DIAGNOSTIC PATCHING REGIMEN

For the Profoundly Multiply Handicapped, Visually-Impaired Child (PMHVI)

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Abstract

Teachers often receive vision reports from eye doctors stating that the profoundly multiply impaired child they are working with is "untestable." In order to plan for and maximize the child's learning potential, the extent to which the child can function visually must be determined in order to incorporate visual stimulation into educational activities. This article presents one method of determining the level of visual functioning of the profoundly multiply handicapped, visually-impaired child through the use of a patching regimen.

Key Words

patching, profoundly impaired, visually-impaired, multiply handicapped (PMHVI)

Low vision patients often present a challenge to the clinician because of their inability to perform visual tasks impacting on their daily activities. Fortunately, they usually can communicate effectively with the eye care practitioner and often benefit from optical and non-optical options which satisfy their needs. However, when working with a severely or profoundly impaired individual with a visual handicap, the practitioner does not have the benefit of this type of communication. In fact, these individuals, particularly children, are most often nonverbal and are dependent upon care givers for survival needs. Because of this communication deficit, these children are most often labeled as "untestable" or their vision is "impossible to quantify."[1,2] Therefore, the degree of impairment in these cases is typically reported as category nine or "undetermined" in the World Health Organization's International Classification of Impairment, Disabilities and Handicaps. For most profoundly multiply handicapped visually-impaired (PMHVI) children, the care givers are often unable to develop training or educational programs with visual input because they often do not even know whether the child can see.[3,4,5,6] This, then, becomes the primary responsibility and the important task of the optometrist.[7,8] Some of these children become frustrated when training with instructional services utilizing the visual presentation of materials. This frustration is shared by their teachers, who cannot determine if unresponsiveness is because of a cognitive or visual disability. Certain information that the optometrist should provide the teacher is of paramount importance; namely, the degree to which the child can see, and the identification of parameters (size, working distance, contrast, lighting, etc.) to facilitate visual functioning. If these parameters are provided and the child does not respond, the tentative diagnosis of cognitive deficit can be made with more certainty. However, if the optometrist is able to determine parameters for visual functioning which facilitate appropriate behavioral responses, the educator can be more aggressive and productive in seeking visually-related educational activities. Most important, appropriate educational resources can be utilized with a minimum expenditure of professional time and financial allocations.[9,10]

Equally important is the parents' or care givers' understanding of the visual capabilities of the child. All concerned should understand the child's visual responses and how these relate to the services offered by the school in order to avoid the misapplication of services. When there is success in the classroom or home-based educational setting, it will contribute to a positive working relationship between parents, teachers, and the school system.

Unfortunately, many eye care practitioners do not have the appropriate experience to effectively evaluate these children in order to obtain important visual information. Conventional clinical evaluation techniques are heavily reliant on verbal communication and are inappropriate in these situations. Experienced clinicians use an alternative approach to the clinical assessment, usually a descriptive evaluation of the child's visual capabilities. However, during these in-office examinations, which are done in short specified time periods, the clinician cannot control such variables as the child's level of fatigue or disposition at that time. These make reliable judgments of subjective responses questionable at best.

We propose a more reliable subjective test sequence that will give the clinician an effective technique to better quantify or describe the child's vision. Diagnostic patching is the key to this subjective evaluation and is a tool found to be extremely valuable in the assessment of the PMHVI child (or adult).[10]

However, there is certain information that must be obtained prior to initiating diagnostic patching.

History

The visual and medical history of the patient should be reviewed in depth. Along with the standard history, the clinician anecdotally determines the interrelationships between physical, visual and mental capabilities. This information can be obtained from parents and professionals alike. Parents are usually the most important resource for a comprehensive overview of the child's previous developmental care. However, caution should be exercised when assessing parents' impressions of their child's visual capabilities. Some will exaggerate the child's visual and/or cognitive abilities due to emotional/denial reasons or because the child has learned rote patterns of response in the home environment. Therefore, direct contact with other professional care givers can be very informative and valuable in validating the parents' observation.

Ocular Health Assessment

While the ocular health evaluation is very important, the results or observations should not necessarily be considered a predictor of the outcome of the functional assessment. Visual functioning should not be predicted solely on the appearance of the anterior segment, media, retina or optic nerve. Often what appears to be an impenetrable media does not necessarily preclude a highly functioning visual system.

Objective Assessment

Prior to beginning the subjective evaluation, it should be determined if there is a significant refractive error. In some of these children, visual behavioral changes can be made simply by utilizing the appropriate lens prescription. There are a number of refractive procedures that address this aspect of the examination[11,12] for the non-communicative patient. Static and dynamic retinoscopy, auto-refraction, photo-refraction, placido disc, keratoscopes, keratometry and even monocular direct ophthalmoscopy can be used to determine the presence of a significant refractive error. If the correction is deemed significant by the practitioner, it should be given to the patient prior to subjective testing to maximize responses. For example, a child with retinopathy of prematurity was determined to have no vision by care givers and a medical examination. In the low vision examination, the retina was observed with a -15 diopter lens in the ophthalmoscope, suggesting a highly myopic eye. After providing the correction, the child was observed to be more alert and aware and was given appropriate functional and educational activities to enhance his quality of life.

