OPTOMETRIC EVALUATION OF THE PATIENT WITH CEREBRAL PALSY

Ellen Richter Ettinger, O.D., M.S.

ABSTRACT
Cerebral palsy is associated with a high prevalence of strabismus, amblyopia, significant refractive errors, oculomotor dysfunction, accommodative deficits and visual perceptual problems. By understanding the etiology, motor and cognitive aspects of cerebral palsy, optometrists can optimize their ability to test, evaluate and manage patients from this population. Methods of testing, assessment, and patient management are discussed.

KEY WORDS
cerebral palsy, temporal classifications, neuro-muscular characteristics, mental retardation, spasticity, dyskinesia, athetosis, ataxia, hemiplegia, quadriplegia, paraplegia, diplegia, monoplegia, triplegia, optometry

Optometrists can provide cerebral palsy (CP) patients with valuable services. It is estimated that there are currently about 500,000 people with CP in this country. Since vision and vision-related performances are often affected, the optometrist can have a significant impact in improving the level of functioning of these patients.

In order to provide maximal optometric services, the practitioner should be well-versed in the etiology, motor and cognitive aspects of the conditions diagnosed as CP; in addition, the clinician should be able to modify and adapt conventional clinical tests to the special characteristics, abilities and needs of the CP patient.

Perspectives
CP is a motor anomaly which results from injury to the motor centers of the brain. The damage may occur before, during or after birth. The severity of the motor impairment varies greatly across patients. CP is a multidimensional, complex condition, and it is important to appreciate the different perspectives from which it can be understood. Table 1 is a summary of these perspectives.

Damage to the motor centers of the brain may occur concurrently with insult to other parts. Thus, associated disturbances, including mental retardation, perceptual deficits, sensory problems and behavioral disturbances may also be present. Figure 1 depicts the relationship of the core motor dysfunction to these associated disturbances.

Table 1
Perspectives for CP Assessment and Management

1. Associated Disorders
   Mental Retardation
   Perceptual Problems
   Sensory Impairment
   Behavioral Deficits

2. Severity
   Mild
   Moderate
   Severe

3. Classification Systems
   Time of Damage
   Neuro-muscular Characteristics
   Portion of Body Affected

Figure 1. Cerebral Palsy: A diagrammatic representation. (Reproduced from Marks NC. Cerebral palsy and disabled children; 1974, courtesy of Charles C. Thomas, Publisher, Springfield, Illinois.)
The severity of the motor problem in CP may vary from mild, to moderate, to severe. In mild forms, only fine movements are impaired. In moderate forms, gross movements and/or fine movements and speech may be somewhat impaired, but the patient is capable of performing general daily activities. In more severe forms, the patient is unable to carry out important functions, and there are more limitations in the patient's activities.

Associated problems, such as mental retardation and perceptual deficits, also occur with different degrees of severity. CP patients exhibit various levels of intelligence and independence: some are very bright and productive, while others are severely limited in their activities and abilities.

Patients with difficulty in speaking, reading and writing will be involved in different daily activities from those whose abilities are not limited. By gaining a sense of a patient's abilities, limitations and individual visual needs, the optometrist can plan which tests and recommendations fit the patient's requirements.

CLASSIFICATION SYSTEMS FOR CEREBRAL PALSY

Time of Onset

Damage to the brain may be associated with prenatal, parnatal, or postnatal causes (see Table 2). Genetic factors and maternal medical problems during pregnancy can cause fetal brain damage. Brain trauma and anoxia may occur during birth, resulting in damage to areas of the brain. Head trauma, infections (e.g., meningitis, encephalitis) and anoxia may also damage the brain postnatally.

Neuro-muscular Characteristics

CP is a non-progressive condition since the damage to the brain is localized and stationary once it occurs; it may, however, erroneously appear to be progressive because of the resulting long-term disuse of muscles.

