

## PSEUDO CONVERGENCE INSUFFICIENCY DISCOVERED BY OPHTHALMOLOGY

Guest Editor, Leonard J. Press, O.D.

*Reading easily and comfortably is of paramount importance in the intellectual development of the child and young adult. It is a relative facility of accommodation and convergence that allows the young person to read at close range. When these mechanisms fail, reading becomes tiring, frequently producing headaches and even diplopia.*

*Asthenopia in a school-age individual can be a significant handicap to learning. An inability to concentrate on written material creates frustration, impeding the learning process. Once the refractive error has been corrected and the symptoms persist, evaluation of the patient for mechanisms of binocular dysfunction is carried out.*

**Y**ou have read statements such as the above from optometric sources before. So what's new? What is new is that these words are emanating from contemporary ophthalmologists!

The two paragraphs quoted above serve as the introduction to a striking article by two ophthalmologists and three orthoptists which recently appeared in the *Transactions of the American Ophthalmological Society*.<sup>1</sup>

The paper describes a study which began with 72 non-presbyopic subjects (mean age 11.6 years). The authors iso-

lated a population who exhibited a convergence insufficiency syndrome associated with accommodative insufficiency. All of the subjects reported headaches, blurred vision at near, and difficulty with reading. They prescribed plus lenses for near and vergence therapy for the majority of the subjects. School-age children had the near prescription in bifocal form.

Of the 26 patients who completed the study, 17 (65%) reported complete alleviation of symptoms and seven of the 26 (27%) reported some improvement of the symptoms. The authors noted that the two remaining patients who did not report improvement were in therapy less than two months. But the authors were puzzled. The mean improvement in the nearpoint of convergence (NPC) was "only" 14 cm and the mean improvement in accommodation was "only" 4 diopters. They were puzzled about how such a small improvement could account for the degree of amelioration noted. The authors speculated that this apparent discrepancy might be explained by the inadequacy of standard testing as follows: "None of the techniques for evaluating nearpoint of accommodation measure the *sustained* nearpoint of accommodation. Likewise we do not assess *sustained* nearpoint of convergence. A 7-year-old child with 9 diopters of accommodation has significantly decreased accommodation. He should still be able to function at near using 3

diopters for work. This, however, is not the case. Momentarily this child may be able to accommodate, but rapidly his ability to focus regresses, making it impossible to sustain the accommodation necessary to function at near."

The format of the *Transactions of the American Ophthalmological Society* provides discussion following each paper. The following are excerpts from comments by two eminent ophthalmologists in their specialties (pediatric ophthalmology and refraction, respectively). They are fascinating and refreshingly candid.

*Leonard Apt, M.D.:  
I am grateful to Dr. Mazow and his  
collaborators for broaching this  
continued on page 196*



Leonard J. Press, O.D.

subject. As they point out in their paper, only a few publications on this topic appear in the ophthalmic literature. Yet, any ophthalmologist who sees a number of students or young adults who do a great deal of close work will concede that asthenopia is a common problem. My impression is that many ophthalmologists handle this disorder poorly. Too often they consider most cases of asthenopia in young persons as instances of uncomplicated convergence insufficiency and treat these patients with simple push-up exercises. This unsophisticated approach oftentimes is not helpful and the patient leaves dissatisfied. Many ophthalmologists do not fully appreciate the role and function of accommodation and convergence, their interrelationship, and how to study their dysfunctions. Thus proper treatment is not given. Many of these patients end up under the care of the optometrists.

David Guyton, M.D.:

I am also puzzled by the lack of correlation between the apparent clinical improvement and the objective findings. I agree with Dr. Mazow that this may indicate we are not measuring the proper parameters. In fact we have probably abdicated the study of accommodation and convergence to the optometric profession. A perusal of the literature will reveal that most of the advances in this area are being made in the optometric institutions by vision scientists who use definitions and terms with which we are not even familiar.

Perhaps it is the ability to sustain accommodation that we should be measuring instead of convergence. Or perhaps we should be measuring accommodative inertia or infacility--the inability to focus back and forth quickly between two distances. We do not even recognize the term "infacility" in our medical language.

In my opinion, this article is indicative of a shift away from the traditional ophthalmological view that:

1. Convergence insufficiency does not represent a functional disorder unless an intermittent exotropia is manifest.
2. The role of accommodation in convergence insufficiency is ignored unless it is associated with a disease process.

What is most noteworthy about the article, and the subsequent commentary by Apt and Guyton, is that they are willing to acknowledge that:

1. Restoring reduced convergence and accommodative ability can result in improved nearpoint performance, but pencil push-ups are an inadequate shotgun approach to treatment.
2. Accommodation plays an important role in the differential diagnosis of convergence insufficiency.

The entity of pseudo convergence insufficiency has been long recognized by optometry.<sup>2,3</sup> Richman and Cron<sup>3</sup> have addressed the differential diagnosis of true convergence insufficiency versus pseudo convergence insufficiency. They state that if the accommodative system is inadequate, and convergence is synkinetically insufficient, plus lenses serve to improve accommodative accuracy and secondarily convergence accuracy. Consequently both the NPC and base-out fusional ranges at near will improve with the appropriate reading prescription.

In the course of my instruction of optometric interns and residents, as well as in continuing education lectures to optometrists, I still raise a few eyebrows when I state that patients with pseudo convergence insufficiency may benefit by the application of plus lenses at nearpoint. "But," they ask, "don't plus lenses always make you more exo at near?" As Mazow and his ophthalmologic colleagues are discovering, plus lenses will aid convergence when the primary cause is accommodative insufficiency.

Most importantly, neither graphical nor OEP analysis per se disclose an adequate profile through which one can diagnose pseudo convergence insufficiency. To do so requires testing of the ability of the patient to sustain accommodative and convergence responses over time.

Hence, the concept of accommodative facility and vergence facility testing and therapy with flip lenses and prisms has emerged. Recent research has generated normative data for these functions across various age populations.<sup>4,5,6,7</sup> In his commentary on the article,<sup>1</sup> Guyton implores his fellow ophthalmologists to utilize nearpoint retinoscopy and cease the abdication of nearpoint analysis to optometrists. Were this to occur, there is the possibility of a new breed of ophthalmologists being created. Might they aptly be called "junior optometrists?"

## References

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