

CERTIFICATE PROGRAM IN MEDICAL PHYSICS

HARVARD MEDICAL PHYSICS RESIDENCY PROGRAM



Handbook

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POLICIES AND PROCEDURES

Program Overview

A Certificate Program is a program of didactic coursework offered by a CAMPEP-accredited graduate or residency program, intended to enable individuals with a doctoral degree in physics or a related discipline to meet the didactic requirements needed to enter a CAMPEP-accredited residency program¹. The Harvard Medical Physics Residency Program administers a CAMPEP-accredited Certificate Program, with initial accreditation achieved in 2016.

The core medical physics didactic material, as specified by CAMPEP, is covered in 7 courses for a total of 18 credit hours. The courses are:

- Physics I: Radiologic physics and dosimetry [3 credits]
- Physics II: Radiation therapy physics [3 credits]
- Medical Imaging Modalities [3 credits]
- Radiation Protection and Safety [3 credits]
- Radiation Biology [2 credits]
- A&P I: Oncology and Pathology [2 credits]
- A&P II: Anatomy and Physiology for Non-physicians [2 credits]

Program Governance

The Certificate Program is administered by the Harvard Medical Physics Residency Program (HMPPR), which is a joint program among the three Harvard-affiliated teaching hospitals (Beth Israel Deaconess Medical Center [BIDMC], the Brigham and Women's Hospital [BWH] and the Massachusetts General Hospital [MGH]). The governance structure is the same as the residency program which is managed by an Executive (Steering) Committee consisting of six ABR-certified (therapeutic radiological physics) medical physicists, two from each of the three hospitals. The Executive Committee members are appointed by the chiefs of each medical physics division at the three hospitals, and they are confirmed by the Oversight Committee as explained below. The Program Director is Yulia Lyatskaya, Ph.D. (BWH) and the Associate Directors are David Gierga, Ph.D. (MGH) and Stead Kiger Ph.D. (BIDMC). The other executive committee members are Brian Winey Ph.D. (MGH), Piotr Zygmanski Ph.D. (BWH) and Martina Hurwitz Ph.D. (BIDMC). The Executive Committee is responsible for the operation, management and continuous improvement of the training program as a whole, including such responsibilities as setting up the didactic courses and the clinical rotations, overseeing the supervision and monitoring progress of the residents throughout their training. The HMPPR and the Executive Committee are governed by a separate Oversight Committee consisting of the chiefs of the medical physics

¹ See CAMPEP definition at <http://campep.org/campeplstcert.asp>

divisions at the three teaching hospitals (Thomas Bortfeld Ph.D., Mike Makrigiorgos Ph.D. and Ed Holupka Ph.D.), two radiation oncologists, one from MGH (Theodore Hong M.D.) and the other from the BWH (Aileen Chen M.D.) and two additional medical physicists, one the director of physics research in radiation oncology at MGH (Harald Paganetti Ph.D.) and the other from BWH (Robert Cormack Ph.D.). The purpose of the oversight committee is to (i) provide broad oversight to the program, (ii) review annually the evaluations of the program and faculty by the residents, (iii) review the evaluations of the residents by the faculty, (iv) assist with the review and selection of candidates, and (v) confirm appointment of the Executive Committee members.

The program is further responsible to the chiefs of the Radiation Oncology Departments at each of the three hospitals, namely Dr. Jay Loeffler (MGH), Dr. Daphne Haas-Kogan (BWH) and Dr. Mary Ann Stevenson (BIDMC). Additionally, the program has the support of the hospital administration at MGH and BWH.

Entrance Requirements

Three main categories of students may be admitted to the Certificate Program or permitted to take Certificate courses for credit: 1) residents in the Harvard Medical Physics Residency Program, 2) postdoctoral fellows or Ph.D. candidates within the MGH, BWH, or BIDMC systems, or 3) certificate students admitted from outside Harvard.

Residents are admitted to our program through the MedPhys Match and entrance requirements are described on our program's website. Residents in our program are limited to one course per clinical year.

Postdoctoral fellows must be in good standing within their respective departments and have the support of their research advisors to take Certificate courses. Students performing PhD research within the hospital network may be permitted to take Certificate courses for credit but the number of courses they can take may be limited due to CAMPEP rules. Permission to take individual courses for fellows and PhD candidates is at the discretion of the Program Director, with input from the Course Directors and the Executive Committee, if necessary.

