Wait for it!!!
3D Vision Syndrome: Solving Patient Problems - Creating a Better 3D Viewing Consumer
Dominick M. Maino, OD, MEd, FAAO, FCOVD-A
AOA National Spokesperson on 3D Vision Syndrome
AOA Classroom 3D & Technology Project Team Member

Professor,
Pediatrics/Binocular Vision Service
Illinois College of Optometry
Illinois Eye Institute
Lyons Family Eye Care

dmaino@ico.edu  MainosMemos.com
www.ico.edu   LyonsFamilyEyeCare.com
This lecture available at
http://www.slideshare.net/DMAINO/maino-vpi-treatment
Millions of people who view 3D movies, television, use 3D in the classroom and while playing video games suffer from blurred vision, headache, diplopia, dizziness, and motion sickness. The proper diagnosis is important, but only treatment will allow patients to improve their quality of life.
House, OD
Is Dx Important?
House, OD
Is it the only thing of importance?
House, OD

What else is important?
Treating 3D Vision Syndrome

Lenses, Prisms, Optometric Vision Therapy
Treating 3D Vision Syndrome
How to Dx an Individual with 3D Vision Syndrome

Comprehensive Exam
Visual Efficiency
Strabismus/Amblyopia
Special Testing
(Visagraph, TOVA, etc)
How to Clinically Dx an Individual with 3D Vision Syndrome

Case Hx

DOFAR

Salient Findings
Visual Acuity
Refractive Error
Oculomotor
Optomotor
Heterophoria
Vergence
Accommodation
Jump Vergences
1st, 2nd, 3rd
Degree Fusion
Non-strabismic BV disorders

Prevalence

• Convergence Insufficiency: 1.3% to 37% of the population; most report 3-5%
• Convergence Excess: ~6%
• Divergence Anomalies up to 4%
• Accommodative disorders: 3-5%

15-18 million people
Strabismus & Amblyopia

3-5% of the population

9-15 million
Should determine Vision Function & Functional Vision
3D Vision Syndrome

What constitutes a syndrome?

A group of symptoms that collectively indicate or characterize a disease, psychological disorder, or other abnormal condition.
So is the 3D Vision Syndrome Really a Syndrome? Yes!

The symptoms and signs consistently include: headaches, nausea, dizziness, a vision induced sense of motion, diplopia, blurred vision and eyestrain; as well as a disconnect between accommodation and vergence. Regarding 3D glasses: No one complains about the red mark on their nose from the 3D glasses.
So is the 3D Vision Syndrome Really a Syndrome? Yes!

Discussed even less is the psychological and cognitive disconnect that occurs because of where we know the image to be (at the screen) and where we perceive it to be (inches from your face).
Treating 3D Vision Syndrome

Lenses, Prisms,
Optometric Vision Therapy
How to Tx an Individual with 3D Vision Syndrome

We really don’t know the best methodology/approach.
Use what we do know

Rx/Prism

Optometric Vision Therapy
Use what we do know

Glasses/Prism

Clear Retinal Image @ Dist/Near

20/51
There was no significant association between the CISS score with any of the baseline binocular vision measurements before or after prism treatment. ....

Optometric Vision Therapy

... is a sequence of neurosensory and neuromuscular therapy procedures prescribed by the doctor to develop, rehabilitate and enhance visual skills and processing. The vision therapy program is based on the results of a comprehensive eye examination or consultation, and takes into consideration the results of standardized tests, the needs of the patient, and the patient’s signs and symptoms. The use of lenses, prisms, filters, occluders, specialized instruments, and computer programs is an integral part of vision therapy........
Optometric Vision Therapy


The findings clearly support the validity of optometric vision therapy. Furthermore, the results are consistent with the tenets of general motor learning.
Optometric Vision Therapy


....Office-based vergence accommodative therapy is an effective treatment for children with symptomatic convergence insufficiency.
**Optometrist Vision Therapy**

**Convergence Insufficiency Treatment Trial Study Group.**


Most children ... who were asymptomatic after a 12-week treatment program ... for convergence insufficiency maintained their improvements in symptoms and signs for at least 1 year after discontinuing treatment....

