AMERICAN ACADEMY of OPTOMETRY

CLINICAL DIPLOMATE

Binocular Vision, Perception, & Pediatric Optometry Section

Clinical Diplomate Candidate's Guide

Welcome to the Binocular Vision, Perception and Pediatric Optometry Section's (BVPPO) Diplomate program. These Clinical Diplomate guidelines outline the requirements and procedures for becoming a Clinical Diplomate in the BVPPO Section.

Clinical Diplomate status is a prestigious designation for optometrists who have demonstrated exemplary diagnostic and patient management skills, clinical proficiency, and professional judgment that ensure the highest quality of care for their patients. It recognizes achievement and excellence and establishes the Diplomate as a distinguished top professional in the area of BVPPO. It is expected that Diplomates continue to pursue new knowledge, apply new research and advances in the field of binocular vision, perception, and pediatric optometry, and also contribute to the Academy by their active participation in Section activities.

Please review the requirements carefully and if you have any questions, contact the Diplomate Chair.

Please note that this guide supersedes all previous information and instructions regarding the Diplomate process.

REQUIREMENTS FOR THE CLINICAL DIPLOMATE

To apply to become a Clinical Diplomate Candidate, you must:

1. Be a Fellow in good standing of the American Academy of Optometry

2. Submit a completed BVPPO Clinical Diplomate application on the AAO website and mail the $100 application fee (made payable to the American Academy of Optometry) to:

Binocular Vision, Perception, & Pediatric Optometry Section Diplomate Program
American Academy of Optometry
2909 Fairgreen Street
Orlando, FL 32803
Fax: 407-893-9890

Once your application is accepted, you must complete the following:

1. Submit five (5) written clinical case reports for review.
    - The first case report must be accepted before the other case reports can be submitted.
2. Pass a comprehensive written examination
    - At least one case report must be accepted to be eligible to take the written examination.

- The examination is administered at the Annual Meeting, typically the Tuesday immediately prior to the meeting
- Passing criterion is 80%
- Please notify the Diplomate Chair of your intention to take the written examination by July 1

3. Pass a practical clinical examination

- All case reports must be accepted
- The written exam must be successfully completed
- The practical examination is administered off-site at a practice location at the Annual Meeting; typically it is scheduled the Wednesday or Thursday of the meeting
- Please notify the Diplomate Chair of your intention to take the practical examination by July 1

4. Pass an oral examination

- All 5 case reports must be accepted
- The written exam must be successfully completed
- The practical examination must be successfully completed
- The oral examination is typically administered on-site at the Annual Meeting on Friday
- Please notify the Diplomate Chair of your intention to take the oral examination by July 1
- During the meeting when the oral examination is administered and successfully completed, please plan on attending the Annual Banquet on Saturday night

Most candidates find having a mentor to guide and advise them through the Diplomate process extremely helpful. If you do have a BVPPO Diplomate mentor in mind feel free to ask that person; if you are unsure of whom to work with, please ask the Diplomate chair to assist you in obtaining a mentor.

I. CASE REPORTS

The first step in the Diplomate process is to complete the case reports requirement. The purpose of the case reports requirement is to inform the Diplomate Committee of your patient care approach and to determine your knowledge and expertise in specific areas of the clinical care of pediatric patients and those with binocular vision and perception disorders. The case reports are important in the process as they are used to determine the candidate's thought process with regard to differential diagnosis and patient management.

Case reports are primarily intended as a means of demonstrating your knowledge, thought process, and management acumen; therefore, comprehensive literature reviews are not necessary. Of course, please add references as appropriate, particularly if you feel that they support your decision-making process. We want to see your approach to patient care presented in a concise and understandable manner for our reviewers. Please be sure to de-identify all case reports and attached materials; do not include your patients' names, your name, or your practice's name. Your case reports will be sent to two BVPPO Diplomates for review. Please wait until your first case report is accepted before submitting subsequent case reports. This will allow you to receive feedback from reviewers and ensure that your first case report is the appropriate length and format, and contains sufficient content before you complete your other case reports.

A. Case Report Topics

The case report requirement is **five (5)** clinical case reports in designated areas. Candidates are required to submit one case report on each of the **three (3)** following conditions:

1. **Management of Significant Refractive Error**: Case should be for a child <4 years of age with previously uncorrected significant refractive error or aphakia. Prescribing rationale, any emmetropization and risk factor considerations, and effect on function (visual and other) should be discussed.

2. **Treatment of Amblyopia**: Case should be for a patient with unilateral amblyopia whose treatment requires more than optical treatment only. A case with some form of active office- or home-based vision therapy is strongly preferred. However, if active vision therapy is not a significant part of treatment, an addendum should be included that discusses the rationale for and components of an active therapy program for amblyopia.

