



PP-409

EFFICACY OF NEW OFFICE BASED
DICHOPTIC THERAPY IN RESIDUAL
AMBLYOPIA WITH ECCENTRIC FIXATION (IN
CHILDREN AND ADULTS)

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Nil Financial Conflict

ECCENTRIC FIXATION AND AMBLYOPIA

- ✓ >30% Indian children with strabismic amblyopia suffer from eccentric fixation (n=1600, IJO 1969;17:245-49)
- ✓ 100% patients with monofixation syndrome/microtropia with identity suffer from eccentric fixation (Br J Ophthalmol 1998;82:219-224)
- ✓ Patients with stable unilateral eccentric fixation do not respond well to conventional occlusion, inverse occlusion or red filter therapy. (BJO 1968;52:929-932)

NEW DICHOPTIC THERAPY

- A (contrast adjusted / **bichromatic**) stimulus is presented exclusively to each eye
- The brain is forced to integrate the images into a single perception
- Multiple studies have found modest, rapid improvement in pediatric and adult amblyopes without recurrence

1.J AAPOS. 2015;19:401-5
2.J AAPOS. 2015 ;19:6-11
3.Eye (Lond). 2014;28:1246-53
4.Vision Res. 2015;114:173-8

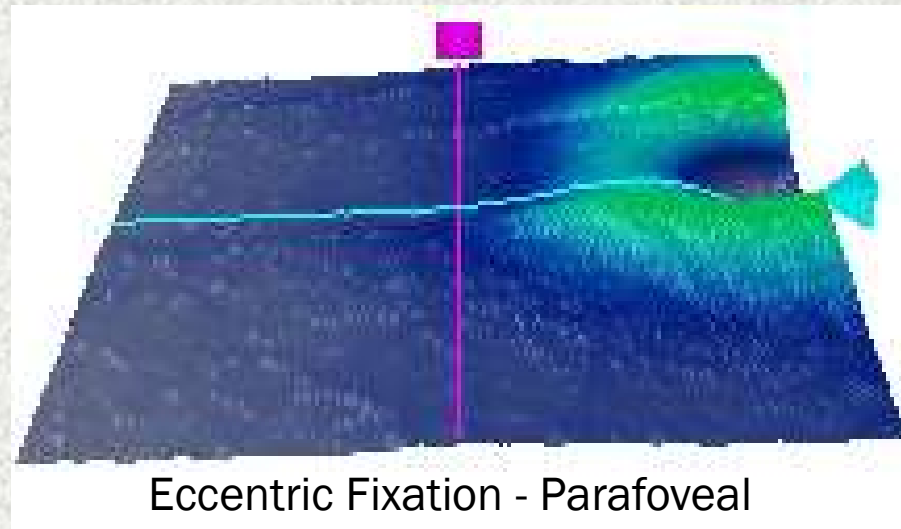
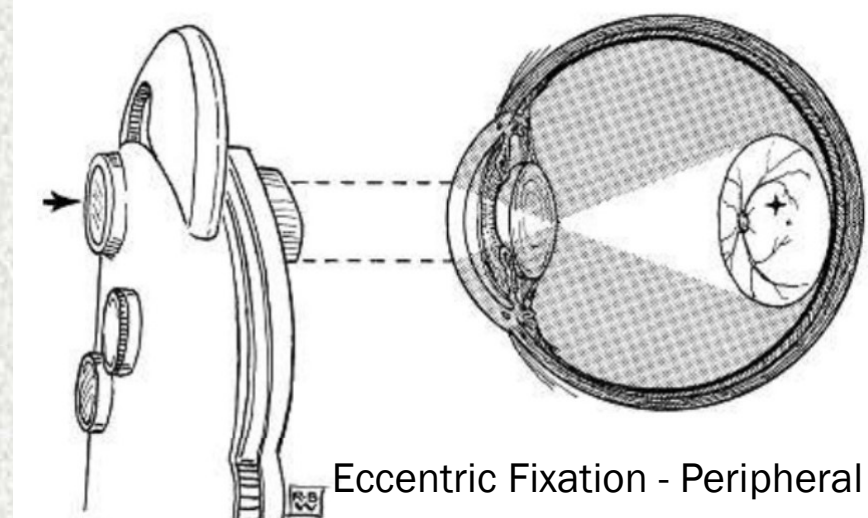
1.Vision Res. 2015;114:161-72
2.Clin Exp Optom. 2014;97:389-98
3.Restor Neurol Neurosci. 2010;28:793-802
4.Optomety. 2012;83:87-94

