



THE AMERICAN ACADEMY OF OPTOMETRY
SECTION ON CORNEA, CONTACT LENSES AND REFRACTIVE TECHNOLOGIES

RESEARCH DIPLOMATE CANDIDATE'S GUIDE

Diplomates of the Section on Cornea, Contact Lenses and Refractive Technologies are Fellows of the American Academy of Optometry who are recognized for their knowledge and expertise in cornea, contact lenses and/or refractive technologies. The purpose of the Research Diplomat is to permit Diplomat status for those individuals who contribute significantly to the fields of cornea and contact lenses or refractive technologies but who are not in clinical practice and, thus, are unable to meet the qualifications of the Clinical Diplomat. Research Diplomates of the section are still required to have both a deep and broad base of knowledge in all aspects of corneal anatomy and physiology with an emphasis on either contact lens or refractive technology, but may not provide patient care. The Research Diplomat status is equivalent to that of the Clinical Diplomat, as both have the same rights and privileges. For those who provide patient care, please see the guidelines for the Clinical Diplomates of the section.

Candidate's Welcome

We welcome you as an applicant. We believe that the learning experience you will go through during this process is a rewarding one. We, who have preceded you, have all found it to be so. Not only will you profit from the added knowledge of your studies, but you will also achieve satisfaction and recognition of your mastery. You will meet colleagues from all parts of the world who share mutual interests and concerns and with whom you may discuss both clinical and research topics with confidence. After you have successfully completed this process, we hope you will remain curious about new advances in both contact lenses and refractive technologies and that you will accept new responsibilities and other leadership activities in lecturing, writing, and teaching

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within the section and among our colleagues. We encourage participation in the American Academy of Optometry Annual Meeting.

This guide contains the requirements and the procedures for becoming a Research Diplomate in the Section on Cornea, Contact Lenses and Refractive Technologies of the American Academy of Optometry.

Please note that this guide supersedes all previous information and instructions.

I. Requirements for Becoming a Candidate

The following are a list of requirements for all candidates who are interested in becoming a Research Diplomate in the Cornea, Contact Lenses and Refractive Technologies (CCLRT) Section:

1. Be a Fellow in good standing of the American Academy of Optometry (AAO).
2. Submit an application form online <http://www.aaopt.org/cclrt> indicating your desire to become a Diplomate of the Section.
 - The application can be initiated at any time and you will have **five years** to complete the requirements.
 - You will submit a current curriculum vitae during the application process.
 - There is an application fee of \$100 (made payable to the AMERICAN ACADEMY OF OPTOMETRY).
 - You will submit a head and shoulders photograph of yourself.
 - You will need to identify which track/emphasis you are interested in pursuing:
 1. Clinical Diplomate (see clinical track guidelines):
 1. Cornea and Contact Lenses (CL emphasis)
 2. Cornea and Refractive Technologies (RT emphasis)
 2. Research (non-clinical) Diplomate

II. Qualifications

The applicant should have made substantial contributions to the body of knowledge relating to the cornea, contact lenses or refractive technologies.

1. The applicant should have already published, as a listed author (in general, this should be as the first, or corresponding author), at least ten papers in journals indexed in Web of Science and/or Scopus in the area of cornea, contact lenses and/or refractive technologies. If the applicant has a funded R or U NIH PI award (or equivalent), this can substitute as two published papers. Patents held by the applicant may also be substituted for up to two published papers. The Research

Diplomate Sub-Chair will determine admissibility of publications and substitutions.

2. The applicant should be actively conducting research in the area of cornea, contact lenses and/or refractive technologies.

III. The Scientific Paper

Topic Selection

1. Once the application has been submitted and accepted, the candidate will be contacted by the Research Diplomate Sub-Chair to discuss possible topics for a scientific paper.
2. The topic of the scientific paper should be one in which the candidate has considerable interest. It should be a topic that the candidate wants to learn more about. An improved understanding of the topic should enhance and expand the candidate's research interests.
3. The topic of the scientific paper should not encompass the candidate's research career. It can be a topic related to the candidate's research interests, but it should not be the central theme of the candidate's current or prior research and publications.
4. The candidate must submit five topics appropriate for a scientific paper to the Research Diplomate Sub-Chair.
5. The Research Diplomate Sub-Chair will appoint a Diplomate Award Committee of three CCLRT Section Diplomates, who have some expertise in the topical areas suggested by the candidate. At least one member of the committee will have attained Diplomate status through the research Diplomate process.
6. The Diplomate Award Committee will rule out any unacceptable topics, and the candidate may select the topic of the paper from the remaining topics.
7. The candidate will not be informed of the identity of the Diplomate Award Committee members.