3. **Treatment of Strabismus**: Case should be a patient with a strabismus where treatment included some active home- or office-based therapy (passive treatment can also be included). Accommodative esotropia that resolved entirely with an optical correction or a low-frequency intermittent strabismus are not acceptable types of cases. If the patient was co-managed with a pediatric ophthalmologist, include the pertinent treatment information from that practitioner. (Simply referring the patient for surgery, without any treatment provided by the candidate, is not acceptable.)

Candidates should select **two (2)** of the following conditions to submit as the remaining 2 case reports to complete the five (5) total case reports:

1. **Non-strabismic Vergence Disorder** (with or without an associated accommodative or saccadic dysfunction): Case should be managed primarily with active vision therapy.

2. **Learning-Related Vision Problem (Visual Information Processing):** Case should include both visual efficiency and visual perceptual diagnoses and be managed primarily with active vision therapy. A case demonstrating your role as a multi-disciplinary team member is preferred.

3. **Pediatric Patient with Identified Developmental Disability**: Case should include unique concerns in regards to the diagnosis and treatment of a patient with a developmental disability, as well as any referrals for additional evaluations and/or care. Any deficits found in visual efficiency and visual perceptual skills should be addressed. Discuss your role as a part of the multi-disciplinary team in the care of the patient.

4. **Pediatric Patient with Visual Impairment**: Case should include unique concerns in regards to the diagnosis and treatment of a child with visual impairment, as well as any referrals for additional evaluations and/or care. The candidate should provide some level of low vision management either as the sole low vision provider or co-management with a low vision specialist. Discuss your role as a part of the multi-disciplinary team in the care of the patient.

5. **Pediatric Ocular Disease**: Case should be either ocular or a neuro-ophthalmic condition or disease where active management is tailored specifically to the pediatric patient. Case should involve a condition or disease that has its onset in childhood and affects visual development and/or general health

and development. Some acceptable case examples include preseptal cellulitis, glaucoma, herpes simplex keratitis, corneal ulcer, fungal infection, uveitis, active toxoplasmosis or histoplasmosis, or phthiriasis palpebrarum. A simple conjunctivitis or corneal abrasion is not acceptable. The case needs to be managed primarily by the candidate. The patient may be co-managed with other professionals and health care providers, provided that the candidate was the individual who made the visual diagnosis and provided the treatment.

6. **Traumatic Brain Injury:** Case should be a child or adult suffering from a traumatic brain injury (TBI) (including concussion) where the primary functional effects are related to sensory motor integration, binocular vision, accommodation, ocular motility, and/or visual perception. The candidate must address lens correction considerations and prescribe either active vision therapy or vision rehabilitation with adaptive technology. Additional disorders such as peripheral or central visual field loss, if present, should be managed either by the candidate or with a low vision specialist. The case should demonstrate understanding of the neurological etiology. The case needs to include appropriate integration of other health care professionals (e.g., primary care provider, neurology, occupational and physical therapy), the patient's family, employer and educator (if applicable), and other support services. This case report could be considered as a substitute for the non-strabismic vergence or strabismus case depending upon the presenting signs; however, for this to be a proper substitute the candidate must have prescribed active vision therapy.

Reports that describe solutions to interesting problems or involve difficult situations are generally preferable to reports in which care progresses predictably and smoothly. Additionally, cases must include follow-up care.

Please see the appendix for information about the form and content of the case reports. If you have a question about the appropriateness of a case that you have selected, please contact the Case Report Chair to discuss.

B. Substitution for Case Reports

You may substitute a published case report(s) or book chapter in place of a required written case report, if the following criteria are met:

- Must be a direct substitute for the required case report
- Was published in a peer-reviewed journal (if not a book chapter)
- You are the first author
- The Case Report Chair and referees will decide whether or not the substitution requirements are met. Generally, the information required in the publication needs to be comparable to that required for the written report. The committee may ask for supplemental information if it is not included in the published case report (e.g., more details in regard to the office- and home-therapy program or follow-up).

Consideration will be given to applicants who no longer see a particular type of patient or do not have a case that satisfies a specific case report requirement. In such a case, the Diplomate Committee has the discretion to make an alternate written assignment relating to that particular case report requirement.

C. Submission and Review Process

Case reports are submitted through email to the Case Report Chair. Upon receiving a case report, the Case Report Chair assigns the case report a coded number and forwards it to two referees who are BVPPO Diplomates. All case reports and attached materials should be de-identified; do not include your name, the patient's name, or your practice's name. This ensures HIPAA compliance and candidate anonymity. If the case report is returned to you for revision, the comments and questions from the referees need to be addressed by revisions or explanation. Referees may ask for clarification or justification of your clinical decision making. They may also provide suggestions regarding other diagnostic or treatment considerations, which may be helpful as you prepare for the oral examination.

