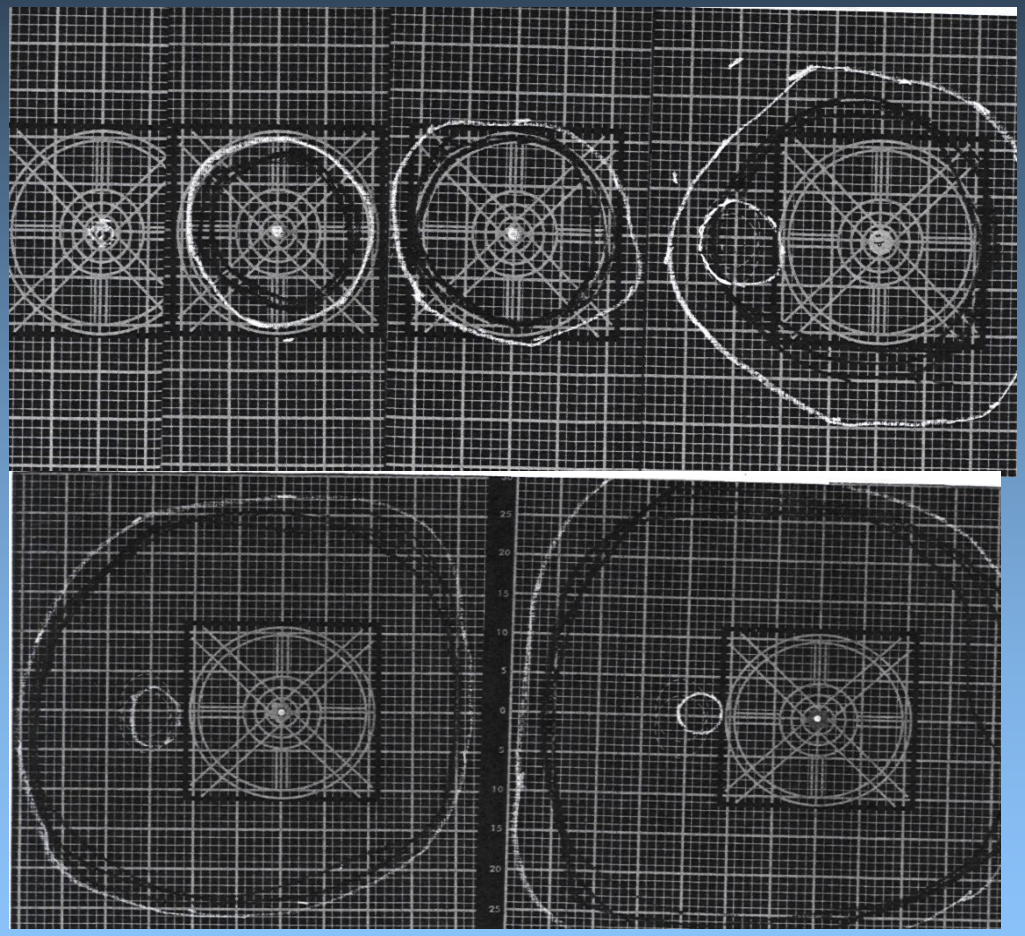
Opening a field is the key to overall wellness and accurate integration with the world and people around us.

It is the most important measurement you will do as a clinician!

The Kinetic Visual Field
What are We Measuring?

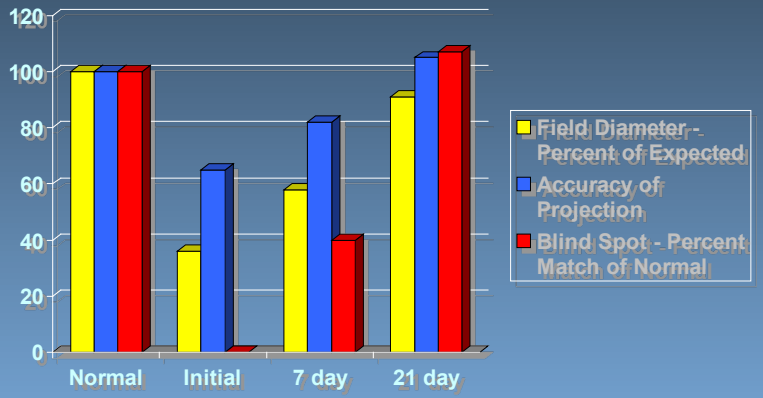
- It reveals the capacity of the brain to process visual input on all levels of visual perception

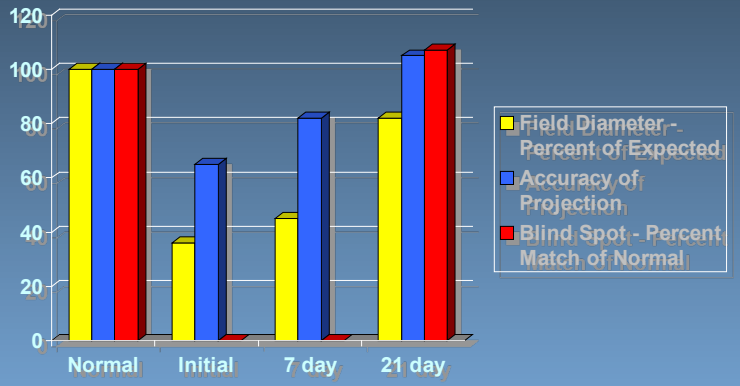
The Kinetic Visual Field To Monitor Success of Therapy

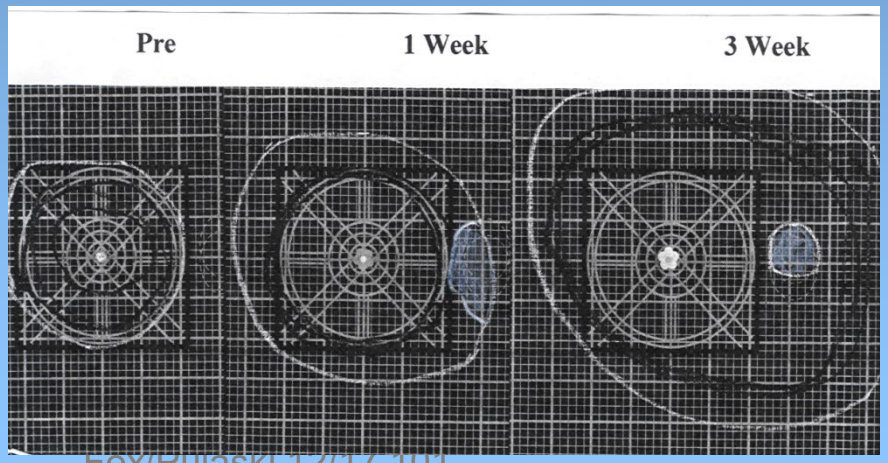


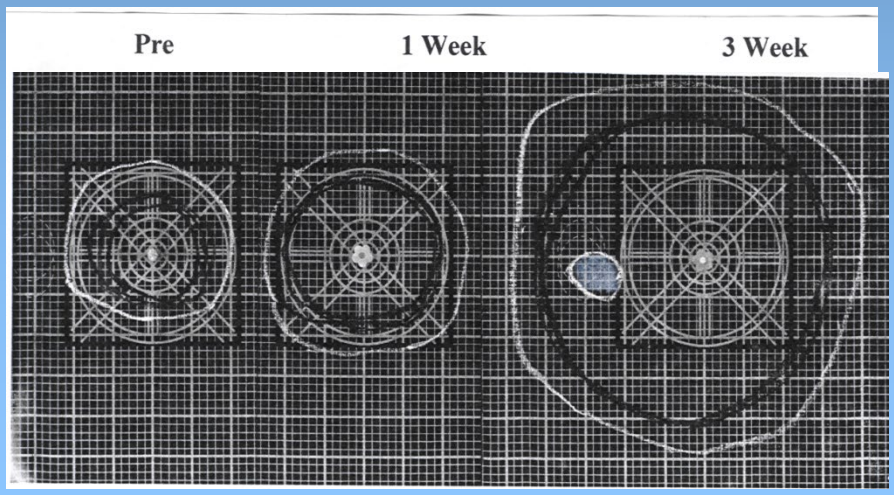
Change in Projection, Field, Blind Spot with Syntonic Light Therapy

Case 1 Stephanie - OU

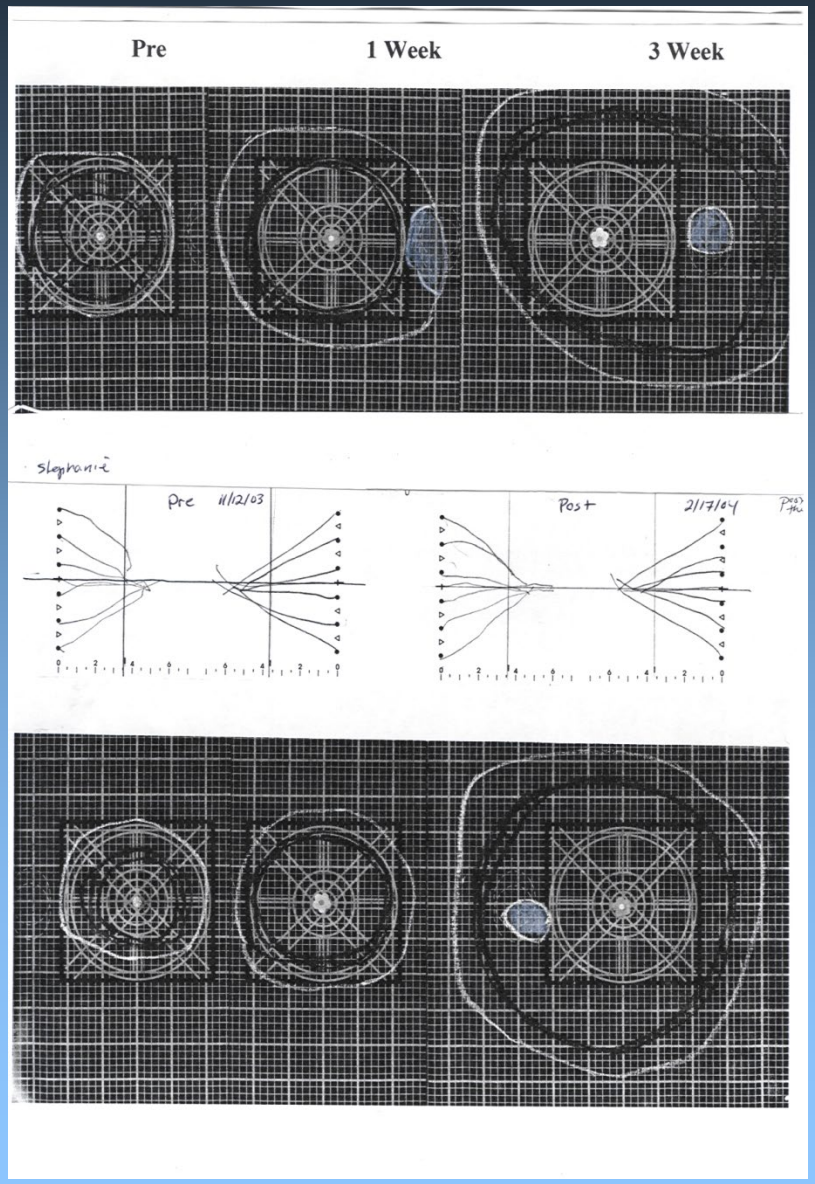








Case 1 Stephanie



Measurements and Tests Influenced by Field Changes

- Refraction
- Phoria
- NPC
- Far/Near Focus
- Pursuit Movements
- Saccadic Fixations

- DEM
- VO Star
- Streff Cap Test (Localization)
- Visual Scanning
- Incomplete Man Copy Forms
- Pupillary Reactions

Measurements Influenced by Field Changes
Refraction Changes Pre/Post

Pre	Post
+100 +075	+150 +150
+200-250 x 170 +200-250 x 10	No Change
-.25 Plano	Plano Plano
Plano -.25-50 x 180	+0.50 +0.75
Pl –025 x135 Pl –050 x 75	+50 –50 x 100 +50 –25 x 75

Pre	Post
-025-025 x 180 -025	+050 +050-25 x 180
-075 -075	-075 -075
-025 -025	-025 -025
+025 +025	+050 +050

Measurements Influenced by Field Changes
Book Retinoscopy Pre/Post

Pre	Post
+075 +050	+125 +125
+300-250 x 170 +300-250 x 10	+275-250 x 170 +275-250 x 10
+062 +075	+062 +062
+.50 +.75-50 x 180	+0.75 +0.75
+1.50 +1.50	+1.25 +1.25

Pre	Post
+50-025 x 180 +50	+075 +075-25 x 180
+1.25 +1.25	+1.00 +1.00
+050 +050	+075 +075
+100 +100	+050 +050

Measurements Influenced by Field Change

Phoria

Pre	Post
Ortho/3eso	1exo/4exo
1exo/3exo	Ortho/6exo
Ortho/5eso	1exo/5exo
3exo/9exo 6exo/12exo	2exo/8exo 1exo/10exo
3eso/9eso	1eso/6eso

NPC

Pre	Post
2/4	1/3
3/9	2/6
2/12	2/6
1/4	1/3
3/6 3/7	2/6 2/5

Measurements Influenced by Field Changes

- Far/Near Focus

  Improvement in all cases – all some degree of difficulty

- Pursuits – Tracking

  Pre - Excessive head move, misfixations, jerky

  Post – Every case showed significant improvement.

  Most were smooth with no head.

- Saccades

  Pre - 90% were inaccurate

  Undershoots, Head move, Fatigue prevalent

  Post – Significant improvement in all cases

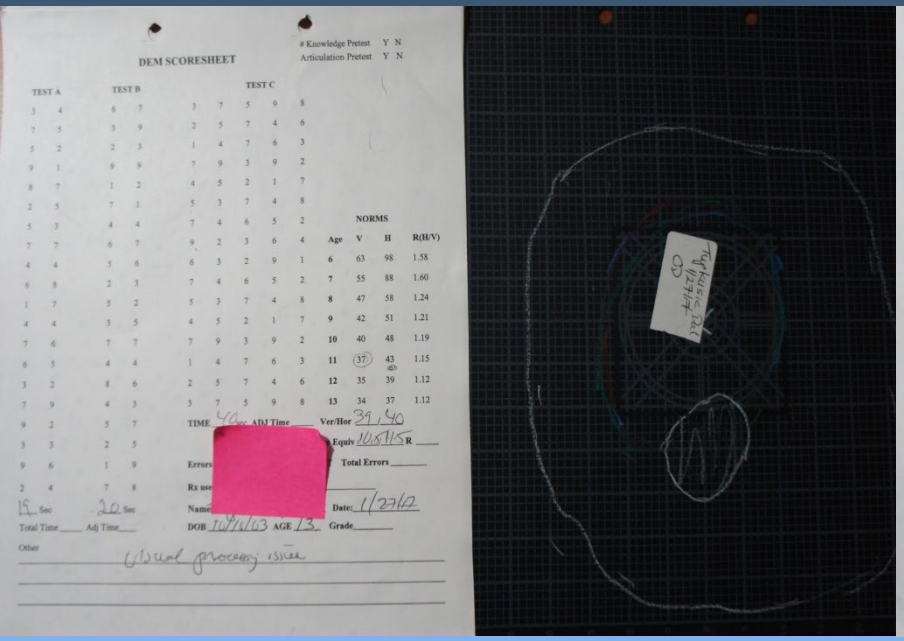
Measurements Influenced by Field Changes
Visual Scanning

Visual Scan – Davis Dot Test

Pre	Post	Age Equivalent Change
38 Dots	43 Dots	2 years
32	46	5
33	35	1
40	55	5
38	50	4
18	35	6
34	42	2
25	28	1
30	34	2
33	33	no change
36	43	3

Measurements Influenced by Field Changes

Other Testing DEM


DEM SCORESHEET

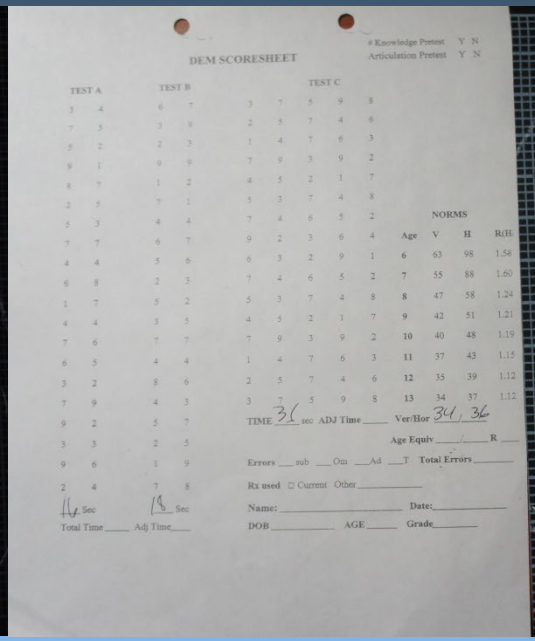
Knowledge Pretest Y N
Articulation Pretest Y N

TEST A TEST B TEST C

NORMS

Age	V	H	R(H/V)
6	63	98	1.58
7	55	88	1.60
8	47	58	1.24
9	42	51	1.21
10	40	48	1.19
11	(37)	43	1.15
12	35	39	1.12
13	34	37	1.12

TIME 46 sec ADJ Time ____ Ver/Hor 39, 40
Equiv 10.5 11.5 R ____
Errors ____ Total Errors ____
Rx used ____
15 Sec 20 Sec Name: [redacted] Date: 1/27/17
Total Time ____ Adj Time ____ DOB 10/16/03 AGE 13 Grade ____
Other
Visual processing issue


