Clinical/Practicum Examination (Exam)
Preparation Instructions and Study Guide

Please note: The ***Preparation Instructions and Study Guide*** are intended to be of **general assistance** to those considering taking or preparing to take the Board's clinical/practicum examination. The ***Instructions*** are meant to familiarize you **generally** with how the exam is conducted. However, it is possible that you will be given instructions at the examination site which will differ in some respects from those found here. Likewise you certainly will be given instructions in addition to those found here, and the procedures utilized for the examination may differ from those described here. The ***Study Guide*** is meant to familiarize you **generally** with the types of cases, patient histories, and patient conditions with which you may be presented at the examination, but the ***Study Guide*** is **not** intended to be a definitive list of the types of cases or conditions with which you will be presented or the responses or information you will be expected to provide to the clinical examiners.

Over the past 40 years the medical eye responsibilities of primary eye care have been embraced in the optometrists' expanded primary care scope. The NC Optometry Board is charged with the responsibility of ensuring the public that an optometrist entering practice is competent and able to manage conditions of the eye and adnexa for the public welfare and safety. The Board feels strongly the exam tests critical thinking skills necessary to ensure this standard.

The guidance and instructions provided in this document are designed to help you prepare to take the exam. Your preparation may clearly be the difference in achieving a passing score on the exam. This letter is designed to help you understand the exam format so you will know what to expect when presenting to take the NC exam. However, in no way does it assure or guarantee your passage of the exam.

The exam is an oral, adaptive, criterion referenced examination. It is designed to simulate cases and presentation of cases that could present to an optometric practice on any given day.

Oral – This is an oral exam; you will be provided pen and paper that you can use to make notes about the case as you develop your diagnosis. However, you will not be scored on any notes you take, only your verbal responses.

Adaptive – When you ask questions about a case you will be given a response by the clinical examiner. If you ask for a particular test, the examiner can give you a verbal response and show you the results of the test for your interpretation. The next question or test you request would be based on the previous answer you received.

Criterion referenced – You must meet a certain standard to achieve a passing score. For this exam that standard is set at 75%. The exam is not graded on a curve. Therefore, it is theoretically possible there could be a 100% pass rate.

Exam Format Summary:

- 5 stations (Red, Blue, Green, White and Yellow)
- 5 Candidates test at the same time, one at each station
- Each candidate rotates through each station in the order directed by the schedule and administrative staff
- Two 10-minute cases per station
- 15 minute break between each station
- Exam length - start to finish 2 hrs. 40 mins.

You will be given 10 cases (two cases in each of five stations) covering a broad range of ophthalmic diseases and disorders. The large majority of these cases are diagnoses that could be related to sight and/or life threatening conditions. You will have ten minutes to achieve a diagnosis and formulate a treatment plan for each case. This is not a “name it and claim it” type of exam. In addition to diagnosing and formulating a treatment plan for the condition you will be asked what your differentials were in making the diagnosis, what type of disease you are dealing with, and to explain the pathophysiology of the condition. Examples are provided below.

What to expect when you enter the exam station:

Room Setup - You will sit at a desk facing a larger desk. Sitting at the larger desk are two clinical examiners and one Board Member. Occasionally, there may be a fourth person at the larger desk as a silent observer of the exam.

Function of Each Member in the Room - Each Clinical Examiner will present a single case to you. However, both Clinical Examiners can ask you questions on each case. The Board Member is there to record any irregularities or mishaps and to make adjustments if necessary to make sure you are provided a full ten minutes for each case. The Board Member will not present a case or participate in testing of a case. However, it is possible the Board Member could offer you a suggestion to clarify an issue to help you move forward with the case.

