UNIVERSITY OF CALIFORNIA SAN FRANCISCO
RADIATION ONCOLOGY RESIDENCY PROGRAM
OVERALL EDUCATIONAL GOALS AND OBJECTIVES

Educational Mission

To train residents to become outstanding radiation oncologists committed to caring, healing, teaching, and discovery.

Educational Goals

Provide residency program training that produces well-rounded radiation oncologists who

1-a) develop an excellent knowledge base in the clinical, physics, and radiation/cancer biology domains
1-b) develop excellent technical skills,
1-c) deliver excellent clinical patient care,
1-d) provide compassionate care,
1-e) collaborate with physicians in related disciplines and thrive in multidisciplinary teams,
1-f) advance knowledge, and
1-g) demonstrate foundations for life-long learning.

Provide the components required to accomplish each aspect of the above goal including needed

2-a) support personnel,
2-b) faculty,
2-c) structure,
2-d) facilities,
2-e) patient resources,
2-f) educational environment, and
2-g) expectations.

3) Meet or exceed all of the requirements of the Radiation Oncology Residency Review Committee (RRC) as outlined in the "Program Requirements for Residency Education in Radiation Oncology" and maintain accreditation by the RRC.

4) Comply with institutional graduate medical education (GME) requirements.

5) Perform training in and evaluation of the six ACGME General Competencies.

6) Maintain a program of ongoing self-assessment and improvement, identifying priorities for improvement and demonstrating progress.

Educational Overview

The UCSF Radiation Oncology residency provides four years of training following a PGY-1 year as specified in the RRC program requirements. There are two tracks for Radiation Oncology residency training, both of which are 48 months in duration:

- The traditional track includes 37 months of clinical radiation oncology rotations along with 11 months of research and/or elective time.
- The Holman pathway includes 27 months of clinical radiation oncology rotates along with 21 months of research time. The Holman pathway is primarily designed for residents with strong research interests and background who have excellent clinical skills such that clinical competence can be achieved in this abbreviated time period.

Schedule: In the interest of allowing individualization of research and elective time depending on each resident's interests and needs (generally allowing a long block of time for laboratory-based research vs. multiple 1-2 months blocks for clinical or physics research and electives), there is no fixed, predetermined rotation schedule that applies to all residents. Each year's rotation schedule is developed with input from the residents, Program Director, and Chair, and the Program Director tracks the rotation schedule to ensure that each resident gets a balanced clinical experience.

Clinical radiation oncology rotations consist of assignments of one resident to one or two attending physicians specializing in one or more areas of Radiation Oncology such as brachytherapy or pediatric, CNS, GI, GU, GYN, breast, lung, or head and neck cancer. An attending physician who is in clinic part-time is generally paired with another part-time or full-time attending physician. Clinical rotations are usually 2 or 3 months in duration. Residents in the traditional track rotate through each service approximately once during their first two years of training and approximately once during the last two years of training. The current clinical rotations include

- BF (breast)/CP (breast)/NRS (breast, lymphoma, skin, hyperthermia)
- KM (uveal melanoma proton beam therapy)
- MR (GU/prostate)
- AG (CyberKnife, sarcomas, GU)
- IH (GYN, brachytherapy, hyperthermia)
- JQ (eye/orbit/H&N)
- SY (lung, H&N, melanoma)
- RK (GI, lymphoma, lung)
- PKS/JN (Gamma Knife, CNS, palliation)
- IB/DAL (CNS, CyberKnife, Gamma Knife, palliation)
- DHK/SF (peds, CNS).

Clinical rotation goals and objectives: Rotation-specific, ACGME competency-based goals and objectives for junior and senior residents are located on the Residency

Training Program section of the Radiation Oncology website. Rotation Goals and Objectives are also uploaded in the E-value system and a link to the goals and objectives is sent to each Resident two days prior to their rotation assignment start date. The E-value system allows tracking of the Goals and Objectives that have been accessed by each Resident. Rotation goals and objectives are also e-mailed to Residents annually. Faculty are asked to review Goals and Objectives with residents at the start of each rotation and verify satisfactory completion of the goals and objectives at the end of each rotation. E*Value resident and faculty evaluations have questions to assess compliance.

