OPHTHALMIC PHOTOGRAPHERS' SOCIETY

EYE IMAGING EXPERTS

BOARD OF CERTIFICATION

CRA™

Certified Retinal Angiographer Program Guide

Version 15.1

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If the date on this Program Guide is more than six (6) months old, please check the OPS website (opsweb.org) to make sure you have the most current version.

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OPHTHALMIC PHOTOGRAPHERS' SOCIETY
EYE IMAGING EXPERTS

Introduction

Welcome! Thank you for your interest in the Certified Retinal Angiographer (CRA) Program. This Program Guide details the process and requirements to obtain CRA certification. It contains the program application, details the eligibility, portfolio requirements, and includes the examination content outline. The CRA Program is administered by the Ophthalmic Photographers' Society Board of Certification (OPS BOC). http://www.opsweb.org/page/Certification

The Ophthalmic Photographers' Society is a not-for-profit organization dedicated to a highly specialized form of medical photography. Main objectives of the OPS are to provide primary and continuing education in the field of ophthalmic imaging, to set and maintain standards for the profession through certification programs, and to promote scientific advancement in the technology.

The OPS serves as a professional organization for its members, sponsoring educational programs and promoting the exchange of information in the field of ophthalmic imaging internationally.

The OPS holds various programs including the Annual Educational Program (AP) concurrently with the annual program of the American Academy of Ophthalmology (AAO) and International Conference on Ophthalmic Photography (ICOP), among others. The OPS programs include presentations on advancements in scientific photography and instrumentation, as well as comprehensive educational endeavors.

The OPS membership includes, but is not limited to, ophthalmic and medical photographers, ophthalmic technicians, assistants, technologists, veterinarians, industry professionals, ophthalmologists, optometrists, nurses, pathologists, researchers, and engineers. Sustaining members are organizations and individuals actively involved with ophthalmology or ophthalmic photography for commercial or charitable purposes. Anyone involved in ophthalmic photography is encouraged to apply to the OPS Membership Office. (ops@opsweb.org).

The Society created the Board of Certification in 1979. The BOC serves as the formal body responsible for the certification of retinal angiographers and ophthalmic photographers. To date, more than 800 ophthalmic photographers have attained the CRA credential. Membership in the OPS, while encouraged, is not a requirement for certification.

Communications

Please direct all communications to:

Mailing Address:	Ophthalmic Photographers' Society 1621 E. Jody Circle Republic, MO 65738
Office Phone:	+1-417-725-0181 +1-800-403-1677
Web Address:	www.opsweb.org
Email Address:	cra.chair@gmail.com

Certification Policies

The Ophthalmic Photographers' Society Board of Certification is responsible for certification of retinal angiographers and ophthalmic photographers. Certification recognizes individuals who have met the BOC's standards of competence. The BOC is responsible for the administration of the certification examination. Prometric, a professional examination administration contractor, proctors the CRA examinations.

CRA

CRA designates an individual who has met the BOC standards of competence in fundus photography and retinal angiography. The BOC standards are meant to ensure delivery of competent, professional fundus photography and retinal angiography services.

CRAs demonstrate competence by understanding and being able to:

- Identify the ocular anatomy
- Recognize common ocular pathology
- Perform single frame fundus photography
- Perform sequential stereo fundus photography
- Perform rapid sequence fluorescein angiography

The CRA examination is offered at Prometric testing centers.

The BOC is the only agency authorized to designate an individual as a Certified Retinal Angiographer. The BOC developed its program to facilitate voluntary certification of ophthalmic photographers. Its sole purpose is recognition of attainment of a standard level of knowledge and skill in fundus photography and retinal angiography. Certification does not guarantee recognition by any other individual, group, agency or institution.
The liability of the BOC or its representatives is limited strictly to this recognition by the BOC.

Provisional Certified Retinal Angiographer (Provisional CRA)

The designation Provisional CRA describes an individual who has met the criteria of the CRA except for the work experience eligibility requirements. The BOC established the Provisional CRA Program for those who wish to become CRA-certified, but do not yet meet the work experience requirements for the CRA Program. Individuals using formal education or professional certification as a substitute for up to one year of the work experience requirement are eligible to participate in the Provisional CRA Program. The work experience waiver procedures are described in the **Examination Eligibility Requirements** section on **page 7**.

The Board offers the Provisional CRA to support those who choose ophthalmic photography as their vocation. The Provisional CRA serves a population who greatly benefits from the OPS's services, educational support and programming as they work towards meeting the requirements for full certification.

To become a Provisional CRA, an applicant must submit a portfolio that satisfies the board's eligibility requirements and pass the multiple-choice examination. Once the CRA Section Chair receives and approves documentation of the required work experience, they will upgrade the candidate's Provisional CRA status to CRA. An applicant awarded Provisional CRA status must use the designation Provisional CRA and must not use the designation CRA.

Statement of Nondiscrimination

The Ophthalmic Photographers' Society Board of Certification shall admit applicants of any age, sex or sexual orientation, race, religion, color, national origin, disability or marital status to all rights, privileges, programs, and examinations generally made available through its association. It shall not discriminate on the basis of age, sex or sexual orientation, race, religion, color, national origin, disability, or marital status in the administration of its certification policies.

Application Process

Complete the following steps in the order listed below to qualify for the CRA examination:

1. Submit a completed CRA program application
2. Submit a portfolio
3. Submit examination application, employment verification, and a copy of a current cardiopulmonary resuscitation (CPR) certificate (forms will be provided after the portfolio has been accepted)
4. Pay examination fee
5. Candidate will receive an email from Prometric with instructions to schedule exam
6. Schedule exam within one year of receiving the email

Submit CRA Program Application

CRA applicants complete a Program Application on the OPS Website at http://www.opsweb.org/?page=portfolio_submission or request an application from the OPS Membership Office (1-800-403-1677 or OPS@opsweb.org).

By applying for the CRA examination the applicant agrees to the terms set forth in this program guide regarding certification requirements and examination. Applicants attest that all information they submit is true and complete to the best of their knowledge. Any misrepresentation or misconduct in the application or examination process may result in disqualification or revocation of certification. (See **Disciplinary Policy page 17**)

Portfolio

The portfolio **MUST BE** submitted to the OPS website.
www.opsweb.org/page/portfolio_submission

To ensure the BOC has adequate time to review a candidate's portfolio, the application and portfolio should be **submitted a minimum of eight weeks in** advance of the desired examination date. Once the portfolio is downloaded the candidate will receive a confirmation email. If the candidate has not received this email within seven (7) days of uploading, please contact the CRA Section Chair. Portfolio requirements are detailed in appendices.

Examination Application and Employment Verification Letter

Once the portfolio is approved, the CRA Section Chair will email the candidate an Examination Application along with further instructions on how to proceed. The application and Employment Verification Letter (confirming a minimum of two (2) years experience) and copy of current CPR certification must be completed and submitted via email to cra.chair@gmail.com. CPR certification requires **in-person skills assessment** in addition to online course work. A current in-person skills assessment is required, regardless of any prior in-person training. Eligibility requirements for the CRA and requirements for **Provisional CRA** are explained in greater detail on **page 7**.

Examination Fees

The examination fee may be paid online at the OPS store or a check can be mailed to the OPS Office (made payable to OPS/BOC in US dollars). There is a **one year limit** for completion of the examination once a candidate has received their email from Prometric (see **Examination Registration page 12**). The examination fee includes a $50 non-refundable application fee and one administration of the CRA examination at a BOC approved testing center.

CRA Examination Fees:

OPS member Fee:	$465
Non-OPS Member Fee:	$590 (includes optional 1 year OPS membership)
Retesting Fee:	$285

All fees must be remitted in U.S. dollars. For any issues with payment, contact the OPS Membership Office (+1-800-403-1677)

Certificates

Once the Board of Certification notifies applicants that they have completed all requirements for certification, they may use the title Certified Retinal Angiographer or CRA, if the certificant maintains their certification (see **CRA Recertification: Requirements page 28**). This designation may be used as part of a signature, and on letterheads and business cards etc. The BOC mails certificates to successful applicants with their notification. **Applicants are responsible for notifying the BOC of any change of name, email, or mailing address,** this will ensure all confidential correspondence concerning certification and recertification will reach the applicant.

Refunds

Examination fees will be fully refunded (minus the $50 application fee) if an applicant submits notification **at least two weeks** before a scheduled examination. Refunds for cancellations received **less than two weeks** before the scheduled examination are subject to a cancellation fee. Refunds are made payable and issued to the party that originated the application fee payment. No refunds or credits will be issued to those who fail examinations, or to those who do not appear for the examinations or failure to schedule an examination date within a one-year window.