GENERAL CONCEPT OF THE TESTING PROCESS

1. You should always follow the SOAP format: subjective (history), objective (testing), assessment (diagnosis) and plan (treatment). The object of each case presented to you is to arrive at a diagnosis and develop a specific treatment plan for that case. You will arrive at your diagnosis based on collecting the appropriate history and obtaining the appropriate testing.
2. You will be provided some basic history and preliminary testing in written form after you are instructed to "start the session."
3. Review that information and then decide what additional history and testing you need in order to make your diagnosis and form your treatment plan for that case.
4. You are free to ask the Examiner who is presenting the case for any additional history and testing. He/she will either provide you the history or testing you asked for or explain otherwise.
5. When you are satisfied you have asked everything you need to make your assessment (diagnosis), you are free to do so. Keep in mind, the Examiner will most likely ask you what other condition (differentials) you considered and ruled out to make your diagnosis.
6. Your will then be asked what type of disease/disorder your diagnosis falls into (see examples below) and to explain the pathophysiology for the diagnosis you made.
7. Finally, you will be asked to form your treatment plan, including such things as the following when appropriate:
    a. If you prescribe a medications, be specific – don't say "I would start the patient on a prostaglandin analog." Rather, say "Start Latanoprost 1 drop left eye at bedtime, 2.5 ml with 1 refill."
    b. If one or more referrals should be made, be specific: a referral to another health-care provider should include their specialty and how soon they need to be seen; you wouldn't refer a retinal detachment to just an ophthalmologist but rather to a retinal specialist; you wouldn't refer someone with a suspected pituitary tumor to a general practitioner but rather to a neurologist, neuro-ophthalmologist, or neurosurgeon.
    c. If you are dealing with a contagious ocular condition such as Epidemic Keratoconjunctivitis (EKC), make sure you discuss knowledge of contagious diseases and prevention of spread of disease. You should mention specific precautions to avoid spread of the disease to others.
    d. If you are dealing with a new diagnosis of an ocular genetic condition, you should consider evaluation and history of other family members.

Start of Exam Process

You will be escorted to your specific exam station and seated at a desk in the room. On your desk you will find the following:

iPad – if you ask for a specific test or image and such test or image is part of the case, it will be provided to you on the iPad (examples: Visual fields, Ocular Coherence Tomography (OCT), Photography (external, corneal, anterior chamber, retinal, fluorescein angiography, etc.).

Paper and pen – provided to you if you want to use to organize your thoughts (not required and not used in grading).

Written Patient Intake History Form and some preliminary testing data – you will hear on the intercom "please begin this session." At that time turn over the Intake Form and begin reviewing the data. The Intake Form will contain demographic and history information that a patient would complete in the waiting room prior to being worked up by a technician. Additionally, there will be some preliminary technician testing data.

THE INFORMATION BELOW IS INFORMATION THAT COULD BE PROVIDED TO YOU ON THE INTAKE FORM.

KEEP IN MIND, ALL OF THE INFORMATION BELOW MAY NOT ALWAYS BE PROVIDED ON THE INTAKE FORM FOR EACH CASE. THE HISTORY AND PRELIMINARY TESTING PROVIDED TO YOU MAY VARY FROM CASE TO CASE. IT IS UP TO YOU TO REVIEW THE INFORMATION YOU HAVE BEEN PROVIDED AND THEN DECIDE WHAT ADDITIONAL HISTORY AND TESTING YOU WILL NEED TO ASK THE EXAMINER IN ORDER TO DEVELOP YOUR CASE AND MAKE YOUR DIAGNOSIS.

- Subjective information (provided to doctor by patient):
  - Patient's age, gender and ethnicity
  - Chief complaint
  - Patient's physical appearance
  - Brief medical history
  - Family medical history
  - Ocular history – surgeries if known
  - Family ocular history
  - Medications
  - Social history – smoking, alcohol, prescriptive and non-prescriptive drug abuse, etc.

    - Allergies
- Objective:
    - Visual Acuity, with and/or without correction,
    - BCVA from pinhole or manifest refraction
    - Refractive data as appropriate
    - Weight and height
    - Confrontation Visual Fields and EOMs

IMPORTANT: the history and preliminary testing on the Intake Form should not be interpreted as being complete. If fact, information on the Intake Form should generate specific case history questions and testing to be requested.

Ten minutes into the session you will hear a beep on the intercom. This beep is a signal that the session is half over and generally time to move to your second case. However, the Examiners are carefully monitoring your time and if you are at a critical place in the first case, they will probably want you to continue, as doing so would be to your advantage. When you do move to your second case, you will again turn over the Intake Form and start this case as you did your first case. At the end of the session, you will hear “This session is over.” You are allowed to finish the sentence you are on and then you must leave the room. When you leave the room, you should leave all paperwork at the desk. You then return to the staging room where you started the exam. You will have 15 minutes before the next session begins.

Should an issue occur during the exam where, for example, an image you requested did not transfer to the iPad, the Board Member will measure that delay and provide you additional time at the end of the exam to compensate for that loss of time.