Certificate students from outside our institution must formally apply using the application posted on the Certificate Program website (<http://harvardmedphys.org/about-the-program/certificate-program/>) and pay the appropriate application fee. Entrance requirements include having earned, or will earn before the start date, a Ph.D. in physics, medical physics, engineering or related science with a minimum of a minor in physics. The Executive Committee serves as the Admissions Committee. Candidates are evaluated based on academic background and achievement, personal qualities such as career goals, motivation, interest in medical physics, and prior experience in medical physics. We do not require any standardized test scores but we do take them into consideration where available. Undergraduate and graduate transcripts together with GPA are reviewed. For non-physics majors, evidence of having taken at least three upper level physics courses must be provided. In addition, we review any other medical physics courses that candidates may have taken to ascertain if these would meet the didactic requirements for residency as stated by CAMPEP. If admitted, outside Certificate Students are responsible for tuition. A non-refundable deposit is required with the acceptance of admission.

Course Tuition

The current tuition rate and due dates are posted on the Certificate Program website. No financial aid is available. Tuition costs are not inclusive of required course materials such as textbooks.

If a student withdraws, tuition will be refunded per the following schedule:

- 90% refund if withdrawal occurs within 10 days of course start date (5 days for Anatomy and Physiology), 50% refund if withdrawal occurs within 30 days of course start date (15 days for Anatomy and Physiology)
- No refunds will be given if withdrawal occurs after 30 days of course start date (15 days for Anatomy and Physiology)

Research Opportunities

Certificate Students admitted from outside Harvard may have the opportunity to work on research projects with faculty members. Funding may not be available for this work.

Certificate students who receive funding for a research project while enrolled in the program will still be required to pay tuition.

Certificate Requirements

Candidates who complete all didactic courses within the structure of our residency program will be granted a Certificate. In addition, all courses must be completed within 5 years. Candidates who complete (equivalent) courses elsewhere and therefore do not complete all of the Harvard courses will not be granted a formal Certificate, but may still satisfy the CAMPEP didactic course requirements for residency.

Course Schedule

The following courses are generally offered on a yearly basis: Physics I, Physics II, Oncology/Pathology, Radiation Biology, and Radiation Protection. Anatomy and Physiology for non-physicians and Medical Imaging Modalities are offered every other year.

Certificate students may not be able to complete all the courses within twelve months, depending on how their start date is synchronized with the course offerings.

Residents in the program can complete all the courses within three years, since most of the courses will be taken in the first research year, and then at most one course per clinical year, as required per CAMPEP.

Course Withdrawal

Students taking a course for credit may withdraw from a course within 60 days. The student's course record will indicate a grade of "W" for the course unless the withdrawal occurs within the

first 30 days of the course. The notification of course withdrawal must be indicated in writing to the Course Director and Program Director.

Grading Policy

Courses will be graded on a PASS / FAIL basis. A student receiving a grade of FAIL may retake that course one additional time. Students who fail more than one course may be dismissed from the program.

Grade Appeal

The Course Director issues a grade for each student taking the course for credit. The course director may consult with the Executive Committee in determining student grades. If a student wishes to appeal their grade, the process is as follows:

1. The student may appeal to the Course Director, in writing, within 30 days after the final grades are issued. The Course Director will inform the Program Director, and the Course Director, Program Director, and Executive Committee will meet and will respond within 30 days.
2. If the student remains dissatisfied, they may appeal to the Oversight Committee, who will respond within 30 days.

Evaluation and Feedback Opportunities

Course Evaluations will be distributed following each course. These evaluations will be confidential and viewed only by the Executive Committee or Course Directors. Significant student feedback will generate an agenda item for the Executive Committee Meeting.

Students are also encouraged to provide feedback to the Program Director or Associate Program Directors. Students may also voice feedback or concerns to their Human Resources representative or to the Harvard Ombuds office. A formal Grievance Procedure is available as noted below.