All revisions to the initial report should be outlined briefly in a cover letter. Changes and additions to the case report should be made to the original document with the changes highlighted or using "track changes" provided that your name or initials are not tracked; see http://wordribbon.tips.net/T010222_Making_Sure_Changes_and_Comments_are_Anonymous.html (You can hover your mouse pointer over a change or comment to make sure that your name does not appear). Revised case reports will be sent back to the original referees for their review. A case report is considered accepted when all necessary revisions have been made; the Case Report Chair will inform you when the report is accepted. Every attempt will be made to send you reviewers' comments within 3 weeks. Candidates are strongly encouraged to work with a mentor (current BVPPO Diplomate) during this process. Once the initial case report is accepted you may submit the other case reports for review. Your final, revised case reports are provided to the oral examination team.

Early submission is strongly encouraged to allow adequate time for review and revision (if necessary). When the five case reports have been accepted by the Case Report Chair, you will have completed this phase of the Diplomate process.

D. Updating of Requirements

From time to time, the Diplomate Committee will make changes in specific case report requirements. You will be required to satisfy the new requirement(s) if you have not previously done so. An exception will be made if the Case Report Chair is aware that you are currently working on a case report to satisfy a prior requirement or if you have previously submitted a report to satisfy a prior requirement and are in the process of revising it for resubmission.

II. THE WRITTEN EXAMINATION REQUIREMENT

Once you have at least one case report (not a substituted published paper) accepted, you are eligible to take the written examination. If you intend to take the written examination at that year's Annual Meeting, please advise the Diplomate Chair by July 1st of that year.

The written examination is designed to evaluate your knowledge in all aspects of binocular vision, visual perception, and pediatric optometry. The examination format is approximately 100 multiple-choice questions followed by a series of short answer/essay questions, video analysis of pediatric visual conditions, and an analysis of case findings. Four hours are allotted for this examination. A minimum score of 80% is required to successfully pass the examination. If you fail the written examination, all outstanding case reports must be completed and accepted before retaking the written examination at a subsequent Annual Meeting.

The examination question categories are as follows:

- Infant Vision & Vision Development (including Refractive Error)

- Vision & Learning and Visual Perception/Visual Information Processing
- Non-Strabismic Binocular Vision Disorders
- Strabismus & Amblyopia
- Vision Therapy *
- Neurological Problems & Pediatric Ocular Disease
- Neurodevelopmental Disorders
- Acquired Brain Injury, Traumatic Brain Injury (including Concussion)

* includes strabismus, amblyopia, visual perception, and non-strabismic binocular vision disorders.

A. Behavioral Objectives for the Written Examination

Behavioral objectives (found in the appendix) will be helpful in preparing for the written and practical examination.

III. THE PRACTICAL EXAMINATION REQUIREMENT

When all five case reports have been accepted and the written examination has been successfully completed, you are eligible to take the practical examination. If you intend to take the practical examination at the Annual Meeting, please advise the Diplomate Chair by July 1st of that year.

The practical examination is typically conducted at an optometrist's office in the area of that year's Annual Meeting. The Diplomate Vice-Chair will provide the exact time, location, and information about transportation to and from the site. Approximately 4 hours are allocated for this examination.

The practical examination is designed to evaluate the candidate's clinical competency in the following areas: technical skills (psychomotor), diagnosis (cognitive), and communication (patient, parent, other professional). The practical examination will involve performing tests/therapy on patients. BVPPO Diplomate proctors will observe you for each patient. You will be given any necessary history and test findings, and asked to evaluate, on a patient, conditions or disorders such as those listed below. You should think aloud as you work, to explain your rationale and methods to the proctors. If you need any equipment that you do not see, please mention this to the proctors. The following represents an overview of the practical examination. There is additional information about specific procedures and equipment in the appendix.

A. Technical Skills

This area is intended to assess your ability to efficiently and accurately administer appropriate clinical procedures used in the identification, diagnosis, and treatment of binocular vision and perceptual dysfunctions (see written examination behavioral objectives for specific conditions). Each section is to be completed in approximately 30 minutes. You will be asked to assess patients in each of the following categories:

1. Strabismus/amblyopia: conduct tests to determine strabismus characteristics, comitancy, correspondence, sensorimotor fusion, and monocular fixation status.

2. Non-strabismic binocular vision/accommodation disorders:
   - Conduct diagnostic tests to measure aspects of accommodation, vergence, and ocular motility.
   - Demonstrate vision therapy procedures for accommodation, vergence, and ocular motility.

3. Visually-related learning problem: administer and score visual perceptual/visual information processing tests

4. Pediatric optometry: administer age-appropriate tests of visual acuity, accommodation, binocularity, eye alignment, refractive error, and ocular health for an infant/toddler or child with developmental disabilities

B. Diagnosis

This area assesses the candidate's ability to analyze test results obtained directly from the patient or as given to the candidate by the proctor. The candidate is required to provide the correct diagnosis for the following types of cases.