AIM

- ✓ To report the efficacy of **NEW** dichoptic therapy in amblyopic patients with monofixation syndrome and unilateral stable **eccentric fixation**.

INCLUSION CRITERIA

1. Unilateral Residual amblyopia (IEAD ≥ 2 lines)
1. Stable unilateral eccentric fixation (confirmed on Ophthalmoscope star and OCT scan of the macula)
2. No improvement with maximum (≥ 6 hrs/day) patching for >3 months
3. Age group 6-40 years



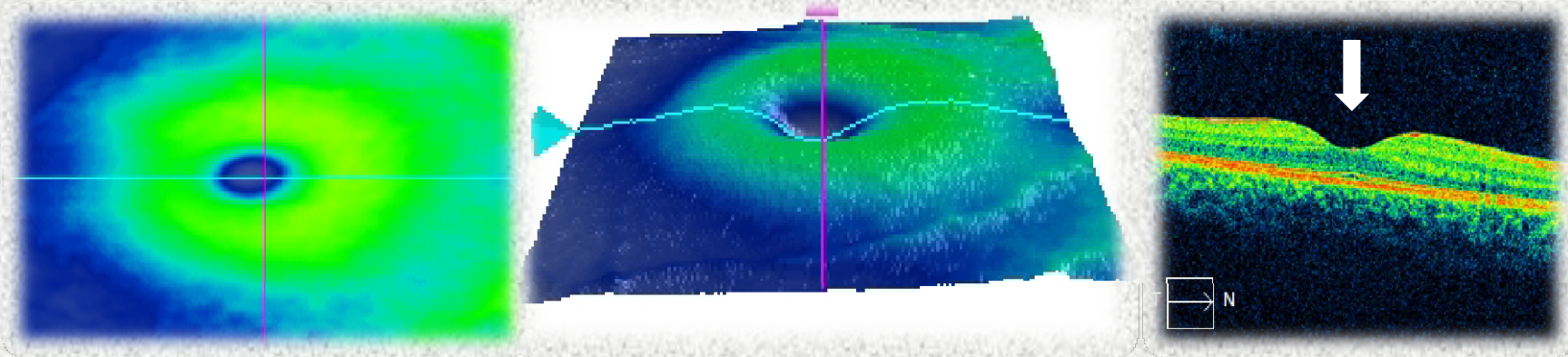
EXCLUSION CRITERIA

ΕΧΘΑΛΛΑΚΟΝ ΑΒΙΠΕΥΑΝ

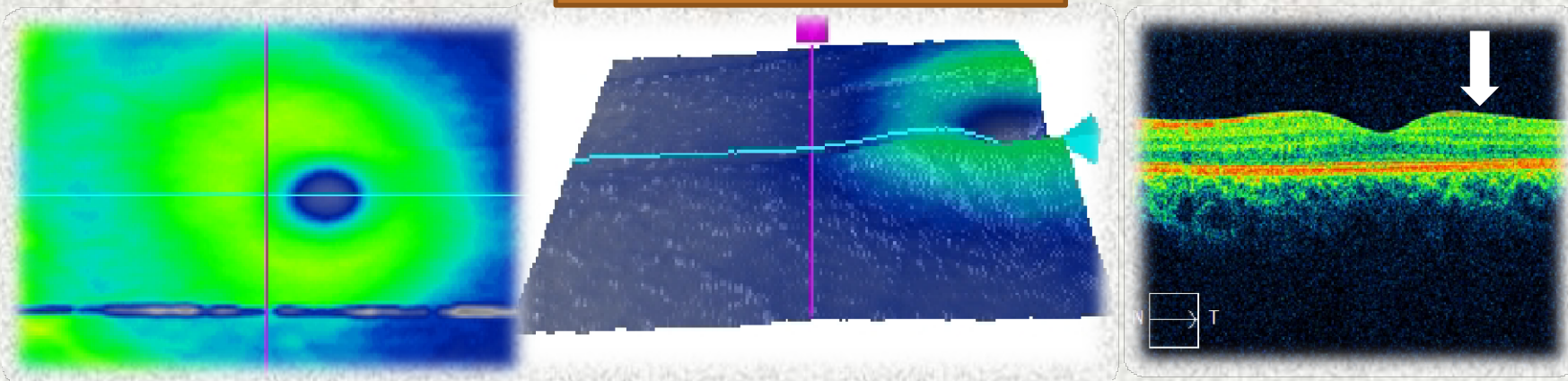
- ✓ Macular pathology or nystagmus or any other ocular comorbidity
- ✓ Poor compliance to patching and VT
- ✓ Previously untreated amblyopia
- ✓ Manifest tropia ≥ 10 PD