Special Testing Arrangements

The BOC grants reasonable accommodations for candidates with documented disabilities, in compliance with the Americans with Disabilities Act (ADA). If special assistance or arrangements are required, the candidate should contact the Prometric testing center at smt-operationsteam@prometric.com, or call +1-866-773-1114 (US or Canada) or other countries, call +1-727-733-1110.

Privacy/Confidentiality Policy

The BOC abides by the OPS' privacy/confidentiality policy demonstrating its firm commitment to CRA candidates and certificant privacy (available at www.opsweb.org >

Certification > Forms & Guides). This policy applies to all aspects of the CRA credential including the secure handling and storage of application materials, examinations, scores, and candidate and certificant records. BOC staff and volunteers are required to complete a non-disclosure document agreeing to protect the privacy of CRA certificants and candidates. It is BOC policy that non-disclosure protected information may NOT be released to or shared with:

- Any member of the public without an applicable statutory exception or written release from the CRA candidate/certificant
- Any member of the BOC, unless the recipient has a legitimate interest, for the use of that protected information to perform a service or carry out a responsibility within that person's scope of employment or engagement as a BOC representative

The BOC policy states protected information may only be released or shared in accordance with said policy. OPS staff and BOC representatives, with access to protected information, are expected to safeguard said information from unauthorized disclosure. This includes, as appropriate:

- Computer Systems and Applications Security: Central processing units, peripherals, portable storage devices, operating systems, applications software, and data
- Physical Security: The premises occupied by OPS personnel, representatives or contractors
- Operational Security: Environmental control, power equipment, operational activities related to operations
- Procedural Security: Established and documented security processes for information technology staff, vendors, management, and individual users of protected information
- Network Security: Communications equipment, transmission paths, switches, terminals, and adjacent areas

The OPS and the BOC reserve the right to change this policy at any time by notifying users of the adoption of a new privacy statement.

Statement Of Proprietary Interest

The BOC has no commercial or proprietary interest in any products used or mentioned in the certification program. The use of brand names in this program guide or on any examination is only for illustration and does not imply BOC endorsement.

Records And Data Retention Policy

All applications, correspondence, supporting documentation and materials generated in the testing process will be held for three (3) years. Computer records of applicant demographics

and test scores are kept indefinitely.

Statement On Administration of Intravenous Injections

The administration of intravenous injections is not a requirement for certification. Therefore, the BOC has no legal authority to test or certify the competency of applicants in the administration of intravenous injections.

The BOC recommends that applicants check with the appropriate agency or agencies within the state that they practice to determine that state's requirements. States regulate the credentials required to administer intravenous injections. The laws and required credentials of each state vary.

Requirements for Certification

Examination Eligibility Requirements

Eligibility for the multiple-choice examination is contingent upon fulfilling these requirements.

1. Submission and acceptance of a satisfactory portfolio (See **Portfolio Requirements page 8**).
2. A letter from the employing physician(s) or institution(s) verifying the applicant's employment history as a Retinal Angiographer for a minimum of two (2) years.

This two-year work experience requirement is meant to allow time for an applicant to acquire, through hands-on experience, the knowledge and skills necessary to perform fundus photography and angiography. It should include enough patient interaction to allow an applicant to develop the clinical judgement and patient management skills necessary for competent performance as a retinal angiographer. A competent retinal angiographer must be able to elicit cooperation from a non-cooperative or challenging patient for acceptable performance of rapid sequence angiography. A competent retinal angiographer should be able to recognize and react to medical and photographic complications during angiography. Internships or practicum are considered part of a formal education program and do not qualify as work experience.

Formal education or professional certification in photography, ophthalmic photography, or ophthalmology, may be used as a substitute for up to one year of the work experience requirement. An official transcript mailed directly from the academic institution to the CRA Section Chair or the photocopy of a current JCAHPO certificate must be submitted for documentation and verification. Work experience substitution waivers will be granted in the following increments:

Associate Degree in Photography, Certified Ophthalmic Assistant (COA)	=	3 months work experience
Bachelor's Degree in Photography, Optical Coherence Tomographer-Certified (OCT-*C*), Ophthalmic Technician (COT)	=	6 months work experience
Bachelor's Degree in Medical/Scientific Photography/Imaging, Certified Retinal Technician (CRT)	=	9 months work experience
Bachelor's Degree in Medical/Scientific Photography/Imaging (With advanced electives in Ophthalmic Photography) or Bachelor's Degree in Ophthalmic Photography, Certified Ophthalmic Medical Technologist (COMT)	=	12 months work experience

After determining qualifying work experience using the table above, and with approval from the CRA section Chair, candidates are eligible to take the examination.

Verification of Eligibility Information

The BOC reserves the right to verify the experience and/or education attested to by the applicant by contacting the employer(s) listed on the application form or requesting written documentation of the submitted information before examination. Applicants will be declared ineligible for examinations if any eligibility requirements are found to be unacceptable.

Portfolio Requirements Outline

The portfolio must be produced entirely by the applicant. See **Appendix A, page 33 for detailed portfolio requirements and standards**. The program application form must be completed and submitted before the portfolio submission. All portfolios must be submitted digitally using the Portfolio Submission online portal (www.opsweb.org/page/portfolio_submission). By submitting the portfolio and form, the applicant attests to the authenticity of the work submitted. Submission of work completed by anyone other than the applicant constitutes fraud. Fraud or misrepresentation of the portfolio may result in disqualification of the applicant.

The CRA Examination

The designation of CRA is meant to assure interested parties (patients, employers, regulators, the public) that the certificant has demonstrated an established level of competency in performing fundus photography and angiography. Certification requires thorough knowledge of the subject matter.

Examination Philosophy

The content validity, relevance, fairness, and accuracy of the CRA examination are assured by the BOC working with experts in the field of certification programming. This mandates the examination development, administration, scoring, and reporting adhere to international professional standards and guidelines, establishing assessment and certification best practices. The most important of these standards are published by such key organizations as the National Commission for Certifying Agencies (NCCA), ISO/American National Standards Institute (ANSI) 17024 Standards, the American Psychological Association (APA), and the Council on Licensure, Enforcement and Regulation (CLEAR). This body of standards provides a means for ensuring that the assessment and credentialing process is a fair measure of competence and is legally defensible.

The examination content outline is based upon the 2017 Job Analysis Study (also called a Role Delineation) that will be revalidated periodically. The most recent study findings were implemented in the summer of 2017 and utilized a full-scale survey methodology inviting all known CRA professionals to participate. This research was performed under the direction of a panel of Subject Matter Experts (SMEs) representing the full complement of diversity in the field, providing a documented link between the content of the examination and practice on the job as a CRA.

The passing standard (cut score) for the CRA examination was determined using methodologies involving a representative panel of CRA SMEs and empirical judgments (Angoff, Design V). New forms and versions of the examination are systematically implemented to preserve the integrity and security of the examination and to conform to testing industry standards. Each new examination form contains a percentage of new questions unique to the new form. Psychometric procedures are used to score the examinations in compliance with relevant technical guidelines. Score scaling, which ensures consistency and fairness, is a common psychometric practice, used on many examinations including the SAT, ACT and OPS OCT-C examinations.

Ongoing question writing, review, and analyses are conducted to ensure that the validity, reliability, and other psychometric characteristics of the examinations conform to standards. New questions written by CRA SMEs are reviewed, verified to an approved reference, and linked to the examination content outline. All questions undergo statistical review to ensure that they are relevant. Professional test development and psychometric staff oversee these activities. The BOC is confident in the validity of the exam content, the reliability of the test instruments and the measurement processes employed to analyze, score, and establish reporting scores.

Examination Design, Scoring and Reporting

The CRA examination is comprised of 175 multiple-choice questions, administered using computer-based examinations. Candidates are allotted two hours to complete the exam. Each multiple-choice question has four answer choices; only one answer choice is correct. It is a closed-book examination. Candidates will be provided with scratch paper and a pencil; both will be collected at the completion of the examination. Candidates are encouraged to read the questions carefully, choosing the single best response, first answering the questions that they are sure of, returning to the more difficult questions as time allows. Credit is given only for questions that have responses. Questions left blank will be scored as incorrect; therefore, there is no penalty for guessing.

At the end of the testing session, a computer-generated score report will be issued. This score is provisional, pending statistical verification that will take place within 72 hours. If candidates do not hear from the BOC or its representatives within that time period, they may assume the score stands as reported. Candidates passing the examination will not receive a scaled score. Failing candidates will receive a scaled score, along with a diagnostic report indicating examination content areas of weakness.

The examination score is based upon the total number of correct responses that represent competency. Scores are unrelated to the performance of other candidates taking the examination.

At times during the examination development cycle, candidate scores may be withheld pending further psychometric analysis. Withheld scores will be released within approximately 60 days of the examination administration date.