1. Strabismus and amblyopia

2. Non-strabismic binocular vision disorders

3. Visually-related learning problem

4. Examination of an infant/toddler or child with developmental disabilities

C. Patient Communication

This area is intended to assess your ability to communicate with the patient (and parent, when applicable) in each of the following categories:

1. Comprehensive case history of a patient (or from the parent of a patient) presenting with strabismus, amblyopia, non-strabismic binocular vision problem, visually-related learning problem, developmental disability, or visual impairment.

2. Ability to present a comprehensive case presentation to a patient or parent of a pediatric patient with strabismus, amblyopia, developmental disabilities, visual impairment, non-strabismic binocular vision problems, or visually-related learning problems including. The case presentation includes the diagnosis, prognosis, and treatment options. You will be evaluated on the content of your discussion as well as the communication style used.

IV. THE ORAL EXAMINATION REQUIREMENT

After successful completion of the case reports, and the written and practical examinations, you are eligible to sit for the oral examination. Please communicate your intention of taking the oral examination to the Diplomate Program Chair by July 1st prior to the Annual Meeting.

Purpose: The oral examination is not a strict defense of your case reports. Instead, it provides candidates an opportunity to more fully demonstrate their knowledge in binocular vision, perception, and pediatric optometry, and to discuss their approach to managing these types of patients. A major objective is to assess candidates' understanding of core binocular vision, perception, and visual development principles, both from diagnostic and treatment perspectives, and to provide candidates an opportunity to justify their diagnostic and treatment methods and rationales.

Format: In a private setting, and in a congenial and professional atmosphere, the oral examination committee (comprised of 3-5 BVPPO Diplomates) will ask the candidate theoretical and practical questions. The Chair will structure the interview to gain insight into the strengths and weaknesses of the candidate as revealed on the written or practical examinations and accepted case reports.

Duration: It is approximately one hour in length.

V. SCHEDULING EXAMINATIONS AT THE ANNUAL MEETING

You may take all parts of the examination sequence in one year or may elect to take specific parts of the examination as long as aforementioned requirements are met. Please provide the Diplomate Chair with as much lead time as possible (before July 1) regarding your intentions for taking the written, practical, and/or oral examinations at the meeting. Typically, the written is administered the Tuesday prior to the meeting, the practical on Wednesday or Thursday, and the oral examination on Friday. Because multiple candidates may be taking the examinations we ask that you be flexible for scheduling during the meeting. Be sure that the Diplomate Chair has your contact information so he/she can get in touch with you at the meeting.

VI. REPEATING EXAMINATIONS

Failure to achieve the required level of performance on any part (written, practical, or oral) of the examination necessitates that part of the examination be taken again at a subsequent Annual meeting. Any parts of the examination that were completed successfully need not be repeated.

VII. DISCUSSION AT ANNUAL MEETING

If you have taken any part of the examination process during the Academy Meeting, the Diplomate Chair will contact you to schedule a meeting. Your progress will be reviewed and helpful suggestions provided. If you have completed all of the requirements, you will be informed of this. Upon completion of the requirements, you will be nominated for the Diplomate in Binocular Vision, Perception, and Pediatric Optometry, which is granted by the Board of Directors of the American Academy of Optometry. We request that you attend the Annual Banquet on Saturday evening, where you will be introduced as a new Diplomate in Binocular Vision, Perception & Pediatric Optometry.

VIII. APPLICATION PERIOD

The candidate has a five (5) year period from the date of acceptance of the application to complete the Diplomate requirements. Failure to complete the requirements in this time frame will necessitate a re-submission of your application and fee and may require retaking the parts of the examination that were completed. If eligible (all 5 case reports accepted), you may take all three parts of the examination in one year; otherwise, you may take the parts for which you are eligible. The BVPPO Executive Committee has the right to extend the candidacy period in special circumstances.

Appendix

Additional Case Report Information

Form of the Case Report

Case reports should be submitted double-spaced with consecutive line numbers (do not restart line numbers on each page) using Microsoft Word, with pages numbered consecutively and the date of submission and case report type included in the footnote section. Graphic images should be attached as a jpeg or embedded in the case report document. Use image compression to reduce the size and/or resolution of the images before submitting if the file is too large to email to the Case Reports Chair. Your name and address should appear only in the email message to the Case Report Chair, NOT on the case reports. Case reports are typically 15-20 pages no longer than 30 pages in length. Please do not submit as a PDF.

Write in a clear and concise manner and use standard optometric terminology that is easily understood by most people in the field. It is acceptable to record ocular health findings as "within normal limits" (WNL) if they have no bearing on the diagnosis and management of the case. We encourage you to place diagnostic data and therapy programs into tables for ease of review and comparison pre- and post-treatment. Please proofread your case reports carefully for spelling, grammar, and typographical errors. Approach your case reports as if you were preparing them to be submitted for publication in a scholarly journal.