DIAGNOSTIC MAPS USED FOR CONFIRMATION OF ECCENTRIC FIXATION ON OCT SCAN

Eye with Normal fixation



Eye with Eccentric fixation



METHODS

- ✓ Complete ophthalmic examination was done
- ✓ Fusion, stereopsis and fixation pattern was determined
- ✓ Patients were treated with 6hr/day of patching of the dominant eye
- ✓ Patients with no improvement despite of 100% compliance were recruited in the study

METHODS

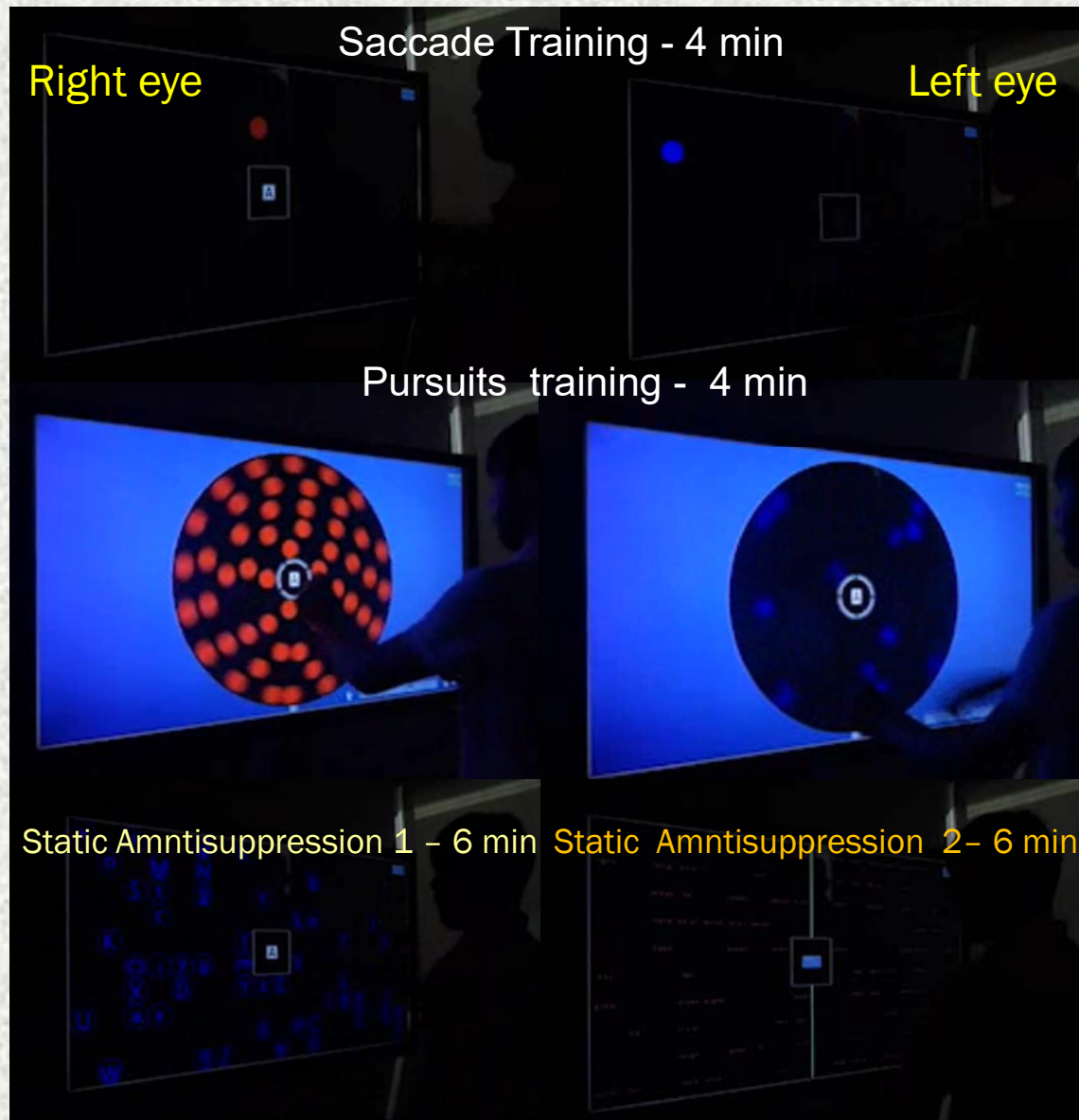
METHODS

- Full time optical correction was given
- Part time patching (2hr/day) of the better eye was continued during the vision therapy
- The patients were started on office vision therapy