Examination Procedures

The CRA examination is available at BOC approved test centers through Prometric to be taken at a location and time of the candidate's choosing. Details and access to a sample online test to familiarize yourself with the process are made available when applying for the exam. Information about Prometric locations is available online at: www.smttest.com/sitesavail/Default.aspx

Preparing For the Examination

The CRA examination tests the applicant's knowledge of general digital photography, fundus photography and angiography. The **Examination Content page 18** identify the areas in which to concentrate for the examination. The BOC provides a suggested reference list as a resource that may be useful to supplement the training and experience related to competent performance as a CRA.

A list of **Suggested References** can be found on **page 26**. The BOC does not endorse any particular text or author. This list is not intended to be inclusive, but reflects references used to support the test development process. Use of the suggested references during study for the CRA exam does not guarantee successful performance on the examination.

Additional Opportunities for Study

The OPS offers related courses, workshops, and publications independent of the BOC. The BOC does not provide training or educational materials. CRA candidates are not required to purchase training or education materials from the OPS in order to pass the examination. Attendance at OPS courses and workshops are not a prerequisite to sitting for the CRA examination; the courses are not designed to serve as examination preparation classes, nor do they serve any ancillary examination-related purposes. The course curriculums are designed specifically to review broad concepts and offer high-level overviews of OPS-relevant topics and sub-topics. More information about educational opportunities may be found at the OPS Web Site at www.opsweb.org.

Advisory Program

The BOC developed an advisor program to provide guidance to prospective CRA applicants. Advisors are CRAs, use the latest ***CRA Program Guide*** for reference, and must work within parameters established by the BOC. The advisor can provide the applicant with advice and direction. Interested applicants are encouraged to contact a member of the Advisory Program Committee. www.opsweb.org/page/examprephelp
E-mail: advisor@opsweb.org

OPS Lending Library

The OPS Board of Directors (BOD) developed the lending library to provide access to standard texts in Ophthalmology and Ophthalmic Imaging that may be of assistance in preparation for the CRA examination. The Advisory Committee member can assist you in selecting books that address exam content areas you feel you would like to study further. Books are lent from the OPS **Membership Office (1-800-403-1677)** ops@opsweb.org

Examination Registration

Once the CRA portfolio and examination application have been approved, candidates will receive official notification to register for the examination and instructions on how to proceed. The examination is offered via computer administration at OPS/BOC approved testing centers.

The CRA Examination is offered at over 250 test sites in the U.S. and Puerto Rico, U.S. Territories, Canada and various sites outside of North America. Most test sites are open from Monday-Saturday from 9:00 AM to 9:00 PM, and Sundays from 1:00 PM to 6:00 PM, excluding holidays. These sites are operated by the CRA administration contractor, Prometric. Information concerning testing center locations and hours of operation may be found at www.isoqualitytesting.com, by clicking the Take a Test tab and then the Locate a Testing Center hyperlink.

Note: candidates **may not register** for a testing site until registration information is provided by the CRA Certification Board upon approval of the application.

Once approved to sit for the CRA examination, candidates will receive correspondence directing them to:

1. Navigate to the testing contractor examination registration page: www.IQTTesting.com
2. Use the option "Examination Registration" and select the organization: OPS
3. Select the exam: CRA
4. Enter the provided Username and Password to login:
   - Username: (Your e-mail address)
   - Password: Unique CRA applicant number provided by Prometric correspondence

After logging in, please follow the on-screen instructions to schedule an appointment. For assistance call toll free in USA and Canada 866.773.1114, or other countries +1.727.733.1110.

***Note: candidates MUST test within 12 months of receipt of application approval.**

Rescheduling an Examination Registration

Examination fees will be fully refunded (minus the $50 application fee) if an applicant submits notification **at least two weeks** before a scheduled examination. Refunds for cancellations received **fewer than two weeks** before the scheduled examination are subject to a cancellation fee. Refunds are made payable and mailed to the party that originated the payment. No refunds or credits will be issued to those who fail examinations or to those

who do not appear for the examinations.

Failure to appear at any scheduled examination site without contacting Prometric or to reschedule an examination date within a one-year window will cause the forfeiture of all application fees. It is the candidate's responsibility to contact Prometric to reschedule a test. Candidates may reapply for the CRA Program by paying the full application fee.

Examination Administration Rules and Regulations

The Examination Administrator or proctor is the BOC's designated agent for maintaining secure and valid examination administration. Any individual found by the Board or its agent engaged in conduct that compromises or attempts to compromise the integrity of the examination process will be subject to disciplinary action as sanctioned by the BOC, The Code of Ethics, and the BOC policies and procedures. Examinations are administered according to a strict protocol to ensure the examination security and to protect the right of each candidate to a standardized testing experience. In addition to the attestation on the CRA Application, as a prerequisite to distribution of examination materials, candidates are required to sign a Security Affidavit agreeing to abide by all rules and regulations, including the following:

- During the registration procedures at the test site, candidates must sign the test roster and provide one form of valid government-issued photo identification, such as a driver's license or passport.
- No books, papers, texts, references, or personal calculators are allowed in the examination room. Scratch paper and a pencil will be provided and then collected by the test proctor after testing. No electronic devices of any kind are permitted in the testing room (e.g. cell phones, smart watches). If any are found, the candidate will be disqualified.
- If possible, personal belongings should not be brought to the testing site. If they are, they will be placed in a secure location and will be unavailable to the candidate during the examination.
- No food or drink is allowed in the examination site. Candidates with a specific medical condition (e.g., hypoglycemia, pregnancy, diabetes) requiring the consumption of water or food during the examination period must submit a written request to Prometric for a special accommodation prior to the examination.
- Visitors are not permitted in the examination room.
- At no time during the examination may candidates give or receive help to one another or communicate in any way. Examination proctors have the authority to remove a candidate suspected of cheating from the examination room, at which time scores will be cancelled and disciplinary action will be taken.
- Candidates are expected to follow all instructions from examination proctors, printed in test booklets and answer sheets, and/or displayed in the computer-testing program. Candidates will be provided with the opportunity to ask questions prior to beginning the examination.

The computer-delivered examinations include a detailed five-minute tutorial program designed to give candidates confidence in the use of the program, as well as familiarity with the system prior to beginning the examination. The tutorial questions are for demonstration purposes only and do not impact examination scores. Candidates are encouraged to take the time to complete the tutorial as it explains features of the computerized testing system. The candidate's name and the name of the examination will be shown at the upper left corner of the screen. If either of these is incorrect, candidates are asked to inform the proctor. A navigation grid is posted on the upper right of the screen, depicting the number of questions on the examination, and the status of those questions (answered, bookmarked for review, or skipped). A digital clock is also posted, indicating a countdown of available time. Registered candidates may take a sample test (content is not CRA-related) before going to the test site by accessing the testing contractor's website using the following URL link: https://www.iqttesting.com/Default.aspx?Function=SampleExam&Exam=8

Candidates may leave the testing room only after receiving express permission from the proctor. Candidates must sign out and sign in from the room and must surrender all testing materials when they exit. Exit from the testing room is permitted for washroom and drinking fountain visits only. Candidates may not access cell phones or leave the building during breaks. Test timing is not paused for these breaks.

Disqualifying behaviors include but not limited to:

- Creating a disturbance
- Aiding or asking for aid from another candidate
- Any attempt to remove copy, buy, sell, or reproduce testing materials
- Unauthorized possession of test materials
- Impersonation of another candidate
- Use of contraband materials or equipment in the testing site
- Any falsification or misrepresentation of information provided during the CRA application process

Candidate Comments

During the examination candidates can post comments simply by clicking on the icon entitled Comment on this Question. Once the examination is completed, candidates may provide additional feedback and comments on the examination exit survey. Examination proctors may not discuss or comment on the examination contents. All comments and questions are reviewed and considered by the BOC; however, security procedures preclude discussion with candidates concerning individual test questions or comments. Candidates should not expect a response to a comment unless it relates to a problem with the examination administration. Candidate comments or lack thereof may be taken into consideration as evidence during the appeals process (details of examination appeal

procedures follow).

Examination Scoring and Reporting

The BOC works with its testing consultant and contractor in the development, administration, scoring and reporting of the CRA examination, and facilitates research studies with a committee of CRAs to establish passing scores for each examination. Using Modified Angoff V standard-setting procedures, the CRAs are asked to review every question on the examination and provide empirical judgments of the likelihood of competent CRAs answering the question correctly. Through this process, a raw score representing competency is established. The raw passing score is translated onto a scaled reporting score.

- Candidates who pass the examination receive notice of successful performance. The CRA examination is a minimum competency examination and is not intended to distinguish scores above the passing point. Numeric scores are not reported above the passing point.
- Failing candidates receive a numeric scaled score and a report indicating content areas of weakness. The report is designed to provide a tool for study and preparation for retaking the examination.
- Examination reports will be provided only to the candidate, and will NOT be provided over the phone, fax, or internet.