Outline

1. Once a suitable topic is agreed upon, the candidate must submit an electronic copy outline of the proposed paper to the Research Diplomate Sub-Chair, who will forward it to the three Committee members.
2. The Diplomate Award Committee will evaluate the outline for the following:
 - a. Depth and breadth of coverage of the topic
 - b. Background information on basic mechanisms
 - c. Potential for development into a scholarly paper
 - d. Time and effort involved in producing a paper from the outline

3. If the members of the Diplomate Award Committee determine that modifications are needed to the outline, the changes will be communicated to the Research Diplomate Sub-Chair. Committee members will also determine, based on the number and importance of the changes to the outline, whether or not submission of the modified outline is required. Any required updates will be communicated to the candidate by the Research Diplomate Sub-Chair.
4. Upon acceptance of the outline, the candidate may begin to write the scientific paper.

The Paper

1. Requirements

- a. The process of researching and writing the scientific paper is intended to be a challenge. The candidate is to demonstrate knowledge and expertise in cornea, contact lenses, and/or refractive technologies, while analyzing and justifying methods and results of scientific studies on the selected topic. It is intended to be a learning, as much as a testing, process.
- b. The paper must provide evidence of extensive literature review and be comprehensively referenced. Cited papers may include publications by the candidate; however, the candidate's own publications must represent a small fraction of the total references.
- c. The paper should demonstrate the candidate's background knowledge in cornea, contact lenses and/or refractive technologies. The scientific basis of issues explored should be well-expressed.
- d. Considerable depth of scholarship should be evident in the topic area.
- e. The paper should be approximately 50 pages long, excluding references, figures, and tables. It should be double-spaced in 12-point font with 1 inch margins.
- f. The paper should include critical evaluation of methods, results, and analyses of past studies (generally published, although unpublished studies may be included where pertinent) concerned with the topic. For references cited, the candidate should be able to (but is not necessarily obligated to in all cases) discuss the rationale for the different designs used in the studies, potential threats to their validity, and improvements that could be made to each study if the candidate were to perform them. Candidate's papers that do not critically evaluate the topic and the level of rigor of prior studies, but simply provide a comprehensive literature review of the field will not be accepted for committee review.
- g. The candidate should discuss the impact of research in the topical area on the public.

- h. The candidate should formulate the specific research questions that have not yet been answered in the topical area and should be able to formulate hypotheses that need to be tested and be prepared to encourage a discussion relating to the studies that are needed to move the field forward.
- i. References should be cited at the end of the paper, following the guidelines of *Optometry and Vision Science*.
- j. Prior to submission of the paper, the candidate may choose to have the paper reviewed by colleagues for grammar, style, clarity, and conformity to the standards of vision science publications.

2. Submission

- a. An electronic copy of the completed paper should be submitted to the Research Diplomate Sub-Chair, who will send this to the three Committee members.
- b. If the candidate is seeking review and acceptance of the paper prior to the annual meeting of the American Academy of Optometry (which would qualify them to sit for the oral examination), the paper must be received ten weeks prior to this annual meeting.

3. Acceptance

- a. If the members of the Diplomate Award Committee agree that the scientific paper is acceptable, the Research Diplomate Sub-Chair will schedule a time for the oral examination, to take place during the next meeting of the American Academy of Optometry.
- b. If there are reservations about the paper, the members of the Diplomate Award Committee will write specific recommendations for improving the paper. The Research Diplomate Sub-Chair will communicate these recommendations to the candidate, who can re-submit the paper after appropriate improvements have been made.
- c. The candidate should consider publishing the accepted paper in its entirety or in sections as a review paper. If appropriate, a portion of the paper should be submitted for publication in a relevant peer-reviewed journal.

IV. The Oral Examination

After the paper is accepted by the Diplomate Award Committee, the applicant must pass an oral examination of approximately two hours. This examination will generally be conducted by the Diplomate Award Committee; however, substitution(s) may be made with (an)other CCLRT Diplomate(s) if necessary.