DEM SCORESHEET

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6	63	98	1.58
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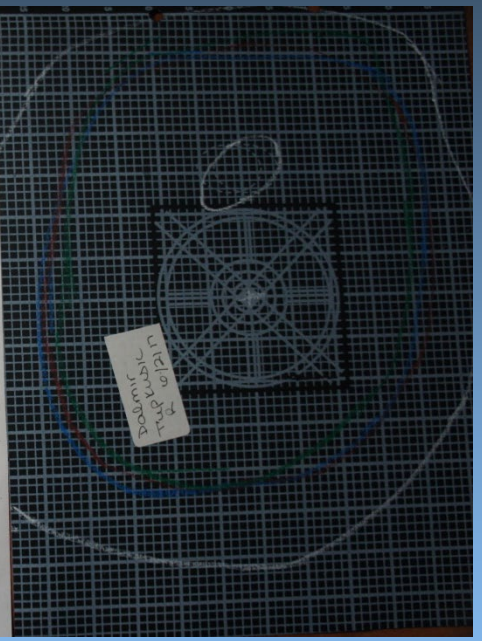
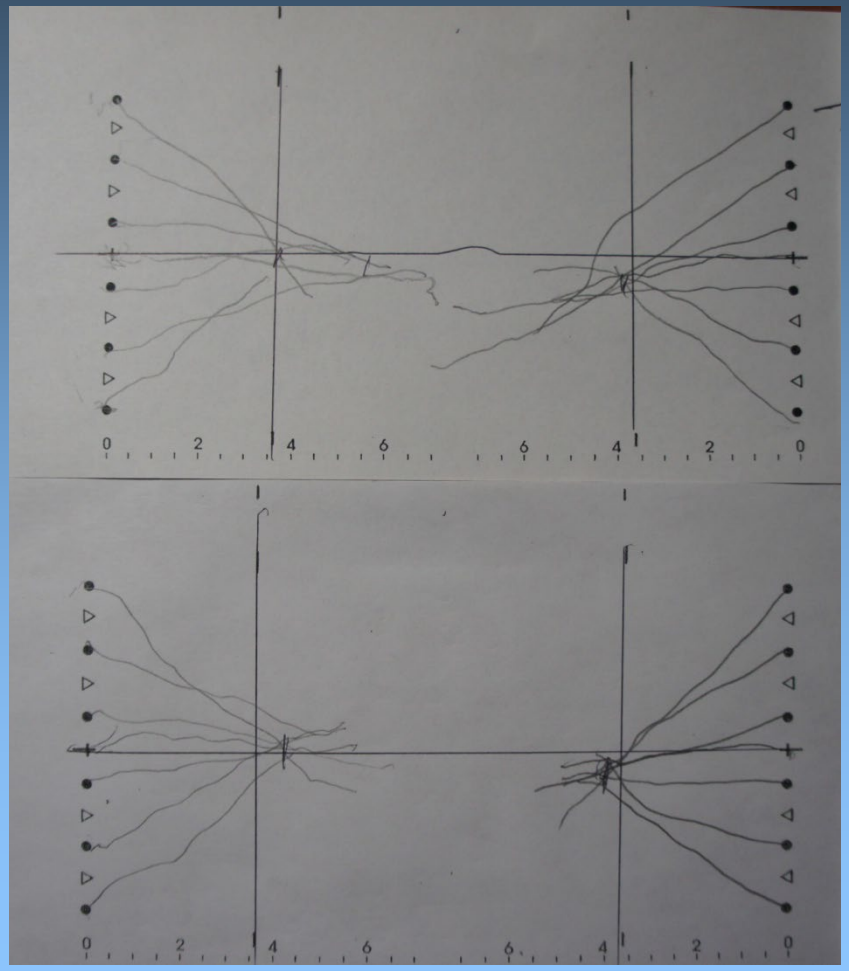
9	42	51	1.21
10	40	48	1.19
11	37	43	1.15
12	35	39	1.12
13	34	37	1.12

TIME 36 sec ADJ Time ____ Ver/Hor 34, 36
Age Equiv ____ R ____
Errors ___ sub ___ Om ___ Ad ___ T Total Errors ____
Rx used ☐ Current Other ____
14 Sec 18 Sec Name: ____ Date: ____
Total Time ____ Adj Time ____ DOB ____ AGE ____ Grade ____

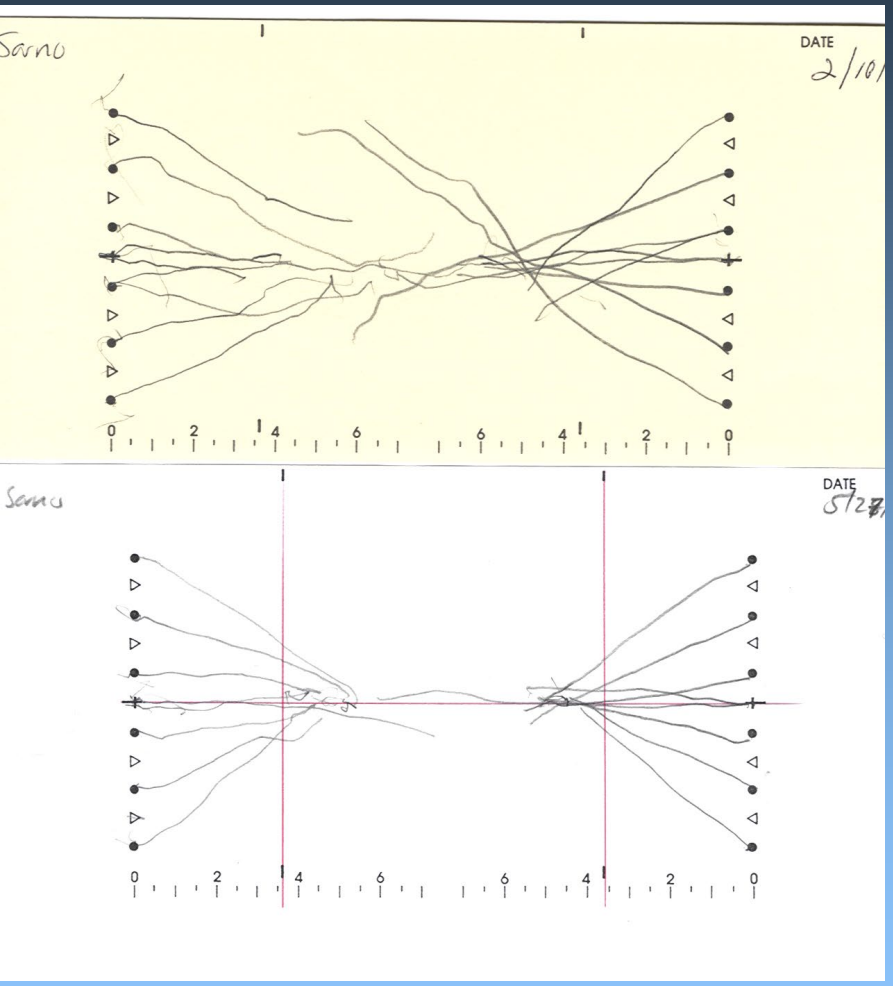


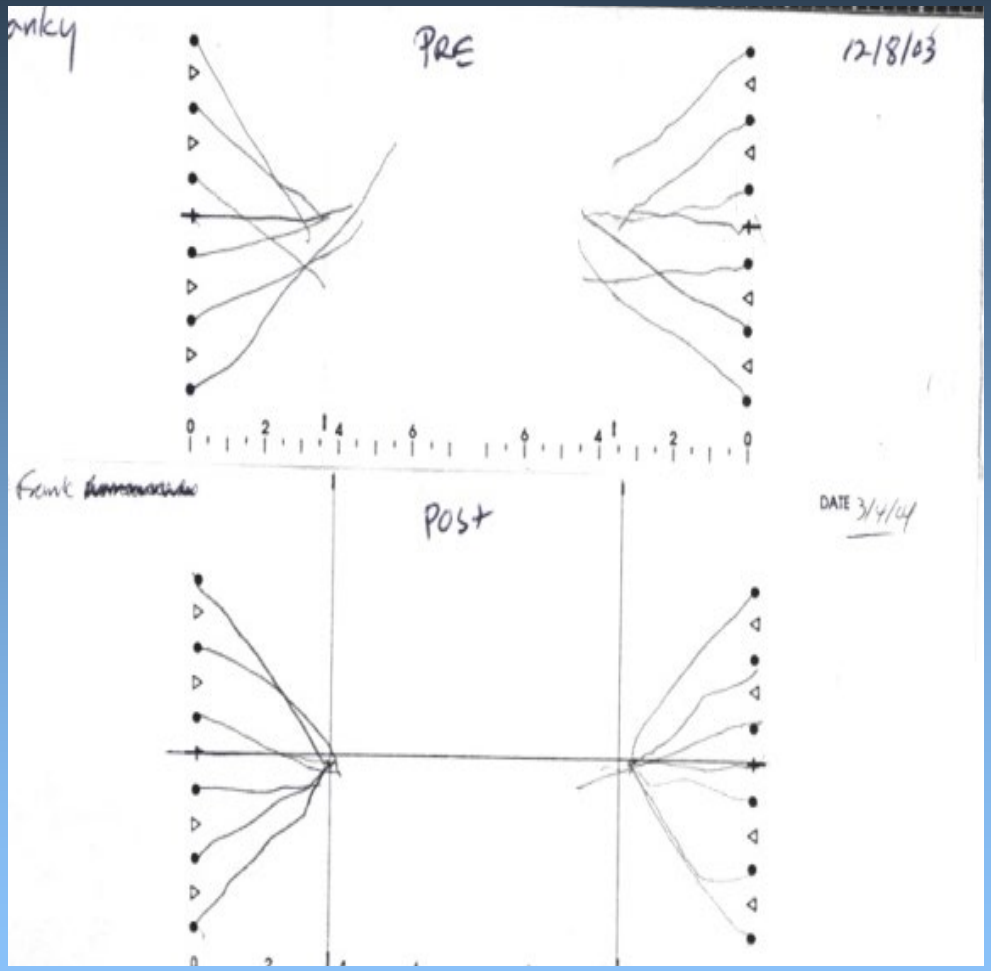
Measurements Influenced by Field Changes

Other Testing VO Star



VO Star

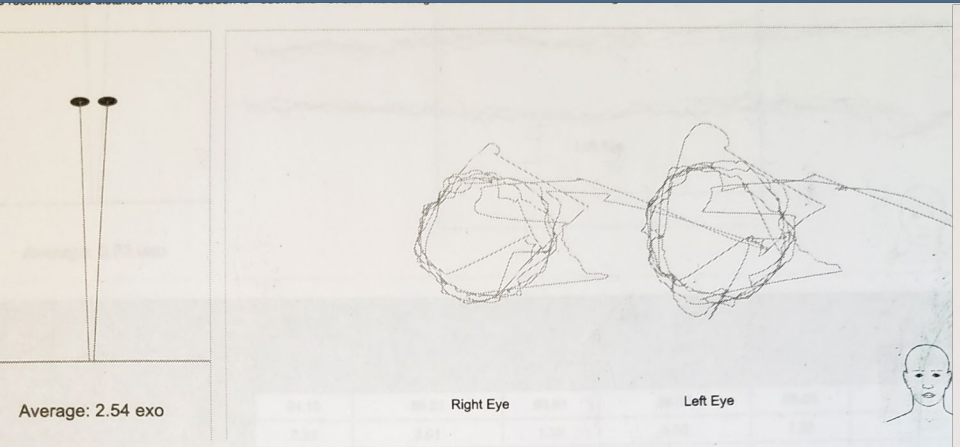




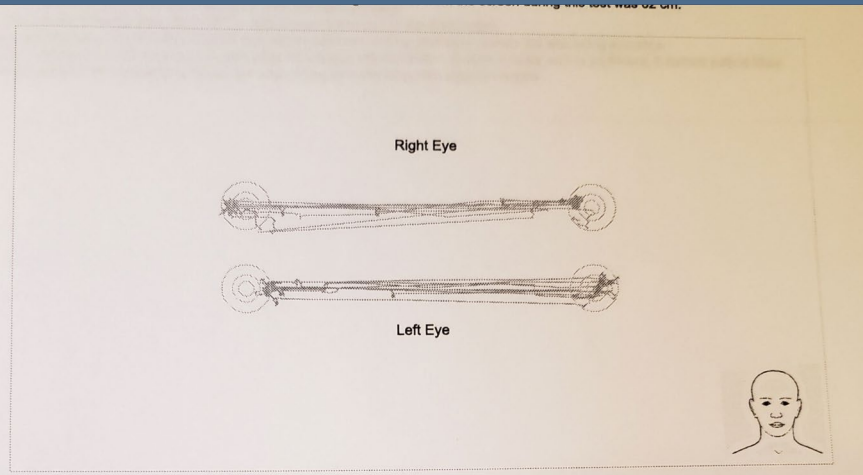
Measurements Influenced by Field Changes

Other Testing

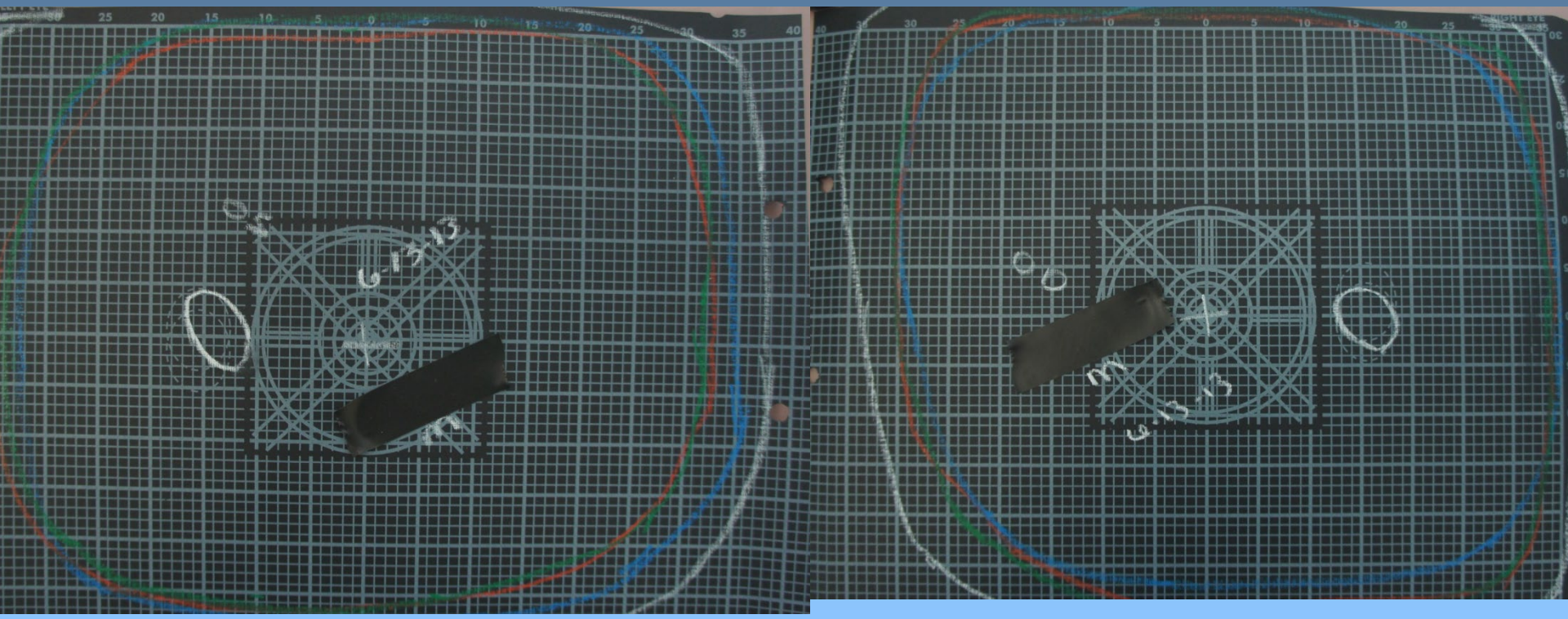
Right Eye



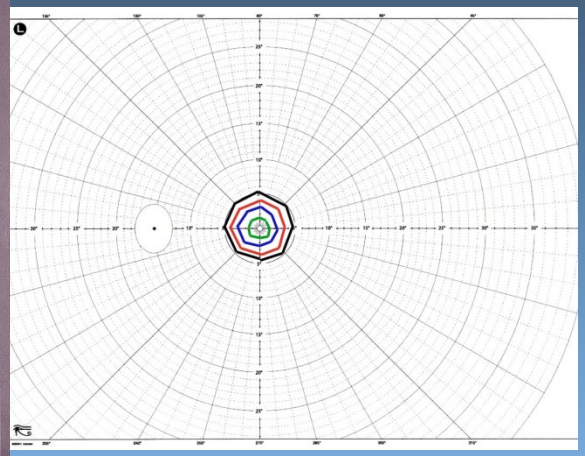
trics	Right Eye		Left Eye		Both Eye	
	Actual	Population Age 53-62	Actual	Population Age 53-62	Actual	Populatio Age 53-6
ooth Pursuit (%)	86.35	89.48	84.12	90.08	83.11	93.11
cade (%)	11.12	4.37	14.65	4.8	12.73	4.02
tion (%)	2.53	3.81	1.23	3.64	4.15	2.17
Target Velocity Error (dps)	21.55	14.77	21.07	14.67	21.21	14.59
zontal Synchronization SP (0-1)	0.97	0.91	0.95	0.9	0.96	0.91
ical Synchronization SP (0-1)	0.98	0.87	0.97	0.88	0.98	0.87
-Metrics	Right Eye		Left Eye		Both Eye	
	Actual	Population Age 53-62	Actual	Population Age 53-62	Actual	Popula Age 53
Target Smooth Pursuit (%)	26.52	59.21	52.64	64.5	59.19	68.9
ictive Smooth Pursuit (%)	16.74	5.97	8.02	3.1	7.20	1.8
nt Smooth Pursuit (%)	37.70	14.82	17.73	10.89	11.35	15.4

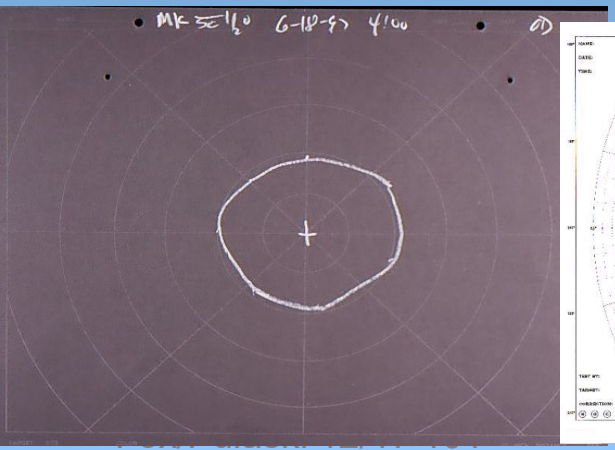


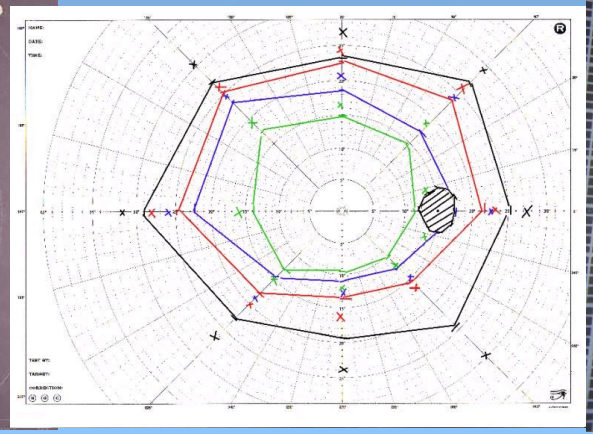
The Kinetic Visual Field
The Normal Visual Field