Do not assume that the reviewers know what you are thinking, even if it seems obvious to you. Please explain everything in detail, especially with regard to the diagnosis and management. The purpose of the case reports is for you to demonstrate your clinical reasoning; therefore, case reports involving difficult clinical situations that involve problem solving are generally more acceptable than reports where everything is straightforward. Sample case reports are posted on the Academy's website under the BVPPO Diplomate Information page.

Content of the Case Report

All case reports must contain the following information:

1. Case report topic (e.g., "exotropia case") and a short abstract of the case.

2. History: chief complaint, age, sex, race/ethnicity (if pertinent); through documentation of history (presenting signs and symptoms of present condition: developmental, mental, ocular, academic and social history or performance difficulties; patient's developmental, educational, eye, and medical history (including medications and allergies); pertinent family eye/medical history; and brief summary of any previous eye care or other pertinent evaluations. All reported patient information must be HIPAA compliant. All identifying names and birthdates must be deleted.

3. Ocular Status/Diagnostic Testing should include, but not be limited to the following. If relevant tests were not completed, a rationale should be provided. In addition, if there are things that you would now do differently, please point these out and what you would do differently. These findings should be placed in a table embedded in the case report document for ease of presentation and review. Pertinent negatives (if applicable) should be addressed.

    a. All case reports: visual acuities, retinoscopy, subjective refraction, eye alignment, sensorimotor fusion, and ocular health assessment.

b. Strabismus and/or amblyopia case reports: characteristics of the deviation (comitancy, direction, magnitude, frequency, eye laterality (preferred eye), cosmesis, AC/A ratio) and associated conditions of amblyopia, monocular fixation, correspondence, sensory-motor fusion status and potential (including suppression and level of stereopsis).

c. For non-strabismic binocular vision/accommodation cases: ocular motility (pursuits, saccades, and fixation), accommodative status (amplitude, facility, lag, PRA/NRA), binocular vision status (magnitude and direction of heterophoria, AC/A ratio, NPC, PFC/NFC at far and near, fixation disparity testing (as relevant) or associated phoria testing, vergence facility, second degree sensory fusion testing, and stereopsis).

d. Learning-related vision problems: a non-strabismic binocular vision evaluation (see "c" above) and an evaluation of visual perceptual development including most if not all of the following: laterality, directionality, visual discrimination, form constancy, visual figure-ground, visual closure, visual memory, visualization, visual motor integration, and visually guided fine-motor skill (eye-hand coordination). It may also include a screening for cognitive ability, reading ability, and auditory processing skills.

e. Developmental disabilities or visual impairment should include detailed information on the child's visual function and any other complications or comorbidities of the disorder. It is important to relate your management plan to the specific needs of the patient. An assessment may include evaluation of visual perceptual development (as applicable) to include: laterality, directionality, visual discrimination, form constancy, visual figure-ground, visual closure, visual memory, visualization, visual motor integration, visually guided fine-motor skill (eye-hand coordination), screening for cognitive ability, and a low vision assessment. Coordination of care with any other professionals should be described.

f. Ocular disease cases should include visual acuity, refraction, eye alignment, stereopsis, pupils, versions, intraocular pressures, and a detailed description of the eye health evaluation (including testing methods used), as well as copies of any special testing (e.g., VEP, MRI, OCT, etc). The report should include detailed information on the child's present visual function and any expected comorbidities. The case needs to be managed primarily by the Candidate. Coordination of care with any other health care professionals should be described.

4. Assessment: diagnosis, supporting data, relationship of diagnosis to entering complaints. A complete differential diagnosis should be included, indicating how the final diagnosis was determined.

5. Management. The candidate's decision-making process and rationale for treatment decisions should be explained. Treatment protocols should demonstrate the candidate's depth of knowledge and be justifiable should they vary from the current standard of care. Follow-up visits should be separate from the others so there is a clear chronology of the examination and treatment of the patient. However, in cases having numerous follow-up visits with essentially the same findings, grouping visits would be practical. For vision therapy cases, similar visits and/or treatment phases can be grouped together for ease of presentation and review; a table format should be considered.

a. Discussion of potential treatment options, including advantages and disadvantages of each, and prognosis.

b. Discussion of course of management plan, including treatments, with rationale for each.

c. Description of any passive or active vision therapy, or other treatment modalities, including lenses, prisms, filters, occlusion, medication, or surgery.

d. If applicable, description and sequencing of home- and office-based vision therapy.

e. If applicable, include coordination of care with other professionals. If the patient was referred to a specialist, the reason for referral should be discussed. If a patient is referred to another provider for a procedure or further testing, include a summary of the provider's report as well as any follow-up with the patient after the procedure was done.

f. Please clearly identify if the patient was examined by another eye provider. This would include an optometrist or ophthalmologist from another practice, within your same practice, or through co-management. It is preferred that the patient be managed by the candidate personally; however, cases managed by optometric educators acting as a student preceptor are allowable. In such cases, it is acceptable for the students to have collected the clinical data and/or conducted the vision therapy; however, the assumption is that the candidate has confirmed the accuracy of any crucial data and that all management decisions have been made by the candidate.

g. Disposition of the case, including results of follow-up care.

