DIFFERENCES BETWEEN THE
CLASSICAL AND BEHAVIORAL
METHODS IN THE THERAPY
FOR STRABISMUS AND
AMBLYOPIA
(WHY OUR WAY IS BETTER!)

Prescribing the Spectacle Correction

Classical Approach: written in every text, is to prescribe maximum plus and to fully correct any measurable anisometropia:
- Ok if ortho
- Object quite strongly, since it rarely has proven successful
- Maximum plus stabilizes the angle and thus they are more likely to develop ARC
- Unless plus produces alignment

When measuring the refractive error of an amblyopia, must be kept in mind that this measurement is likely not being made along the optic axis of that eye.
- Since the majority of amblyopes have an eccentric fixation and they are not fixating with their fovea, the line of sight will pass through a peripheral portion of the cornea.

Using the peripheral part of the cornea

- Since that part of the cornea is flatter and more toroidal, will find more plus and more cylinder, thus giving the illusion of an anisometropia.
- If you correct it, it will always remain an advantage for the patient to use this false line of sight since it will provide him with the best acuity.
- In addition, the aniseikonia created by the difference in lens powers will make binocularity more difficult to create.

Prescribing

Amblyopia:
- Reduce the power found in the fixating eye from 0.50 to 1.00 diopters
- Make both lenses relatively equal in power
  - Forget cylinder

Esotropia:
- Usually prescribe additional plus if it significantly reduces the angle of deviation
  - The first stage of VT incorporates a large amount of accommodative work to allow us to prescribe more plus

Exotropia:
- Never use more minus that the amount of minus that restores standard visual acuity.
  - Even though this will likely reduce the angle of deviation it is done at the expense of increased accommodative effort, which creates stress, which in turn, is likely to reduce academic performance.
  - Don’t let the patient use accommodation to correct an exo deviation

Esotropia:
- If the ACA relationship is tight and cannot be loosened up, then there is not choice and bifocals must be prescribed. The segs should be set very high
Prescribing

- **Divergence Excess**
  - Usually they are 35 exo at distance and close to ortho at near
  - Usually have high ACA: 10 or 12 to 1.
  - They used to be high eso at near and in order to survive through the reading task, they solved the problem by using lots of negative relative convergence and thus they became ortho at near and high exo at distance
  - Surgical intervention is usually a failure because if they get aligned at distance then they have esophoria at near
  - Primarily this is an accommodative-convergence problem
  - Prescribe a bifocal to eliminate the effect of the ACA and then VT is successful.

Patching

- **Three schools of thought**
  - Direct patching of the good eye
  - Inverse occlusion:
    - Eccentric fixation
    - Amblyopia
    - Binasals

No Patching

- Not needed to get results – if used they generally aggravate the child and/or parent and makes them dislike the VT and me.
- Patching hardly ever works
  - It’s like throwing a baby into a swimming pool
    - A few kids will learn how to swim
    - But most kids will end up hating the water

VT

- **VT For Strabismus**

General Principles for Successful Strabismus Therapy

- **Monocular Skills**
  - Early in career – not much attention here
  - Over the course of my career – more and more importance
- Both visual fields need to be lined up in the same common visual direction – some differences that are negative:
  - Spatial location
  - Z-axis location
  - Timing differences between channels
- If too different, then one is suppressed.
- Monocular VT is a must to make both circuits equal

Monocular

- Same visual direction
- Distance
- Size
- Speed
Equal Behavior

- Versions
- Saccades
- Accommodation

Information Processing

- Space Matching
- McDonald Form Field

Pleoptics

- Use an afterimage to tag the fovea
- Involve the person in small exacting tasks which require the use of the fovea

Pleoptics

- Macula Integrity Tester
- Photoflood Lamp
- After Image Techniques:
  - Death Ray
  - After Image Transfer

Do Not Ignore Traditional VT with Strabismics

- If versions and saccades are accurate with one eye and not with the other there is no way to get the two channels to work together.
- Accommodation is usually good with one eye and miserable with the other
  - With Eccentric Fixation, the only accommodation present is the consensual response
  - In fovea there is a 1-to-1 hookup between cone, bipolar, ganglions and optic nerve cells/fibers
  - Therefore: once central fixation is achieved lots of accommodative work must be done