- Initially VT session of 30-45 minutes each given daily for 1 week and then alternate day until vision continued to improve
- The VT and patching was stopped when the vision did not improve after at least 10 sessions of continued vision therapy

SESSION 1 OFFICE DICHOPTIC THERAPY

Sanet Vision Integrator (20 minutes session)

(touch screen orthoptic therapy unit, patient wears Red Blue goggle)

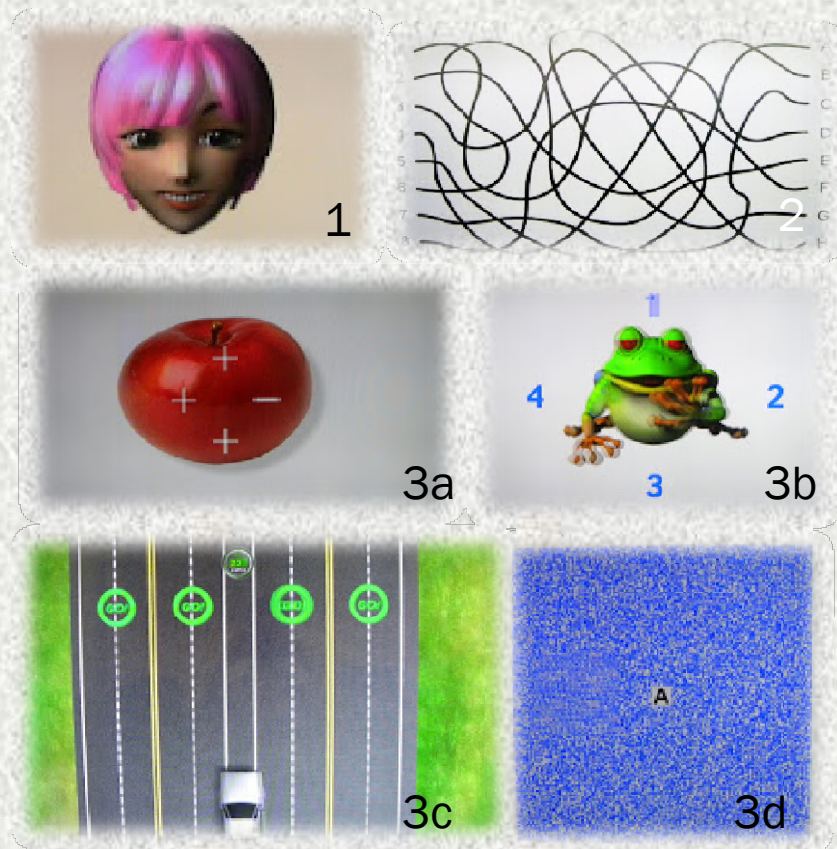


- First saccade training, then pursuit training, then static antisuppression training
Total 20 minutes
- **Initially without crowding phenomenon (low spatial frequency)**
- Contrast and size progressively reduced depending on the visual acuity