Award of Certification

Once the BOC notifies applicants that they have completed all requirements for certification, they may use the title Certified Retinal Angiographer (CRA) if the certificant maintains their certification (see recertification guidelines below). This designation may be used as part of a signature, and on letterheads and business cards, etc. The BOC mails official certificates to successful applicants.

Retesting

Candidates who did not pass the exam are allowed to reapply with payment of a $285 re-examination fee. The first retest may take place after payment is received and processed. Candidates may retest four times within twelve (12) months. A six (6) month waiting period is required after the fourth attempt.

Appeals

Candidates have the right to appeal examination results according to the following specified criteria.

Section 1: Grounds for Appeal

Candidates may appeal examination results in extraordinary circumstances that arise coincidentally with the examination administration.

If written documentation of extraordinary circumstances is not received by the BOC within seventy-two (72) hours of an examination, a candidate will forfeit the right to appeal.

Section 2: Methods of Appeal

Candidates will:

- Submit appeal in writing
- Detail the specifics of the appeal and all particulars necessary for adjudication
- Include a non-refundable fee of $50

Section 3: Appeal Procedures

BOC Review and Action:

- An appeal will be submitted to the BOC within fourteen (14) days of the receipt of examination scores
- Two BOC representatives will determine the validity of the appeal
- The BOC will review the following:
    - Appellant's statement of appeal
    - Statement from a Prometric representative or psychometric professional staff member concerning the exam process relative to the appeal
    - Examiner reports and comments submitted by the appellant at the time of the examination
- BOC representative will notify the appellant within thirty (30) days of receipt of the appeal regarding status of the appeal

All decisions of the BOC are final. Any charge or complaint will be investigated, reviewed and reported to all parties concerned.

CONTACTS:

CHAIR, CRA SECTION AND PORTFOLIO COMMITTEE
E-mail: cra.chair@gmail.com

CHAIR, CRA RECERTIFICATION SECTION
E-mail: recert@opsweb.org

CHAIR, BOARD OF CERTIFICATION
E-mail: BOC@opsweb.org

EXECUTIVE DIRECTOR, OPS MEMBERSHIP OFFICE
Barbara S. McCalley
1621 E. Jody Circle Republic, MO 65738 Phone: 417-725-0181 or 800-403-1677
E-mail: ops@opsweb.org http://www.opsweb.org

Revocation

Fraud or misrepresentation on the application, portfolio, or in the examination can result in denial or revocation of Certification. The BOC reserves the right to void examination results, bar participation in the certification program and revoke certification or other sanctions in accordance with the Disciplinary Policy. The BOC will consider such actions if members have reason to question the validity of an applicant's examination results, suspects misconduct at a test center or suspects an applicant has reported fraudulent information. Denial or revocation of certification may be appealed in writing to the Chair of the BOC.

Disciplinary Policy

The BOC may impose sanctions against applicants or individuals already awarded certification for failure to meet BOC rules and standards of initial certification or recertification. The CRA program is a voluntary process, not required by law for employment in the field. Monitoring and evaluating actual job performance is beyond the scope of the BOC.

Grounds for Action

The Board of Certification reserves the right to deny certification, void examination results, bar participation in the certification program or to revoke certification. The following are grounds for action:

- Fraud or misrepresentation on any certification application, document, portfolio, or examination
- Unauthorized possession, distribution or disclosure of examination materials or content
- Misrepresentation of certification or certification status
- Failure to cooperate reasonably with any BOC investigation of a disciplinary matter

Violations of standards of conduct or examination procedures may result in denial or suspension of eligibility. Appeals may be submitted to the BOC.

Examination Content

As described, the examination content outline is based upon Job Analysis research of the role of the imager. The examination construction is based upon the ten (10) main content areas as outlined below:

I. Applies the Principles of the Anatomy, Physiology, and Pathology of the Eye
(16% 28 items on exam)

A. Demonstrates an understanding of external ocular structure
B. Demonstrates an understanding of anterior segment structures (cornea, anterior chamber, iris, lens)
C. Demonstrates an understanding of posterior structures (vitreous, retinal layers, pigment epithelium, choroid, optic nerve)
D. Demonstrates an understanding of anatomical landmarks and terminology
E. Understands the circulation properties (iris, retina, optic nerve, choroid)
F. Understands metabolic processes of the retina
G. Recognize and identify the ocular manifestations and associated findings of ophthalmic diseases and disorders:
    1. Systemic
    2. Vascular
    3. Retinal
    4. Choroidal
    5. Optic disc/nerve
    6. Scleral
    7. Inflammatory
    8. Trauma
    9. Lesions/tumors
    10. Hereditary/congenital
    11. Anterior segment diseases affecting patient safety or image quality
H. Recognize and identify the clinical findings relating to:
    1. Diabetic retinopathy
    2. Hypertensive retinopathy
    3. Macular degeneration
    4. Vascular occlusions
    5. Ocular histoplasmosis
    6. Central serous retinopathy
    7. Toxoplasmosis
    8. Cystoid macular edema
    9. Macular hole
    10. Angioid streaks
    11. Macroaneurysm
    12. Hereditary macular dystrophies
    13. Malignant melanoma

14. Hemangioma
15. Retinoblastoma
16. Choroidal nevus
17. Optic atrophy
18. Optic neuritis
19. Glaucoma
20. Papilledema
21. Drusen
22. Uveitis
23. Retinal detachment/tear
24. Retinopathy of prematurity
25. Autoimmune retinopathy
26. Sickle cell retinopathy
27. Cytomegalovirus retinitis
28. Anterior ischemic optic neuropathy
29. Coloboma
30. Coats' disease
31. Epiretinal membrane
32. Retinal toxicity
33. Stargardt disease
34. Retinal plaque
35. Retinitis pigmentosa
36. Lattice degeneration
37. Media opacities

II. Patient Management and Patient/Operator Safety

(6% 10 items on exam)

A. Perform a patient flashlight examination to determine:
   1. Contraindications to dilation
      a. narrow angles
      b. contact lenses
      c. iris fixated/anterior chamber intraocular lens
   2. Media opacities (e.g., scarring/cornea and lens)
   3. The presence of inflammation (e.g., infection)

B. Inform patient of procedures to be performed, pharmacologic agents to be administered, expected outcomes, and potential side effects

C. Answers patient questions concerning the procedure

D. Elicits cooperation from uncooperative or physically disabled patients

E. Provides for written informed consent for angiography

F. Establishes/reviews patient records including:
    1. Medical/surgical history
    2. Allergies
    3. Pregnancy
    4. Ocular history
    5. Photographic history
G. Administers prescribed drops including:
    1. Verifies physician's orders
    2. Maintains aseptic/sterile technique
    3. Performs punctal occlusion
    4. Monitors and assesses the effects of the drops
    5. Recognizes and responds to adverse reactions to drops
H. Demonstrate proficiency in CPR
I. Adheres to Universal Precautions as defined by the Centers for Disease Control and Prevention (CDC)
J. Observes Occupational Safety and Health Administration (OSHA) and The National Institute for Occupational Safety and Health (NIOSH) regulations relating to ophthalmic photography
K. Understands HIPAA confidentiality and privacy regulations relating to ophthalmic photography

III. General Photography

(10% 18 items on exam)

A. Understands the functions and properties of digital imaging including:
    1. Demonstrates basic computer skills
    2. Stocks and inventories digital supplies
B. Understands the function and components of the digital camera including:
    1. Still digital camera – color
    2. Still digital camera – monochrome
    3. Digital video
    4. Central processing unit (CPU)
    5. Archiving devices and media
    6. Backup power and voltage protection
    7. Electronic components
C. Performs routine maintenance and digital equipment troubleshooting including:
    1. Electronic components
    2. Cleaning equipment including relay lenses
    3. Software maintenance
    4. Hardware maintenance
    5. Storage utilization
D. Understands digital imaging properties including:
    1. Resolution
    2. ISO rating/gain/noise
    3. Dynamic range

4. Contrast
5. Exposure control
6. Color balance
7. Gamma
8. Bit depth

E. Understands the use of digital image overlays
F. Understands the use of digital measurement utilities
G. Understands digital color management
   1. Monitor calibration
   2. Printer calibration
H. Demonstrates digital image processing skills related to output including:
   1. Proof sheet production
   2. File format/compression
   3. Output resolution
   4. Contrast enhancement
   5. Sharpening
   6. Brightness
   7. Color balance
   8. Resampling
   9. Scaling
   10. Printing
   11. Composite/montage
I. Recognizes sources and corrects conditions causing digital artifacts including:
   1. Blooming
   2. Noise
   3. Over/under exposure
   4. Over/under saturation
   5. Over sharpening
   6. Interpolation
   7. Sensor dust
   8. Pixel dropout
J. Follows established clinical imaging protocols (practice-based or clinical trials)
K. Follows clinical trial certification procedures