Injury to certain areas of the brain results in specific symptoms which make it possible to recognize the different clinical types of CP:

Spasticity, the most common type, occurs in about 60% of cases and results from a disharmony of muscle groups. Spasticity is associated with damage to the central motor area or pyramidal tract. This causes unusually strong tonus in various muscle groups. The patient's muscles are often tense and contracted. An individual can move involved muscles voluntarily, but the spasticity of the muscles causes the movement to be slow and inaccurate. When reaching for objects, a rotation of the wrists may occur, and jerky, arhythmic movements may be seen. A patient's first reach for an object may be inaccurate, missing the target, but on a second attempt he may pick up the object successfully.

Dyskinesia (athetosis) occurs in about 20% of cases, and is characterized by involuntary, extraneous motor activity. Uncoordinated, arhythmic, uncontrollable sets of movements describe the motor characteristics of this classification. It is caused by damage to the extrapyramidal tract and basal ganglia. The athetoid is capable of reaching for an object, but shows involuntary, uncontrollable movements along the way. Her arms and legs may move away from the body involuntarily. These movements may affect the extremities (athetoid) with jerky, writhing movements of fingers, wrists, arms or legs. Conscious effort to perform a motor task and emotional stress often intensify the athetoid movements.

Hearing deficits are common in individuals with athetosis, and this will affect the overall function of the individual. In place of the arms and legs (athetoid), the proximal parts (dystonic) of the limbs and trunk may be affected by these uncontrollable, jerky movements.

Ataxia occurs in about 10% of cases, and is characterized by poor balance, a high-stepping gait, and gross and/or fine motor coordination problems. Resulting from a lesion in the cerebellum, which is responsible for controlling balance and muscle coordination, the ataxia's kinesiologic body awareness and sense of balance is disturbed. Awkwardness and unsteadiness in maintaining balance are typical. Nystagmus is common.

Mixed types, with combinations of the above forms, occur in 15-40% of patients; spasticity combined with athetosis is the most frequent combination, with ataxia and athetosis also seen together, but less commonly.

Part of Body Affected

Cerebral palsy is also classified by the portion of the body that is affected (see Table 3). Hemiplegia, occurring in about 30-40% of cases, is the term used when the deficit is limited to one side of the body, such as partial or complete paralysis of either the complete right or left side.
Quadruplegia, occurring in 15-20% of cases, refers to involvement of all four extremities.

Paraplegia, occurring in 10-20% of cases, means involvement of both legs, with a relative or complete sparing of the arms.

Diplegia, occurring in 10-20% of cases, refers to a form that falls between para- and quadriplegia. The predominant involvement is of both legs, but all four extremities are involved. Spasticity is most common in this type.

Monoplegia, with only one limb (arm or leg) involved, is very rare.

Triplegia, with three limbs involved, is also quite rare, and is usually of the spastic type.

### Table 3

<table>
<thead>
<tr>
<th>Terminology Of Portion Of Body Affected</th>
<th>Description</th>
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<tbody>
<tr>
<td>Hemiplegia</td>
<td>affects one side of the body</td>
</tr>
<tr>
<td>Quadruplegia</td>
<td>affects all four extremities</td>
</tr>
<tr>
<td>Paraplegia</td>
<td>affects both legs, with a relative or complete sparing of arms</td>
</tr>
<tr>
<td>Diplegia</td>
<td>predominant involvement of both legs, but all four extremities are involved</td>
</tr>
<tr>
<td>Monoplegia</td>
<td>only one limb (arm or leg) affected (very rare)</td>
</tr>
<tr>
<td>Triplegia</td>
<td>affects three limbs (very rare)</td>
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</table>

Duckman reported a prevalence of 92% of oculomotor dysfunction, 100% of accommodative insufficiency, and 78% of visual perceptual dysfunction in a group of CP children. He found that most showed an inability to make accommodative shifts of as little as 0.25 D. Further, he demonstrated improvements in ocular nolities25,26 and in accommodative amplitude and facility25,26,27 with vision therapy. He also found improvements in visual perceptual abilities, directionality concepts, and body schema. Such improvements suggest that CP patients can benefit from appropriately-designed vision therapy programs.