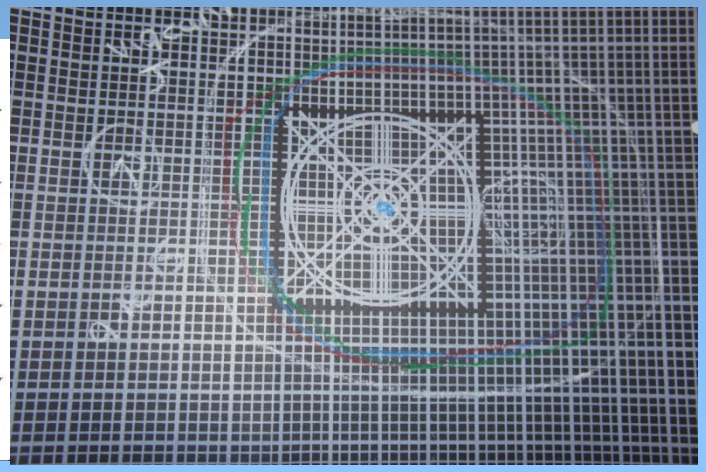


The Kinetic Visual Field
The Abnormal Visual Field





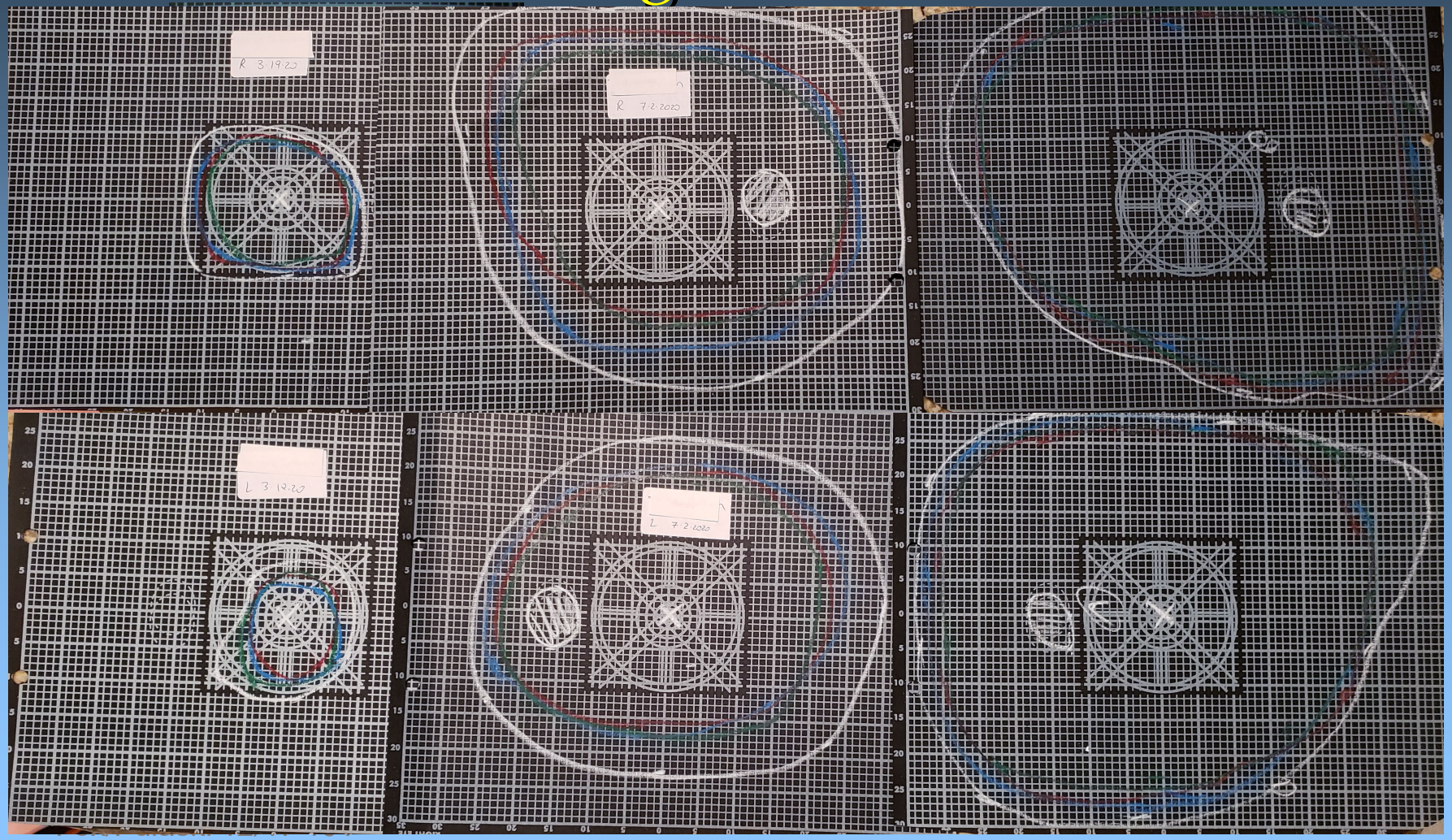




The Kinetic, Functional Field

Abnormal Fields

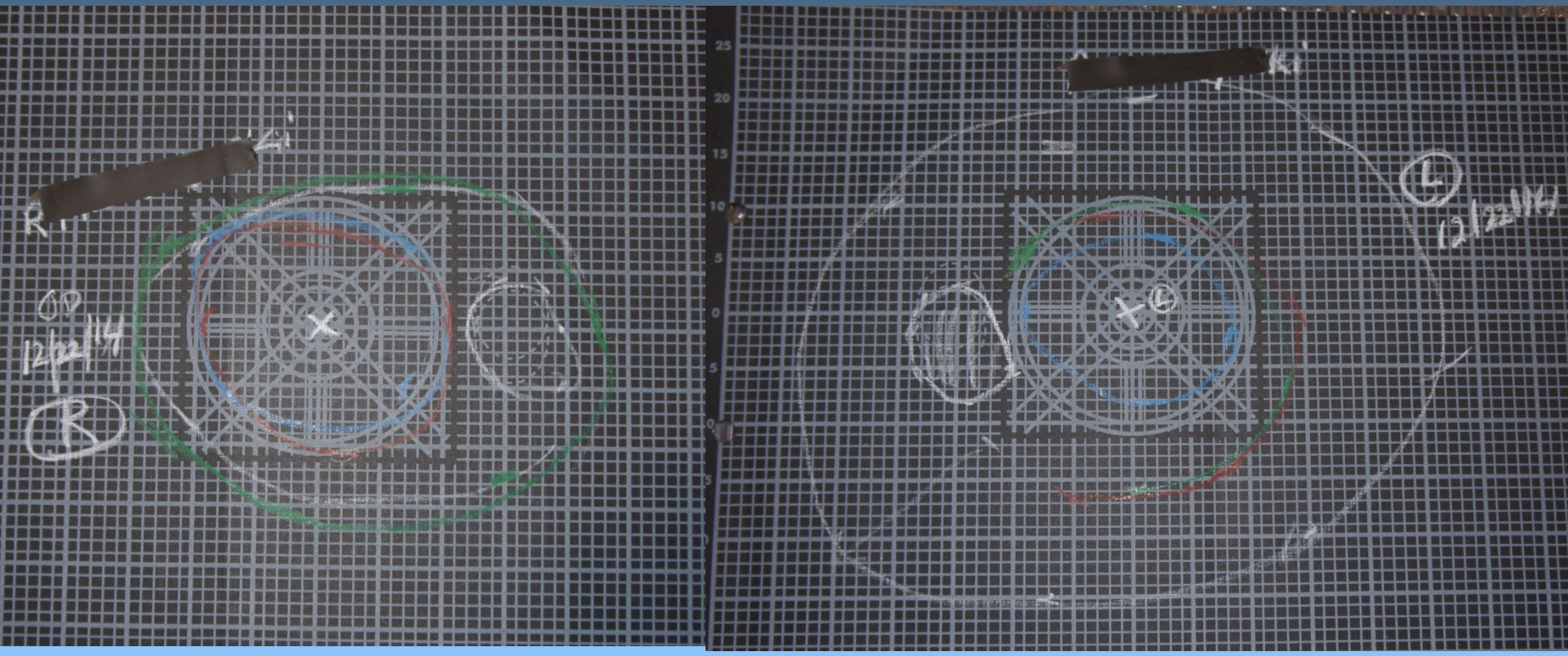
Learning Problem



The Kinetic, Functional Field

Abnormal Fields

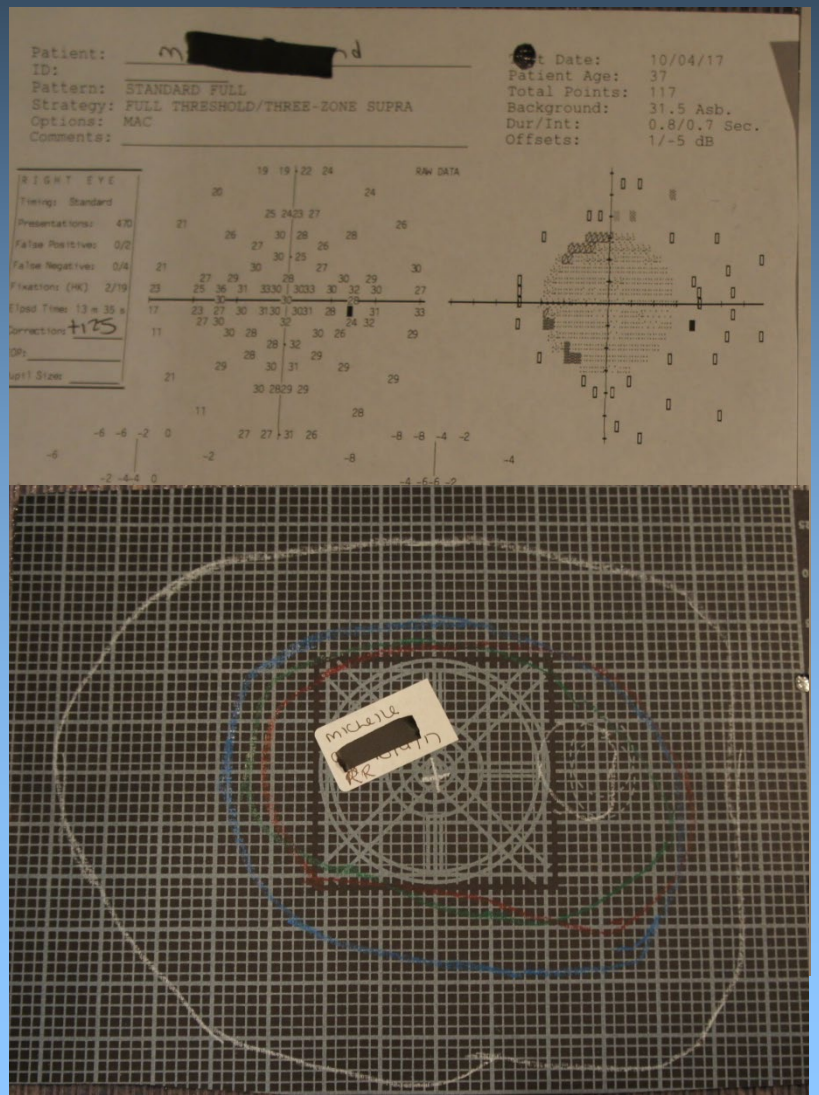
TBI Concussion

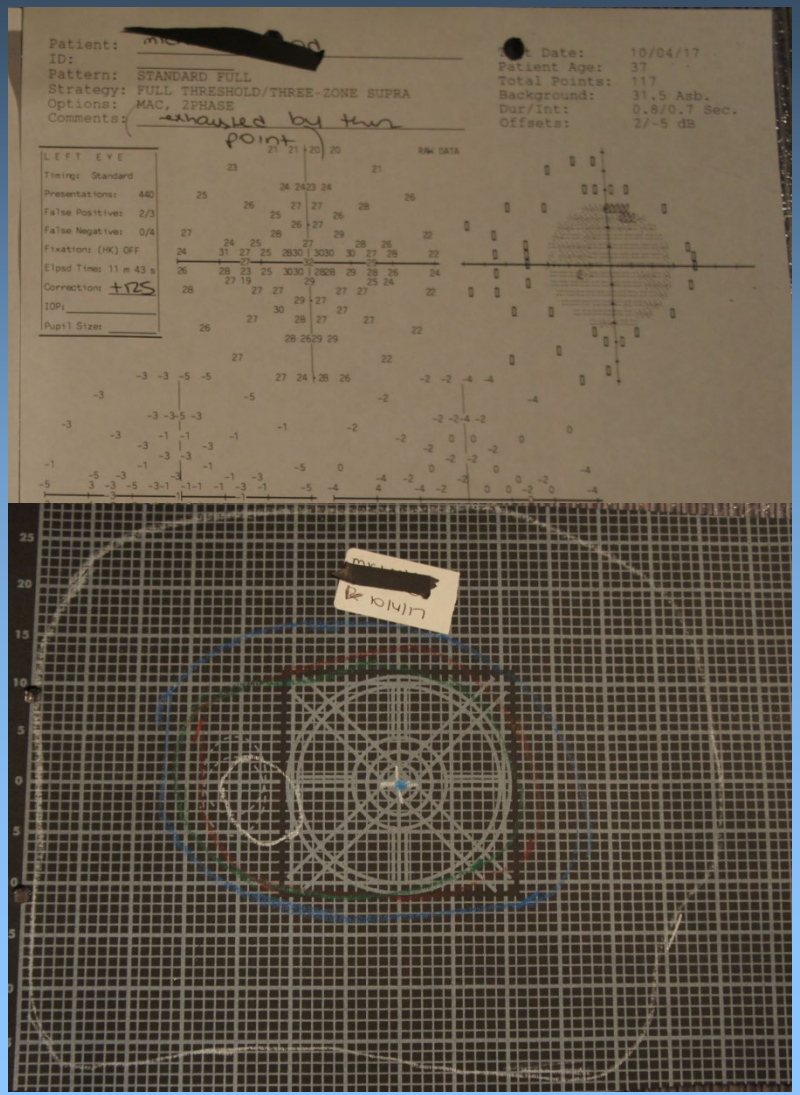


The Kinetic, Functional Field

Abnormal Fields

TBI Concussion

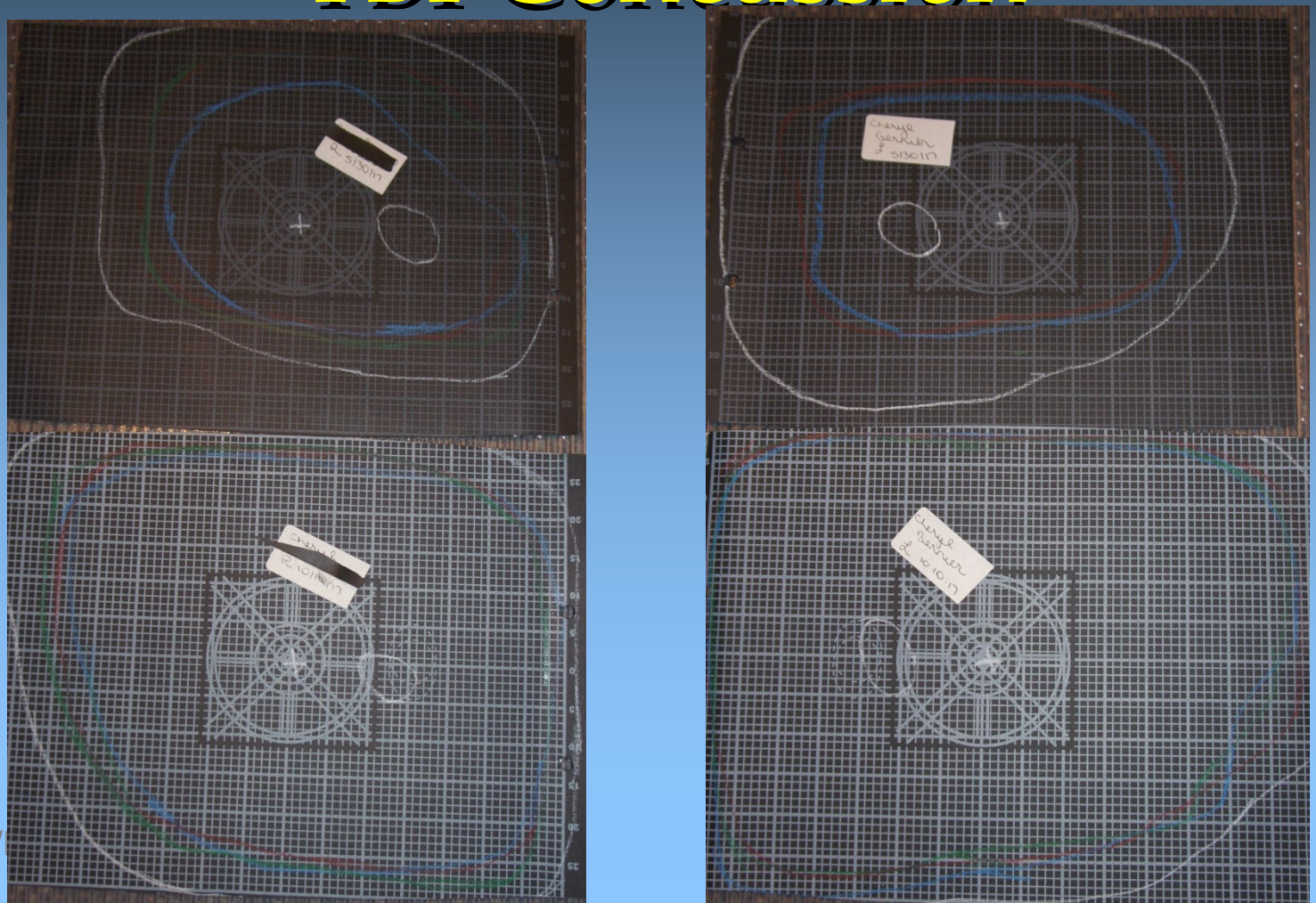




The Kinetic, Functional Field

Abnormal Fields

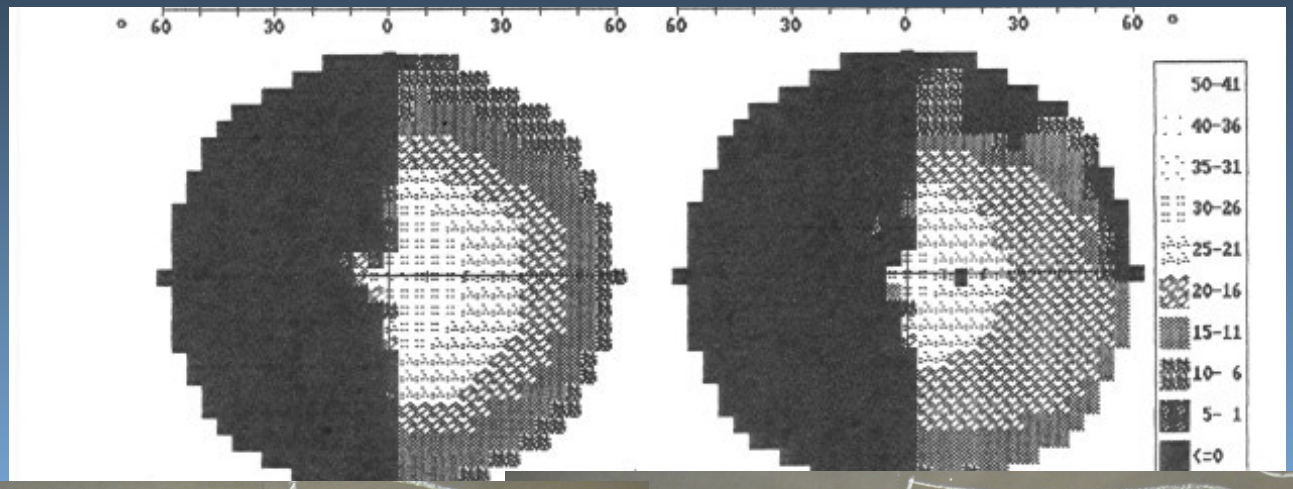
TBI Concussion

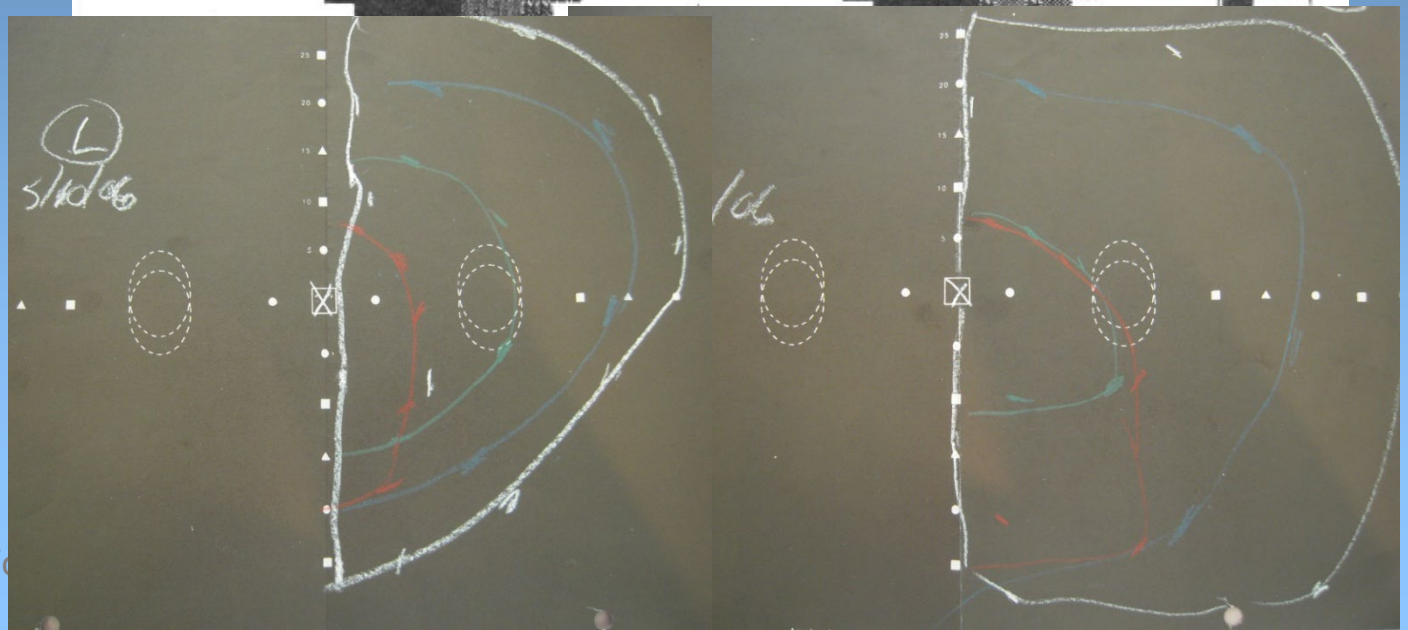


The Kinetic, Functional Field

Abnormal Fields

Stroke

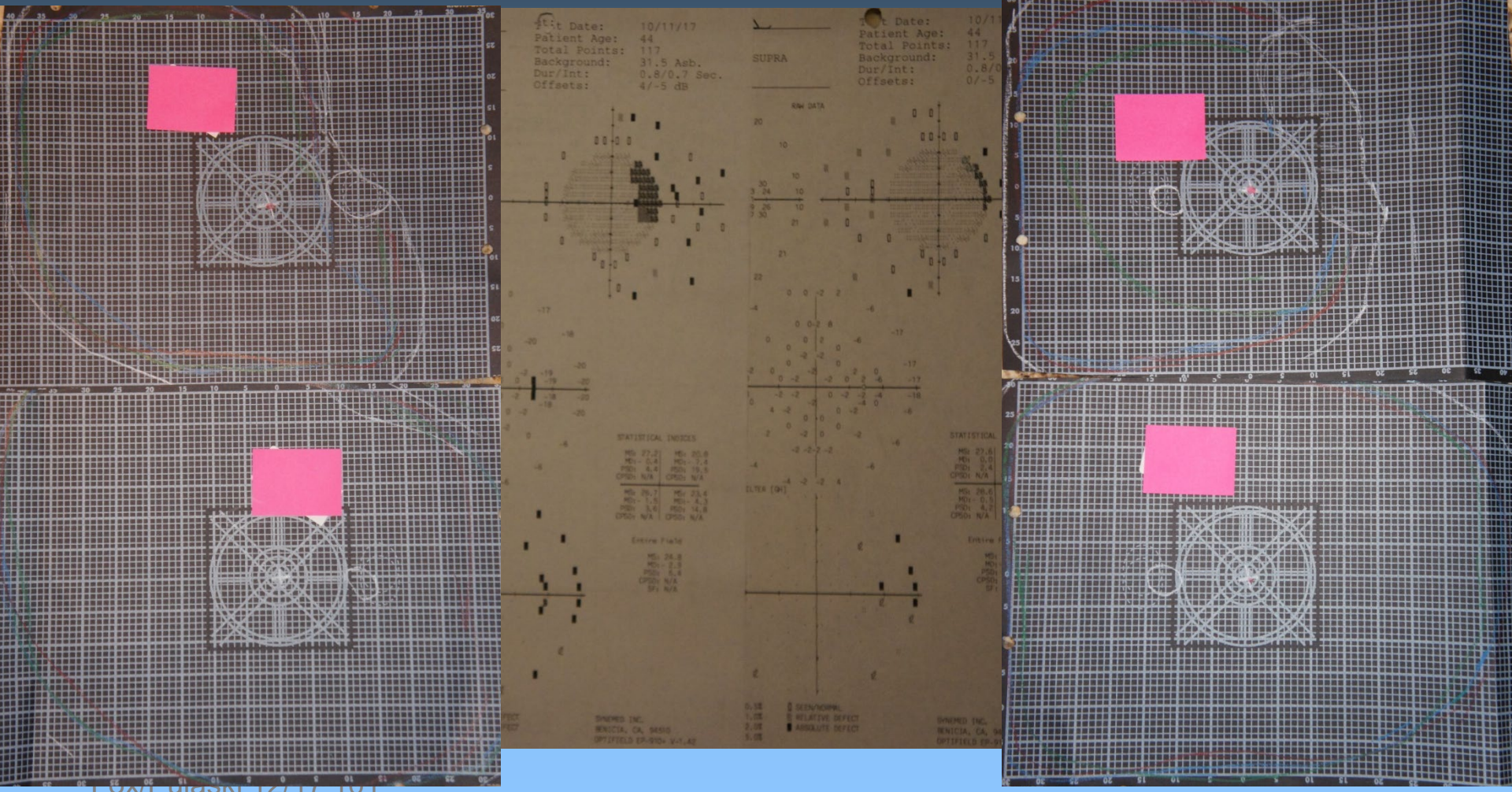




The Kinetic, Functional Field

Abnormal Fields

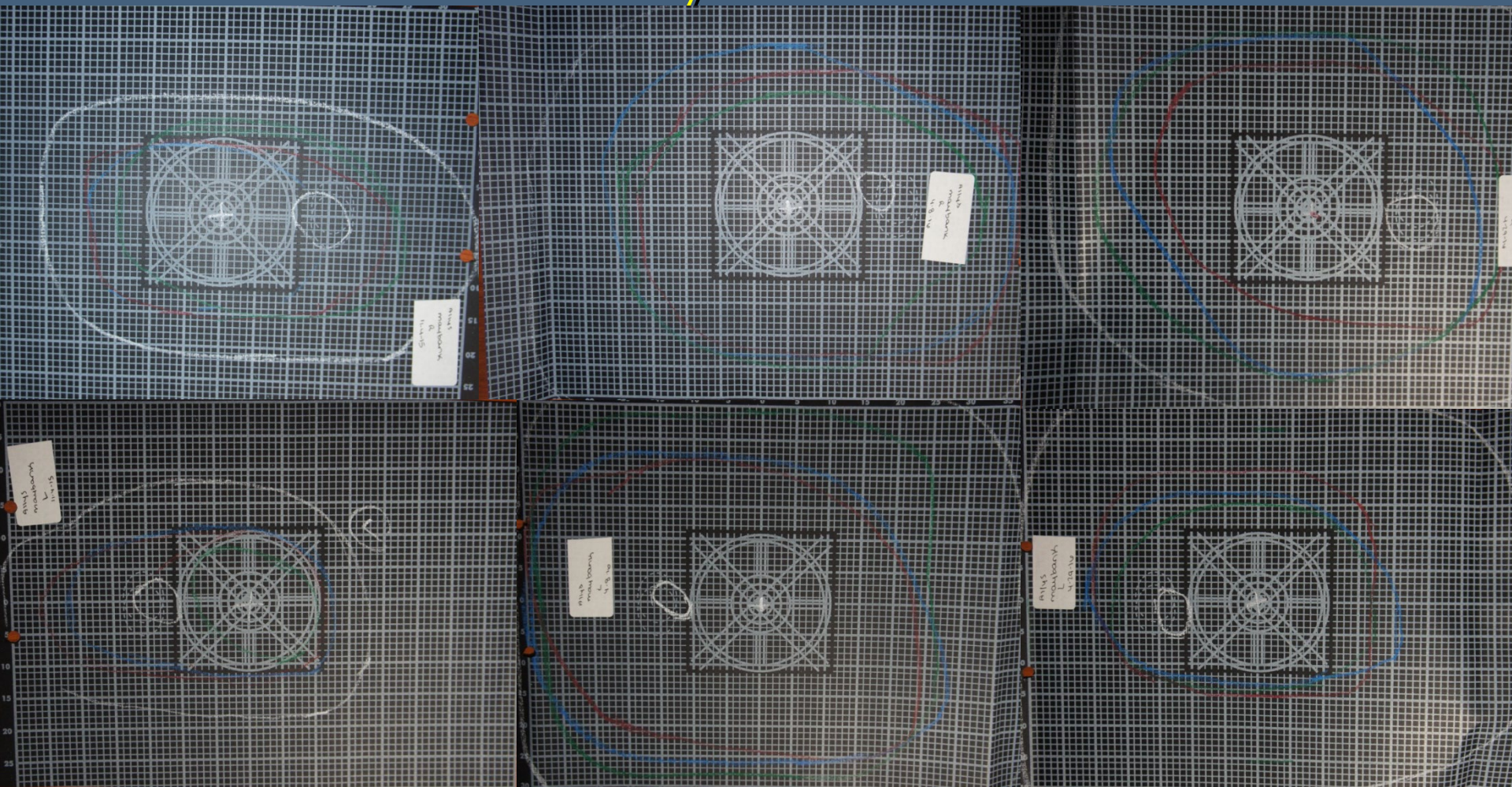
Stroke



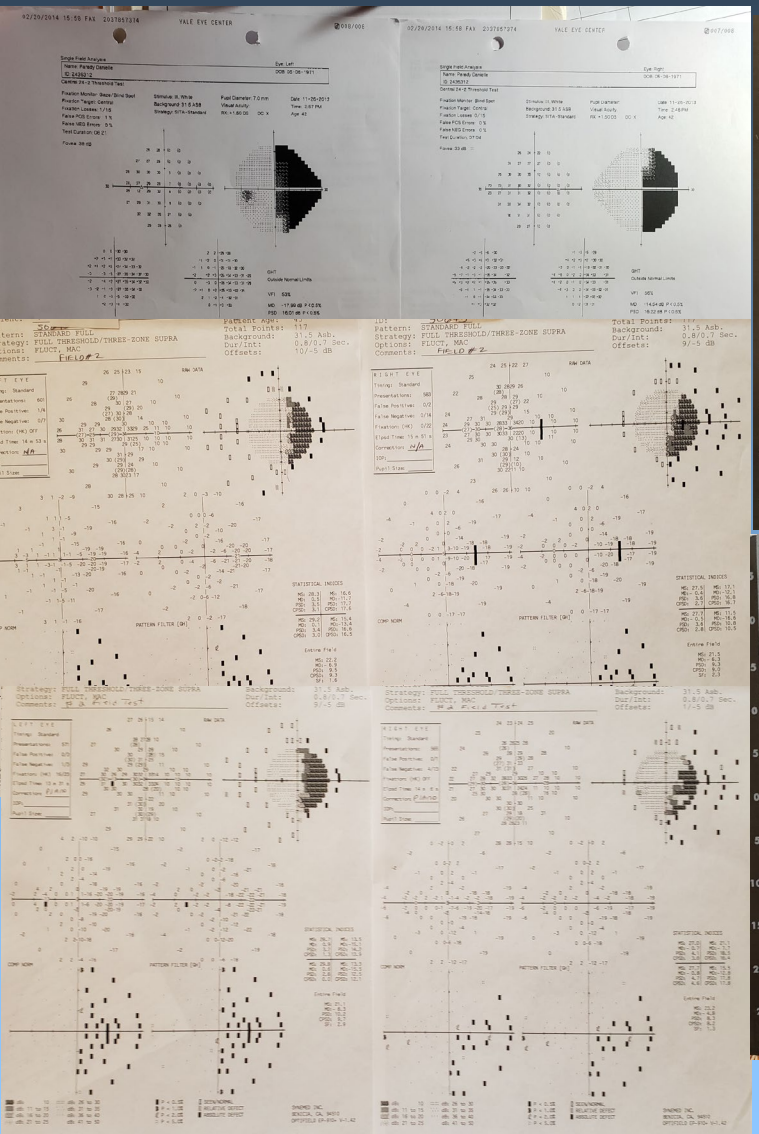
The Kinetic, Functional Field

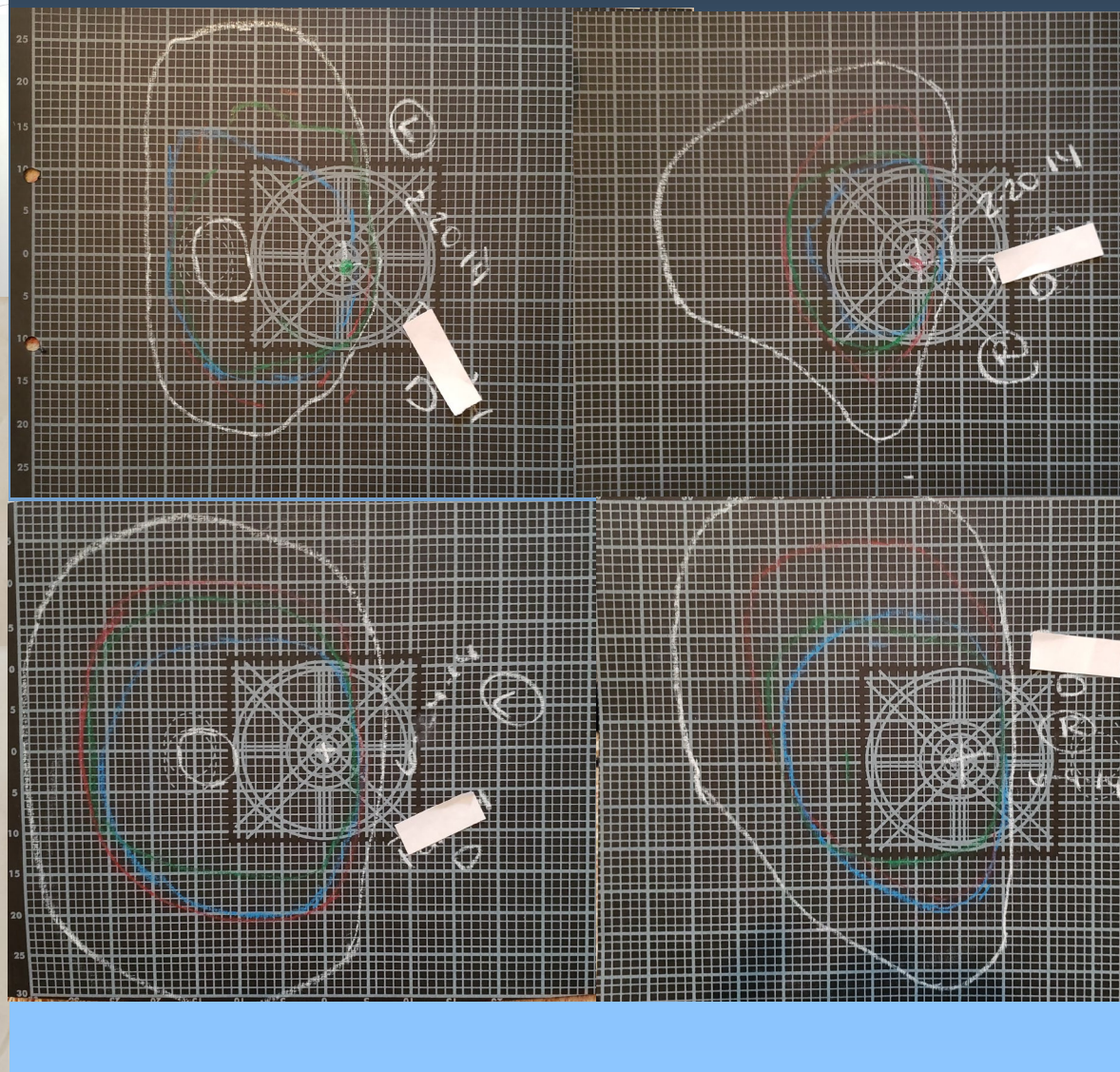
Abnormal Fields

Lyme

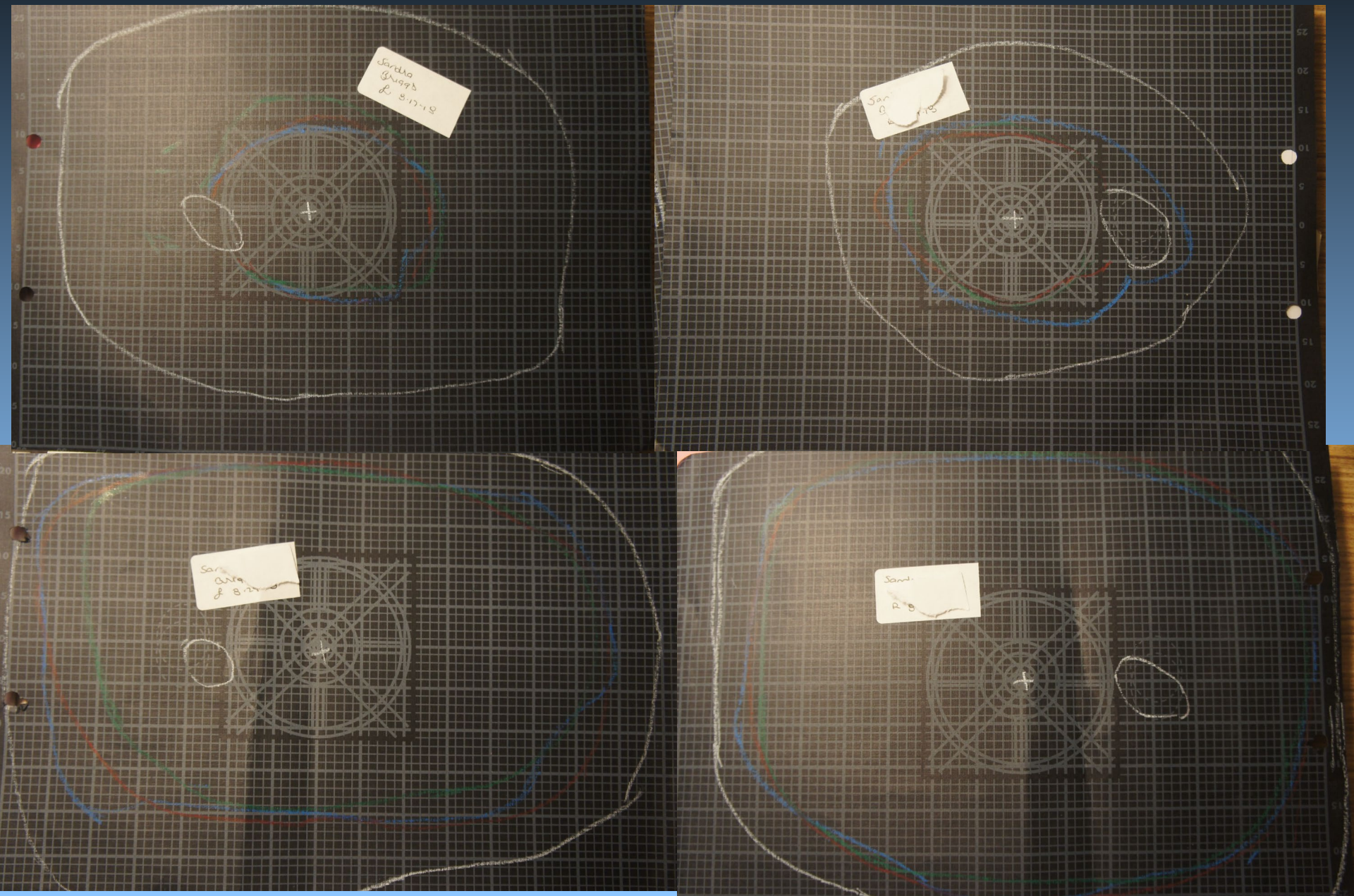