Clinical training: In the course of the clinical radiation oncology rotations, residents receive clinical training in a wide variety of treatment and treatment planning techniques:

- simulation
- computerized treatment planning
- standard photon external beam radiotherapy
- electron beam radiotherapy
- three-dimensional conformal radiotherapy
- intensity modulated radiotherapy
- single fraction Gamma Knife radiosurgery
- single or multi-fraction Cyberknife radiosurgery
- intraoperative radiotherapy
- permanent and temporary low-dose-rate brachytherapy
- high-dose-rate brachytherapy
- total body irradiation for stem cell transplantation
- hyperthermia
- electron and kilovoltage radiotherapy for skin cancer

Total skin irradiation, plaque therapy, radioimmunotherapy, and particle therapy are covered didactically in physics and/or clinical lectures. Residents go to Nuclear Medicine by arrangement to participate in unsealed source therapy including at least 3 oral and 3 parenteral cases. Residents gain limited experience with particle radiotherapy in that our department runs the proton beam facility located in Sacramento used primarily to treat ocular melanoma patients. Dr. Kavita Mishra evaluates and simulates patients for ocular proton therapy at the Mt. Zion campus and then travels to the proton facility to supervise treatments.

Clinical resources: A wide variety of adult and pediatric patients are treated in the Department of Radiation Oncology, drawn from UCSF, UCSF/Mt. Zion, San Francisco General Hospital (the county hospital, which has no radiotherapy department of its own), and the San Francisco Veterans Administration Medical Center (which has no radiotherapy department of its own). There is a good variety of patients in terms of tumor types (CNS, GU, GI, GYN, head and neck, breast, lung, pediatrics, sarcomas, lymphomas and leukemia, benign disease, etc.) and there are adequate numbers of

pediatric and adult external beam simulations, radiosurgery cases, and brachytherapy cases for our residents to meet the RRC case-log requirements.

Research and elective time: Residents choose what kind of research they do and what kinds of electives they take, with approval of the Program Director who monitors each resident's progress toward meeting graduation requirements and checks for satisfactory performance on research and elective rotations. Common 1-month electives include Diagnostic Radiology (CT and/or MRI), Dosimetry/Treatment Planning, Radiosurgery, and Medical Oncology. Less common electives include Pathology and Surgical Oncology. Residents also have the option of designing an elective specific to their interests, subject to input from and approval of the Program Director. Each resident is required to complete at least one research project during their four years of residency.

Scholarly activities: Collectively, the Radiation Oncology faculty at UCSF are very active in securing research funding, publishing peer-reviewed articles, publishing review articles and book chapters, and presenting at meetings. Every resident participates in at least one clinical or laboratory research project during residency, and most residents are involved in multiple projects. A variety of resources support scholarly activity, such as personal computers for every resident, medical libraries on both campuses and access to extensive on-line journal subscriptions, a historical VAX database of all Radiation Oncology patients treated since the early 1960s, a LANTIS database of Radiation Oncology patients treated from 2003 forward, the Gamma Knife database, the Prostate Cancer database, access to the Neuro-Oncology Medlog database, access to Tumor Registry data, and access to statistical support (Vivian Weinberg, Ph.D. for general Radiation Oncology projects and Kathleen Lamborn, Ph.D., for CNS projects). The faculty also has extensive experience in and success at mentoring resident and medical student research. Each resident receives an allowance of $2,000 to spend on meetings, books, subscriptions and other educational items over their 4 years of residency. In addition, the Department pays from an education fund for travel expenses for residents presenting papers at meetings; pre-approval of travel is required for residents and faculty alike, but is essentially always granted.

Resident supervision: All patient care is supervised by qualified faculty, and faculty schedules and coverage are structured to provide residents with continuous supervision and consultation. Each resident on a clinical service is assigned to one or two attending physicians. Attending physicians complete a consult note on each new patient, write weekly notes on patients under treatment, and sign all simulation films, port films, treatment plans, and treatment prescriptions. All faculty members carry pagers. Faculty coverage for vacation and meeting time is documented in "Lantis" and "Meeting Maker" schedules available on-line widely throughout the department. An attending physician takes call weekly along with a resident on call. All new patients seen emergently after hours or on weekends are seen by both a resident and an attending physician, and the attending physician approves films and the treatment

prescription prior to emergency treatment. Call schedules with pager numbers and home phone numbers are posted at various locations and are distributed throughout the department by e-mail.

All electives are supervised and research rotations mentored. At the start of research rotations, residents report their mentor to the Program Director and Program Coordinator, and the mentor evaluates the resident at the end of the research rotation via the E*Value system.