6. Discussion, Summary and Conclusions

Discuss your treatment approach and any problems that you might have encountered. Include a discussion of whether you would have approached the case differently had you had different treatment options available that were not available when you started the case or if in hindsight, you would now handle the case differently. For all cases where disease is discussed, detail the pathophysiology relevant to the case. Give equal emphasis to positive and negative aspects of the case, stating any additional care or clinical intervention that might be recommended. Conclude with the broader clinical implications illustrated by the case report.

The discussion section should describe the diagnosis in greater detail including the pathophysiology where appropriate. Use this section to further discuss your decision-making process. Explain variations from normal relating to your specific patient's presentation. Discuss the standard of care for the condition and why you may have deviated from it. If there are alternative treatments, explain each and discuss advantages and drawbacks.

The discussion should be your original writing, and should refer to the specifics of your case report. Any information gathered from outside sources should be properly documented. Plagiarism is considered a violation of the Standards of Conduct of the AAO and, if verified, are grounds for termination of your application and referral to the Academy's Ethics Committee.

7. References

The candidate may elect to include a bibliography of any references used in developing the case report, especially those references that support the use of unique management decisions or treatment options; however references are not required. Sources may be textbooks or peer-reviewed journal articles. Whenever possible, references should be current, published in the last 5-7 years, unless they are considered a seminal reference. If the treatment or management reflects the standard of care for the condition, no references are necessary. If a candidate chooses to list references, no more than 25 references should be included.

References, relevant to the specific topic being discussed can be included, particularly if they support your diagnosis or treatment decisions. References should be numbered consecutively in the text (superscripts) and in the reference list. The candidate should be familiar with the content of the cited references; these may be used as subject matter for the oral examination. References should be cited using *Optometry & Vision Science* guidelines. Candidates should be sure that their case reports are appropriately edited and grammatically correct.

Additional Written Examination Information

Behavioral Objectives for the Written Examination

The following behavioral objectives will be helpful in preparing for the written and practical examination. The candidate for Diplomate status is expected to be able to do the following in the areas listed:

Infant Vision & Vision Development (including Refractive Error) Behavioral Objectives

- Describe methods of evaluating the eyes and visual status (i.e., eye health, refractive, visual acuity, binocularity, accommodation assessments) of an infant, preschool, and school-aged child (less than 13 years of age). Discuss the benefits and limitations of the various methods designed for the differing capabilities of these patients.
- Describe normal growth and development of the eye, orbit, and visual system from birth through the first 6 years of life.
- Describe normal growth and developmental characteristics of infants and children in the areas of physical development, gross and fine motor skills, cognitive changes, speech and language development, and social skills.
- Describe the development of visual acuity, accommodative skills, pupillary response, and ocular motor skills including fixations, pursuits, saccades, versions, vergence, and optokinetic nystagmus.
- Discuss the concept of emmetropization, how it impacts the development and correction of refractive errors in children and how uncorrected refractive error may be a risk for amblyopia or strabismus. Be able to correlate structural changes to changes in refractive error.
- Discuss the physical, emotional, and ocular signs/symptoms of child abuse and neglect
- Discuss the important issues relating to the prenatal, perinatal, and postnatal case history.
- Describe vision screening techniques appropriate for infants, preschoolers, and school-aged children.
- Discuss the management considerations for a pediatric aphakic patient.

Vision & Learning & Vision Perception Behavioral Objectives

- Describe methods of obtaining, clarifying and assessing information gathered from parents, teachers and/or other professionals regarding potential visual processing deficiencies, including a developmental history from parents, a teacher questionnaire, and psycho-educational evaluation results.
- List and describe the methods (including clinician observations) of evaluating the developmental level of performance in the areas of:
    - Gross motor and bilateral integration
    - Laterality and directionality
    - Visual analysis to include: form discrimination, figure ground, visual closure, and form constancy
    - Visual memory and visualization
    - Visual motor integration and visually guided fine-motor control
    - Auditory processing skills, to include: auditory visual integration, auditory discrimination, and auditory memory
- Given a history, test findings, and observations develop a diagnosis and prognosis.
- Be able to correlate entering signs and symptoms with vision perception testing results.
- Describe how visual or visual perception problems can affect academic performance.
- Propose possible recommendations to educators about classroom accommodations for a child with vision processing deficiencies.

- Determine and describe what information gathered in the case history, optometric evaluation, or other ancillary testing would suggest the need for additional testing or treatment by another professional.
- List and describe a sequential vision therapy program, including a rationale for lens therapy, for visual processing deficits, and possible follow-up care.
- Describe the underlying principles and be able to illustrate specific vision therapy techniques used in remediating visual perceptual-motor development (e.g., explain the sequence of therapy involved in training laterality and directionality skills).