Vision therapy/orthoptics is effective in improving accommodative amplitude and accommodative facility ....
Optometric Vision Therapy


1. Base-in prism reading glasses were no more effective than placebo reading glasses in improving clinical signs or symptoms in children;
2. In-office vision therapy/orthoptics is more effective than home-based convergence exercises or home-based computer vision therapy/orthoptics in improving clinical signs and symptoms in children...
Patient #1
Single Subject Design Research Study
Symptoms:

blurred vision, double vision, nausea, headache, dizziness
3D Vision Syndrome Patient #1

27 y/o white female
College educated
Athletic trainer
Hx of reading problems since 5\textsuperscript{th} grade
Remedial reading class in college
Seasonal allergies
Nephrectomy
3D Vision Syndrome  Patient #1

Initial Findings

VA’s CLS RE/LE 20/20
OR RE -.25, LE PL  Acceptable Fit
MR  RE -4.25-50X175 20/15,
LE -4.00-.50X175 20/15
Pursuits/Saccades +4
CT 18 XOP @ near
2\textsuperscript{nd} Degree Fusion Variable
Initial Findings

Random Dot 100" (?)
NPC 2/6/4"

After 5 attempts pain noted
PFV/NFV @ near could not do/diplopia
Accommodative amplitudes (lens)
-could not do
NRA +2.00 diplopia
PRA -1.00
3D Vision Syndrome
Patient #1

Initial Findings
Diplopia, Accommodative Facility, MEM variable
Ocular health mild allergic conjunctivitis
3D Vision Syndrome  Patient #1

Diagnosis

Convergence insufficiency
Accommodative dysfunctions
Headache
Diplopia
Allergic conjunctivitis
3D Vision Syndrome  Patient #1

Plan

Obtain past records
Start Optometric Vision Therapy
3D Vision Syndrome  Patient #1

Previous Eye Examination (10/09)

“No Binocular Testing Done!”

Hx “General Exam”, health “good”, Aided VAs 20/20 RE/LE, SLE unremarkable, Non-dilated fundus evaluation unremarkable, Ret -4.00 Sph RE/LE, MR -4.00-50X175 RE, -4.00-.50X180 LE, CT 2XO dist/Ortho near, BI 20/8, BO 24/12 near

Dx Myopia, Astigmatism
3D Vision Syndrome
Patient #1

Optometric Vision Therapy

Phase 1  Phase 2  Phase 3  Phase 4
Mono     Biocular  Binocular  Integration
Oculo-Motor, add anti-suppression add vergence Stabilization
HE, Acc

3 month post OVT maintenance Tx and final progress evaluation
3D Vision Syndrome
Patient #1 Optometric Vision Therapy

OVT #1
HC Saccades
HC Rock
HTS (saccades, pursuits, accommodation)
Brockstring

HVT
Sent Home all of the above
3D Vision Syndrome
Patient #1 Optometric Vision Therapy

OVT #2

Reviewed HVT
Vision Builder (saccades)
Franzblau Red Rock Brockstring
3D Vision Syndrome
Patient #1    Optometric Vision Therapy

OVT #3

Reviewed HVT
Minus lens dips
HC accom rock
Vision Building
(binoc reading)

Quoits
3D Vision Syndrome
Patient #1      Optometric Vision Therapy

OVT  #4

Reviewed HVT
Vision Builder
Randot Vergence
Eccentric Circles
Quoits
3D Vision Syndrome

Patient #1

OVT #5
Reviewed HVT
+/- Flippers (mono)
Eccentric Circles
HTS autoslide vergence
  Jump vergences (vectos)
Brockstring (bug on a string) HVT
ECC BO/Brockstring, HTS jump vergences
3D Vision Syndrome
Patient #1 Optometric Vision Therapy
OVT #6

Review HVT
ECC
Vectogram Jump
Vergence
Lifesaver Cards
3D Vision Syndrome
Patient #1      Optometric Vision Therapy
Progress evaluation #1