SESSION 2 OFFICE DICHOPTIC THERAPY

Vision Therapy System 4 (15 minutes session)

(3D screen orthoptic therapy unit, patient wears Plaroid goggle)



1. Flash vergence training (1)– 5min
2. Cheiroscope (2) – 5 min
3. Fusional (vergence) exercises for 15 min
 - a) Flat fusion (3) – 5min
 - b) Flat fusion global stereopsis (Contour stereopsis) for 5 min
 - c) Dynamic global stereopsis (Contour stereopsis) for 5 min
 - d) Random dot stereopsis for 5 min

RESULTS

- 11 patients
- 7 females
- Mean age 17.3 years \pm 9 years (SD)
- Range 7 years – 36 years
- 8 had anisometropia with monofixation syndrome
- 2 had primary monofixation syndrome

RESULTS

| | Before treatment (VA in logMAR) | | After treatment (VA in logMAR) | |
|--------------------------|------------------------------------|---------|-----------------------------------|---------------------------|
| | Distance VA | Near VA | Distance VA | Near VA |
| Mean VA | 0.8 | 0.6 | 0.5 (3 lines improved) | 0.2 (4 lines improved) |
| SD | 0.2 | 0.2 | 0.2 | 0.2 |
| Range | 0.5-1.0 | 0.3-1 | 0.2-0.8 | 0-0.4 |
| Two tailed paired t test | | | 0.0084 | 0.0062 |

RESULTS

- ✓ Maximum improvement was 7.5 lines!!
- ✓ 3 patients had no improvement
- ✓ Two patients gained stereopsis for near
- ✓ Two developed bifoveolar fixation!

RESULTS

- ✓ Average no of vision therapy sessions given
- ✓ Minimum – 15 and Maximum – 30 sessions
- ✓ Follow up was done after 6 weeks, followed by every 3 months twice, followed by every 6 months

RESULTS

- ✓ Mean follow up was 8.4 months (2-12 months)
- ✓ Only one patient experienced **PARTIAL** recurrence
- ✓ In this 16 years old boy with microesotropia, out of initial 3 lines improvement, 2 lines dropped after stopping VT
- ✓ It recovered promptly with 3 sessions of VT but dropped again after stopping
- ✓ None of the patients had any side effects of VT (viz. permanent diplopia)

DISCUSSION

Effectiveness of past treatments in the treatment of eccentric fixation

| Type of treatment | Journal | Conclusion |
|----------------------|---|---|
| Intensive occlusion | Br Med J. 1961 Dec 16; 2(5267): 1610–1612, Doc Ophthalmol 23:228, 1967., Arch Ophthalmol 73:776, 1965, TB of <i>Binocular Vision and Ocular Motility</i> , GK von Noorden | 1. Improves fixation (Recurrence +) in children < 5 years |
| Inverse occlusion | | 2. Improves visual acuity (Recurrence +) in children < 5 years 3. Residual amblyopia is common |
| Red filter treatment | Brit. J. Ophthal. (1967) 51, 1651-69 | 1. Needs prolonged treatment (≈12 months) 2. Fixation improves in few 3. Best vision ≈ 6/12 |
| Pleoptics | <u>Cesk Oftalmol.</u> 1989 Nov;45(6):456-63. | The treatment did not prove successful |

CONCLUSION

- ✓ **New office based dichoptic therapy, when used along with part time patching, could significantly improve visual acuity in 70% patients with stable unilateral eccentric fixation with good sustenance**
- ✓ **Further studies are needed to ascertain the sustenance over longer duration, correlation with degree of eccentricity, optimal therapeutic algorithm and comparison of this therapy with inverse occlusion or red filter therapy.**