Medical Oncology: The RRC requires two months of medical oncology or its equivalent. Residents are given the option of doing 1 or 2 months of medical oncology electives, but most residents meet this requirement by attendance at multidisciplinary tumor boards and teaching conferences where medical oncology is discussed. During their four years of residency, residents in the traditional track will spend four months on the pediatric clinical radiation oncology service, during which they attend the weekly 1.5-hour multidisciplinary Pediatric Tumor Board where pediatric case management is discussed by pediatric medical oncologists and radiation oncologists.

Diagnostic Imaging: The RRC requires one month of diagnostic radiology or its equivalent. Most residents do a formal one month rotation in diagnostic radiology, though they are given the option of meeting this requirement by attendance at multidisciplinary tumor boards and teaching conferences where diagnostic imaging is shown and discussed. During their four years of residency, residents in the traditional track will spend four months on the pediatric clinical radiation oncology service, during which they attend the weekly 1.5-hour multidisciplinary Pediatric Tumor Board where imaging is shown and discussed by a pediatric radiologist.

Pathology: The RRC requires one month of pathology or its equivalent. Residents are given the option of doing a month of anatomic pathology as an elective, but most residents meet this requirement by attendance at multidisciplinary tumor boards and teaching conferences where oncologic histopathology is shown and discussed. During their four years of residency, residents in the traditional track will spend four months on the pediatric clinical radiation oncology service, during which they attend the weekly 1.5-hour multidisciplinary Pediatric Tumor Board where pediatric oncologic histopathology slides are shown and discussed by a pathologist specializing in pediatric malignancies.

Didactic components: All residents are expected to attend and participate in morning conference every Monday, Tuesday, Thursday, and Friday from 8:00 a.m. to 9:00 a.m. in L34 on the Parnassus campus and in H1031 on the Mt. Zion campus, with video-teleconferencing between the two sites. This time slot is used for most of the departmental didactic activities, including **Morbidity & Mortality** Conference one Friday monthly, Grand Rounds or other special lectures on the other Fridays, an

"Introductory Lecture" series each summer and early fall, **Physics** and **Radiation and Cancer Biology** lectures on alternate weeks, and a combination of journal review, case conferences, statistics, and site-specific or technique-specific didactic sessions on other mornings. Attending physicians are responsible for helping to run morning conferences during their on-call weeks, and all available attending physicians are expected to attend conferences of general interest, such as resident research presentations, morbidity & mortality conference, and grand rounds. **Dosimetry** is covered in the Physics lectures, some residents do a specific one-month Dosimetry rotation, and we have recently instated "Dosimetry Labs" in which focused, hands-on dosimetric work is performed and reviewed with Dosimetrist or Physicist and all the residents at a single site, once every two months.

New patients are reviewed at the weekly **Chart Rounds**, held separately at the Parnassus campus on Wednesday mornings from 8:00-9:00 am and by various clinical services at the Mt. Zion campus.

Residents attend one or two **multidisciplinary tumor boards** weekly, with the attending physician(s) to whom the resident is assigned. Multidisciplinary Tumor Boards generally include representation from relevant medical and surgical oncologists, one or more pathologists, and one or more diagnostic radiologists, with case-specific discussions of the potential benefits and limitations of each treatment modality. **Problem cases** are discussed at these multidisciplinary tumor boards, chart rounds, and at selected morning conferences. The fact that residents rotate on each service at least twice over their four years of training ensures exposure to the full spectrum of tumor boards both as a junior resident and as a senior resident. The Program Coordinator gathers weekly data on resident attendance at tumor boards and conferences along with verification of conference/tumor board content in terms of pathology, medical oncology, and diagnostic imaging.

The Chief Resident (which is a rotating position) attends a monthly departmental **Continuous Quality Improvement** meeting and reports back to all of the residents regarding quality improvement issues.

Tumor Boards: There are a wide variety of site-specific multidisciplinary tumor boards at UCSF (Breast, Gamma Knife, GI, GU, GYN, H&N, Melanoma, Neuro-Oncology, Pediatric, Sarcoma, Skull Base, Spine, Thoracic, Thyroid, and Visible Tumor) plus general tumor boards at the V.A. Hospital and San Francisco General Hospital. Most attending Radiation Oncologists attend two tumor boards weekly. During clinical rotations, residents go to the tumor boards that their attending physicians attend, ensuring exposure to all of the tumor boards multiple times during the course of residency training.

Physics: There is a separate physics course for first-year residents including formal didactic lectures and some labs as well as an on-going every-other week series of physics lectures and labs for all residents, alternating with radiation/cancer biology lectures, with a total of 53 contact hours yearly. A complete schedule of the lectures/labs may be found in the didactic program section of our ACGME Program Information Form.

