A. A Look at Some Conventional Wisdom

1. **Suppression to avoid diplopia causes amblyopia.** The image on the fovea of a deviating eye would cause confusion, not diplopia. How often have you had a patient complain of confusion (two objects appearing in the same place)?

2. **Anomalous retinal correspondence.** ARC is a poor name. It implies an anatomical connection. Anomalous projection AP is a better term.

3. **Suppression is the enemy.** Is suppression cause or effect? Suppression is easy to eliminate but almost impossible to teach.

4. **Intensive, constant occlusion is mandatory.** The effects of occlusion on normal development and eye hand coordination can be major. The emotional impact can be disastrous. Part time occlusion with specific tasks can be as effective.

5. **Start with full refractive correction.** It is difficult to refract an amblyopic eye. Refraction can change with improvement in fixation and accommodation. Some patients may be better off without full correction when all factors are considered. Optical problems with
high anisometropia may outweigh benefits. Monovision is sometimes useful.

6. **Finer stereo acuity is the goal of treatment.** Patients can show good stereopsis and poor spatial localization. Speed of stereo appreciation is, for me, more important than acuity. The price of finer stereopsis may be more physiological diplopia. (Gordon Walls on "common sense horopter" in Am J Opt 1940s)

B. Insights derived from the work of Fred Brock

1. The three degrees of fusion concept is backward. Stereopsis (3rd degree) is most fundamental for normal vision. Second degree (flat fusion) fusion can only be arranged via artificial means. Simultaneous binocular perception (1st degree) without fusible elements is even further from normal.

2. Physiological diplopia awareness is an abnormal experience. Objects normally are perceived as single even beyond Panum's areas. Stereoscopic awareness includes all objects from infinity to within a few inches of the eyes, contrasted to what he called the "true fusion" range limited by Panum's areas. A process beyond that of "true fusion" must be postulated to account for the isomorphism between actual and perceived space.
3. We all utilize a variety of cues for spatial judgments. Normals utilize NRC to reference spatial judgments. Strabismics must emphasize other cues.

4. Adapted strabismics may have better factual awareness on tests. An adapted strabismic perceives the single string as it actually is.

5. Paraphrase of a Brock quote: "A patient lacking stereopsis does not speak the same language as we do. Use logical structures to develop normal projection and stereopsis.

6. Brock was less concerned about amblyopia than binocularity. "Do not force patient into less effective adaptation"

7. When possible, begin training at a patient's centration point. Start with peripheral targets and gradually become more central. Begin with large targets with low acuity demand. Blurring targets is often helpful.

8. Use activities that encourage binocular participation, such as pointer in tube and reflected light on multiple pointers. Integrate visual cues with SILO and spatial localization. Use manipulation of virtual images and real targets.

9. Finesse ARC when possible. Begin treatment where there is NRC and extend bifixation range.

10. Avoid diplopia training if possible. Diplopia without fusion is worse than residual amblyopia.
11. Postural set and anticipation are important for bifixation. (If avoidance of diplopia is primary control for alignment, why not more complaints of transient diplopia?) Develop ability to align on non-fusible targets.

C. Clinical Suggestions

1. Train monocular fixation, pursuits, saccades, and accommodation with strabismics before or, along with, binocular procedures. Generally, both eyes need monocular work - more for the deviating eye. Often, the turn angle reduces prior to starting binocular activities.

2. Avoid total occlusion at all costs. It is cruel, disastrous for the patient, and unnecessary. Short time patching with carefully prescribed appropriate tasks is as effective without damaging the patient. The only exception might be patching an eye with eccentric fixation to disrupt that pattern.

3. When treating a deep amblyope, it is difficult to obtain a precise refraction. Assigning home fixation activities using a penlight target before prescribing often permits better patient response.

4. Don't chase small cylinders when refracting a patient with poor sensitivity. It is not important at this phase of treatment and is exhausting and time consuming for both doctor and patient.

5. When beginning amblyopia treatment with a patient with high anisometropia and strabismus, use of temporary high RX glasses (only when doing monocular training activities) avoids potential cosmetic and aniseikonia issues. These can be addressed later as binocular function is achieved.
6. Getting patient compliance with wearing high anisometropic glasses or monocular contact lenses is often difficult, particularly when the better eye has good acuity without correction. If you achieve stable binocular function, the patient will not see immediate benefit from the refractive correction. This is not a major problem if explained properly. There may be need for brief tune up therapy periodically, and any slight decline in the acuity of the amblyopic eye is not significant. Once an acuity level has been reached, it is easily restored.

7. Maximum plus at the outset is not always the best approach for a constant esotrope unless the plus permits bifoveal alignment. If the plus does not give a centration point, it may be better to delay the full plus until later.

8. When treating young accommodative esotropes, prescribe sufficient plus to produce comfortable alignment rather than maximum plus. As they approach school age and increased intensive near activities, the additional plus will be needed and available. Very high segment bifocals become useful at school age. Crowding plus may foster development of unnecessary additional hyperopia.

9. When treating intermittent divergent strabismus, near plus based on OEP-Skeffington concepts is very effective – when prescribed at the correct time. (See my articles on this).

10. The controversy regarding in-instrument versus out-of-instrument treatment is nonsense. Both are useful and one or the other often more appropriate.

11. I like the Brock based approach and used it most of the time – but sometimes old fashioned orthoptics is necessary.