DP, 42 yo, Metastatic Melanoma to Brain





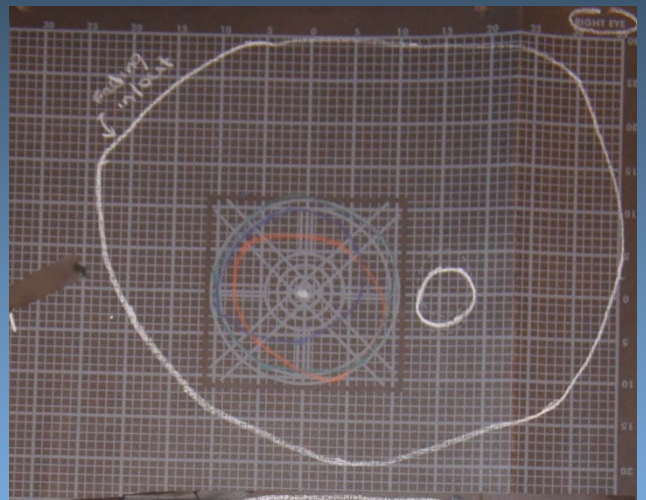
Sandra B Bee Sting

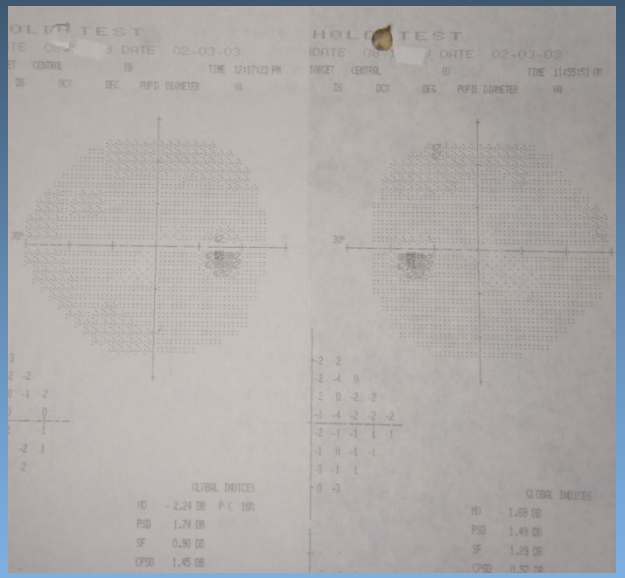


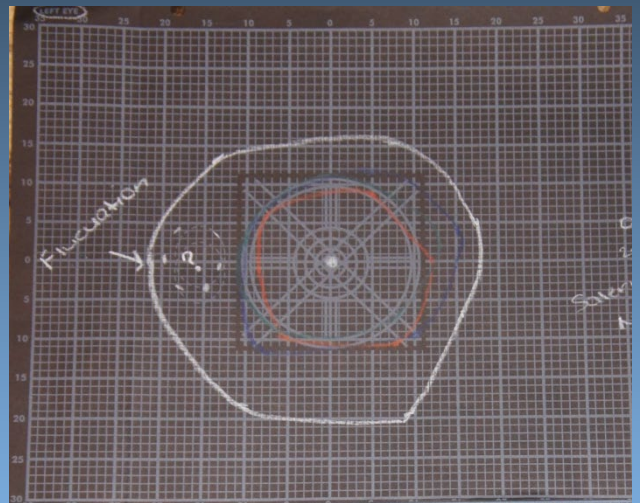
The Kinetic, Functional Field

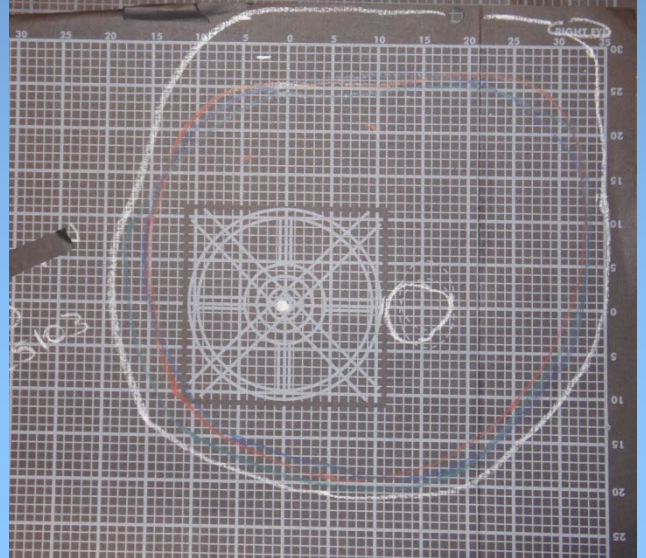
Abnormal Fields

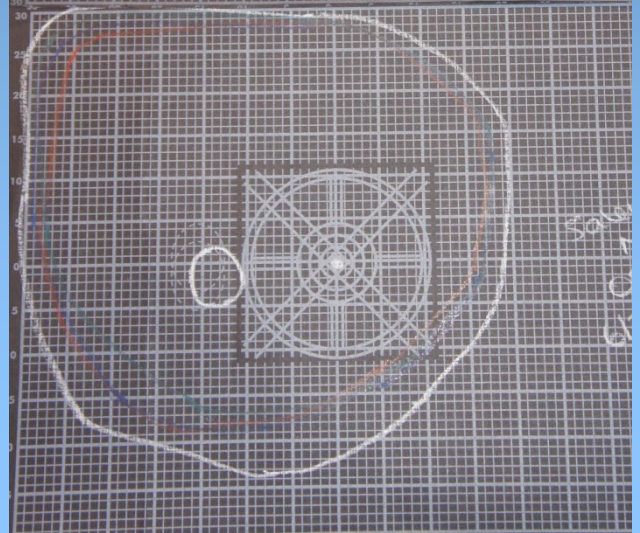
Stress











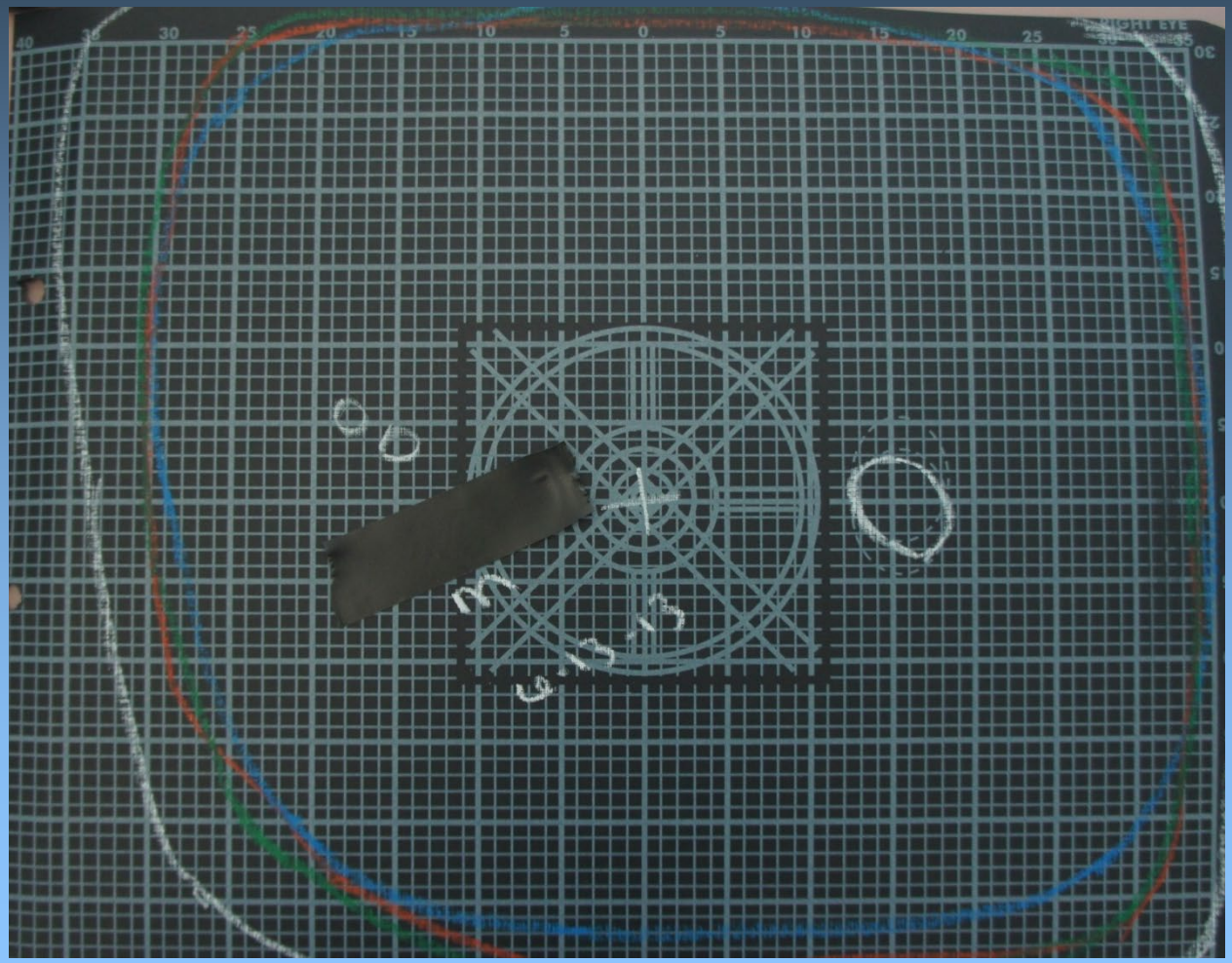
Norms for Visual Fields

Borish

Clinical Refraction 3rd Edition

	White (form)	Blue	Red	Green
Out:	100^0	75^0	41^0	30^0
In:	60^0	38^0	23^0	18^0
Up:	60^0	38^0	26^0	18^0
Down:	80^0	46^0	29^0	24^0

The Kinetic Visual Field Interpretation



The Kinetic Visual Field Interpretation

Blind Spot

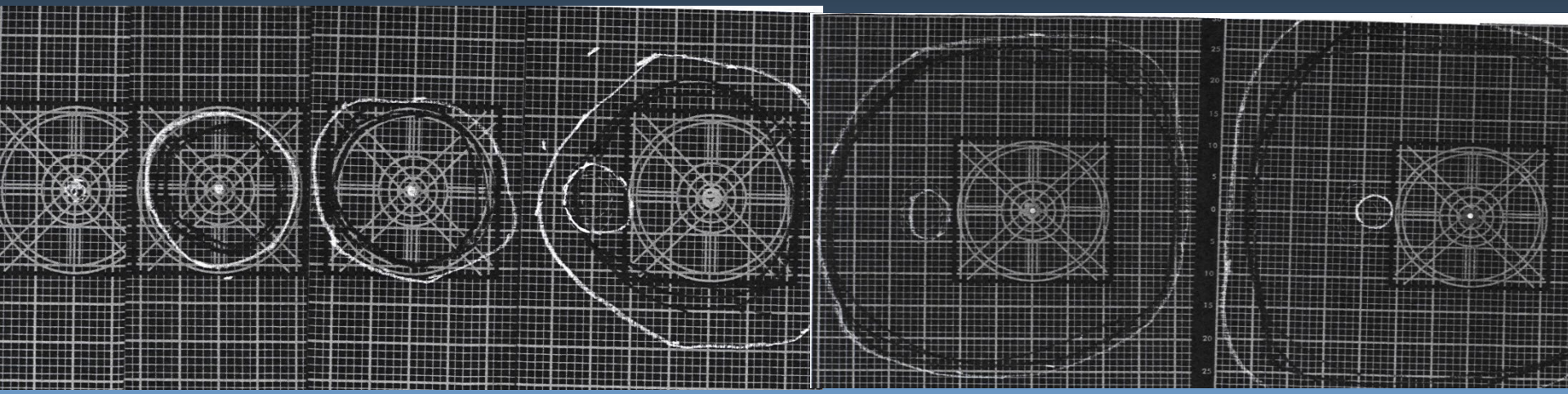
- A very important measurement - Reveals the accuracy of projection!!
- Cannot be measured in severely compressed fields
- Different from glaucomatous field
- Can be 2-5x normal size
- Often associated with reading problems
- Often associated with brain trauma
- Helps determine when to stop therapy