Certificate Student Status

Certificate Students admitted from outside Harvard will be classified as “non-employee students” and must satisfy any hospital administrative on-boarding requirements, which may include a background check. Certificate students may additionally be eligible for “Visiting Scholar” status which can entitle the student to a Harvard ID and library access.

ACADEMIC INTEGRITY

Residents and certificate students in the Harvard Medical Physics Residency Program (HMPPR) are expected to demonstrate the highest levels of integrity in the classroom, laboratory,

and clinic. This document primarily outlines expectations and the academic integrity policy for HMPRP didactic courses. Harvard Medical School (HMS) standards for academic integrity are oriented towards medical students and medical school courses and are not very well-suited for HMPRP courses. Therefore, we have developed our own academic integrity policy for academic courses.

Residents and certificate students are also expected to follow all institutional standards for ethical and professional behavior in clinical and research environments. More specific guidance in these areas may be found below in the 'Other Resources' section.

Expectations for Didactic Courses

The objective of the didactic courses is to develop an understanding and long-term retention of course material through lectures, individual study and reading, problem sets, and workshops. Our expectations for residents and students are outlined in the following principles.

Class meetings and workshops

Students should attend class meetings regularly and demonstrate engagement in the course. Students should be on time for class meetings. Students who expect to miss a class meeting should notify the course director and the instructor in advance. Failure to attend class meetings consistently is likely to result in failure of the course. Out of courtesy for others, students should mute their electronic devices (e.g., phones and pagers) during class meetings.

Assigned readings

The scope of most Certificate courses is such that no single text covers the course material. Moreover, some subjects in the courses are not well-covered by any text. Consequently, instructors may assign reading from a variety of sources: the text book(s), chapters from other books, papers, task group reports, and other materials. Students are expected to complete all assigned readings.

Problem Sets

Students should complete assigned problem sets and homework in a timely manner. Due dates are set by individual instructors, but completed problem sets should typically be returned to the instructor for scoring within 1-2 weeks after being assigned. Late submissions will be scored at the discretion of the instructor and may not be accepted if prior arrangements have not been made with the instructor.

Some problem sets are straightforward while others are very challenging. Students should make their best efforts to fully complete all problem sets and show all of their work to justify their answers. Students at this level should be well aware of the value of unit analysis and are expected to use unit analysis in their solutions wherever appropriate.

When submitting problem set solutions electronically, each student should include his/her name in both the text and the filename of the submitted file to facilitate identification by the instructor.

Collaboration on Problem Sets

Discussing course material and problem sets with other students contributes to learning and is strongly encouraged. Some notes of caution and rules in this area are warranted, however. First, you should think about and attempt to solve problem sets on your own before discussing them with others. Second, if you work together, the work that you submit should still be your own; it should not be copied from another student. You need to work through and understand the solution to the problem set yourself. Finally, discussion of and collaboration on group projects, or extensive group work should be disclosed by recording the names of your collaborators on your solution. Failing to acknowledge collaboration could be regarded as plagiarism.

Good grades on homework achieved by copying the work of another student leads to reduced comprehension of the subject material and will be correlated with poor exam grades. The following section elaborates on the collaboration vs. copying issue.

Collaboration works for you; copying works against you.¹

If you copy, you are less prepared.

MIT Professor David E. Pritchard, the Cecil and Ida Green Professor of Physics, has said, “Doing the work trumps native ability.” Those who invest the time working through the problem sets are better prepared to answer exam questions that call for conceptual thinking.

If you copy, you aren’t learning.

Research done in 2010 by Professor Pritchard and others showed that those who copied more than 30% of the answers on problem sets were more than three times as likely to fail the subject than those who did not copy.²

If you copy, you violate the principles of academic integrity.

Copying is cheating. When you fail to uphold the principles of academic integrity, you compromise yourself and the [program].

If you collaborate, you learn from your peers.

Every student brings a unique perspective, experience, and level of knowledge to a collaborative effort. Through discussion and joint problem solving, you are exposed to new approaches and new perspectives that contribute to your learning.

If you collaborate, you learn to work on a team

¹ This section is excerpted from the MIT Handbook on Academic Integrity, retrieved from <http://integrity.mit.edu/handbook/copying-and-other-forms-cheating> on July 17, 2017.