There are no tricks or deceptive presentations made in the examination. Cases are presented on an entry-level basis. Over the years, many successful candidates taking the North Carolina Boards have stated that studying for and taking the Exam have made them a better provider in the way they are able to apply critical thinking skills in caring for patients. Indeed, the NC Board hopes that is your experience as well.

NC Optometry Board Clinical Cases

The following list of cases and topics is being provided to you as a study guide to help you prepare for the exam. There is no significance to the order of cases as listed. You will draw 10 cases from the list below. There are a few examples in red embedded in the cases as an explanation of what knowledge is critical for you to know for that topic. This information in red is not necessarily all the information you may need to know about a case, but would be important information for a case in one of these subject areas.

- Acute External or Internal Hordeolum
- Chalazion and Recurrent Chalazion
- Lid Myokymia
- Canaliculitis
- Dacryocystitis
- Dacryoadenitis
- Congenital Nasolacrimal Duct Obstruction
- Acquired Nasolacrimal Duct Obstruction
- Contact Dermatitis
- Cutaneous Herpes Simplex Virus
- Corneal Dystrophies - Central Crystalline, EBMD, Granular, Lattice, Macular, Meesmann's, Reis-Buckler
- Fuch's Endothelial Dystrophy
- Band Keratopathy
- Ocular Pemphigoid
- Dellen
- IOL Displacement
- Dry Eye Disease - Keratitis Sicca, Meibomian Gland Disease, Sjogren’s Syndrome
- Post Refractive Surgery Induced Corneal Ectasia
- Decentered Ablation following laser based refractive surgery
- Post PRK slowed epithelial Healing (diabetes)
- Post-operative Lasik with Basement Membrane Dystrophy
- Post-operative Lasik Flap Slip
- Acid Burn with Corneal Involvement
- Alkaline Burn with Corneal Involvement
- Conjunctival Foreign Body
- Conjunctival Laceration
- Corneal Foreign Body with Rust Ring

- Corneal Laceration
- Non-vegetative Corneal Abrasion
- Vegetative Corneal Abrasion
- Eyelid Laceration with or without involvement of Lacrimal Drainage System or Levator
- Orbital Blow-out Fracture
- Penetrating Ocular Injury (foreign body or otherwise) with or without vitreous or iris prolapse
- Thermal/Ultraviolet Keratopathy
- Traumatic Hyphema
- Post-operative Hyphema
- Traumatic Iritis
- Keratoconus / Keratoglobus
- Non-Infectious Corneal Infiltrate
- Cataracts – Nuclear Sclerosis, Cortical, Posterior Subcapsular, Hypermature
- Basal Cell Carcinoma of Eyelid
- Conjunctival / Corneal Intraepithelial Neoplasia
- Iris Cyst / Malignant Melanoma of the Iris
- Lacrimal Gland Mass / Chronic Dacryoadenitis
- Orbital Tumor, Metastatic tumor
- Orbital Tumor, Primary Bony Origin
- Posterior Segment Metastatic Tumors in Adults
- Sebaceous Gland Carcinoma of the Eyelid
- Squamous Cell Carcinoma of Eyelid
- Squamous Cell Carcinoma of the Conjunctiva
- Post-operative Lasik Diffuse Lamellar Keratitis (DLK)
- Post-operative Lasik Epithelial Ingrowth with or without flap melt
- Post-operative Bullous Keratopathy associated with endothelial cell loss
- Post-operative Keratitis
- Preseptal Cellulitis
- Orbital Cellulitis
- Recurrent Corneal Erosion (RCE)
- Superior Limbic Keratoconjunctivitis (SLK)
- Thygeson's Superficial Punctate Keratitis (SPK)
- Vernal Conjunctivitis
- Epidemic Keratoconjunctivitis(EKC)/Pharyngoconjunctival Fever(PCF)/ Acute Hemorrhagic Keratoconjunctivitis
- Staphylococcal Blepharitis with Marginal Ulcer / Chronic Meibomianitis
- Herpes Simplex Keratitis (HSK): Epithelial or Stromal