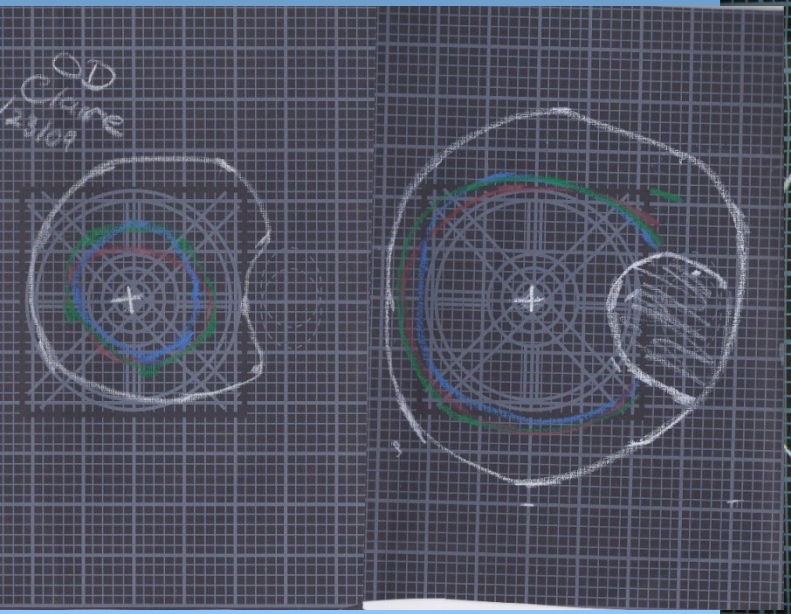
The Kinetic Visual Field Interpretation

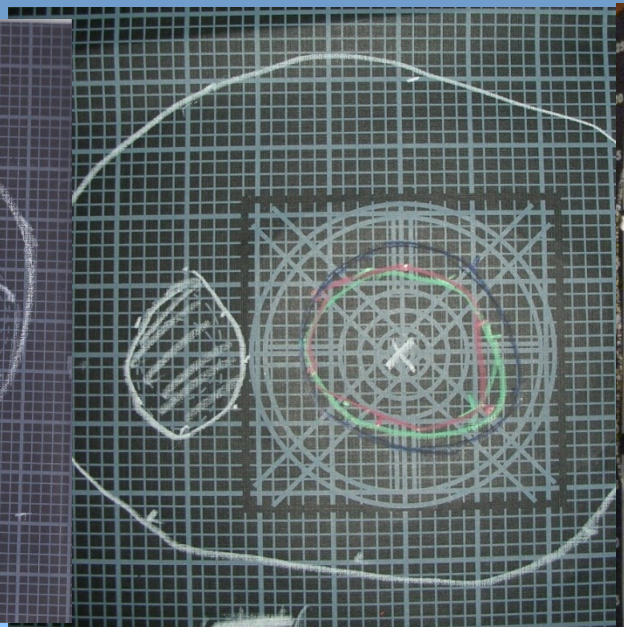
Blind Spot Enlargement

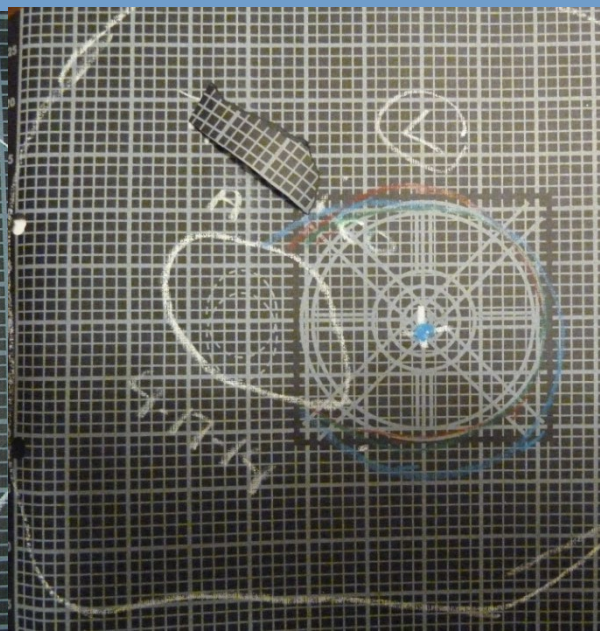
- Optic Nerve
  - Edema, Atophy, Traumatic Neuropathy
- Cortical
  - Anomalous projection
  - Misplaced or Torqued

The Kinetic Visual Field
Blind Spots









The Kinetic Functional Field

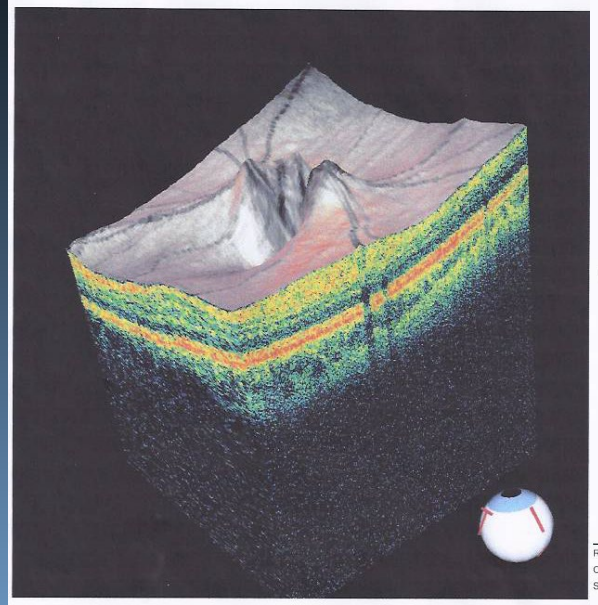
Questions and Confusion

- Blind spot enlargement. Is it edema
- Small Functional Field. Is it Tunneling

Blind Spot Enlargement Traditional

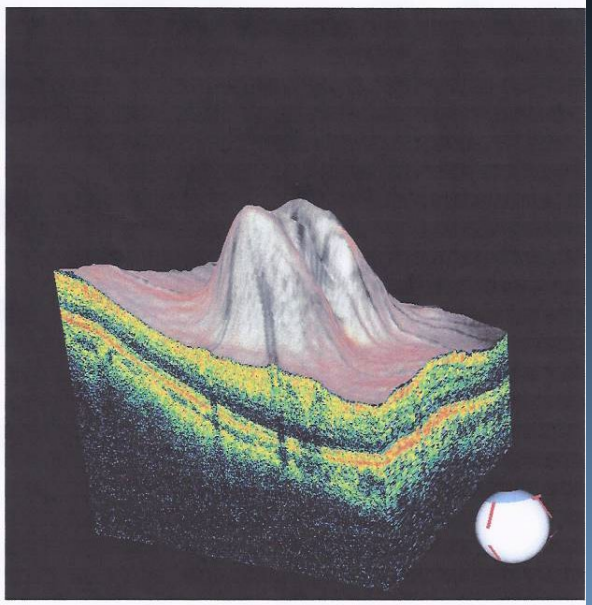
Edema as the cause of functional Blind spot enlargement

- But why is it that we do not see it on retinal exam, do not detect it in a conventional field test and see no signs in OCT testing?
- How is it that a huge blind spot can change improve so quickly (in a matter of a few days) with our treatment protocol? Papilledema changes over many weeks.
- Why is it that the more constricted the field the larger the blind spot?