² D.E. Pritchard, “What are students learning and from what activity?” Plenary presentation at the Fifth Conference of Learning International Networks Consortium 2010. Retrieved in July 2017 from <http://linc.mit.edu/linc2010/proceedings/plenary-Pritchard.pdf>

Gaining the skills to be an effective team member is fundamental to your success as a student, researcher and professional. As you collaborate with your peers, you will face the challenges and rewards of the collegial process.

Exams and quizzes

Exams and quizzes, whether in-class or take-home, are designed to assess the fund of knowledge of an individual in a particular subject area. They should be completed by the resident/student alone, without assistance from any other person(s) (except for the course director or his/her designee in response to questions), using only the resources allowed by the course director/instructor.

Cheating and Academic Dishonesty

Copying the work of current or previous students is not acceptable. In addition to being detrimental to learning (as discussed above), this is a form of plagiarism. Again, collaboration is encouraged but all students should be submitting their own work.

Distributing exam questions and problem set solutions to students taking the course in subsequent years is also not acceptable.

Plagiarism is representing the work (exact or similar words, ideas, code, figures, or data) of others as your own, i.e., without properly acknowledging the source. Plagiarism is an offence that can carry very serious consequences including, in many settings, termination. References in the Other Resources section elaborate on this definition of plagiarism.

Other forms of academic dishonesty include but are not limited to:

- Misrepresenting (lying about) a personal or family situation in order to gain an extension or some other exception
- Falsifying or fabricating data
- Using prohibited resources (e.g., notes, books or electronic devices) during an exam or quiz
- Assisting others in any of the above actions

Cheating or other academic dishonesty should be reported to the course director or program director.

Think twice before you cheat or engage in dishonest behavior; consider the consequences. Cheating is damaging to yourself, to your reputation, and to the residency program.

Other Ethical Questions

Additional guidance on ethical questions can be sought from the course directors, program director, and instructors. The HMS Ombuds office is an additional resource for ethical questions. <https://hms.harvard.edu/departments/ombuds-office>

However, before posing a question, ask yourself the simple question “Would I want other people to know if I handled the situation in this way?” If you wouldn’t want your colleagues and potential employers to know about it, it is probably a bad idea.

Policy Violations

The consequences of academic integrity policy violations will be decided by the course and program director in conjunction with the instructor. Possible disciplinary actions include but are not limited to the following:

- Receiving zero credit for an assignment, quiz, or exam
- Re-doing an assignment
- Completing an additional assignment
- Failing a course
- Dismissal from the residency or certificate program

Students should recognize that the damage to one’s reputation from a policy violation may be far worse than some of the actions listed above.

Other Resources for Ethics/Academic Integrity

General Ethics Guidelines

Ethics at Partners

<http://www.partners.org/About/Ethics/Default.aspx>

Interactions with Industry

<http://www.partners.org/About/Ethics/Interactions-With-Industry/Default.aspx>

BIDMC Code of Conduct

<http://www.bidmc.org/~media/Files/AboutBIDMC/CodeofConduct.pdf>

BWH Code of Conduct

http://www.brighamandwomens.org/about_bwh/humanresources/code_of_conduct.pdf

MGH Ethical Standards Guide

http://apollo.massgeneral.org/compliance/wp-content/uploads/sites/13/2016/12/MGH_Guide_to_Ethical_Standards.pdf

Academic Integrity

MIT has an excellent handbook on academic integrity, available in html and PDF.

<http://integrity.mit.edu/>

<http://integrity.mit.edu/handbook/print-demand>

Research Ethics

Standards for ethical conduct of research may be found in institutional guidelines and policies for HMS, BIDMC, BWH/DFCI, and MGH.

National Academy of Sciences, National Academy of Engineering, and Institute of Medicine. *On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition*. Washington, DC: The National Academies Press, 2009. <https://doi.org/10.17226/12192>.