20/15 BVA, RE/LE
CL OR RE +1.00-.50X180 20/20
LE +1.25 20/20
MR RE -3.25-.25X175 20/20
LE -3.250.75X005 20/20
Pursuits +4   Saccades +3
CT 2EP (near)
W4D 4 at all distances
Random dot 20 ‘

NPC TN no pain
BI 12/9 near
BO > 45
Amps 7 D RE/LE
Facility 8 CPM RE, 11 CPM LE, 10 CPM OU
MEM +.75 each eye

During evaluation no diplopia, pain, suppression, stable findings
Symptoms improving, not resolved
3D Vision Syndrome
Patient #1
Optometric Vision Therapy
OVT #7

Clown vectograms (push BI)
Chicago Skyline (jump)
3D Vision Syndrome
Patient #1      Optometric
OVT #8
Clown vectograms (push BI) with +/-1.00
Tranaglyph BC 601
Brockstring
Aperture Rule
Switch to HVT only due to change in work schedule
Saw 3D movie...no problems!
3D Vision Syndrome
Patient #1      Optometric Vision Therapy

Progress Evaluation #2  1 month later

Majority of symptoms resolved
BVA 20/20 RE, LE
Slight + CL OR
CT ortho/2 EXO
NPC TN
After 5 trials TN
NPC with RL 7/10 cm
Vergence dist BI x/14/10 BO
X/30/25
Near BI 16/12  BO 35/25
W4D 4 all distances
Random Dot 25’
Pur/Sac +4

Amps 8.33 RE/LE
NRA +2.50
PRA -2.25
Facility 6 RE, 7LE, 8 OU CPM no suppression
MEM +.50 RE, LE
RTO 6 mos CEE, intermittently do HVT
Started Here:
VA’s CLS RE/LE 20/20
OR RE -.25, LE PL Acceptable Fit
MR RE -4.25-50X175 20/15,
LE -4.00-.50X175 20/15
Pursuits/Saccades +4
CT 18 XOP @ near
2nd Degree Fusion Variable
Random Dot 100” (?)
NPC 2/6/4”
After 5 attempts pain noted
PFV/NFV @ near could not do/diplopia
- Lens amplitudes could not do
Facility/NRA +2.00 diplopia
PRA -1.00

Ended Here:
Majority of symptoms resolved
BVA 20/20 RE, LE
Slight + CL OR
CT ortho/2 EXO, NPC TN
After 5 trials TN
NPC with RL 7/10 cm
Vergence dist BI x/14/10 BO X/30/25
Near BI 16/12 BO 35/25
W4D 4 all distances,
Random Dot 25’
Pur/Sac +4
Amps 8.33 RE/LE
NRA +2.50, PRA -2.25
Facility 6 RE, 7LE, 8 OU CPM
no suppression
MEM +.50 RE, LE
Convergence insufficiency, Accommodative dysfunctions, Headache, Diplopia, Blurred vision, Double vision, Nausea, Dizziness

All resolved in 8 OVT visits and HVT

Last Progress Evaluation on 7/10

On 8/1/10 the patient texted me and said, “Just saw a 3D movie. It didn’t hurt! It was an awesome experience!”
Computer Programs Used in Optometric Vision Therapy

Home Therapy Solutions

Personal Trainer for Vision Training!

Computer Aided Vision Therapy
3D Resources

AOA
http://www.aoa.org

3D Eye Health.org
http://www.3deyehealth.org/

COVD
http://www.covd.org

Vision Performance Institute
http://www.pacificu.edu/vpi/

OEPF
http://www.oepf.org

Optometrists Network
http://www.vision3d.com/
No matter your age, if you have 3D Vision Syndrome it is treatable.
Questions?


Professor, Pediatrics/Binocular Vision Service
Illinois College of Optometry/Illinois Eye Institute
3241 S. Michigan Ave. Chicago, Il. 60616
312-949-7280 (Voice) 312-949-7358 (fax)

dmaino@ico.edu  MainosMemos.com
www.ico.edu    LyonsFamilyEyeCare.com