IV. Data and Image Management

(4% 7 items on exam)

A. Has a working knowledge of image editing software
B. Organizes archival systems in accordance with state and federal regulations
C. Coordinates network file transfers for archiving/patient database systems
D. Observes networking security (e.g., firewalls, patient privacy, security, access, wireless transmissions)
E. Uses technology for image review (e.g., video, projection, stereo-viewers, electronic transmissions, digital overlays)
F. Demonstrates knowledge of Picture Archiving and Communication Systems (PACS)

and Electronic Medical Records (EMR)

G. Understands Digital Imaging and Communications in Medicine (DICOM) Standards

V. Fundus Photography – Fundus Camera and Scanning Laser Ophthalmoscope

(23% 40 items on exam)

A. Performs routine fundus camera maintenance and equipment troubleshooting including:
   1. Replaces viewing bulbs and flash tubes
   2. Replaces fuses
   3. Clean equipment including lenses

B. Demonstrates the techniques of image production using a fundus camera including:
   1. Set reticule for accommodative correction
   2. Verify filter positions
   3. Establish photographic plan
   4. Adjust photographic plan during photography in response to unusual situations or findings
   5. Set viewing angle
   6. Set flash power
   7. Set shutter/flash synchronization
   8. Set viewing light intensity
   9. Position patient for photography
   10. Establish fixation
   11. Establish alignment and focus
   12. Recognize the need for diopter/axial eye length compensation
   13. Perform fundus photography - non-stereoscopic
   14. Perform fundus photography - stereoscopic
   15. Perform fundus photography - using astigmatic correction device
   16. Perform anterior segment photography with a fundus camera to document:
      a. media opacities
      b. gross anterior pathologies

C. Demonstrates the technique of image production using a Scanning Laser Ophthalmoscope (SLO) including:
   1. Verify filter positions
   2. Establish photographic plan
   3. Adjust photographic plan during photography in response to unusual situations or findings
   4. Set/establish magnification/angle of view
   5. Select appropriate light source
   6. Set light source intensity

7. Position patient
8. Establish fixation
9. Establish alignment/working distance/focus
10. Adjust gain/sensitivity
11. Recognize the need for diopter/axial eye length compensation
12. Perform SLO fundus photography - non-stereoscopic
13. Perform SLO fundus photography - manual/auto stereoscopic
14. Perform SLO anterior segment photography to document:
    a. media opacities
    b. gross anterior pathology

VI. Monochromatic Imaging and Fundus Autofluorescence

(5% 9 items on exam)

A. Uses monochromatic light sources/filters to perform monochromatic imaging including:
   1. Blue (~480nm)
   2. Green(~540nm)
   3. Red (~640nm)
   4. Near Infrared (~800nm)
   5. Autofluorescence- visible
   6. Autofluorescence- infrared

B. Uses Scanning Laser Ophthalmoscope or Modified Fundus Camera to use fundus autofluorescence for imaging including:
   1. Uses excitation and barrier filters/wavelengths
   2. Understands image acquisition mean calculations/image averaging
   3. Understands exposure, noise effect, and gain
   4. Understands the cause of artifacts (e.g., retinal bleaching, ghosting)
   5. Understands disease specific applications (e.g., RPE changes/lipofuscin)

VII. Fluorescein Angiography with Fundus Camera or Scanning Laser Ophthalmoscope

(25% 43 items on exam)

A. Performs fluorescein angiography including:
   1. Makes preparations for IV fluorescein injection or oral fluorescein administration
   2. Identifies and confirms patient demographics
   3. Perform green filter (red-free) photography:
      a. non-stereoscopic images
      b. stereoscopic images
   4. Coordinates photographic sequence with the administration of dye
   5. Takes a control photograph
   6. Starts timer
   7. Acquires angiographic sequence on non-stereoscopic images
   8. Acquires angiographic sequence of stereoscopic images
   9. Monitors and assesses patient response to the procedure
   10. Responds to any adverse reactions

B. Understands the theory of luminescence including:
    1. Fluorescence
    2. Pseudo and autofluorescence
    3. Excitation filters/wavelengths
    4. Barrier filters/wavelengths
C. Performs descriptive angiographic interpretation including recognizing:
    1. The phases of circulation including:
        a. early phase (filling phase): choroidal
        b. early phase (filling phase): arterial
        c. early phase (filling phase): arteriovenous
        d. early phase (filling phase): venous
        e. mid phase
        f. late phase
    2. The mechanisms of hyperfluorescence including:
        a. transmission defect
        b. leakage
        c. staining
        d. pooling
    3. The mechanisms of hypofluorescence including:
        a. blockage
        b. filling defects
    4. The anatomical location of lesions

VIII. Indocyanine Green (ICG) Angiography

(3% 5 items on exam)

A. Performs ICG Angiography
B. Understands principles and properties of ICG dye
C. Understands applications of ICG Angiography
D. Performs descriptive angiographic interpretation by recognizing:
    1. The phases of circulation
    2. The mechanisms of hyperfluorescence
    3. The mechanisms of hypofluorescence
    4. The anatomical location of lesions

IX. Pharmacology

(5% 9 items on exam)

A. Understands and recognizes the properties and effects of pharmacologic agents related to or effecting ophthalmic photography including administration of:
    1. Topical miotics
    2. Topical mydriatics
    3. Topical cycloplegics
    4. Topical anesthetics
    5. Topical lubricants
    6. Topical stains and dyes

7. Intravenous sodium fluorescein
8. Intravenous indocyanine green (ICG)
9. Oral sodium fluorescein
10. Oral antihistamines
11. Oral anti-nausea agents

B. Understands the significance of patient's age and weight
C. Understands and recognizes contraindications and adverse reactions to topical agents
D. Understands and recognizes contraindications and adverse reactions to intravenous agents (e.g., fluorescein, indocyanine green (ICG))
E. Monitors agents for potential contaminations
F. Monitors agents for expirations

X. Other Imaging Technology

(3% 6 items on exam)

A. Optical Coherence Tomography (OCT)
B. Optical Coherence Tomography - Anterior Segment (OCT)
C. Slit Lamp Imaging
D. Non-mydriatic fundus/angiography cameras
E. Ultra-Wide Field Fundus Imaging

Suggested References:

Below is a list of study resources compiled by CRA examiners and candidates who have taken the examination. Many of the texts and references cover similar material, so it is not necessary to review them all. A candidate can choose from these or other appropriate references based on availability and individual need. Some references may be available in the OPS Lending Library.

OPS Store:

CRA Exam Study Flash Cards

Recommended Resources:

Atlas of Clinical Ophthalmology Spalton DJ. [3rd Edition 2004] Mosby Ltd; ISBN-13: 978-0323036562

The Ophthalmic Assistant: A Text for Allied and Associated Ophthalmic Personnel Stein HA, Stein RM, Freeman MI, Stein RL, [11th Edition 2022] Elsevier; ISBN-13: 978-0323757546

Ophthalmic Imaging: Posterior Segment Imaging, Anterior Eye Photography, and Slit Lamp Biomicrography Sission CP, [1st Edition 2017] Routledge; ISBN-13: 978-1138885998

Ophthalmic Photography: A Textbook of Retinal Photography, Angiography, and Electronic Imaging Saine PJ, Tyler ME. [2nd Edition 2002] Elsevier - Health Sciences Division; ISBN-13: 978-0750673723

Principles of Ocular Imaging Golgorsky D, and Rosen R, [1st Edition 2024] CRC Press; ISBN-13: 978-1630915995

Practical Retinal Photography and Digital Imaging Techniques Tyler ME, Saine PJ, Bennett T. [1st 2003] Butterworth-Heineman Medical; ISBN-13: 978-0750673716

Retina: Expert Consult Premium Edition: Enhanced Online Features and Print Ryan SJ, Schachat AP, Wiedemann P, Hinton DR, [5th edition 2012] Saunders; ISBN-13: 978-1455707379

Supplemental Resources:

Atlas of Indocyanine Green Angiography Coscas G, [1st Edition 2006] Elsevier; ISBN-13: 978-2842997298

Atlas of Laser Scanning Ophthalmoscopy Scheuerle AF, Schmidt E, [2003] Springer; ISBN-13: 978-3540018681

Clinical Eye Atlas Gold DH, Lewis RA. [1st Edition 2002] American Medical Association; ISBN-13: 978-1579471927

Clinical Ocular Photography (The Basic Bookshelf for Eyecare Professionals) Cunningham D, [1st Edition 1998] CRC Press; ISBN-13: 978-1556423772