<http://navigator.partners.org/Documents/OnBeingAScientist-3rdEd-2009.pdf>

Partner's Responsible Conduct of Research (RCR) Training Program

[http://navigator.partners.org/Pages/Responsible-Conduct-of-Research-\(RCR\).aspx](http://navigator.partners.org/Pages/Responsible-Conduct-of-Research-(RCR).aspx)

MGH Office for Research Career Development archive of seminars for RCR credit

<https://facultydevelopment.massgeneral.org/orcd/rcr-orcd.html>

HMS Guidelines for Investigators in Scientific Research

[http://ari.hms.harvard.edu/files/integrity-academic-medicine/files/guidelines for investigators in scientific research 0.pdf](http://ari.hms.harvard.edu/files/integrity-academic-medicine/files/guidelines%20for%20investigators%20in%20scientific%20research%200.pdf)

International Committee of Medical Journal Editors, "Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals," December 2016.

<http://www.icmje.org/icmje-recommendations.pdf>

<http://www.icmje.org/recommendations/>

HMS Authorship Guidelines

https://ari.hms.harvard.edu/files/integrity-academic-medicine/files/authorship_guidelines.pdf

Plagiarism

HMS White Paper on Plagiarism and Research Misconduct

https://ari.hms.harvard.edu/files/integrity-academic-medicine/files/white_paper_plagiarism_statement_121510.pdf

<http://www.opencolleges.edu.au/informed/teacher-resources/plagiarism/>

Miguel Roig, "Avoiding plagiarism, self-plagiarism, and other questionable writing practices: A guide to ethical writing," U.S. Department of Health and Human Services, 2015.

<https://ori.hhs.gov/sites/default/files/plagiarism.pdf>

Professional Ethics

The report of AAPM Task Group 109 (TG-109) delineates ethical and professional guidelines for the conduct of a medical physicist.

<http://onlinelibrary.wiley.com/doi/10.1118/1.2995758/pdf>

http://www.aapm.org/pubs/reports/RPT_109.pdf

AAPM/RSNA Ethics and Professionalism Modules

<https://www.aapm.org/education/onlinemodules.asp>

RESOURCES

Libraries

MGH and BWH maintain a selection of those books deemed essential for the didactic and clinical course work. Online journal access is available for those with Hospital appointments.

The Countway Library is the main Harvard Medical School library and available for students with Harvard appointments. You will need your identification card for admittance. Students are encouraged to obtain an eCommons username and password through the Countway library, for easy access to free and subscription-only (through Harvard) online journal articles and textbooks.

The MGH Treadwell library (<https://library.massgeneral.org/>) maintains access to various electronic journals and books and is available using a Partners login.

Ombuds Office

Some concerns appropriate for the ombuds office include: sexual harassment; racism or other kinds of discrimination; professional/scientific misconduct; research-related issues; authorship; feelings of stress or anxiety; ethics/whistle blowing; personality conflicts/meanness; working conditions; fear of retaliation; favoritism.

The Ombudsperson will assist people with complaints involving interpersonal misunderstandings or conflict. The Ombuds Office is independent of any existing administrative or academic structures and is responsible only to the dean of each school. The office supplements the existing resources available to members of our communities. Speaking with the Ombudsperson will likely increase your awareness of alternative available to you for resolving your concern. Possibilities will be tailored to fit your particular circumstances and take into account any fears you may have about retaliation or other negative career consequences. The goal will be to enhance your ability to deal more effectively with the situation on your own. If more assistance is requested, further information can be gathered on your behalf, referrals can be made to those more expert on a specific concern, or proper authorities at your school or affiliated hospital can be contacted. When appropriate, shuttle diplomacy or mediation can be employed to help find a satisfactory solution.

The Ombudsperson is a designated neutral and, as such, does not advocate for any individual or point of view.

Informal Process

The Ombudsperson will provide you with a safe forum to voice your concerns, evaluate your situation, organize your thoughts, assess your feelings, and decide on what is important and relevant your specific circumstance. Together, the ombudsperson and you will explore options for you to consider. Options can range from simply talking about your problem to pursuing a formal grievance proceeding. You will select the options you prefer. Your privacy will be respected, as conversations will ordinarily remain confidential. No records are kept. In unusual circumstances, such as where information is subpoenaed for a legal proceeding or there is a

potential threat to safety and other options have been exhausted, information may have to be shared. If you have particular concerns about confidentiality, please raise the issue.

Formal Process

If all attempts at resolving the situation informally have failed, you may choose a more formal grievance process. All individuals will be subject to the policies and procedures of Harvard Medical School for their group. If the situation also involves an affiliated hospital, the Ombuds Office will work together with that institution to determine the best way to proceed.