Operator:
Disease:
Gender: M
ID: 46083

OD
GCC Significance
Optic Nerve Head Map
Exam Date: 03/31/2011, SSI= 82.9
Exam Date: 03/31/2011, SSI= 46.6
OS
Optic Nerve Head Map
GCC Significance
Solid line - OD
Dash line - OS
Report Date: Thursday March 31 12:34:39 2011
Software Version #6, 1, 0, 4
Comments:
Signature:
Defining the OCT Revolution
optovue



Operator:
Disease:
Gender: M
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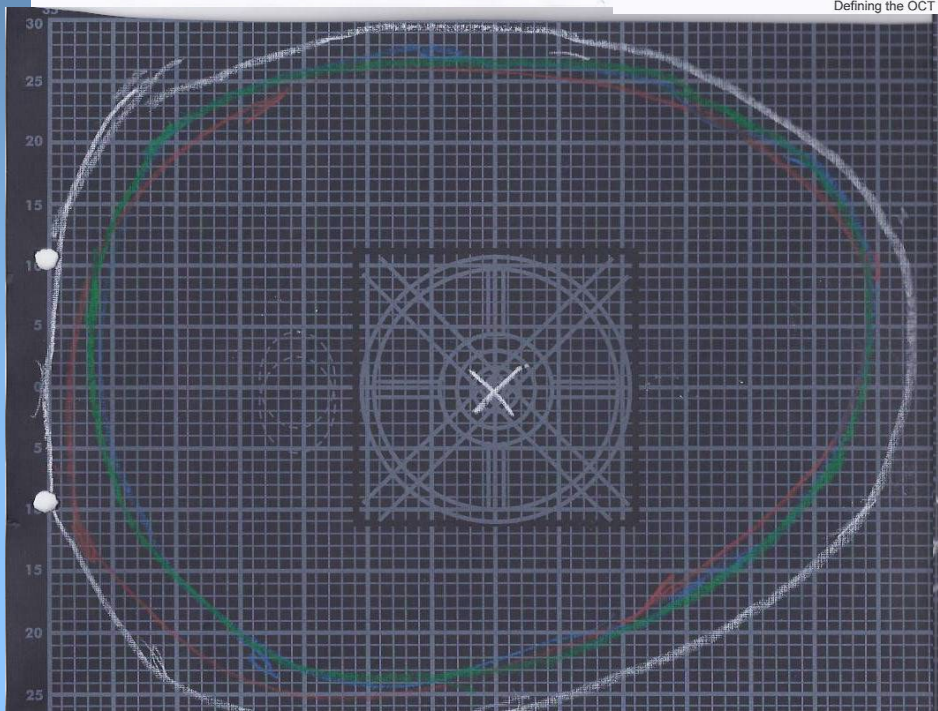
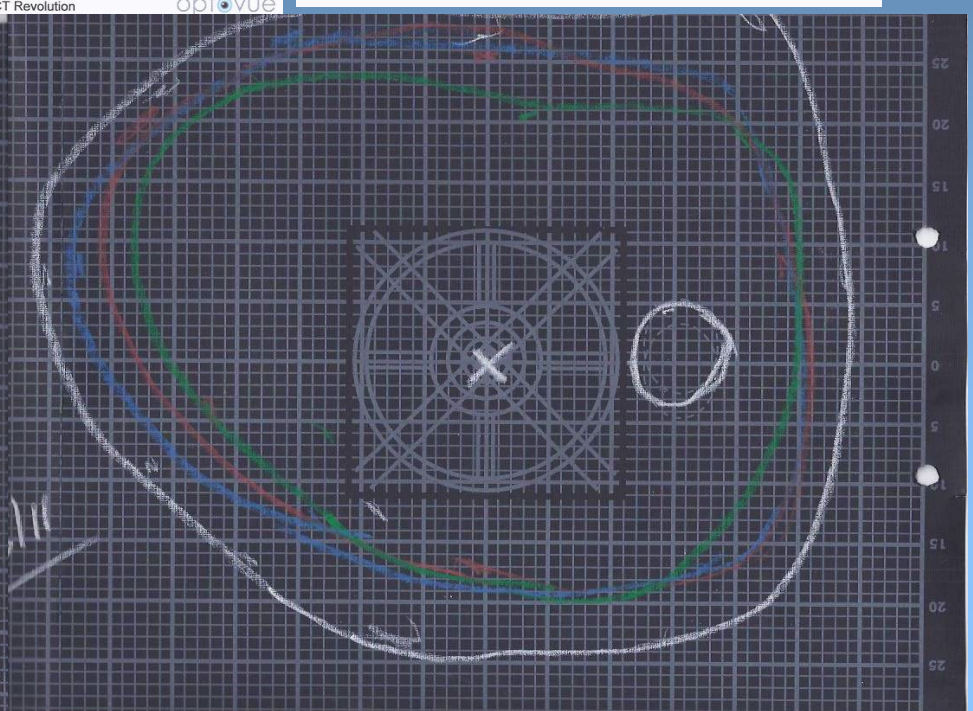




Normal Blind Spot

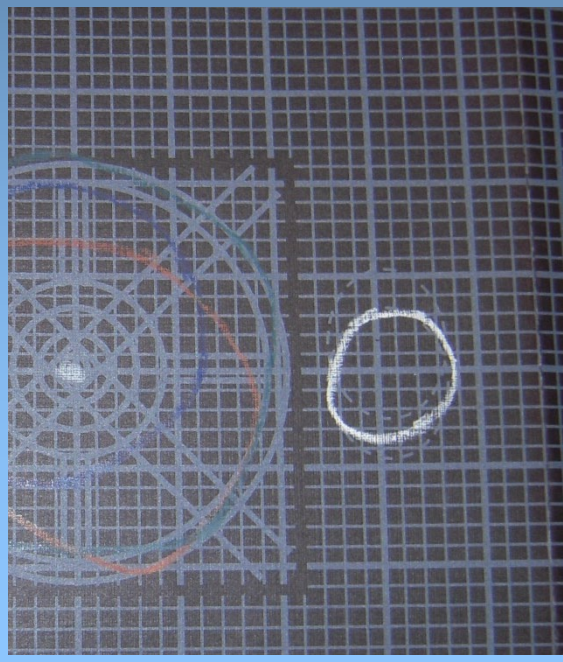
Anatomically

- Retina is 32 mm from ora to ora.
- Blind spot is about 1.76mm horizontal x 1.92mm vertical or 5.5-6% of the total retina.
- Located 15.5° temporal from point of fixation and 1.5° below horizontal

Normal Blind Spot

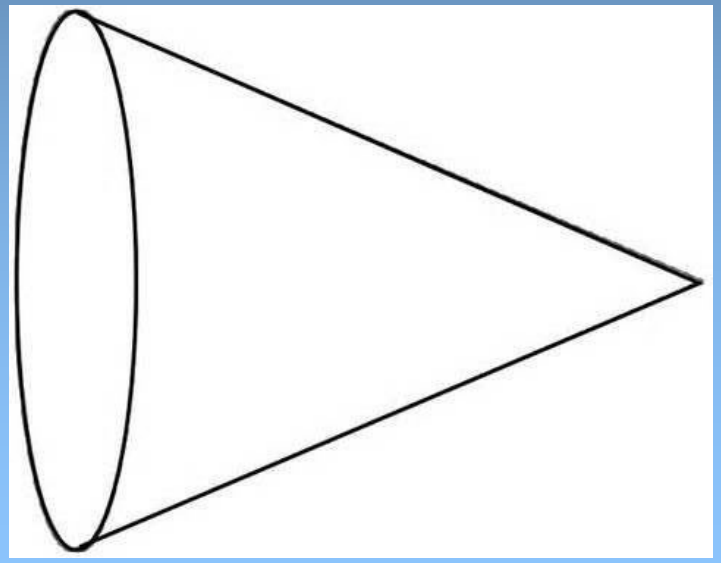
On Visual Field Plot

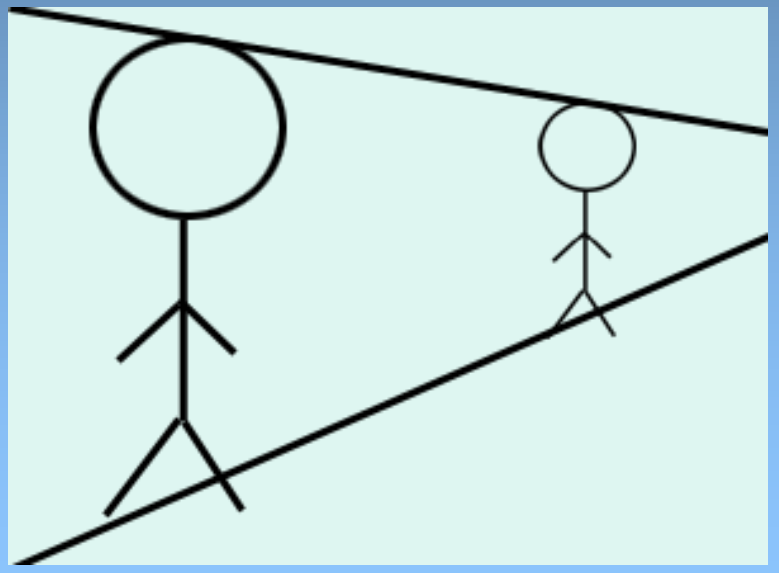
- Vertical Oval with steep edges - 5.5° by 7.5° (20x28mm)
  - (18mm x 25mm@ 20cm) or .71"x1"
  - (96mm x 132mm @ 1m) or 3.8 x 5.2"
  - (193mm x 263mm @ 2m) or 7.6" x 10 "
- 1° amblyopic zone around circumference of blind spot



Normal Blind Spot

It is conical - It's size is only limited by how far one can project their vision. Ideally it should be the same relative size in our field.





Normal Blind Spot

Consider the 5.5° x 7.5° or 5-6% size as you look through space. It is the size of a

Dime when looking at 8 inches

Basketball when looking at 8.5 feet

Car tire when looking at 25 feet


@ 5 miles
1.5 miles
@ 300’
32’
Sinclair
ATM

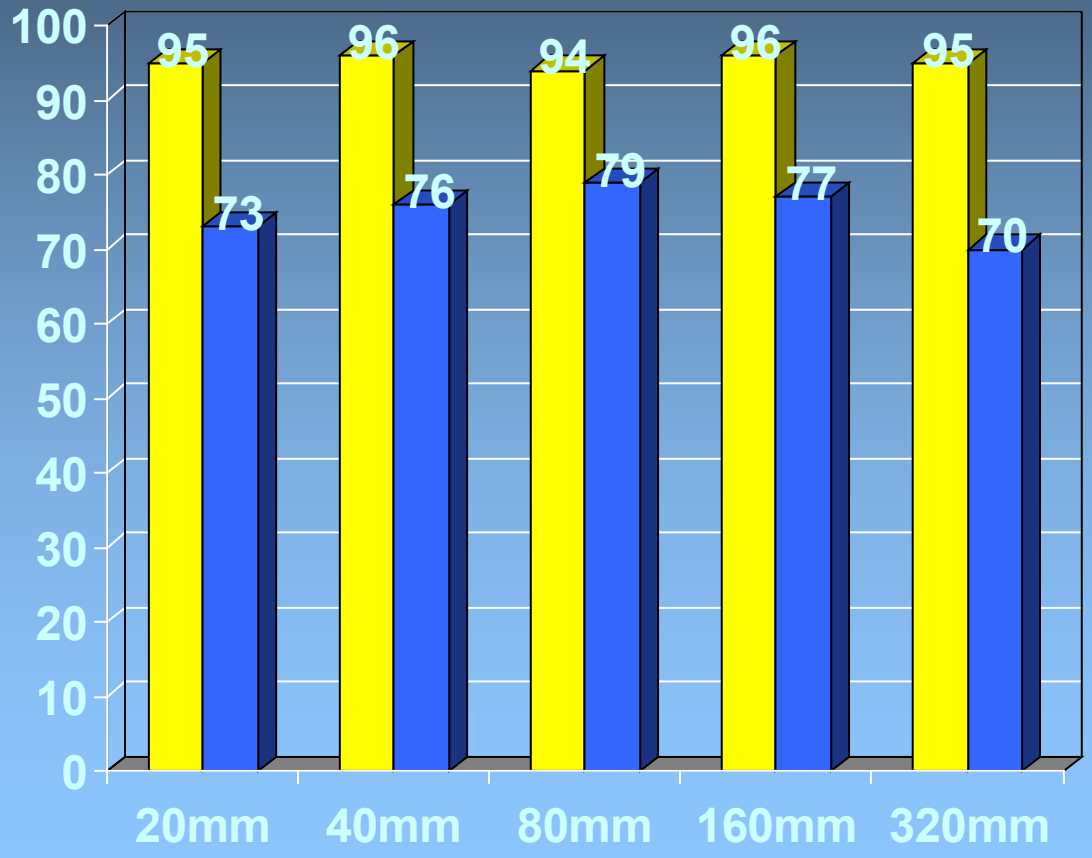
Blind Spot Enlargment

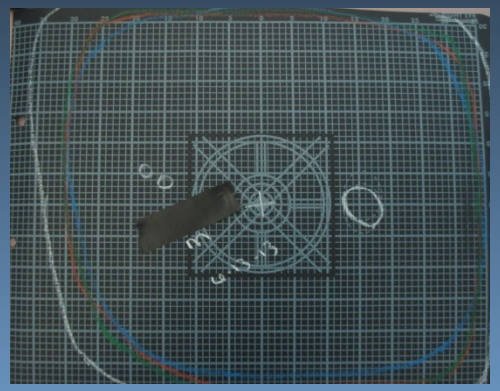
Could it related to the accuracy of

The Projected Image

Projection Accuracy

8 Patients - Full fields and Normal Blind Spot
20 Patients - Compressed fields
(Pulaski 2010)



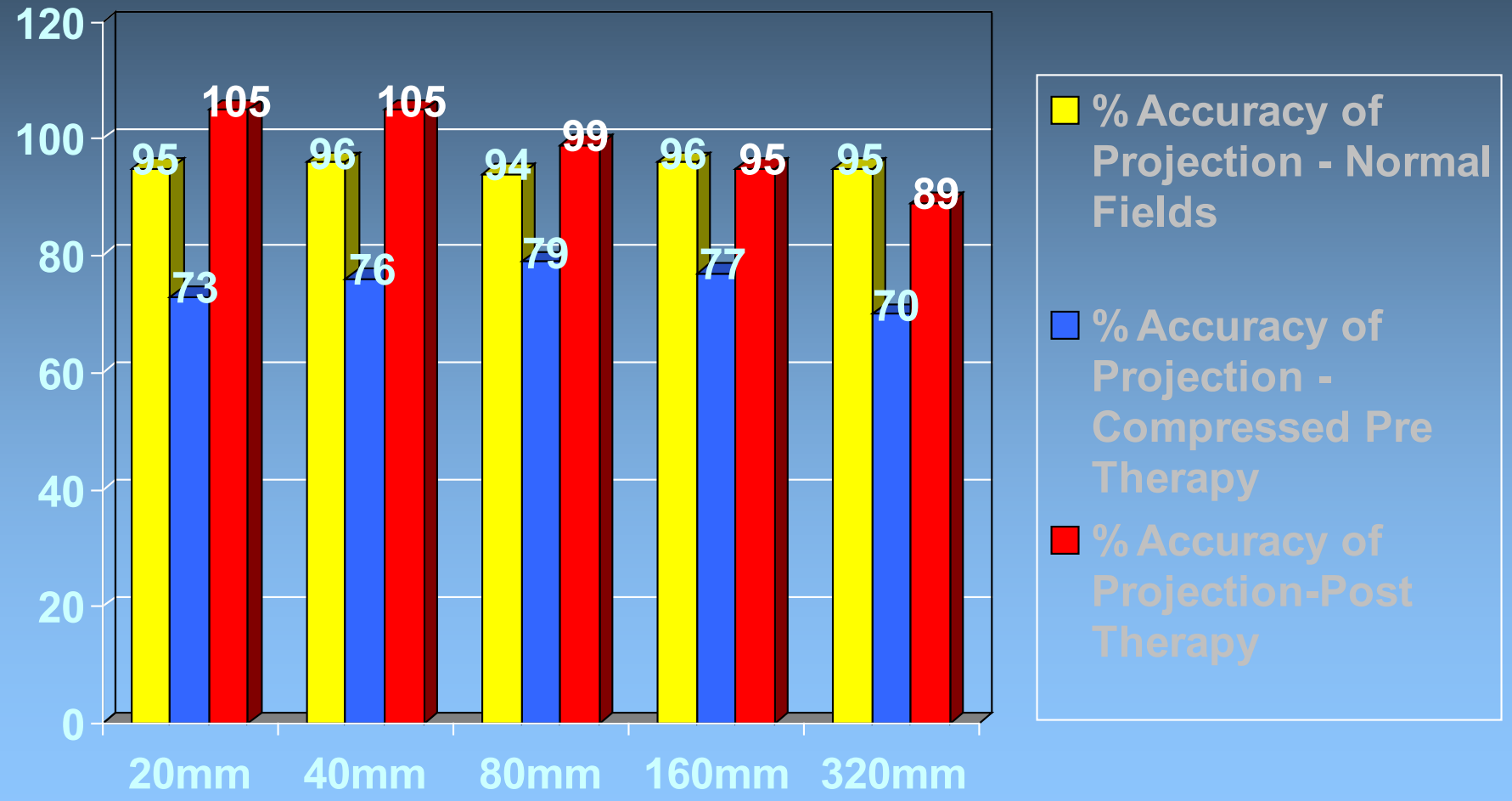


% Accuracy of Projection - Normal Fields

% Accuracy of Projection - Compressed Fields

Projection Accuracy

Full Field Patients Vs Compressed Field Patients - Pre/Post Therapy (Pulaski 2010)