### Table 4

<table>
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<tr>
<th>Visual Problems With A Higher Frequency In Cerebral Palsy Patients Than In A Random Population</th>
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<tr>
<td>Strabismus (15-69%, most studies over 40%);6,19</td>
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<tr>
<td>Amblyopia (6-32%);6,11,13,18,19</td>
</tr>
<tr>
<td>Oculomotor Dysfunction (92%);17</td>
</tr>
<tr>
<td>Accommodative Insufficiency and Infacility (100%);17</td>
</tr>
<tr>
<td>Visual Perceptual Deficits (78%);17</td>
</tr>
<tr>
<td>Significant Refractive Errors (40-76%);10,11,13,16,17,19,20</td>
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The literature on visual anomalies in CP indicates a high prevalence (see Table 4).

In particular, studies have shown high rates of strabismus,6-19 amblyopia,6,11,13,18,19 significant refractive errors,17 oculomotor dysfunction,17 accommodative deficits,17 and visual perceptual problems.17 Nystagmus6-11,13,16,19 and optic atrophy6-11,13,18,19 have also been cited, although at much lower rates than the previous problems. The significant occurrence of these conditions emphasizes the importance of providing vision care to these patients.

Strabismus is the most commonly cited visual finding in CP patients, with most reports showing a prevalence between 30-60%; this is much higher than that of a random population. It is believed that in CP patients, strabismus is a consequence of the injury to the motor centers of the brain. Discussions on this suggest that since the strabismus is neurological, and not of a functional origin, vision therapy is not indicated. Consequently, optometric therapy programs for CP patients with strabismus and amblyopia are frequently not instituted, unless the condition is believed to be of a functional nature, such as an intermittent exotropia. A study in a small group of CP patients showed, for example, that neither vision therapy nor surgery was effective in correcting strabismus. There are, however, a number of other visual problems which are ameliorated by vision therapy.

The examination of a CP patient starts when the patient enters the optometrist’s office. By making careful observations about the patient’s abilities and skills. The patient’s gait, the manner in which she navigates the environment, whether she negotiates the wheelchair or requires someone else to push it are all cues that provide an initial impression of the patient’s motor skills. The patient’s ability to make eye contact with the optometrist and staff reveals information about her visual responsiveness and fixation.

From the onset of the clinical encounter, care should be taken to ensure patient comfort. It is at this point that the doctor-patient rapport begins to develop. From the case history, through the full examination sequence, the optometrist will find that establishing and building good doctor-patient rapport can contribute to the success of the clinical interaction. While this is true in all patient care, it is particularly so for “special population” patients.

A patient’s comfort can be optimized if the office is prepared to accommodate his or her special needs. Often, patients in wheelchairs are made to feel that allowing for the wheelchair is an imposition on the optometrist and office staff. With proper furniture arrangement, space can be made available for the wheelchair. Some optometrists have room directly next to the traditional examination chair; this arrangement facilitates the use of the phoroptor, keratometer and other traditional optometric equipment in patients for whom this is appropriate.

Arranging the furniture in the office properly and making the appropriate equipment available are important to the comfort and satisfaction of both the patient and the optometrist; when the furniture is not placed suitably, and the patient’s needs are not met, a frustrating experience for both optometrist and patient results. An office that is arranged appropriately, on the other hand, can make the patient feel welcome and at ease. This contributes to the success of the clinical interaction.

Another way of optimizing patient comfort is to inquire about the patient’s needs at the time the appointment is made. The office staff member then asks whether the patient requires any special accommodations, and plans accordingly to prepare for the patient’s arrival.
Case History and the "Entry Form"

The examination of a CP patient should start with a detailed case history so the optometrist has a good sense of any visual problems, as well as a clear understanding of the motor deficits and associated disturbances. This provides the optometrist with helpful insights into the patient's overall functioning.

An "Entry Sheet for the Cerebral Palsy Patient" is presented to assist the optometrist to effectively identify and gather pertinent patient history and background (see Figure 2).

An early question on the sheet inquires whether the person who accompanies the patient is assisting in responding to case history questions. This will later remind the optometrist of the degree to which the patient is verbal, and whether non-verbal forms of communication will be required during the examination sequence. For patients with limited verbal skills, or for those who are non-verbal, the individual accompanying the patient should be someone who knows the patient well and can provide the required information about the patient's activities and needs. Parents, teachers and social workers who accompany patients are usually very cooperative and helpful in providing the necessary details.