Why?

Harvard's Medical School, School of Dental Medicine, and School of Public Health and the affiliated hospitals are large and complex institutions. Misunderstandings and disagreements can occur. Conflict can drain your emotional energy, decrease your productivity, complicate your dilemma, or add stress. You may need assistance. The Ombuds Office is a place where you will find help to handle interpersonal difficulties.

Who?

You are eligible and welcome if you are affiliated with any of the three schools as a: student, trainee, faculty member, or staff person.

How?

Contact Melissa Brodrick, Ombudsperson, Harvard Medical Area, 164 Longwood Ave, Boston, MA 02115. Call (617)432-4040 (Confidential), (617)432-4041 (Staff Assistant). Fax (617)432-0586.

E-mail melissa_brodrick@hms.harvard.edu

Web Site <http://www.hms.harvard.edu/ombuds/>

HMPRP CERTIFICATE PROGRAM DUE PROCESS POLICY

The Certificate program maintain an "open door" policy for students and residents to discuss and resolve the administration of policies, interpersonal relationships, and work performance as they arise.

We do recognize that not all problems may be resolved during this informal procedure. Therefore, we have adopted a formal grievance procedure for students that want to pursue a problem beyond the informal procedure. This procedure is designed to provide unbiased and timely resolution of problems and will hold no adverse affect upon the resident as a result of utilizing this procedure.

Residents taking Certificate Courses should follow the current policies of the office of Partners Graduate Medical Education: <http://www.partners.org/Graduate-Medical-Education/Policies-Resources/Policies.aspx>

Policies for Certificate Students who have are classified as Non-Employee Students are as follows:

Certificate Student Redress of Grievances Policy

1. Grievances pertaining to the training program, faculty or work environment should first be directed to the training program director in writing, and copied to the Chair of the Oversight Committee.
2. A written response to the grievance should be provided by the training program director within two weeks. If no response is received or if the response is not satisfactory to the Graduate Trainee, the Graduate Trainee should contact the Chair of the Oversight Committee. The Chair of the Oversight Committee will meet with the Graduate Trainee and the program director if further information is needed, and will present the issue to the full Oversight Committee for resolution.
3. If steps 1 and 2 do not resolve the Grievance, the student may contact Human Resources who may work with the Program Director and/or Oversight Committee to resolve the matter.

Certificate Student Adverse Action Process

1. "Adverse action" includes any of the following actions by the Hospital/certificate program: revocation or suspension of a right or a privilege; censure; written reprimand;; required performance of public service or of a course of education; counseling or monitoring arising out of the filing of a complaint or a formal charge; restriction or non-renewal of a right or a privilege; denial of a right or privilege; resignation; or dismissal reflecting on the student's performance.
2. Adverse action may be taken for due cause which shall include, but is not limited to, any of the following reasons:
 - a. Violations of the Academic Integrity Policy.
 - b. Professional incompetence, or conduct that might be inconsistent with or harmful to good patient care or safety, lower than the standards of the Medical/Professional Staff, or disruptive to Hospital operations;
 - c. Conduct which calls into question the integrity, ethics or judgment of the student, or which could prove detrimental to the Hospital's patients, employees or operations;
 - d. Violation of the bylaws or policies and procedures of the Professional/Medical Staff, the Hospital or Harvard Medical School;
 - e. Misconduct in science; and
 - f. Failure to perform duties.

3. Initiation of Adverse Action

The adverse action process may be instituted by the Program Director. The Program Director shall give written notice of the action or proposed action and the reason for it to the affected student. The student shall also be notified of his/her right to the grievance policy as described above.

WEBSITE

A website has been created for those interested in our program. Feel free to browse:

<http://harvardmedphys.org/about-the-program/certificate-program/>

LISTING OF PROFESSIONAL ORGANIZATIONS

American Association of Physicists in Medicine (AAPM)

<http://www.aapm.org>

Mission/Function:

The objectives of the American Association of Physicists in Medicine are to promote the application of physics to medicine and biology, to encourage interest and training in medical physics, and to prepare and disseminate technical information in this and related fields. The scientific activities of the AAPM primarily involve radiological physics of ionizing radiation (dosimetry, physics of radiologic diagnosis and therapy, radiation safety, etc.), but there is an increasing emphasis on the physics of non-ionizing techniques for the diagnosis and treatment of disease.