- Acanthamoeba Keratitis
- Fungal Keratitis
- Gonococcal Corneal Ulcer
- Neurotrophic Corneal Ulcer
- Pseudomonas Corneal Ulcer
- Staphylococcal Central Corneal Ulcer
    - Example: With the presentation of a corneal ulcer:
        - understanding clinical symptoms and signs considering such things as pain and discharge
        - understanding clinical characteristics if infectious agents (gram + & - bacteria, etc.)
        - appropriate culturing of the defect
        - understanding culturing techniques and culture medias
        - interpretation of results and sensitivities
        - initiating and modifying treatment(s) including various compounded/fortified antibiotics if indicated
- GLAUCOMA
    - Ocular Hypertension
    - Primary Open Angle Glaucoma
    - Normal-tension Glaucoma
    - Angle Recession/Angle Recession Glaucoma
    - Pseudoexfoliation/Pseudoexfoliative Glaucoma
    - Neovascular Glaucoma
    - Glaucomatocyclitic Crisis
    - Hemolytic and Ghost Cell Glaucoma
    - Malignant Glaucoma
    - Choroidal Detachment Following Glaucoma Filtering Surgery
    - Normotensive Glaucoma following corneal thinning refractive surgery
    - Narrow Angle/Acute Angle Closure Glaucoma
    - Phacolytic Glaucoma
    - Pharmacologically Induced Glaucoma
    - Pigmentary Glaucoma
    - Post-operative Elevated IOP
    - Post-operative Malignant Glaucoma
    - Blebitis
    - Uveitis-Glaucoma-Hyphema (UGH) Syndrome
    - Uveitic Glaucoma
    - Understanding low and high risk (risk criteria for developing) for all types of Glaucoma

    - Understanding of Primary, Secondary, and Angle Closure Glaucoma including mechanisms and pathogenesis, staging of disease, when to begin treatment, treatment options and modalities available (observation, laser, pharmacological and surgery, etc.)
    - Understanding key eye research studies that led to establishing staging and treatment criteria
- UVEITIS
    - Idiopathic Iritis/Uveitis
    - Uveitis Associated with
    - Ankylosing Spondylitis
    - Acquired Syphilis
    - Toxoplasmosis
    - Tuberculosis
    - Herpes Zoster Ophthalmicus
    - Recalcitrant Uveitis Herpes Zoster Ophthalmicus
    - Sarcoidosis
        - Fuch's Heterochromic
        - Behcet's
        - Juvenile Idiopathic Arthritis
        - Reactive Arthritis
    - Intermediate and Posterior Uveitis
        - Pars Planitis
    - Post-operative Anterior Uveitis
    - Post-operative Hypopyon
    - Posterior Uveitis secondary to Aids with or without Kaposi Sarcoma
    - Sympathetic Ophthalmia
    - Understanding and being able to differentiate between clinical presentations of non-granulomatous and granulomatous uveitis
    - Understanding the indications for ordering and interpretation of labs, testing, and imaging when necessary to diagnose the underlying etiologies of the various forms of uveitis
    - Understanding the treatment and management of both the systemic and ocular uveitic conditions
- DIABETES
    - Presentations of Undiagnosed and Previously Diagnosed Conditions
    - Presentations of Unilateral (or greater severity in one eye) of Diabetic Retinopathy and related etiologies
    - Diabetes Mellitus (Type 1 and Type 2) w/ and w/o Diabetic Retinopathy

        - Understanding of disease states, treatments, progression and prognosis
        - Understanding of ocular treatments and side effects/complications of treatment
        - Understanding key eye research studies that led to establishing staging and treatment criteria
        - Understanding of Classification and Criteria for staging of:
            - Non-Proliferative Diabetic Retinopathy (NPDR)
            - Proliferative Diabetic Retinopathy (PDR)
            - Clinically Significant Diabetic Macular Edema (CSDME)
    - Understanding of Associated Conditions:
        - Neuropathies
        - Nerve palsies
        - Glaucoma
        - Retinal Detachment
        - Cataracts
        - Dry Eye
        - Refractive Changes
        - Etc.
- Age Related Macular Degeneration (ARMD) dry/non-neovascular
- Age Related Macular Degeneration (ARMD) wet/neovascular
- Branch Retinal Artery Occlusion (BRAO)
- Branch Retinal Vein Occlusion (BRVO)
- Central Retinal Artery Occlusion (CRAO)
- Central Retinal Vein Occlusion (CRVO)
- Central Serous Choroidopathy
- Chloroquine / Hydroxychloroquine Retinopathy
- CME Associated with Cataract Surgery
- Endophthalmitis (endogenous)
- Endophthalmitis (exogenous)
- Malignant Melanoma of the Choroid
- Commotio Retinae
- High Myopia with Retinal Degeneration (peripheral or macular) post staphyloma
- Hypertensive Retinopathy secondary to chronic hypertension
- Hypertensive Retinopathy secondary to malignant hypertension
- Non-Age Related Non-Traumatic Maculopathy
- Ocular Albinism
- Retinoblastoma
- Optic Pit with Serous Detachment