Subjective Assessment

Since most rehabilitation and education programs are dependent upon some visual response to the environment it is vitally important to know the extent to which the patient can see. It would be satisfying to be able to determine a subjective level of acuity or acuity potential for each child through traditional interactive techniques. However, most of these children are so profoundly impaired that they are unable to provide information to determine the presence or absence of vision by verbal responses. Some techniques address the presence or absence of vision based on responses during a finite period of time. This type of testing is typical of preferential looking, optokinetic nystagmus, matching, etc.[14,15] To those powerful clinical tools the clinician can add diagnostic patching. This method can help quantify the child's vision, is independent of time and is structured around prolonged systematic observations. The following are steps for administering this diagnostic patching regimen for a PMHVI child.

1. The child should be observed performing the same activities requiring vision at a specific time of day so that baseline data can be established. The teacher or care giver must observe these activities very carefully to determine any consistencies in behavior. Additionally, this prepares the observer to be more aware of what to expect as the patching program progresses. It will also make the educator or care giver more comfortable in making these important observations during the patching program. Once this is established, the actual patching can begin.
2. The child first has a patch placed on the forehead to eliminate any behavioral change caused by the sensation of the patch. Otherwise, behavioral changes related to the irritation and occlusive effect of the patch cannot be appropriately separated and interpreted. The length of time this is necessary depends upon the personality, tactual awareness or defensiveness of the patient. Once it is determined that the patch does not create any behavioral changes, the next step can be initiated.
3. The patch is placed over one of the eyes during the same visual activities as in Step 1. This interaction should occur at the same time every day and remain consistent over the duration of the assessment. Patching should be avoided during meal times and toileting. It is inappropriate to disrupt the child at these times from a psychological standpoint. These activities can present additional uncontrolled variables that may confound the information.

   Patching is done for a specific length of time each day. This should be determined by the educator who keeps a log to determine any behavioral changes (positive, negative or neutral) which occur during this time in contrast to behavior without the patch. This is repeated for as long as the educator feels is necessary to determine whether there are any consistent responses when the child is patched. Some exam-

ples of the types of responses that may be expected are:

a. The child continues to perform the task with the same level of interest and capability as without the patch. This may indicate the child is not using any visual input from the patched eye and has no functional vision in that eye or is incapable of processing the visual input.
b. The child tears the patch off at each session and does not perform the task. This may indicate a new preoccupation with the patch or that the patched eye is the one used for gathering information and when occluded, eliminates vision.
c. The child continues to perform the task as before but changes to an abnormal posture, closer working distance, takes more time to complete the task, performs at less efficiency, etc. This may suggest some vision in the open eye but that the child functions better binocularly. This observation requires further assessment by the optometrist.
d. The child may perform the task better with the patch. This may indicate a problem with binocularity, such as diplopia or ghost images. In this eventuality, the teacher, with comanagement by the optometrist, may wish to continue the patching during visual activities that are more cognitively demanding.

4. Once the educator has accumulated enough information in the log to be comfortable with the reliability of the observations, the other eye is patched. The teacher should continue to maintain the log, looking for the same behavioral changes as noted in Step 3 above.
5. If there is no change in response to monocular patching, both eyes are patched for a period of time. This patching should be done during the same activities and time periods as occurred during the monocular patching and with a continuation of the log. The purpose of the patching is to determine if total occlusion of both eyes results in a decrease in performance compared to all the other phases of the patching regimen. If there are no changes, this suggests that the child does not have light perception or has not learned to take advantage of a very reduced degree of vision or does not have the cognitive skills to appreciate the visual information. This might lead to an educational plan that would concentrate on auditory and/or tactual inputs, placing visual activities lower on the educational hierarchical scale. However, it is important that the assessment be conducted again at a later time. A lack of response doesn't necessarily preclude further development of vision at a later date. Growth and development, as well as continued general stimulation, can trigger visual changes.

All the data should be reviewed for any consistent visual responses. If it is determined the results were caused by simple practice effects, then a different time or activity (with similar parameters) should be attempted. However, if the data appears to be valid, it should be used as a guide in developing an appropriate program for both cognitive and visual stimulation. The authors have also had the parent/care giver keep a similar log without sharing that information with the educator. It is very interesting to compare the results to see how responses are recorded and interpreted.

Conclusion

Decisions concerning the visual processing of PMHVI children should not rely on a single type of evaluation. An assessment using long-term monocular and binocular patching and observation can provide the clinician-teacher team with strong evidence to confidently proceed with the development of an educational plan. When making these observations or recommendations for a PMHVI child, it is best to treat the suggested treatment option(s) as a "best hypothesis" based on the child's present performance. Monitoring changes or progress in the educational program and providing clinical follow-up care will insure an optimal level of vision and learning environment for the child.

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