The association publishes the monthly journal, *Medical Physics*, as well as a newsletter covering developments in the profession and the association. AAPM also publishes a scientific monograph series, a symposium proceedings series, and a technical report series.

MEMBERS:

Membership is open to individuals who are engaged in the application of physics to medicine and biology in medical research or educational organizations.

New England Chapter of the AAPM (NEAAPM)

<http://chapter.aapm.org/NE/NE.html>

Mission/Function:

The objectives of the New England Chapter of the American Association of Physicists in Medicine are to bring together medical physicists in the New England area through a series of meetings. The year begins with a half-day winter meeting, followed by the Young Investigators' Symposium in spring. The summer meeting is an all-day affair located at a resort or hotel in the area. The final meeting, the annual meeting, is held in the fall and includes the society's board meeting and election of new officers.

MEMBERS:

Membership is open to individuals who are engaged in the application of physics to medicine and biology in medical research, industrial or commercial organizations or educational organizations.

American Society for Therapeutic Radiology and Oncology (ASTRO)

<http://www.astro.org>

Mission/Function:

The purposes of the society, (ASTRO), are to extend the benefits of radiation therapy to patients with cancer or other disorders; to advance its scientific basis, and to provide for the education and professional fellowship of its members. Active members are board certified physicians, radiation physicists and radiation biologists who confine their professional practice to radiation oncology or in support of radiation oncology.

American Board of Radiology (ABR)

<http://www.theabr.org>

Mission/Function:

The American Board of Radiology was organized and administered its first certification examinations in radiology in 1934. The purposes of the ABR are to improve the quality of medical service to the public; to improve the quality of graduate education in radiology; to encourage the study of radiology and to evaluate the standards of training in radiology; to arrange, control, and conduct investigations and examinations for specialists in radiology and radiological physics in order to evaluate the qualifications of voluntary candidates for certification by the ABR; to grant and issue certificates in the field of radiology, diagnostic radiology, diagnostic radiology with special competence in nuclear radiology, radiation oncology, and radiological physics and its subfields to voluntary candidates who have been found qualified by the board; to maintain a registry of holders of such certificates; and to serve the public, physicians, hospitals, and medical personnel by preparing and furnishing lists of practitioners who have been certified by the board. The ABR certifies individuals, while the RRC/ACGME certifies the program. Useful information about the ABR is available through its website.

MEMBERS/SPONSORS:

The ABR is sponsored by the American College of Radiology, the American Roentgen Ray Society, The Radiological Society of North America, the American Radium Society, the American Medical Association 'Section on Radiology', the American Society for Therapeutic Radiology and Oncology, the Association of University Radiologists, and the American Association of Physicists in Medicine. In 1981, the first physicist member was elected to the board of trustees, nominated by the American Association of Physicists in Medicine.

American College of Radiation Oncology (ACRO)

<http://www.acro.org>

Mission/Function:

The American College of Radiation Oncology was founded in 1989 to represent radiation oncologists and radiation oncology in the socio-economic and related arenas. It was organized to meet the interests of radiation oncology as they diverge from diagnostic radiology. Thus far, ACRO's activities have been primarily directed towards lobbying efforts and legal representation in Washington, D.C. However, the organization has also devoted resources towards educational concerns, including sponsorship of the Radiation Oncology Self-Assessment Program (ROSAP) and supplemental fellowship training for residents. ACRO sponsors the Howard Wong Fellowships which provide \$2000 for a resident to spend at least one month at an outside institution.

Membership is open to radiation oncologists and physicists in the United States, and to radiation oncology administrators through associate membership. The Board of Chancellors and officers are elected from members representing all types of practices including university, hospital based, free-standing, fee for service, HMO, government, etc.

American College of Radiology (ACR)

<http://www.acr.org>

Mission/Function:

The objectives of the American College of Radiology are to advance the science of radiology, to improve radiologic service to the patient, study the economic aspects of the practice of radiology, and to encourage improved and continuing education for radiologists and allied professional fields. The staff of the ACR supports the operations of the Radiation Therapy Oncology Group (RTOG), the Particle Clinical Trials Program and the Radiologic Diagnostic Oncology Group (RDOG). The staff also supports the efforts of the Patterns of Care Study in Radiation Oncology (PCS).

