Course Outline

I. Natural history

II. Prevalence

III. Diagnosis
   A) Types of IXT
      A) Divergence excess
         (a) True
         (b) Simulated
      B) Basic
      C) Convergence insufficiency
   B) Clinical Testing
      A) Case History
         (a) Symptoms
         (b) IXT questionnaire
      B) PEDIG Control Scale
      C) Cover testing
         (a) Near and far distance
         (b) Remote test distance - significance
      D) Stereopsis
         (a) Distance Randot test
         (b) Near stereo testing
      E) Second degree fusion
      F) Correspondence
      G) Vergence ranges and NPC
      H) Cycloplegic refraction

IV. Management of IXT
   A) Treatment effectiveness
      A) Current evidence for different forms of treatment
      B) Cochrane review
V. Over-minus Lens Therapy for IXT
A) Passive treatment: Rx more minus (or less plus) than refraction
B) Patient Profile - young patients with good accommodative amplitudes and normal to high AC/A (Basic & DE XT) who are unable to do other treatments
C) Theories
D) Magnitude reduced by stimulating A/C
E) A/C triggers reflex fusional vergence
F) May allow clear distance vision, facilitating fusion
G) Prescribing guidelines
   A) How much minus
   B) Combine with base-in prism?
   C) IXT frequency more important than magnitude
H) Length of treatment?
I) Parent education
J) Myopia progression?

VI. Prism Therapy for IXT
A) Typically, BI relieving prism
B) Caloroso’s residual vergence demand - leave 10-15△ fusional convergence demand
C) Effectiveness
D) Vertical prism for associated vertical deviation: primary vs. secondary vertical
E) Clinical impression: a little can go a long way

VII. Occlusion Therapy for IXT
A) Prescribed part-time mainly for younger children
B) Intended as passive tx of suppression
C) Effectiveness
D) PEDIG RCT: IXT-2
   A) Design
   B) Major eligibility criteria
   C) Treatment, follow-up
   D) 6 month primary outcome data

VIII. EOM Surgery for IXT
A) Generally for IXT >25-30△
B) Effectiveness: cosmetic outcome vs. functional outcome
C) Concerns

IX. Active Vision Therapy for IXT
A) Uses feedback techniques & procedures to improve fusional vergence and sensory fusion to decrease IXT frequency

X. IXT: Sequential Treatment Plan
A) Phase 1: Establish initial optical correction
   A) Refractive error correction
      (a) Provide equally clear retinal images
(b) Promotes accommodative accuracy, discourages suppression, promotes improved sensory fusion
(c) For IXT, Rx least plus to BCVA
(d) Some cases, clear retinal images may be sufficient to eliminate IXT

B) Over-minus correction? with possible plus add if DE

C) Prism therapy
   (a) Horizontal: consider relieving prism if can’t do VT
   (b) Vertical: primary versus secondary

D) Occlusion therapy
   (a) Part-time occlusion if amblyopia or deep suppression

B) Phase 2: Improve monocular visual functioning
   A) Amblyopia treatment (if needed)
   B) Accommodation: amplitude, facility, accuracy
   C) Ocular motility (saccades & pursuits)

C) Phase 3: Establish & improve normal sensorimotor fusion at ortho position
   A) Gross convergence
      (a) Use all types of convergence (proximal, accomm, fusional) to become aware of “feeling” of convergence with ultimate goal of voluntary convergence
      (b) Add an element of sensory fusion & physiological diplopia (suppression check)
      (c) Techniques: convergence surprise, pencil push-up, Brock string, 3-dot card

B) Anti-suppression therapy
   (a) Eliminate suppressions at ortho position
   (b) Develop diplopia awareness when XT manifest
   (c) Techniques

C) Fusional vergence
   (a) Add accommodative control
   (b) Increases smooth vergence, step/jump vergence and vergence facility
   (c) Techniques

D) Other considerations
   (a) training distances: near to intermediate to far distances
   (b) 3rd to 2nd to 1st degree fusion
   (c) typically, mostly free space activities
   (d) train divergence ranges

XI. Case Reports