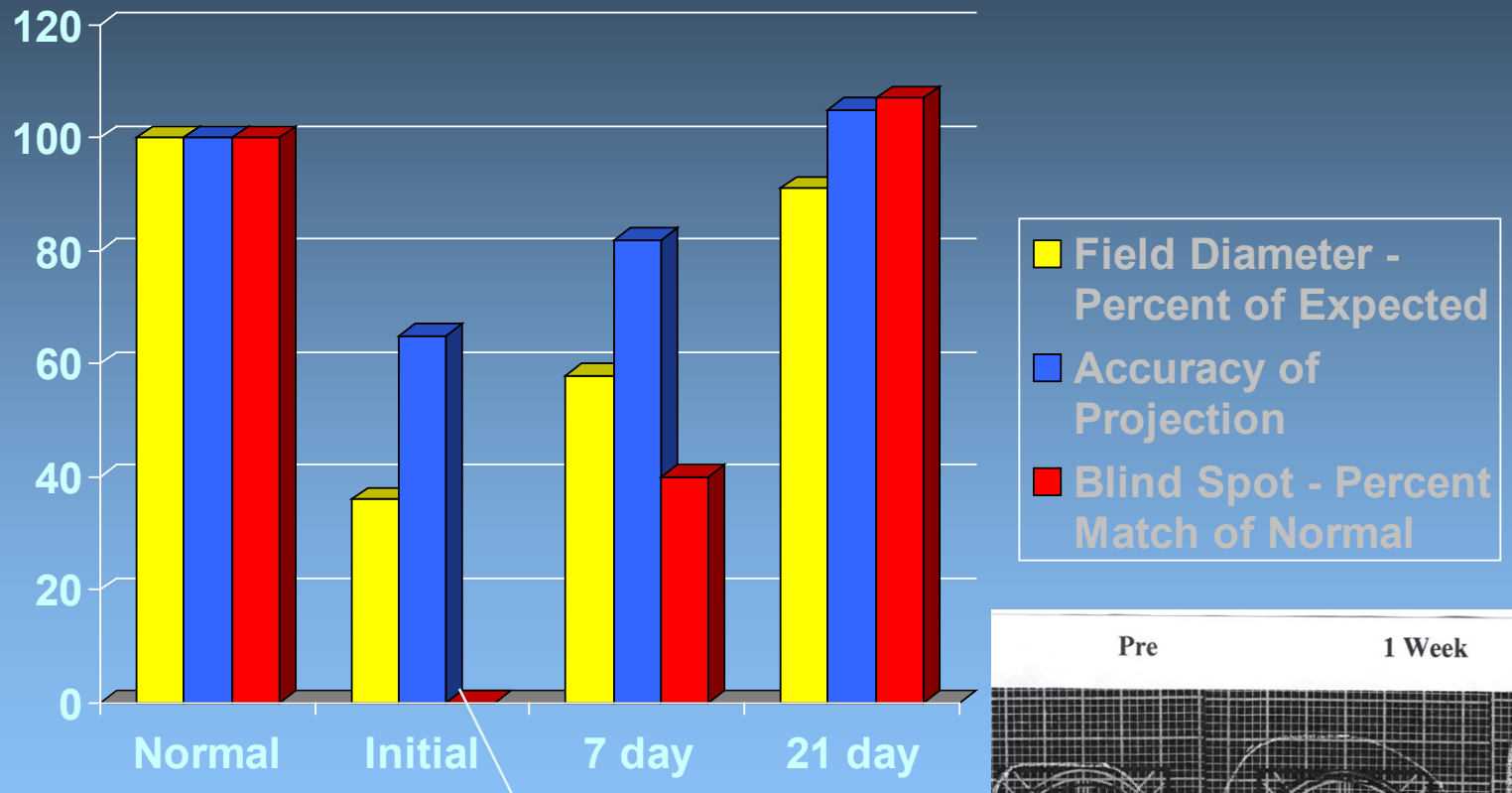
Field Size vs Projection Accuracy

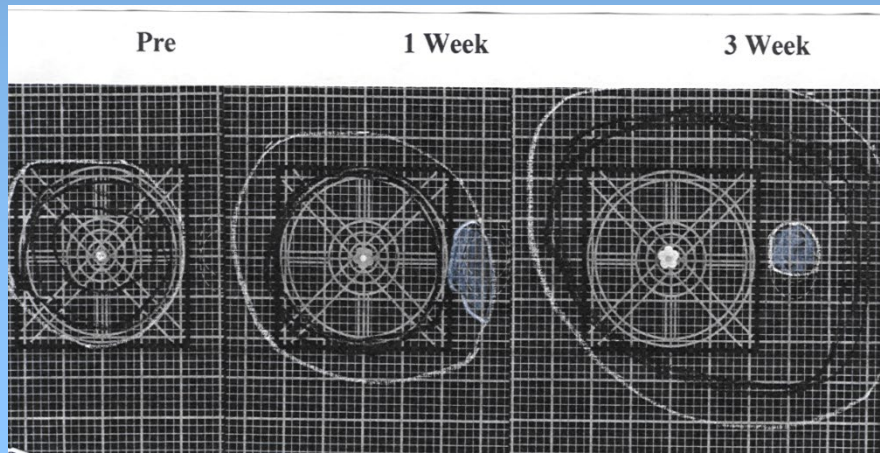
(Pulaski 2010)

Target Distance	20cm	40cm	80cm	160cm	320cm
Patients with Full Fields(8)					
• Accuracy(%)	95%	96%	94%	96%	95%
• Range(cm)	19-21	35-40	72-77	145-159	289-314
Patients with "Tunnel Fields"(20) – Pre Treat					
• Accuracy(%)	73%	76%	79%	77%	70%
• Range(cm)	11-18	23-39	52-72	74-138	120-308
Patients with "Tunnel Fields"(20) – Post Treat					
• Accuracy(%)	105%	105%	99%	95%	89%
• Range(cm)	16-28	34-50	74-82	139-171	241-318

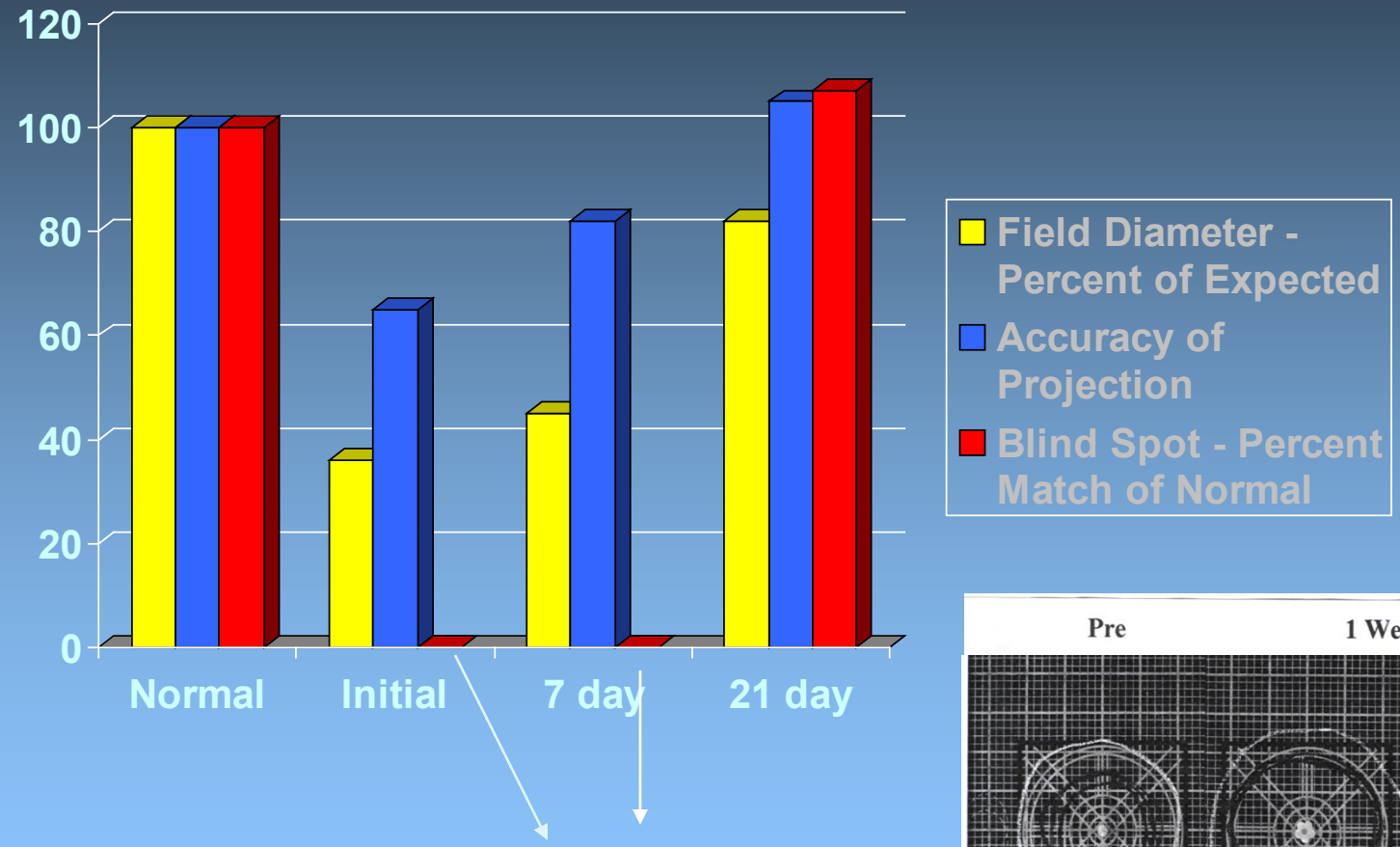
Change in Projection, Field, Blind Spot with Syntonic Light Therapy

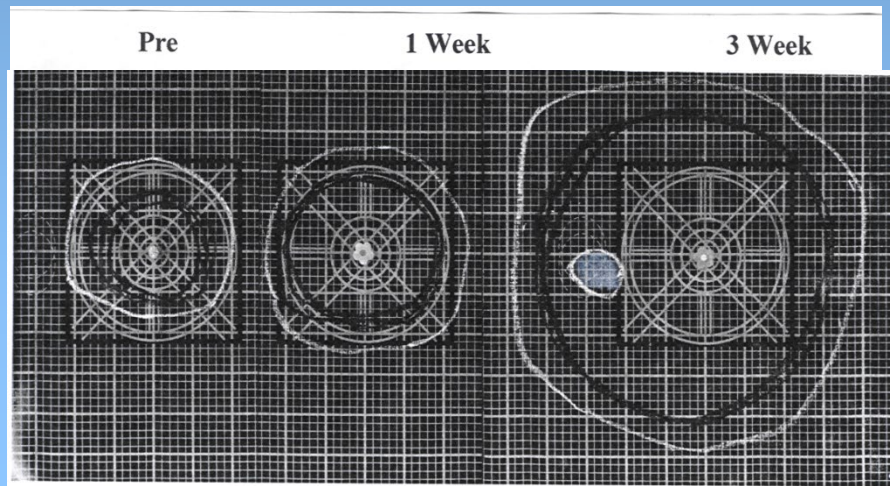
Case 1 Stephanie - OD





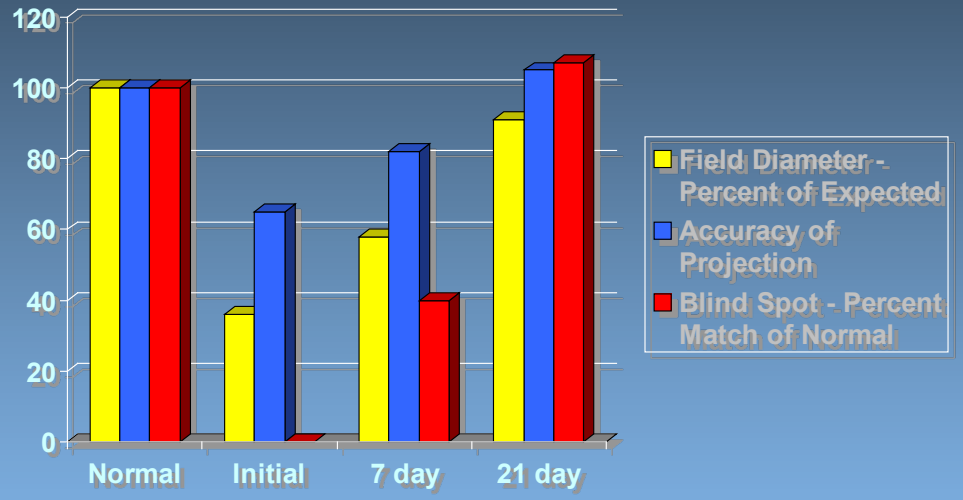
Change in Projection, Field, Blind Spot with Syntonic Light Therapy
Case 1 Stephanie - OS

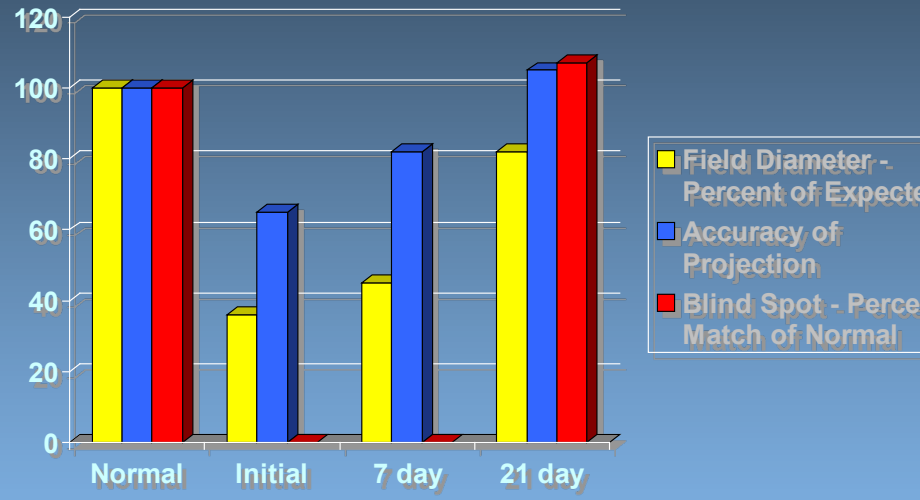


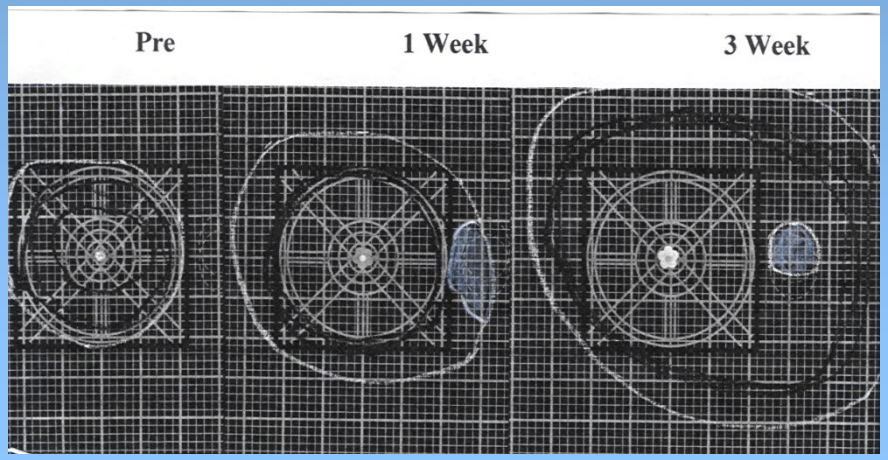


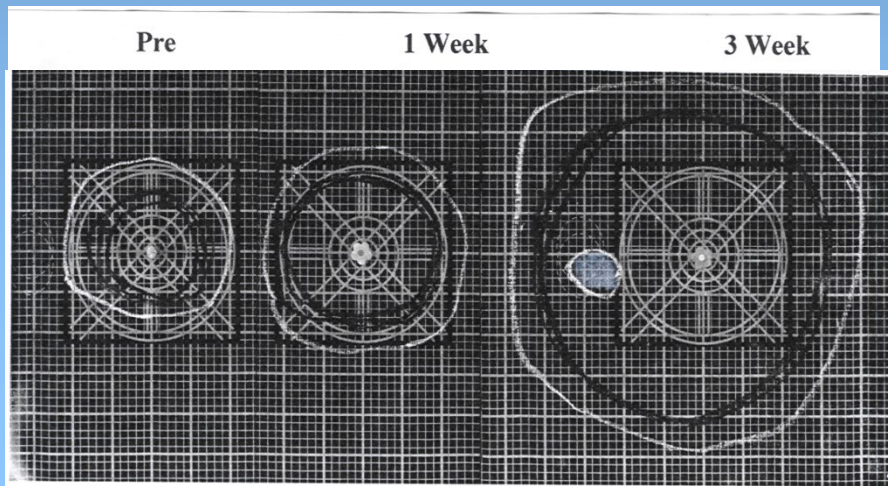
Change in Projection, Field, Blind Spot with Syntonic Light Therapy

Case 1 Stephanie - OU









Vision as a Process of Projection
Spatial Compression

- Consider Tangent screen at .5m 1m and 2m. Note that the further out one measures the less field that can be measured.
- Consider the Projection results.
- Consider Streff's statement that we are pulling distance in as we compress space.

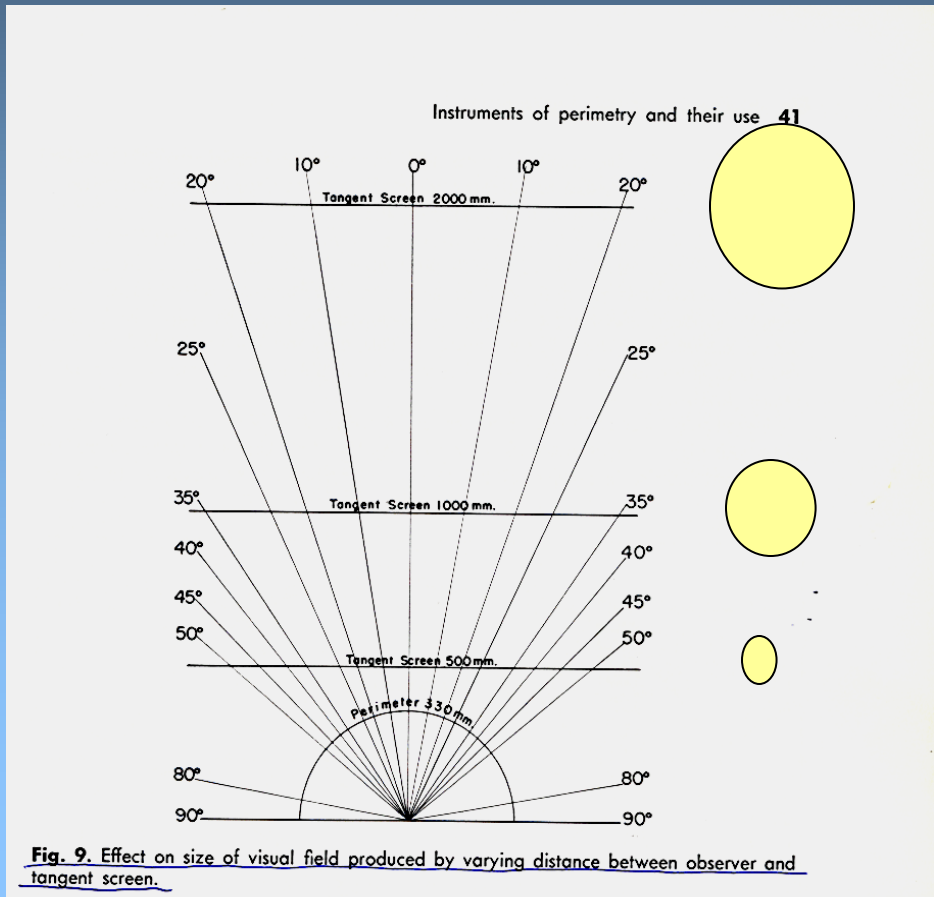


Fig. 9. Effect on size of visual field produced by varying distance between observer and tangent screen.