Scheduling

The Research Diplomate Sub-Chair will coordinate the scheduling of the oral examination with the members of the Diplomate Award Committee and the candidate. The candidate will not know the identity of the members of the Diplomate Award Committee until the time of the oral examination. Normally the examination will be conducted "face-to-face" at the annual meeting of the AAO; however, in exceptional circumstances a virtual examination may be accommodated.

Format

Each member of the Committee will be involved in asking the candidate questions and evaluating the ability of the candidate to answer the questions. Depth and accuracy of response and the ability to communicate articulately are assessed.

The 2 hour examination will be divided into 3 sections.

Section 1

The first section is described as "general knowledge" and will count for approximately 25% of the examination time. Topics that will be included are the cornea, tear film, and contact lenses (listed below). The general knowledge section should also be personalized to the candidate's background.

1. The Cornea
 - a. Anatomy
 - b. Hydration control
 - c. Biochemistry
 - d. Optics and transparency
 - e. Regeneration and wound healing
 - f. Corneal sensitivity
 - g. Corneal surgery
 - h. Corneal biomechanics
2. The Tears
 - a. Structure and Secretion
 - b. Drainage
 - c. Physical Properties
 - d. Tear Film Stability and Dry Eye
3. Contact Lenses
 - a. Contact Lens Optics
 - b. Contact Lens Materials
 - c. Fitting of Contact Lenses
 - d. Verification and Inspection
 - e. Complications of Contact Lens Wear

- f. Contact Lenses in Abnormal Ocular Conditions (keratoconus, post-surgical, therapeutic)
 - g. Contact lenses in Special Populations (children, presbyopes, astigmats)
 - h. Modes of Contact Lens Wear (disposable lenses, extended wear, orthokeratology)
4. Instrumentation and Methodology
- a. Methods to Measure Corneal Topography
 - b. Methods to Measure Corneal Thickness
 - c. Microscopy of the Cornea
 - d. Methods of Evaluating Corneal Physiological Response
 - e. Methods for Tear Film and Tear Flow Evaluation
 - f. Methods to Evaluate On-Eye Performance of Contact Lenses

Section 2

The second section is described as “hot topics” and will count for approximately 10% of the examination time. This section is intended to test the candidate’s knowledge of current and ongoing key research. An example of a topic that may be included is myopia control with contact lenses.

Section 3

The third section of the oral exam will be confined to questions on the candidate's paper and will account for approximately 65% of the total time of the examination. The questions will include the significance of the paper, unanswered questions on this topic, limitations of the described research, and/or what additional techniques/technology should or could be developed or applied. Additional questions will be designed by the examining committee that must be personalized to the candidate's work.

Grading

For each section, the examiners are required to independently “grade” the candidate’s answers / defense using the CCLRT Research Diplomate’s Oral Examination Form.

Four “grades” are used on this form:

- Unacceptable
- Weak
- Acceptable
- Exceptional

A candidate must achieve a grade of “Acceptable” or “Exceptional” for section 3 in order for the examiner to recommend a pass for the oral examination. If a candidate is graded by the examiner as “Weak” on Section 1 or 2, but “Exceptional” on Section 3, they may still be recommended to pass the oral examination by the examiner.

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All three examiners must reach a consensus as to whether the candidate should pass or fail the oral examination, based upon their completed CCLRT Research Diplomate's Oral Examination Forms. If a consensus cannot be reached, the Research Diplomate Sub-Chair will make the final decision.

Failing the Oral Examination

If the Diplomate Award Committee members determine that the candidate failed the oral examination, they will document an explanation for the negative decision on the CCLRT Research Diplomate's Oral Examination Forms. They should list the areas in which the candidate was weak, as well as suggestions for improvement.

The candidate may repeat the oral examination the following year at the next meeting of the American Academy of Optometry. In cases where this will exceed the five-year time frame, permission must be given by the CCLRT Diplomate Award Chair to repeat the oral examination after this time.

A new Diplomate Award Committee will be selected by the Research Diplomate Sub-Chair. One member of the original Diplomate Award Committee must serve on the new committee. The new committee will not assess the acceptability of the topic, outline, or scientific paper. They are charged only with re-evaluating the candidate in the oral examination.