The "Neuro-muscular Classification" and "Portion of the Body Affected" sections give the optometrist an understanding of the status and extent of the problem. The "Time of Onset and Cause" sections give information that can alert the optometrist to specific visual conditions. If the CP resulted from rubella, for example, the optometrist should be aware of the potential for the classic rubella "salt and pepper" fundus findings; in cases of prematurity and birth trauma, the optometrist is alerted to signs of retinopathy of prematurity.

Individuals with CP are often under the care of several health professionals, including neurologists, internists, orthopedists, psychologists, physical and occupational therapists and social workers. The section "Other Health Professionals Involved" accounts for this. Many patients are involved in multiple therapies and, in order to manage the visual status comprehensively, it is important to consider how it affects, and is affected by, the patient's other medical concerns and treatments. Communication with the other health professionals involved in treating an individual may be advisable and is often paramount in the interest of optimal optometric patient management.

The "Current Medical Problems/Medications Taken/Other Health Professionals Involved in Caring for the Patient" section is particularly important because many of these patients are treated with drugs that have ocular side effects (e.g., Phenobarbital, and other anti-convulsants and anti-seizure medications). These can have significant effects on the patient's visual abilities.

At the end of the set of inquiries on the "Entry Form," the optometrist continues the history with more general types of questions (e.g., clarity of vision at distance and near). By initially collecting the information on the "Entry Sheet," the optometrist has an advantage in continuing with the traditional optometric history and in planning the examination in a patient-oriented manner.

The "Entry Sheet" offers a framework for the clinician to gather relevant information about the patient's CP assessment and associated problems. Without an understanding of these characteristics, the optometrist may be apprehensive about how he or she will approach working with a patient. By gaining this information at the onset of the encounter, the optometrist obtains a better understanding of the patient's level of function, visual requirements and special needs for optometric testing.

Figure 2.
same tests are used and carried out the same way on all patients. Although certain problem-oriented tests are added to address specific concerns, most optometrists use a standard battery of tests on their patients. In the CP population, this regularity and predictability is not routine. Many patients are unable to respond to standard clinical tests; they may not have the verbal skills to respond in the conventional way, nor the motor skills to sit in front of a phoropter or biomicroscope. In addition, the range of abilities across patients means that different patients may have difficulties with different parts of the exam. As the exam progresses, the optometrist has to decide how to best gather the clinical data for each component of the exam. He or she has to consider performing traditional tests in non-traditional, but reliable, ways and find alternative methods of obtaining clinical findings for this population.

If the optometrist determines that the patient will be unable to perform certain tests in the examination sequence, a creative modification can often allow for some, if not most, of the desired information to be gathered. These modifications enable the clinician to carry out tests which initially may appear impossible to do.

Planning for Different Modes of Patient Communication

A prime example of modifying testing methods involves patient communication. Some CP patients have good verbal skills, but for those with limited verbal abilities, alternative methods of communication should be considered. Although it may initially appear difficult, or impossible, to communicate with a non-speaking patient, some may actually be able to give a lot of information. To facilitate this, the optometrist should find out the patient’s mode of communication. For example, some non-verbal patients can use communication boards. These devices are generally positioned like a table, in front of the patient’s wheelchair; the board can contain letters of the alphabet, words and/or pictures. The use of letters, words and/or pictures is determined by the patient’s cognitive skills, and ability to use language. A typical communication board is shown in Figure 3.

On communication boards with pictures, commonly used items, objects and people who frequently come into contact with the patient are represented. If a letter board is used, patients may be able to spell out words by pointing to letters, or answer questions by pointing to ‘Y’ for “yes,” and ‘N’ for “no.” Communication boards can be powerful tools to glean information from CP patients.

Flexibility and Creativity During the Examination

When a patient becomes bored or uncooperative with a particular area of testing, changing to a different type of task, or moving to a different part of the room, may reenergize attention and cooperation. Moving from the examination chair to a chair and table on the other side of the room, or switching from distance testing to near testing, are two possibilities.