Non-strabismic Binocular Vision Disorders Behavioral Objectives

- List and describe diagnostic methods used in evaluating:
    - Ocular motility/eye movement skills: pursuits, saccades, fixation.
    - Accommodative skills: to include amplitude, facility, accommodative response (posture or lag), and relative accommodation.
    - Vergence skills: to include near point of convergence, vergence facility, amount of heterophoria, fixation disparity, and fusional vergence.
    - Sensory fusion: second degree fusion, suppression, and stereopsis
- Given a simulated patient, analyze the results of the diagnostic testing and determine abnormal and normal findings.
- Given a simulated patient, list a syndrome-based diagnosis and supportive data (e.g., convergence insufficiency - receded NPC, high exophoria at near, reduced PFC at near).
- Evaluate and explain the relationship between entering signs and symptoms, and test data in order to achieve an accurate diagnosis of vision efficiency problems (e.g., blur at distance after near work and a finding of accommodative infacility).
- Describe the theoretical and physiological relationships between accommodation and vergence.
- Discuss fixation disparity testing and analysis as well as the control systems model for vergence and accommodation.

Strabismus & Amblyopia Behavioral Objectives

- List and describe the diagnostic methods you would use in examining a patient presenting with strabismus and/or amblyopia in the following areas: refractive status, visual acuity, monocular fixation, characteristics of the deviation (comitancy, frequency, direction, eye laterality (eye dominance), magnitude, AC/A ratio, cosmesis), correspondence, sensorimotor fusion (second degree fusion and stereopsis).
- Given a simulated patient, evaluate and interpret the results of the diagnostic testing, and formulate a diagnosis and a prognosis for the patient's condition(s).
- Recall the etiology, prevalence and clinical characteristics of the following conditions:
    - Amblyopia: form deprivation, refractive (isoametropic and anisometropic), strabismic, and relative amblyopia.
    - Comitant Strabismus
        - Exotropia: convergence insufficiency, basic exo, divergence excess, infantile XT
        - Esotropia: convergence excess, basic eso, divergence insufficiency, accommodative (refractive, non-refractive and combined), partially accommodative, infantile (congenital), acute-onset comitant ET, sensory ET, microtropia, monofixation syndrome/ microtropia with identity, blind spot syndrome and pseudoesotropia
        - Vertical strabismus
        - Sensory strabismus

- Noncomitant Strabismic Conditions
    - Dissociated vertical deviation
    - Overaction of inferior obliques
    - A-V Syndromes
    - Paretic strabismus (IIIN, IVN, VIN)
    - Special forms of strabismus: Duane syndrome, Brown syndrome, endocrine myopathy, fractures of the orbit, myasthenia gravis
- Other types of strabismus
    - Consecutive strabismus

- Recall and contrast current theories relative to the etiology of strabismus, amblyopia, eccentric fixation, and anomalous correspondence.

Vision Therapy Behavioral Objectives

- List and describe in detail a sequential vision therapy program relative to vision inefficiency (basic skills) which would include a rationale for lens therapy, vision therapy including home and office therapy, and follow-up care.
- Describe the underlying principles and be able to illustrate specific vision therapy techniques used in the remediation of ocular motility, accommodative, and non-strabismic vergence deficiencies. For example, when using the single Aperture-Rule Trainer, describe where vergence and accommodation are positioned when the patient reports clear and single vision.
- List and describe a sequential vision therapy program relative to strabismus and amblyopia which would include a rationale for lens therapy, prism therapy, occlusion therapy, potential pharmacological therapy, surgery, and active vision therapy including home and office therapy, and possible follow-up care.
- Describe the underlying principles and be able to illustrate specific vision therapy techniques used in the remediation of strabismus and amblyopia. For example, explain the process of co-variation of correspondence that occurs in intermittent exotropia.

Neurological Problems & Pediatric Ocular Disease Behavioral Objectives

- Describe the most significant congenital and early acquired ocular disorders, including assessment, differential diagnosis, and management. This should include congenital cataracts, retinopathy of prematurity, red eyes, uveitis, nasolacrimal duct obstruction, glaucoma, optic nerve disorders, albinism, retinitis pigmentosa, retinoblastoma, for example.
- Describe the clinical presentation, differential diagnosis, and management of different forms of nystagmus including congenital, acquired, latent, sensory, manifest-latent, and spasmus nutans.
- Describe the clinical presentation, differential diagnosis, and management of III, IV, and VI nerve palsies.

Pediatric Neurodevelopmental Disorders Behavioral Objectives

- Describe the physical and ocular manifestations as well as appropriate examination techniques when dealing with individuals diagnosed with intellectual impairment, deafness, and developmental disabilities such as cerebral palsy, Down syndrome, Fragile X syndrome, autism spectrum disorders, fetal alcohol syndrome, etc.
- Describe common causes of visual impairment in children. Be able to address the examination techniques, differential diagnosis, and plan/treatment options, as well as referrals to other medical and educational resources.