The American College of Radiology consists of more than 28,000 members and fellows in diagnostic and therapeutic radiology, radiologic physics, and related disciplines. Full regular membership in the ACR is open to radiologists and physicists who achieve certification by the American Board of Radiology or an equivalent board. Other classes of membership are open to qualified individuals practicing radiology full-time or working in allied fields. Members are structured into chapters which not only offer local programming, but also serve as geographic districts for representation on the ACR council, the policy making body of the college.

Radiation Research Society

<http://www.radres.org>

Mission/Function:

The Radiation Research Society is a professional society of biologists, physicists, chemists, and physicians contributing to the knowledge of radiation and its effects. The society's objectives are to promote original research in the natural sciences relating to radiation, to facilitate integration of different disciplines in the study of radiation effects, and to promote the diffusion of knowledge in these fields.

American Association of Medical Dosimetrists (AAMD)

<http://www.medicaldosimetry.org>

Mission/Function:

The objectives of the American Association of Medical Dosimetrists are to promote the proper application of medical radiation dosimetry, to clarify and strengthen the position of dosimetrists within the radiation therapy community, to establish guidelines for the training and continuing education of dosimetrists, and to develop more direct lines of communication among dosimetrists. The AAMD also publishes a journal, *Medical Dosimetry*.

Members:

Full membership is open to individuals who are primarily involved with the application of medical radiation dosimetry with a minimum of one year of full-time experience. Other membership classifications are available for individuals not fulfilling full membership classifications. Student membership is open for individuals who are currently enrolled in a formal dosimetry training program. Corporate membership is available for corporations who are interested or involved in the field of radiation dosimetry.

Society for Radiation Oncology Administrators (SROA)

<http://www.sroa.org>

Mission/Function:

As an organization for radiation oncology administrators, SROA's aims are: a) to improve the administration of the business and non-medical management aspects of radiation oncology and the practice of radiation oncology as a cost effective form of health delivery; b) to provide a forum for dialog between the members of professional interest; c) to disseminate information to and among members of the society; and d) to promote the field of radiation oncology administration.

Members: Active members are persons currently engaged in the administrative responsibilities of radiation oncology at the executive, divisional, or departmental level, on a full or part-time basis. These persons have a spectrum of responsibilities including 1) the supervision of personnel (technical, clerical, and ancillary employees); 2) budgetary responsibility in at least two of the following areas: personnel, operating expense, capital equipment; and 3) development of operational procedures and guidelines for radiation oncology departments. SROA has no sponsors, but it maintains liaisons with AAPM, AAMD, ACMP, ACR, AHCRA (American Health Care Radiology Administrators), ASRT, ASTRO, the Associations of Educators in Radiological Sciences, Inc., ARRO, the Manpower Summit, and RSNA Associate Scientists Consortium.

American Radium Society

<http://www.americanradiumsociety.org/>

Mission/Purpose:

The American Radium Society is an organization of physicians and other scientists with common interests in cancer therapy. Its members include radiation oncologists, surgeons, gynecologists, medical oncologists, radiologists, and physicists. It is said to be the oldest multidisciplinary oncology society. Its primary purpose is the education of its membership and other cancer care professionals, by providing a forum for multidisciplinary discussion.

Active membership may be held by physicians and allied scientists. Physicians must be graduates of recognized medical colleges, and in good standing of their local medical community. They must have an active and sustained interest in the objectives of the society as evidenced by adequate formal training and continuing practice in those branches of medicine which are closely allied in the management of cancer. They must be certified by a board or have equal qualifications. If there is an oncology board in their specialty, they must be certified by that subspecialty board to provide evidence of qualifications in oncology.

American College of Radiology Institute

Mission/Function:

The American College of Radiology Institute (ACRI) was established as a corporate entity separate from the American College of Radiology to develop, produce, and distribute educational materials for radiology. This role differs from that of the publications section of the ACR in that the materials produced by ACRI are primarily non-print based.

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