Creativity and flexibility in performing examinations can enable the examiner to obtain the most clinical information, with the greatest patient cooperation. Recommendations for various parts of the examination sequence follow:

Visual Acuities

It should not be assumed that all non-verbal patients cannot respond to a Snellen chart. Although it may appear difficult to obtain visual acuities in a non-speaking patient, the optometrist may have the patient point to letters on the communication board; this is an example of a traditional test done in a non-traditional way. Rather than calling out letters on a near chart, other patients may be better able to write them on a sheet of paper, as the clinician points to them.

The optometrist should also have other methods readily available, since the Snellen chart will not be suitable for all patients. Other tools to assist in the assessment of visual acuities include Tumbling E charts, distance and near picture charts, the Broken Wheel test, Allen Picture Cards, and the Parson’s Visual Acuity Test.

For those not able to verbalize or otherwise indicate letters, symbols or pictures, still other methods can be used. The Forced Preferential Looking (FPL) Technique is based on evidence that infants will look at patterned fields rather than homogeneous fields of matched brightness. In the FPL technique, the stripes of the patterned field stimulus cards become increasingly narrower. The examiner watches a child’s eye or head movements to determine which of the two fields he prefers. At the point when the stripes are no longer resolvable by the patient, both sides appear homogeneous, and the examiner can no longer identify a preference in the child’s pattern of looking. In the non-handicapped population, this technique usually is ineffective by about 10 months of age, but its usefulness has been shown to go well beyond this age in a neurologically-impaired population. The Teller Acuity Cards are available to clinicians who wish to use the FPL technique.

The optokinetic nystagmus (OKN) response can also be used with patients who are not able to give direct visual acuity responses. When moving stripes are presented to the patient, involuntary optokinetic eye movements usually result. In this technique, stripes of gradually decreased width are rotated in front of the patient. When the OKN response disappears, the stripes are no longer resolvable by the patient. Visual acuity is calculated by considering the testing distance and stripe width.

Still another probe to aid in the determination of visual acuity in the otherwise unresponsive patient is electrodiagnostic testing. The Visual Evoked Potential (VEP) provides an objective assessment of macula and optic nerve function. It is an electrophysiological measure of activity in the visual cortex resulting from stimulation of the central retinal cones. In VEPs, the most common stimuli are flashing checkerboard patterns, which are decreased in size until electrophysiological activity is no longer evident. The size of the checkerboard in the pattern at this point is used to compute the visual acuity. The Electroretinogram (ERG) is another objective procedure, but it is a more gross test of retinal function. In ERGs, brief, bright flashes of light are presented to the
patient; unlike the VEP, the ERG measures overall retinal stimulation. Both VEPs and ERGs involve attaching electrodes to the patient. Once they are in place, very little else is required of the patient.

**Oculomotor Assessment**

Probes here include the cover test, the Hirschberg test, pursuits, saccades, and nearpoint of convergence. The clinician should use bright, interesting targets to maintain the patient’s attention, and have several on hand in order to change targets for different tests. Transilluminators, flashlights with colored filters, animals that light up and brightly-colored toys are helpful.

A projection-type ophthalmoscope is useful with CP patients to determine fixation patterns.

**Refractive Status**

Several tests can be used productively with CP patients to help determine their refractive conditions. The curvature of the front surface of the cornea can be evaluated with a keratometer in those patients who have the requisite motor skills and control; the Placido disc can provide this data when keratometry is not possible. For distance retinoscopy, lens racks or +2.00 flipppers are appropriate when only quick glances of the reflex are possible. These enable the optometrist to obtain a “ball park” estimate of the patient’s refractive condition.

The extent of subjective testing for ametropia depends on the patient’s responsiveness and ability to participate. Some patients with mild CP can sit behind a phoropter and give valid and reliable responses, but this occurs with a minority of patients. Most will more likely require trial frame refractions with a more limited subjective sequence. In these instances it is often helpful to use larger increments in lens power than is done in the conventional subjective.

When the patient shows limited responses, the optometrist should be prepared to use other procedures such as cycloplegic retinoscopy, cycloplegic subjective examination, the Mohindra retinoscopy technique, and photorefraction. No specific contraindications for cycloplegia are found in the literature specifically for CP patients; however, since this population has a high incidence of systemic disease and many are on medications, the potential of drug interactions and ocular side effects should be considered. Cycloplegic refraction can be very helpful, but many clinicians utilize pharmaceutical agents conservatively in this population. As with pharmaceutical use in all patients, the decision to use cyclopletics is made on an individual basis.