Clinical Retina Quillen DA, Blodi BA. [1st Edition 2002] American Medical Association; ISBN-13: 978-1579472849

Everyday OCT: A Handbook for Clinicians and Technicians Schuman JS, Puliafito CA, Fujimoto JG, Duker JS, [2nd Edition 2017] Slack Incorporated; ISBN-13: 978-1630911720

Fluorescein and Indocyanine Green Angiography: Technique and Interpretation Berkow JW, Flower RW, Orth DH, Kelly JS, [2nd Edition 1997] Oxford University Press; ISBN-13: 978-1560550440

Fluorescein and ICG Angiography: Textbook and Atlas Richard G, Soubrane G, Yannuzzi LA, [1998] Thieme; ISBN-13: 978-0865777125

Fundus Autofluorescence Lois N, Forrester JV, [2nd Edition 2015] LWW; ISBN-13: 978-1451194593

Fundus Fluorescein Angiography Chopdar A, [1st Edition 1996] Butterworth-Heinemann; ISBN-13: 978-0750618854

Ocular Therapeutics Handbook: A Clinical Manual Onofrey BE, Skorin L, Holdeman NR, [4th Edition 2019] LWW; ISBN-13: 978-1975109042

Ophthalmic Terminology: Speller and Vocabulary Builder Stein HA, Slatt BJ, Stein RM, [3rd Edition 1991] Mosby; ISBN-13: 978-0801664380

Quick Reference Dictionary of Eyecare Terminology Ledford JK, Hoffman J, [5th Edition 2007] CRC Press; ISBN-13: 978-1556428050

The Retinal Atlas Freund B, Mieler WF, Yannuzzi LA, Sarraf D, [2nd Edition 2016] Elsevier; ISBN-13: 978-0323287920

Stereoscopic atlas of macular diseases: Diagnosis and treatment Gass JD, [2nd Edition 1977] C.V. Mosby; ISBN-13: 978-0801617546

Wolff's Anatomy of the Eye and Orbit Bron AJ, Tripathi RC, Tripathi BJ, [8th Edition 1997] Hodder Education Publisher; ISBN-13: 978-0412410109

Vaughan & Asbury's General Ophthalmology Riordan-Eva P, Augsburger JJ, [19th Edition 2017] McGraw Hill/Medical; ISBN-13: 978-0071843531

Online Resources

Digital Imaging Montague PR, https://www.opsweb.org/?page=digitalimaging

Fundamentals of Fluorescein Angiography Bennett TJ, https://www.opsweb.org/?page=FA

Fundus Autofluorescence Bennett TJ, http://www.opsweb.org/?page=Autofluorescence

Fundus Photography Saine PJ, https://www.opsweb.org/?page=fundusphotography

Journal of Ophthalmic Photography https://www.opsweb.org/?JOPDownload

Monochromatic Fundus Photography Bennett TJ, https://www.opsweb.org/?page=Monochromatic

Scanning Laser Ophthalmoscopy Bennett TJ, http://www.opsweb.org/?page=SLO

****The accuracy of the source information is the responsibility of the authors****

Additional Opportunities for Study

OPS offers CRA related courses, workshops and publications independent of the BOC, providing no training or educational materials. It is important to note that CRA candidates are not required to purchase training or education materials from the OPS in order to pass the examination. Attendance at OPS courses and workshops are not prerequisites for the CRA examination. The courses are not designed to serve as examination preparation classes, nor do they serve any ancillary examination-related purposes. The course curriculum is designed specifically to review broad concepts and offer high-level overviews of OPS-relevant topics and sub-topics. More information about educational opportunities may be found at the OPS Web Site at https://www.opsweb.org.

CRA Recertification: Requirements

CRA recertification is required in three-year intervals following initial certification. Certificants may achieve recertification by accrual of continuing education credit or retesting. It is the responsibility of the certificant to provide proof of compliance with the recertification requirements prior to the end of the third year. The three-year recertification cycle begins on January 1st of the year after certification is earned. Only education credits earned within the three-year interval will be accepted. Failure to recertify will result in the revocation of CRA certification. Once certification is revoked, a candidate can regain certification by applying for and fulfilling the current requirements for CRA certification.

Requirements for recertification:

1. **15 hours** of continuing education credit **(15 CECs)** during each three-year interval OR
2. Retesting prior to the end of the third year

CEC Requirements:

- Of the fifteen required hours, **a minimum of five (5)** MUST be earned by attending official OPS courses or OPS BOC pre-approved courses and workshops. Each 1:1 OPS approved hour of lecture or workshop equals one credit hour (1 OPS CEC)
- Of the fifteen required hours, **a maximum of ten (10)** MAY be earned by teaching official OPS or OPS approved courses or workshops. Each hour of lecture or workshop equals one credit hour (1 CEC)
- Of the fifteen required hours, **a maximum of ten (10)** MAY be earned by attending NON-OPS APPROVED courses or workshops. These include courses or workshops approved by the Joint Commission of Allied Health Personnel in Ophthalmology (JCAHPO) or courses approved by the American Medical Association (AMA) for Category I Continuing Ophthalmic Medical Education. Each hour of these courses or workshops equals one half-credit hour (1/2 CEC)
- Of the fifteen required hours, **a maximum of ten (10)** MAY be earned by first authorship or co-authorship in the OPS Journal, ophthalmic or photographic journals or textbooks and other scientific publications. Submission of publications for CEC review must be made by separate application. (See CECs for Publication on OPS website for details)

Responsibility and Verifications

It is the responsibility of certificants to maintain their CECs and submit their application with supporting documentation verifying teaching or attending a course/workshop or publication credits. Credits for teaching must be supported by a copy of the printed program reflecting the type and degree of content. A certificate or statement of attendance on official letterhead from the director of the course or workshop is required. A paid receipt is not acceptable as evidence of attendance. Credits for publications require a validation letter from the Recertification Section Chair. CECs submitted for OCT-C recertification may also be used concurrently for CRA recertification.

Payment of the **recertification fee** is submitted with the recertification application. Certificants that choose to retest will pay the examination fee and will not be required to pay a recertification fee. Payment by check in US dollars to OPS/BOC or by credit card can be made on the OPS Website "Store" (opsweb.org).

Recertification Fees:

Non-member Fee: $225 OPS Member Fee: $100

Please call the OPS Membership Office (1-800-403-1677) to verify your membership status

Recertification Extensions and Appeals

Individuals may request a one-time 6-week recertification extension based on extreme hardship. The Recertification Section Chair (recert@opsweb.org) is authorized to give this one-time

extension. A $25.00 late fee will be applied to all late recertification requests. Letters of revocation are sent after the 6-week period. Should recertification be denied, the applicant may appeal within thirty (30) days to the Chair of the BOC (BOC@opsweb.org). Appeal instructions are provided with the letter of revocation. The BOC decision regarding all appeals is final and binding. Refer to **Appeals** on **page 15** for details.

Recertification Applications and Information

During the third year of the certification interval, the CRA Recertification Section Chair will notify certificants of the need for recertification.

Recertification instructions and applications are available on the OPS web site; CRA Recertification page at www.opsweb.org > Certification > Recertification.
Certificants having difficulty completing their requirements or who expect to be unable to meet the December 31st deadline should contact the Recertification Section Chair as soon as possible. The Recertification Section Chair may be able to provide assistance or a course of action for completing the requirements. Certificants should contact the CRA Recertification Section Chair for any questions or concerns about recertification requirements or accrual of continuing education credits.

CRA Retired

The CRA Retired (CRA-R) certification is designated exclusively for current CRAs who have fully retired from active practice in the field and are no longer working in an ophthalmic imaging capacity.

CRA Retired Recertification: Requirements

CRA-R recertification is required in three-year intervals following initial certification. Certificants may achieve recertification by accrual of continuing education credit or retesting. It is the responsibility of the certificant to provide proof of compliance with the recertification requirements prior to the end of the third year. The three-year recertification cycle begins on January 1st of the year after certification is earned. Only education credits earned within the three-year interval will be accepted. Failure to recertify will result in the revocation of CRA-R certification. Once certification is revoked, a candidate can regain certification by applying for and fulfilling the current requirements for CRA-R certification.