- Post-operative Hypotony with and without choroidal detachment
- Post-operative Retinal Detachment
- Preretinal or Vitreous Hemorrhage following High Suction Surgery (Lasik)
- Presumed Ocular Histoplasmosis Syndrome (POHS)
- Posterior Vitreous Detachment (PVD) - Partial or Complete with or without Photopsia
- Retinal Dialysis
- Retinal Tear /Horseshoe Retinal Tear / Retinal Break
- Traumatic Retrobulbar Hemorrhage
- Traumatic Choroidal Rupture
- Retinitis Pigmentosa
- Retinoschisis
- Rhegmatogenous Retinal Detachment
- Toxic (pharmacologically induced)
- Tractional Retinal Detachment
- Vitreoretinal-Macular Traction / Epiretinal Membrane / Macular Hole
- Headaches – Tension, Cluster, Migraine (Common, Classic, Acephalgic Migraine),
- Vascular or Neurological associated
- Amiodarone Optic Neuropathy with Vortex Keratopathy
- Nonarteritic Ischemic Optic Neuropathy
- Arteritic Ischemic Optic Neuropathy
- Giant Cell Arteritis (GCA) / Temporal Arteritis
- Cavernous Sinus Syndrome / Carotid Cavernous Fistula
- Cerebral Space Occupying Lesion – Benign or Malignant
- Cerebrovascular Accident – Involving Visual Pathway
- Cerebrovascular Accident Midbrain (Pons / Medullary) Lesion
- Drusen of the Optic Nerve
- Essential Blepharospasm
- Argyll Robertson Syndrome
- Adie's Tonic Pupil
- Horner's Syndrome
- Isolated 3rd Nerve Palsy - Pupil Involved
- Isolated 3rd Nerve Palsy - Pupil Spared
- Isolated 4th Nerve Palsy
- Isolated 6th Nerve Palsy
- Bell's Palsy / 7th Nerve Palsy – Central or Peripheral
- Nystagmus - Congenital or Acquired
- Internuclear Ophthalmoplegia

- Orbital Pseudotumor / Orbital Myositis
- Papillitis / Optic Neuritis not demyelinating
- Toxic / Metabolic Neuropathy
- Retrobulbar Optic Neuritis with or without Multiple Sclerosis
- Papilledema
- Pituitary Tumor
- Pseudotumor Cerebri / Idiopathic Intracranial Hypertension (IIH)
- Vertebrobasilar Artery Insufficiency
- Chlamydial Inclusion
- Collagen Vascular Disease – Rheumatoid Arthritis
- Collagen Vascular Disease – Systemic Lupus Erythematosus (SLE)
- Episcleritis recurrent
- Graves Ophthalmopathy
- Leukemia
- Lyme Disease
- Myasthenia Gravis
- Ocular Ischemic Disease
- Ocular Manifestations of Pregnancy
- Scleritis – Initial and Recurrent
- Sickle Cell Disease
- Marfan Syndrome
- Stevens Johnson Syndrome
- Transient Vision Loss / Amaurosis Fugax - Unilateral or Bilateral

EVIDENCE BASED MEDICINE

Every North Carolina licensed optometrist is obliged to utilize procedures and protocols that are supported by the well-accepted studies that demonstrate treatment efficacy. The Early Treatment Diabetic Retinopathy Study along with the Ocular Hypertensive Treatment Study and the Temporal Arteritis Treatment Study are just a few of a number of studies that an entry level optometrist should incorporate in managing diseases related to these studies.

TYPES OF DISEASES
Infectious
Inflammatory
Autoimmune
Malignant
Toxic

Endocrine
Vascular/Ischemic
Neurological
Metabolic
Mechanical/Traumatic– skeletal/muscular
Aging
Genetic

Examples:
Temporal arteritis – inflammatory and vascular
Allergies – autoimmune
Common Cold – infectious
Dermatochalasis - Aging

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