**Binocular Vision and Accommodative Testing**

Only the most alert patients will be able to respond to the full set of standard binocular and nearpoint tests. When conventional binocular tests are not feasible, tools to help assess binocularity include the Randot E Test, the Stereo Fly Test, various vectograms and anaglyphs, and Worth 4-Dot Test, and stereoscopic fusion cards. Accommodative data can be gathered in patients with whom accommodative amplitudes and accommodative facility testing (+2.00 flipppers) are possible. To obtain accommodative data in non-verbal, less responsive patients, the more objective tests are helpful. Various forms of dynamic retinoscopy, including the monocular estimation method (MEM) can be used.

**Perceptual Testing**

Tests to assess body knowledge, form perception and directionality are important, since limitations in these areas are common in the CP population.

When motor abilities allow, some of the tests within the SUNY battery, such as Standing Angels-In-The-Snow, Chalkboard Circles, 3:3 Alternate Hop, and Pegboard Testing can be administered. In assessing the patient’s concept of self-lateralization and directionality, the Piaget Left-Right Awareness Test can be used. Auditory-visual integration can be assessed by the Birch-Belmont Test, in which the patient listens to an auditory sequence and then identifies the corresponding visual pattern.

Even when the patient’s motor defects are severe, it is still possible to assess visual perception. The clinician can use non-motor tests, such as the Test of Visual-Perceptual Skills (TVPS). Visual discrimination, visual memory, visual spatial relations, visual figure-ground and visual closure are some of the subtests of the TVPS. The normative data of these tests are often of little practical use with the CP patient. However, the raw scores of these tests can provide the practitioner with a baseline of the patient’s abilities over a range of perceptual and cognitive skills. Frequently the optometrist can provide new and valuable information about these aspects of vision to parents, teachers and social workers.

**Ocular Health Testing**

As primary eye care providers, optometrists examining CP patients should examine for pathology in the usual manner and make appropriate recommendations and referrals in the event any is found. Direct and indirect ophthalmoscopy are of paramount importance in this vulnerable population. Since many patients move around in the chair as a result of their motor defects, and many have poor fixation, dilation has significant advantages with this population. The benefit of dilating agents, however, has to be considered in combination with the potential side effects and risks. As with cycloplegics, the decision on whether to use pharmaceutical agents for dilation is best made on an individual basis.

External inspection of the eyes, both with the naked eye and magnification, should be done to identify any abnormalities. For patients unable to sit behind a biomicroscope, a hand-held model should be available, as should a portable tonometer.

**Patient Management**

Four aspects of patient management are addressed: communications, binocular dysfunctions, decision-making on strabismus surgery, and when to prescribe glasses.

a. **Communications**

One of the most important aspects of patient management is the communication of the clinician’s findings. By providing information about the visual status and abilities of a CP patient to parents, teachers, social workers, psychologists and other health care professionals, the optometrist can facilitate the development of realistic goals and activities. In particular, input from the optometrist can have a significant impact on educational planning and placement.
b. Binocular Dysfunctions

An important management strategy is for the optometrist to thoroughly discuss with the patient, or the patient’s agent, the effect a binocular problem does or does not have on the patient’s functioning. Often, those involved in the patient’s life are unaware of a severe accommodative or convergence insufficiency that hampers the patient’s ability to read or write for any length of time. In this instance the inability is wrongly thought to be solely the result of inattention. On the other hand, they may attribute negative functional influences to a more cosmetically obvious, long-standing constant strabismus.

Because there is evidence that certain binocular dysfunctions can be ameliorated by vision therapy,25,26,27 it should not be eliminated as a viable option simply because the patient has CP. A future article will address the factors that need to be considered, the planning and methods used to optimize vision therapy for CP patients.

c. Decision-making on Strabismus Surgery

Optometrists are often consulted on whether strabismus surgery is indicated, and the high incidence of strabismus makes the question of surgery a very realistic and important one for parents and other health professionals. The neurological basis for strabismus, the risks of surgery in this vulnerable population, and the guarded success of strabismus surgery in CP patients24 should make the optometrist thoroughly consider whether strabismus surgery is in the best interests of the patient. My experience is that there is little to recommend this invasive intervention for CP patients.

d. When to Prescribe Glasses

Decision-Making here is often complicated since it is sometimes difficult to predict whether a patient will benefit from a prescription. In general, if a patient has complaints of blurred vision, the optometrist should prescribe corrective lenses, as he or she would in the non-CP population.