Requirements for recertification:

- Recertification requires the accrual of **three (3) hours** of continuing education credit **(3 CECs)** during each three-year interval
- CPR certification is not required

CEC Requirements:

- Of the three required hours, **a minimum of one (1)** MUST be earned by attending official OPS courses or BOC pre-approved courses and workshops. Each hour of lecture or workshop equals one credit hour (1 CEC)
- Of the three required hours, **a maximum of two (2)** MAY be earned by teaching official OPS or OPS approved courses or workshops. Each hour of lecture or workshop equals one credit hour (1 CEC)
- Of the three required hours, **a maximum of two (2)** MAY be earned by first authorship or co-authorship in the OPS Journal, ophthalmic or photographic journals or textbooks and other scientific publications. CECs. Submission of publications for CEC review must be made by separate application. (See CECs for Publication on OPS website for details)

Responsibility and Verifications

It is the responsibility of certificants to maintain their CECs and submit their application with supporting documentation verifying teaching or attending a course/workshop or publication credits. Credits for teaching must be supported by a copy of the printed program reflecting the type and degree of content. A certificate or statement of attendance on official letterhead from the director of the course or workshop is required. A paid receipt is not acceptable as evidence of attendance. Credits for publications require a validation letter from the Recertification Section Chair. CECs submitted for OCT-CR recertification may also be used concurrently for CRA-R recertification.

Payment of the **recertification fee** is submitted with the recertification application. Certificants that choose to retest will pay the examination fee and will not be required to pay a recertification fee. Payment by check in US dollars to OPS/BOC or by credit card can be made on the OPS Website "Store" (opsweb.org).

CRA-R Recertification Fees

Non-member Fee: $60 OPS Member Fee: $30

Please call the OPS Membership Office (1-800-403-1677) to verify your membership status.

Recertification Extensions and Appeals

Individuals may request a one-time 6-week recertification extension based on extreme hardship. The Recertification Section Chair (recert@opsweb.org) is authorized to give this one-time extension. A $25 late fee will be applied to all late recertification requests. Letters of revocation are sent after the 6-week period. Should recertification be denied, the applicant may appeal within thirty (30) days to the Chair of the **BOC** (BOC@opsweb.org). Appeal instructions are provided with the letter of revocation. The BOC decision regarding all appeals is final and binding. Refer to **Appeals** on **page 15** for details.

Recertification Applications and Information

During the third year of the certification interval, the CRA Recertification Section Chair will notify certificants of the need for recertification.

Recertification instructions and applications are available on the OPS web site; CRA-R Recertification page at www.opsweb.org > Certification > Recertification > Retired Recertification. Certificants having difficulty completing their requirements or who expect to be unable to meet the December 31st deadline should contact the Recertification Section Chair as soon as possible. They may be able to provide assistance or a course of action for completing the requirements. Certificants should contact the CRA Recertification Section Chair for any questions or concerns about recertification requirements or accrual of continuing education credits.

Returning to CRA Certification

Transitioning from CRA-R to CRA requires reapplication, portfolio, and written exam.

Appendix A

Portfolio Requirements

The portfolio must be produced entirely by the applicant. All submissions must be uploaded to the BOC web portal: www.opsweb.org/page/portfoliosubmission

Detailed image and folder labeling instructions are found within this section.

The online **portfolio submission form** (found at the end of this program guide) must be completed and **submitted with the portfolio.** By signing the portfolio submission form, the applicant attests to the authenticity of the work submitted. Submission of work completed by anyone other than the applicant constitutes fraud. Fraud or misrepresentation of the portfolio may result in disqualification of the applicant.

The CRA portfolio should reflect the pride, skill, and professionalism of the applicant. It is more important to demonstrate the quality of photography rather than unique pathology. The portfolio may include normal eyes where applicable. The Portfolio Committee reviews all images using the same rating standards.

Photography Requirements

Color Imaging Section

This section demonstrates the applicant's ability to produce clinical color images. Applicants have the choice of submitting images captured with a standard fundus, SLO, widefield, or ultra-widefield camera. **Submit 1 portfolio in its entirety, either portfolio A or B.**

- Portfolio A – 90° or less field of view (FOV)
- Portfolio B – 100° or greater field of view (FOV)

General criteria

All images submitted must be of diagnostic quality (digital color images saved with minimal or lossless compression are acceptable. e.g. tiff, png, jpeg, PDF) and uploaded to the BOC web portal.

Portfolio A: 90° or less FOV Portfolio Requirements

Thirty (30) color images arranged/identified according to the **Portfolio Assembly on page 39.**

Refer to the **Field Definition Guide on page 37** for field definition of these images.

The images are taken at the required FOV. If not defined, you may take the images at whatever FOV you deem appropriate for the pathology and assignment.

Required color photographs:

1&2	Sequential stereo pair of the posterior pole of one eye
3	Macula, centered on the fovea
4 & 5	Sequential stereo pair centered on the optic disc
6	High magnification of optic disc (20° FOV)
7	Nasal to optic disc of the Right Eye (centered at least 2 disc diameters from the optic nerve)
8	Temporal to the macula of the Right Eye
9	Superior temporal arcade of the Right Eye
10	Inferior temporal arcade of the Right Eye
11	Superior nasal field of the Right Eye
12	Inferior nasal field of the Right Eye
13	Nasal to optic disc of the Left Eye (centered at least 2 disc diameters from the optic nerve)
14	Temporal to the macula of the Left Eye
15	Superior temporal arcade of the Left Eye
16	Inferior temporal arcade of the Left Eye
17	Superior nasal field of the Left Eye
18 & 19	Sequential stereo pair of the inferior nasal field of the Left Eye
20	Macula centered image captured at 45-60° FOV of atrophy or fibrosis
21	Lesion in mid-periphery (most posterior margin of the frame is located at least 3 disc diameters from the disc margin)
22	Posterior pole image of a high myopic or aphakic eye
23	Posterior pole image **THROUGH** media opacity (hazy view)
24	Posterior pole image **AROUND** media opacity (same eye as #23) (clear view)
25	Posterior pole **THROUGH** small pupil (< 3 mm)
26	External image **FOCUSED** on the Iris (same eye as in #25)
27	Posterior pole image **THROUGH** an IOL
28	External image **FOCUSED** on the Iris (same eye as in #27)
29	Fundus image with an alignment artifact (crescent) present
30	Fundus image with the artifact corrected (same eye as in #29)

Portfolio B: 100° or greater FOV Portfolio Requirements

Thirty (30) color images arranged/identified according to the **Portfolio Assembly on page 39.**

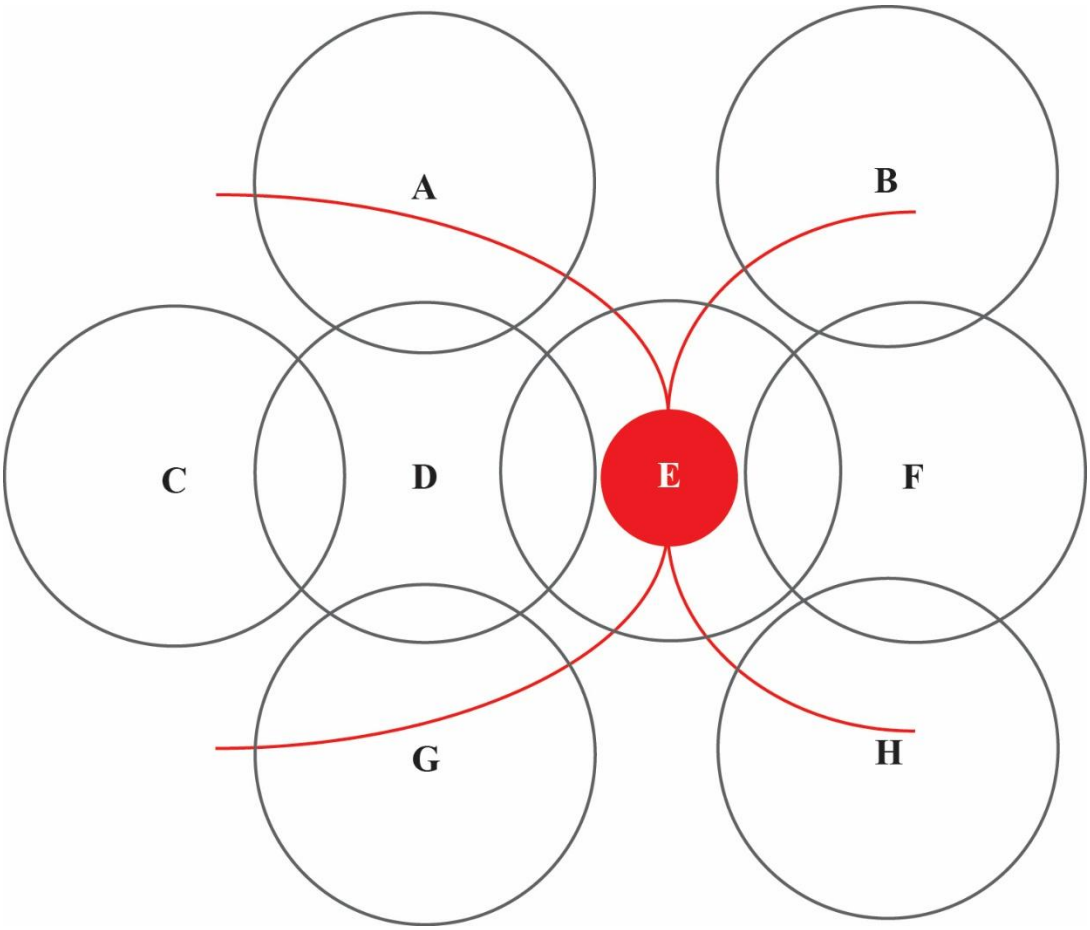
Refer to the **Field Definition Guide on page 37** for field definition of these images.