Body Bilaterality

- Developmentally
  - Team two sides of the body first
  - Learn control of gross muscles first
  - Strabismus is from head to toe
- Walking rail
- If we ignore this aspect, we do so at our own peril and we are not acting in the patients’ best interest
Body Bilaterality

- Developmental Sequence
- Team Body First
- Learn Gross Muscles First
- Strabs – work from head to toe

Eliminate Suppression

- Usually does not take a great deal of time and effort
  - Using intermittent light has made this easier
    - Lights flash at approximately the alpha rhythm (10 cps)
    - Instruments such as the TBI
  - Much harder to suppress flashing lights at this speed – the light is on and off again before the suppressing circuits can go active
  - Strobe lights are very useful
    - Walk around with one in my hand
    - Whenever suppression occurs, simply shine on the target being suppressed or directly into the eye that is being suppressed.

Monocular Work in a Binocular Field

- Single slide of Vectograms
- Anaglyph
- Rotoscope
- 4-Ball Cards
- Projector

Simultaneous Vision

- Binasal occluder with ruler
- Vectograms
- Polariod and Mirror
- BAR Reading
- 4 Ball Cards

Simultaneous Vision

- City and plane
- R-G Lite Brite
- Vectograms
- R-G Filter with overhead
- Septum

Posturing

- Pierce Light
- Vertical Prism
- Red Green “V” Lights
- Lines and light
- Feel what eyes are doing
Physiological Diplopia

- ABE
- Alphabet Pencils
- Brock String
- Feedback

General VT Principles

- Once suppression has been weakened or eliminated, we need to bridge the gap between monocularity and binocularity.
  - Monocular work in a binocular field
  - Simultaneous vision
  - Simultaneous vision with the person having to move their eyes some to achieve alignment.
    - Align Red/Green target
    - Feel what they are doing
  - Physiological diplopia (Brock String) – best means of feedback, which is a major principle of VT; allows patient to monitor his own performance.

Fusion Reflex

- When an image moves off the fovea there is an increase in the tonus of the extra-ocular muscles to bring the image back to the fovea
  - Involuntary fusion movements to maintain single, binocular vision
  - Exists only in the foveal area due to 1-to-1 hookup
  - During ductions they make involuntary movements to compensate, which only become voluntary after diplopia begins and they make a voluntary movement to overcome it.
- Test by fusion or lustre at any distance with a small prism (1 or 2 diopters) and see if they make small movement to reestablish fusion.

Lustre

- No figure – just ground
- Red Green Lenses
- Blur helps
- Avoid split field

VT From this Base

- The rest of the time is spent with traditional binocular VT and is about 50% of the total case.
- In the past we tended to come in to the binocular phase too fast.
### Less Use of Instruments

- Initial phase of VT is more free-space and uses instruments less.
  - Disadvantages of using instruments:
    - Artificial space world
    - Eliminates peripheral clues
    - Works only in primary gaze
    - How often does real life take place in primary gaze?
    - Eyes look from place to place
    - On midline = symmetrical demand
    - Off midline = asymmetric demand
    - Moving side to side requires different use of muscles

### Structure VT Like Real Life

- If we want results to carry over to real life we need to train in life-like settings.

### Instruments Used Late for Fine Tuning

- Create a match-mismatch situation where what the patient sees is different from what he knows.
- If they can maintain binocularity under these conditions, we know he has good skills.
- We must provide the patient with binocular skills which are better than his monocular skills or he won’t use them.

### Real-Life More Discontinuous

- Create demands to both the accommodative and convergence systems in jump amounts rather than in graded amounts.
  - This is the way it is in real life.
  - You look here – then here – then out there – and then up there, etc.
  - We use flip:
    - Polaroids
    - Anaglyphs
    - Lenses
    - Prisms

### Muscle Strength?

- In the binocular phase of VT we are not trying to build up muscle strength.
- We all know that the muscles of the eyes are on the order of 100 times stronger than they need to be.

### Beginning Fusion

- 3 Balls
- RG Lantern
- Ring Float
- Quoits
- Aperture Rule
- Anaglyphs
- Troposcope
- Bagolini Lenses
- Fusion Games
Thank You

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