The Kinetic Visual Field Interpretation

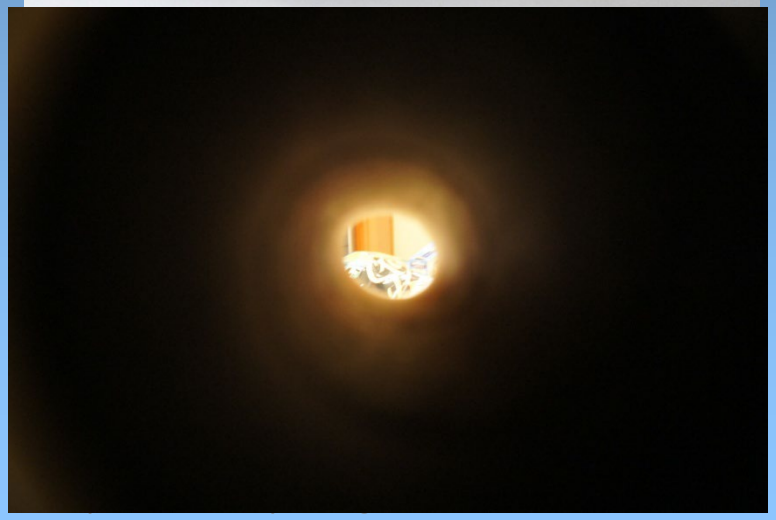
How can the patient see and function if their field is 5 degrees and inside the blind spot?

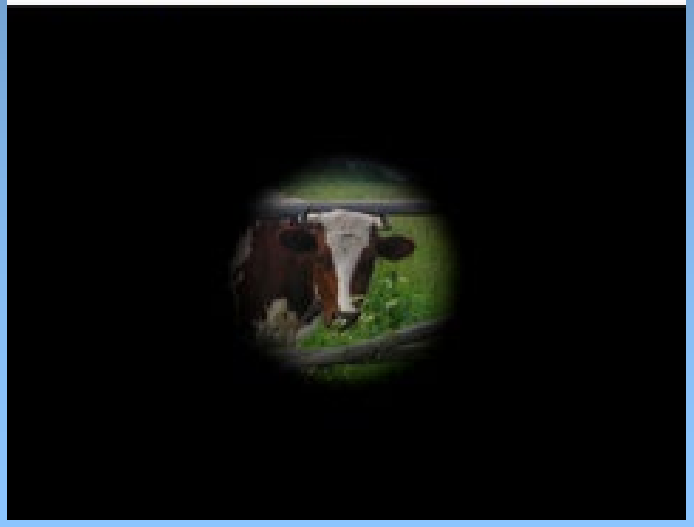
Why is the Confrontation and Static Field open?

Could it be related to the accuracy of Projection as well?

Learning from our patients.

Tunneled Field





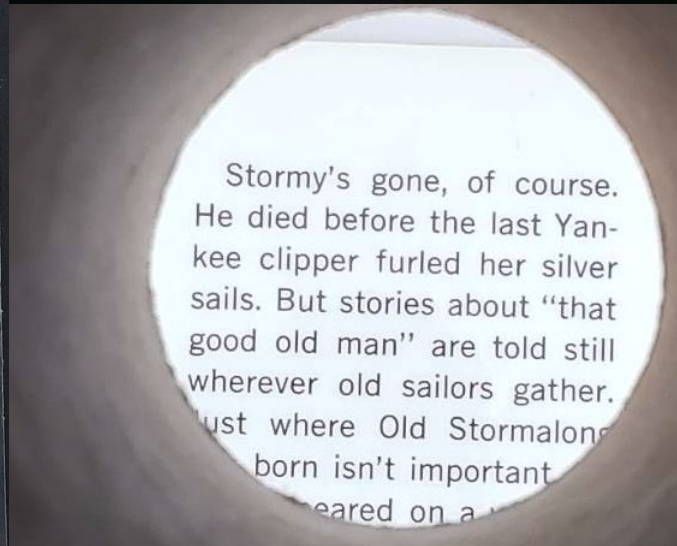
Stormy's gone, of course. He died before the last Yankee clipper furled her silver sails. But stories about "that good old man" are told still wherever old sailors gather. Just where Old Stormalong was born isn't important. He first appeared on a wharf in Boston Harbor. The captain of the *Lady of the Sea*, the largest clipper ship in the China trade, was signing on men. Stormy gave his full name, Alfred Bullrod Stormalong. Without looking up from his ledger, the captain wrote down the initials, "A.B."

A. B. Stormalong stood five fathoms tall, which is the same as thirty feet. The captain glanced up at his new man. He whistled with surprise. "Phew!" he said. "There's an able-bodied seaman for you, boys."

Someone noticed that the giant's initials stood for just that. From that day to this sailors have tacked A. B. after their names. This shows that

Compression

Tunneling



Stormy's gone, of course. He died before the last Yankee clipper furled her silver sails. But stories about "that good old man" are told still wherever old sailors gather. ust where Old Stormalon born isn't important eared on a


Got Talent 604


Got Talent 604
ON
0:00
0:45
0:12

Vision as a Process of Projection
Spatial Compression

- If the blind spot is enlarged because of inaccuracy of spatial compression so to is the visual field compressed or pulled in.
- One still sees everything but not in the proper place. Confrontation fields are normal.

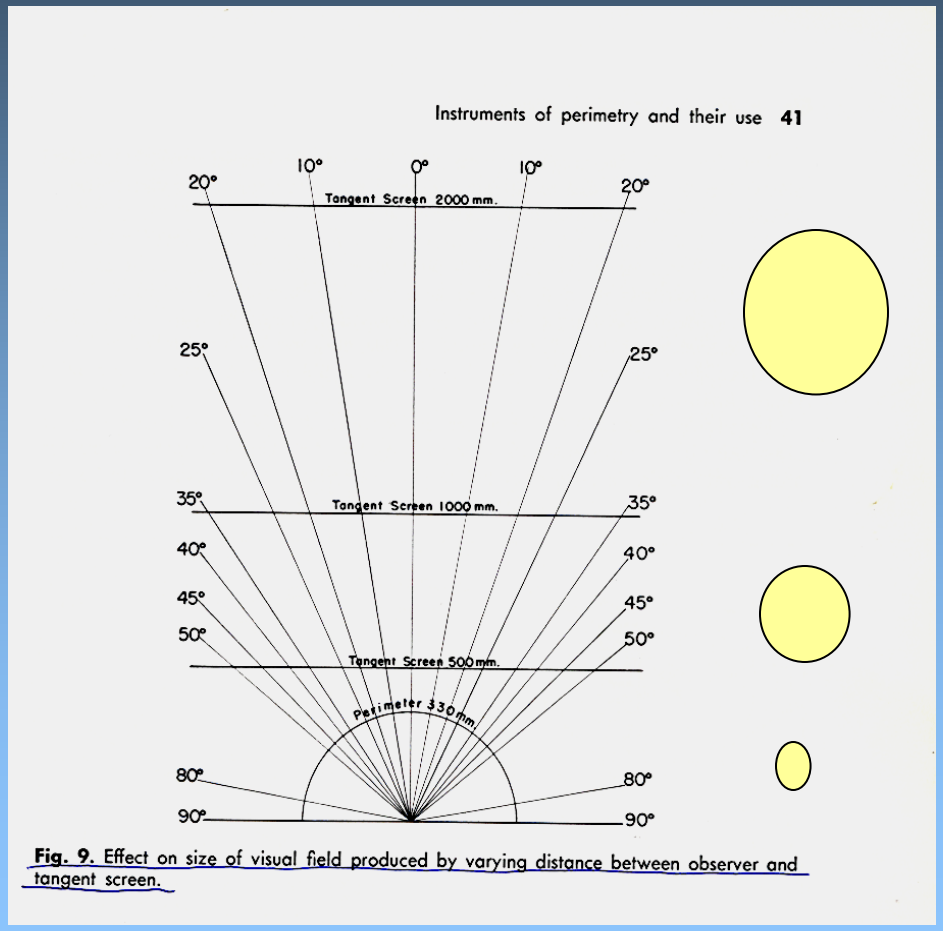


Fig. 9. Effect on size of visual field produced by varying distance between observer and tangent screen.

Vision as a Process of Projection
Spatial Compression

- Consider what we do to help our patients with learning problems/post trauma
- Increase font
- Increase spacing
- Less information per page
- Binasal Occlusion
- Tints and Low plus

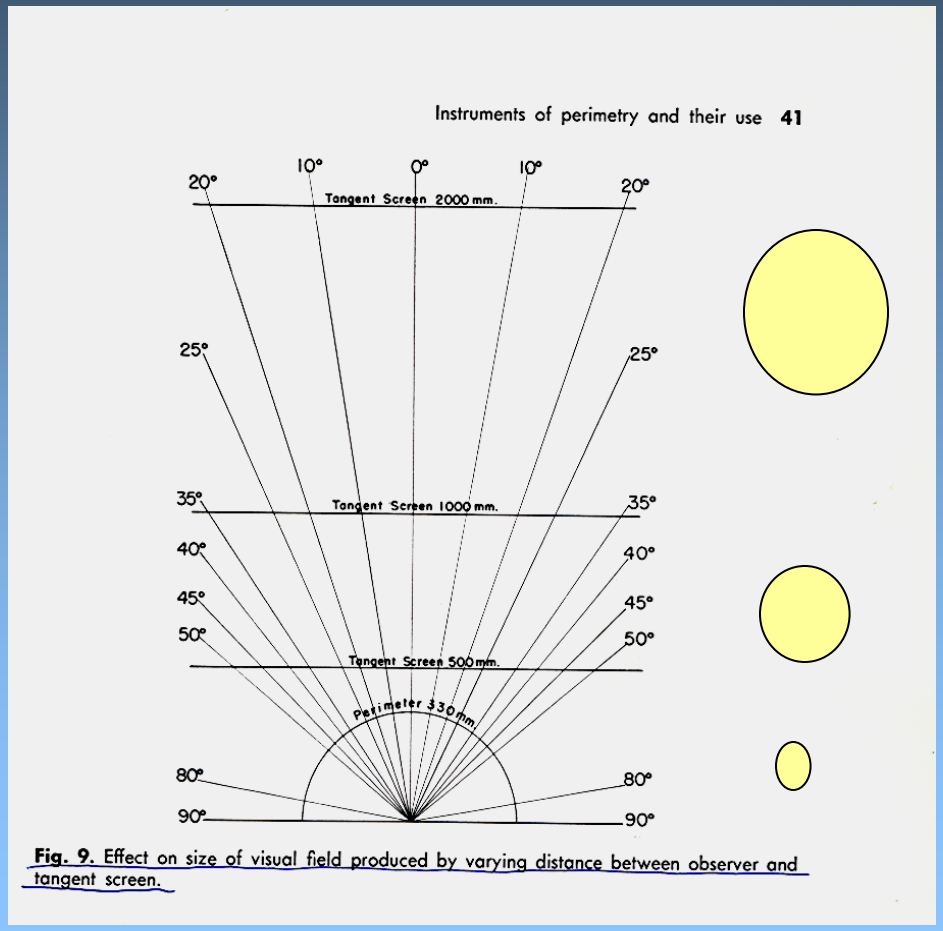


Fig. 9. Effect on size of visual field produced by varying distance between observer and tangent screen.

Why Functional Field Important
Treatment Creates Spatial Expansion

Relates to

- Acuity
- NPC
- Eye Movements
- Pupil and Accommodation
- School work
- Writing
- BI, BD, Low +
- Sports
- TBI

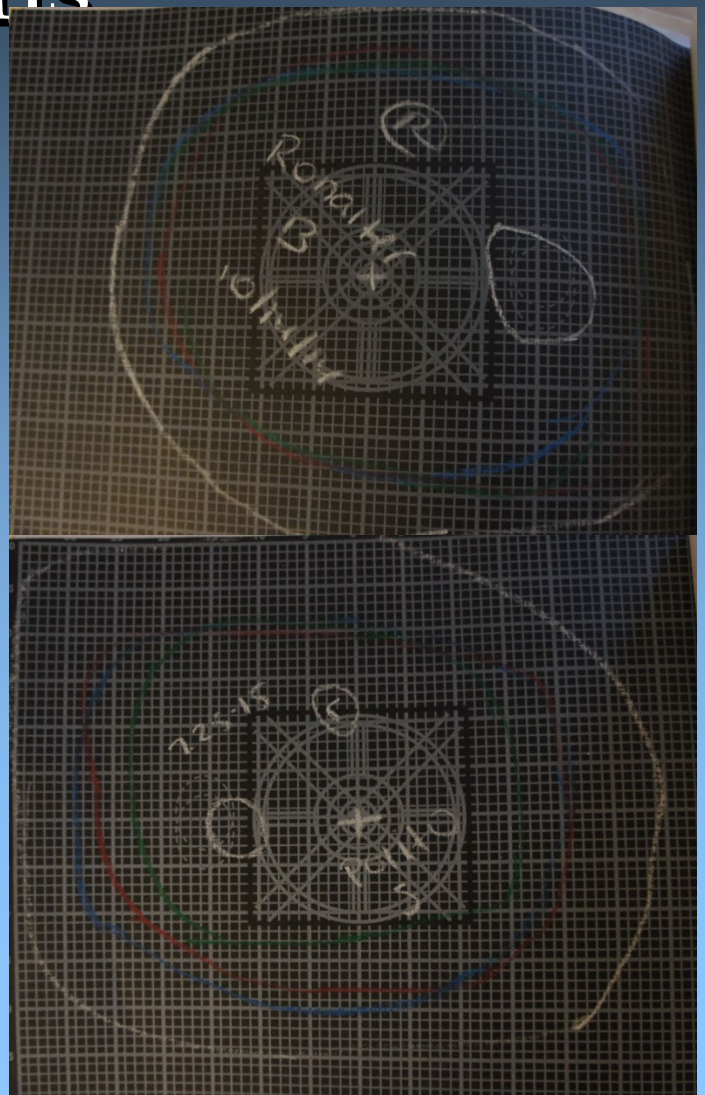
Streff

Are stuck at distance

Distance has become near

Vision as a Process of Projection Conclusions

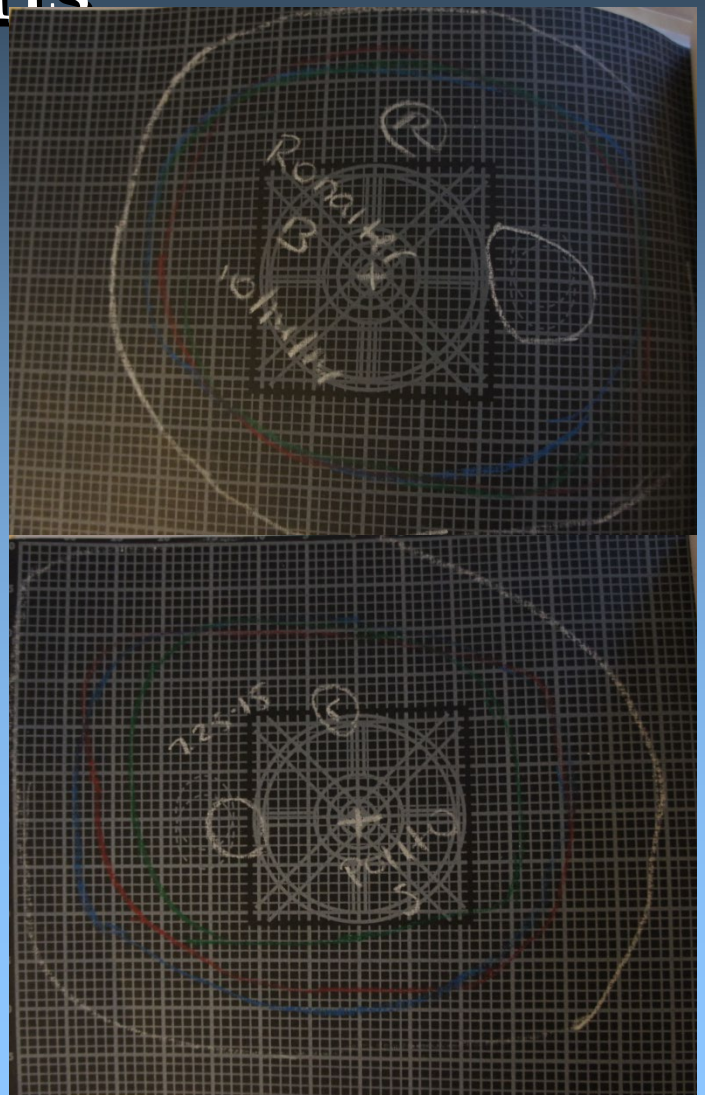
- A direct relation is found between Projection Accuracy and Field size.
- An indirect relation is found between Projection Accuracy and Blind spot size.
- Edema is not generally the cause of the blind spot enlargement.
- The small field is usually not a tunneled field.



Vision as a Process of Projection
Conclusions

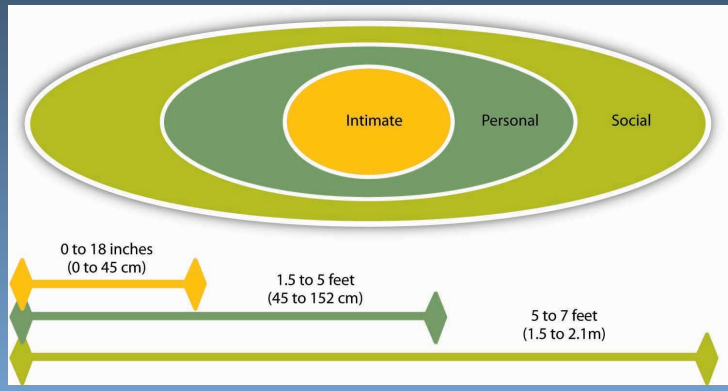
- The blind spot size is likely the most important indicator of spatial compression.

- In Syntonic treatment normalizing the blind spot and expanding the field is key to restore optimum visual functioning.



Vision as a Process of Projection Conclusions

- Spatial compression relates to all aspects and elements of visual perception.

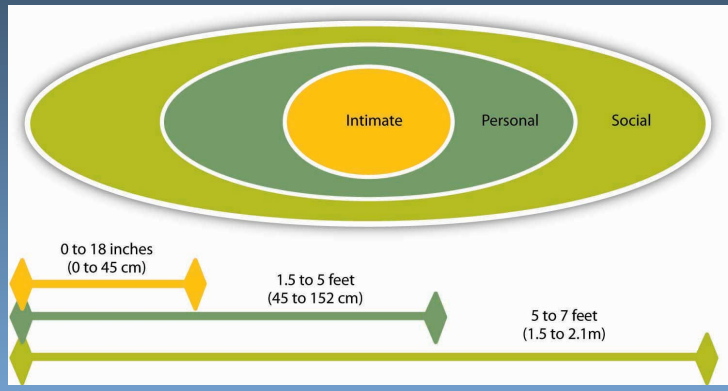


- Projection is not an aspect of vision. It is vision (Shapiro)

- The compression includes all objects and space within the patient's usable field of vision.

Vision as a Process of Projection
Conclusions

- Tunneling may be an acute form of compression. Streff syndrome, complete collapse.



- The vitality of the ANS, the genetic make up and developmental experience are key components in accurate projection and therefore the ability of the human being to interact fully with space and the environment around them.

General Considerations

- If peripheral fields are not within normal limits, VT results are greatly reduced

- If fields are normal in size but blind spot is enlarged, results will not hold unless the blind spot is normal size.

General Considerations

- How long do I treat?

  Treat as long as field continues to open. There may come a plateau where the changes need to me integrated/assimilated.

- How often do I treat?

  Daily or minimum 3x/week.

- Do I ever have to change the filters?

  Yes when field is not responding or worsening.

- What about very sensitive patients?

  Need to start slow for shorter periods and gentle filters.


Thank You!