- Define learning disability, reading disability, & dyslexia & be able to describe the psycho-educational methods used to identify these conditions.
- Describe the clinical characteristics & current treatment procedures for Attention Deficit Disorder & Attention Deficit & Hyperactivity Disorder.
- Describe the roles of educators & other medical professionals in the multidisciplinary care of the child with learning problems, including optometry's role in the Individual Education Plan (IEP) / 504 Plan process. Describe instances where referrals are appropriate.

Acquired Brain Injury or Traumatic Brain Injury (including Concussion) Behavioral Objectives

- Define ABI, TBI, and concussion and discuss their causes.
- Describe the physical and ocular manifestations as well as appropriate examination techniques when dealing with individuals diagnosed with acquired or traumatic brain injury
- Describe the clinical characteristics and current treatment procedures for the ocular sequelae of acquired brain or traumatic brain injury (including concussion).
- Discuss any co-management considerations
- Describe the role of other professionals involved in the care of the patient such as, physical therapists, occupational therapists, vestibular therapists, or neuro-psychologists

Additional Practical Examination Information

Evaluation of Strabismus and Amblyopia

Ocular Alignment

- Cover testing (unilateral, simultaneous prism and alternate cover test)
- Comitancy testing: alternate cover test in different action fields, red lens/Maddox rod test, Parks 3-step, versions

Correspondence Testing

- Major amblyoscope testing for correspondence (as available)
- Bagolini striated lens test
- Red lens test for correspondence
- Hering-Bielschowsky afterimage test

  Additional testing: performed as necessary
  - Cüppers Bifoveal Test (as appropriate)
  - Haidinger's brushes and Afterimage transfer (as appropriate)

Monocular fixation Testing

- Visuoscopy

Visual Skills Evaluation/Treatment

Oculomotor Evaluation

- Objective evaluation of pursuits and saccades (4+ scale, or equivalent)
- Developmental Eye Movement (DEM) or King-Devick test

Accommodative Evaluation

- Accommodative facility
- Accommodative accuracy (MEM or Nott retinoscopy)

Binocular Vision Therapy

- Vision therapy procedures (one technique chosen by the proctor, one technique chosen by the candidate) using: Brewster-type stereoscope, Aperture rule, Vectograms or Tranaglyphs, cheiroscope (single oblique mirror stereoscope), eccentric circles, lifesaver cards (colored circles cards), Brock string, Wheatstone stereoscope

Visual Processing/Developmental Evaluation

Case History

- Detailed case history

Evaluation of Non-Motor Processing Skills

- Test of Visual Perceptual Skills (TVPS, Gardner) or equivalent

Evaluation of Visual Motor Skills

- Developmental Test of Visual Motor Integration (Beery VMI) or equivalent

Case Presentation

- Presentation of test findings to patient/parent/teacher

Preschool Examination

Visual Acuity/Fixation Preference

- Pediatric visual acuity assessment (e.g., Lea symbols, HOTV, Cardiff, Teller Cards)
- Fixation preference testing

Binocular Evaluation

- Hirschberg / Kappa
- Krimsky
- Brückner test
- Prism bar vergences

Refractive Error Evaluation

- Retinoscopy using lens bar

The following equipment will be available for your use:

- Snellen visual acuity chart; Lea, HOTV, Cardiff, or preferential looking cards
- Phoropter, chair and stand
- Major amblyoscope and targets
- Macular Integrity Tester/Trainer (Haidinger's brushes)
- Bagolini striated lenses
- Worth dot
- Afterimage flasher
- Brewster-type stereoscope with stereograms
- Brock string
- Polachrome orthopter (illuminated Vectogram holder)
- Vectograms
- Tranaglyphs
- Cheiroscope
- Aperture-rule trainer
- Free space fusion cards (e.g., eccentric circles, lifesaver cards)
- Retinoscopy lens bars
- ±2.00 accommodative flippers
- #9 Vectogram or accommodative rock cards
- Polarized suppression check strips
- Loose prisms with red lens
- Horizontal prism bar
- Anaglyphic and Polarized filters
- Pointer
- Tape measure
- Beery Visual Motor Integration Test (VMI)– (test plates, manuals, and recording sheets)
- Test of Visual Perceptual Skills (TVPS) (test plates, manuals, and recording sheets)
- Developmental Eye Movement (DEM) Test (test plates, manuals, and recording sheets)

You are asked to bring the following equipment:

- Occluder
- Age-appropriate cover test targets
- Diagnostic set (ophthalmoscope w/ visuoscopy target, retinoscope, transilluminator)
- MEM cards
- Maddox rod
- PD ruler

The Diplomate Committee cannot guarantee which versions of the various perceptual tests will be available on site. If the candidate prefers to bring their own TVPS (or other motor free visual perceptual skills test), saccadic test (King-Devick or DEM), or standardized test of visual motor integration, s/he may do so.