Image must contain **5% or less** of lash and lid artifacts unless otherwise directed.

Required color photographs:

1	Right eye image of primary gaze (disc & macula)
2	Left eye image of primary gaze (same patient as in #1)
3 & 4	Sequential stereo pair centered on the optic disc
5	High magnification of optic disc (crop/zoom to exclude macula)
6	Nasal to optic disc of the Right Eye
7	Temporal to the macula of the Right Eye
8	Superior field of the Right Eye
9	Inferior field of the Right Eye
10	Montage of the Right Eye
11	Nasal to optic disc of the Left Eye
12	Temporal to the macula of the Left Eye
13	Superior field of the Left Eye
14	Inferior field of the Left Eye
15	Montage of the Left Eye
16	Primary gaze image of a macular pathology
17	High magnification of macular pathology (same eye as #16) crop/zoom to exclude optic disc
18	Primary gaze image captured of vascular disease
19	Peripheral image of vascular disease (same eye as #18)
20	Lesion in periphery (outside of the arcade) with all borders captured
21	Peripheral image of the Ora Serrata
22	Primary gaze image of a high myopic or aphakic eye
23	Primary gaze image **THROUGH** media opacity (hazy view)
24	Primary gaze image **AROUND** media opacity (same eye as #23) (clear view)
25	Primary gaze image with lid/lash artifact greater than 25% of the image
26	Primary gaze image with lid/lash artifact corrected (same eye as #25)
27	Primary gaze image **THROUGH** an IOL
28	External image **FOCUSED** on the Iris (same eye as in #27). Image cropped to canthus to canthus
29	Fundus image with alignment/working distance artifact present
30	Fundus image with artifact corrected (same eye as in #29)

Field Definition Guide
Circles approximate a 30°-50° FOV



A - SUPERIOR TEMPORAL
B - SUPERIOR NASAL
C- TEMPORAL
D - MACULA, CENTERED ON FOVEA
E - CENTERED ON DISC
F - NASAL
G - INFERIOR TEMPORAL
H - INFERIOR NASAL

*****Please note the fields referenced above are not representative of any research/study protocol*****

Fluorescein Angiography Section

All images in a fluorescein angiogram submission must be acceptable as stated in the **Portfolio Rating Standards on page 40.** Otherwise, the angiogram, in its entirety, will be rejected and require resubmission.

This section demonstrates the applicant's ability to capture the flow dynamics of fluorescein dye passing through the circulatory systems of the eye in a clinical setting.

General Criteria:

- **Four angiograms are required**
- All four (4) angiograms will be captured using a standard fundus, SLO, widefield, or ultra-widefield camera
- All images must be submitted as digital files
- All images must be saved in sequential order on proof sheets

Each angiogram must be of a different patient. Three of the four angiograms must have pathology, the fourth can be without pathology.

Requirements:

1. **Proof Sheets**
   Digital angiograms – A one (1) page proof sheet **with 16 images**, saved as a high-quality digital file (tiff, png, jpeg, PDF). The timer must be recorded on the proof sheet.
2. **FA Images**
   Digital FA images are submitted as minimal or lossless compressed images (tiff, png, jpeg, PDF). The timer must be recorded on the images. There should be four (4) FA images in each folder. Refer to the **Phases of Circulation Guide on page 39**.
3. **Color Images**
   A color image of the posterior pole of the primary eye of each of the corresponding Four (4) angiograms is required. If the area of pathology covered by the angiogram is not in the posterior pole, then a second image centered on the area of pathology of the involved eye must also be submitted. Label the color images as described in the **Portfolio Assembly Section on page 39** and place in the appropriate FA folder; use FA3C for the posterior pole image and FA3C2 for an additional image if the pathology is not in the posterior pole.
4. **Monochromatic Images**
   Two (2) images: One (1) centered on the optic nerve (Field 1) and one (1) centered on the fovea (Field 2) may be taken in a monochromatic filter of choice red, green, blue, or infra-red. Please select a wavelength that will highlight the pathology present in the transit eye.

Phases of Circulation Guide

Use this guide to determine which frames to select from each angiogram to document the early, mid and late circulation phases for each of the four (4) angiograms required for the portfolio.

- **Early Circulation Phase (Filling Phase, Arterial Phase, Venous Phase)**
  Fluorescein dye is present only in the choroid and retinal arteries or in the choroid, retinal arteries and veins.
- **Mid Circulation Phase (Early Recirculation Phase)**
  Fluorescein dye of high intensity is equally present in the retinal arteries and veins.
- **Late Circulation Phase (Late Recirculation Phase, Elimination Phase)**
  Five (5) minutes or later post injection, fluorescein dye of reduced intensity is present in the choroid, retinal arteries and veins or the choroidal and retinal vessels are dark. One (1) posterior pole image is required.

Portfolio Assembly

The required image files must be labeled as described below.
Submit Digital Image files as described below to the BOC web portal in five (5) folders labeled: CF, FA1, FA2, FA3, and FA4.
Please zip each folder using WinZip (PC) or "Create Archive" (Mac) and upload each zipped folder.

CF Folder: CF1 through CF30 (For sequential stereo pairs, label the left image with an L and the right image with an R. For example, Portfolio A images 1 & 2 should be labeled CF1L and CF2R).

Folder	Labeling
FA1 Folder	• FA1C (for color image[s]) • FA1proof • FA1E (for early) • FA1M (for mid) • FA1L (for late) • FA1MONO 1 (for field 1) • FA1MONO 2 (for field 2)
FA2 Folder	• FA2C (for color image[s]) • FA 2 proof • FA2E (for early) • FA2M (for mid) • FA2L (for late) • FA2MONO 1 (for field 1) • FA2MONO 2 (for field 2)

FA3 Folder	• FA3C (for color image[s]) • FA3proof • FA3E (for early) • FA3M (for mid) • FA3L (for late) • FA3MONO 1 (for field 1) • FA3MONO 2 (for field 2)
FA4 Folder	• FA4C (for color image[s]) • FA4proof • FA4E (for early) • FA4M (for mid) • FA4L (for late) • FA4MONO 1 (for field 1) • FA4MONO 2 (for field 2)

The portfolio will be deemed unsatisfactory if it contains extra examples of the requested images.

Portfolio Rating Standards

The Portfolio Committee uses standards established and approved by the Board to perform ratings of CRA portfolios. CRA portfolios are rated by applying the following standards:

Intent:	Is the required image present?
Field of view:	Does the image show the specified field of view?
Focus:	Is the image within an acceptable range of focus?
Exposure:	Is the image exposure within an acceptable range?
Contrast:	Is the image contrast within an acceptable range?
Artifacts:	Is the image free of undesirable artifacts?

All criteria for each required image must be met for the portfolio to be found satisfactory.

Portfolio Submission

The portfolio must be uploaded to the BOC web portal. Take the same care packaging your portfolio as you did producing it. Complete the program application online: https://opsweb.site-ym.com/?page=portfolio_submission

The CRA Portfolio Committee will review the portfolio within **thirty (30) days**. Portfolios meeting the requirements will receive a notification of acceptance.

Portfolios not meeting the requirements will receive a critique of the unacceptable segments. The applicant can correct any deficiencies and resubmit the required component(s). If the portfolio committee returns the entire portfolio, correct the required components and resubmit the entire portfolio.

The BOC assumes no liability for any materials lost through the web submission process and recommends that applicants maintain a copy of the portfolio for their personal records.

The Portfolio Committee will notify the CRA Section Chair of the applicant's examination eligibility.

CRA Application Check List

_____1. Compile CRA Portfolio

_____2. Submit a completed online Program Application

_____3. Upload your portfolio

_____4. After your portfolio is accepted, complete and submit the Examination Application (sent to you by the CRA section chair), CPR card, and Employment letter. Pay exam fees as directed (payable in US dollars to the OPS/BOC or by credit card via the OPS website store or the OPS Central Office at 1-(800)-403-1677

_____5. Once all paperwork and fees are received, the CRA Section Chair will contact you with instructions for the examination

Ophthalmic Photographers' Society
BOARD OF CERTIFICATION

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If the date on this Program Guide is more than six (6) months old, please check the OPS website to make sure you have the most current version.