If a significant refractive error is found, the optometrist should also prescribe, even if the patient is apparently asymptomatic. My general guideline for "significant" is at least 1.50 diopters of myopia, hyperopia or astigmatism. However, since many of these patients’ activities are primarily at near, hyperopes can sometimes benefit from corrective lenses of smaller magnitudes. In presbyopic patients, even 1.00 diopter of hyperopia may warrant correction. The general guideline of at least 1.50 diopters is a good rule of thumb, but individual decision-making is important in fine-tuning the plans for a specific patient.

In cases in which a refractive error is found, but there are no symptoms, or where cognitive abilities are limited, the optometrist should be aware that patients may reject the glasses and refuse to wear them. The optometrist should not consider this a failure but rather an opportunity to see how the patient responds to glasses. Frequently it is difficult to determine whether a patient will accept a refractive correction unless is is actually worn.

SUMMARY

Optometrists have the opportunity to make a significant difference in the visual functioning of patients with CP. In order to maximally serve this population, a summary of the recommendations discussed is provided:

1. The clinician should be knowledgeable about the etiologies, the motor, sensory-motor, cognitive, and visual dysfunctional characteristics of the CP patient.
2. The patient’s comfort with the office environment, and the optometrist, should be optimized. Development of doctor-patient rapport is particularly paramount in this population.
3. Anticipating the needs of patients from special populations, arranging furniture in the optometric office appropriately, and preparing the applicable testing equipment in advance can result in more successful clinical encounters. Office procedures which facilitate inquiries about a patient’s special needs, at the time the appointment is made, can assist the optometrist and office staff in preparing for the special needs and comfort of the patient.
4. The optometrist should be flexible in terms of departure from a rigid testing sequence. The motor, verbal, cognitive and visual abilities of CP patients require that innovative methods be used to obtain maximum information about the patient’s visual system.
5. Optometric intervention for CP individuals should not be based solely on evaluation of the visual system. Rather, the patient’s overall abilities should be considered so the recommendations are realistic, attainable, and germane to the patient’s lifestyle and goals. While this is true for all patients, it is particularly important for this special population.

6. The clinician must understand that these patients require more time, effort and creativity to cater to their special needs. Consequently, there must be a real commitment to serve them.

ACKNOWLEDGMENT

The author wishes to thank Dr. Robert Duckman for his assistance in reviewing this manuscript. Preparation of this manuscript was supported in part by a grant from the NYS/UAU Joint Labor-Management Committees.

FOOTNOTE


REFERENCES


**Editorial continued from page 113**

the output of OEP, the network for behavioral optometry. As the major vehicle for information regarding clinical behavioral vision care, the output of OEP is judged to be the body of knowledge of behavioral vision care. However, OEP cannot, will not and never has dictated the way the clinician should practice. OEP shares information so that the participants in the network have access to the body of knowledge that is behavioral optometry. The one consistency that I have seen in behavioral vision care is the difference from practitioner to practitioner. These small differences, sometimes competing philosophies of behavioral optometric vision care, this constant evolution of thought, methods and treatment regimens are the reasons why OEP exists in 1991. The OEP Foundation, this journal, the curriculum monographs, the seminars and congresses, all exist so that individual practitioners can discover and understand how and why their colleagues practice as they do. There will probably never be another Skeffington, Getman or Hendrickson. From this time forward, behavioral optometry will operate without a single apostle as the source of all knowledge. That role will continue to be shared by all behavioral practitioners. OEP is the network through which they will communicate between themselves and with the future generations of behavioral optometrists.

*Corresponding author: Ellen Richter Estinger, O.D., M.S. SUNY College of Optometry 100 E 24th Street New York, NY 10010 Date accepted for publication: May 10, 1991*