Radiation/cancer biology: There is a separate radiation/cancer biology course for first-year residents including formal didactic lectures as well as an on-going every-other week series of radiation/cancer biology lectures for all residents, alternating with physics lectures, with a total of 28 contact hours yearly. A complete schedule of the lectures/labs may be found in the didactic program section of our ACGME Program Information Form.

Duty Hours

Duty hours are limited to 80 hours per week averaged over a four-week period, inclusive of all in-house call activities.

Residents are provided at least 1 day in 7 free from all educational and clinical responsibilities, averaged over a 4 week period, inclusive of call. One day is defined as one continuous 24-hour period free from all clinical, educational, and administrative activities. (Studying and preparation time for conferences do not count as duty hours).Residents are provided at least 10 hours off between daily duty periods, averaged over a 4 week period.

No new patients may be accepted after 24 hours of continuous duty. For Radiation Oncology, 24 hours of continuous duty will be defined as performing in-house duties (including transit time) for the majority of the period from midnight to 6:00 a.m. after performing normal clinical duties the prior day.

Radiation Oncology duty hours have been monitored since June 2000 with two questions on the "Evaluation of the Residency Program" which is completed by the residents every 6 months: "Please estimate the average number of hours you spend per week on duty (in the clinic and/or hospital)" and "How many additional hours do you spend per week on duty (in the clinic and/or hospital) when you are on call?" This information has been obtained using the E-value system since December 2003. To assist in documenting continued full compliance with the 80-hours-per-week duty hours limit, Residents are asked to "Please estimate the maximum number of hours per week that you have spent on duty (including clinic duty and on-call duty), averaged over any 4-week interval over the past 6 months." Based on the program evaluation forms submitted every 6 months, residents typically estimate spending 45-60 hours on duty per week with an additional 2-10 hours per week on call. Call is limited to no more

often than 2 weeks in one 4-week period of time, and is usually less than once per month. No resident has ever reported spending even as much as 70 hours on duty per week on average. Effective July 1, 2010 Residents are required use the E-value duty hours tracking tool to log their duty hours.

Evaluation

Attendance verification: The Program Coordinator maintains records of each resident's attendance at teaching conferences and tumor boards, along with information on conference content in terms of medical oncology, diagnostic imaging, and pathology. Residents and attending physicians sign attendance sheets in binders kept in the conference rooms at Parnassus (L34) and Mt. Zion (H1031) and reply to a weekly e-mail that is sent out soliciting tumor board and chart rounds attendance data.

Resident case logs: All resident experience logs are being kept on-line at the ACGME website (www.acgme.org), accessed under the "Resident Case Log System" heading. Every six months, the Program Director reviews the experience log with each resident to try to ensure accuracy and to verify that the case numbers and distribution are appropriate and on track to meet graduation requirements. This discussion is documented in each resident's file, attached to a hard copy of the log. A hard copy of each graduating resident's cumulative 4-year log signed by the Program Director is submitted to the ACGME yearly in July.

E*Value system: E-value, a web-based evaluation tool widely used by UCSF Graduate Medical Education Programs is used for the majority of the Radiation Oncology evaluations including: Resident, Faculty and Program evaluations.

Resident Evaluations: Faculty members (educators) are scheduled to evaluate Residents at the end of every rotation assignment (often monthly) in the six ACGME competencies (Patient Care, Medical Knowledge, Practice-Based Learning and Improvement, Interpersonal and Communication Skills, Professionalism and Systems-Based Practice). Residents are also scheduled to evaluate faculty members (educators) at the end of each rotation assignment (often every month).

In addition to rotation specific evaluations, Residents are also evaluated using the 360 degree evaluation process. This evaluation process solicits evaluations from multiple members of the Radiation Oncology Department including Nurses, Dosimitrists, Therapists, Administrative Staff and Peers. Each 360 degree evaluator group evaluates Residents twice a year.

Residents are evaluated in each competency area using at two evaluation tools for each ACGME competency.

Tools Used to Evaluate Each Competency Area:

Patient Care: 1. Global Assessment Evaluation. Frequency: Per Rotation or Monthly.
2. Direct observation (mini-CEX,). Frequency: Six or more evaluations per academic year if trainee has a clinical schedule that allows for such evaluations. Mini-CEX evaluations are not completed on non elective rotations.

Medical Knowledge: 1. Global Assessment Evaluation. Frequency: Per Rotation or Monthly. 2. ACR In-Training Exam. Frequency: Annual.

Practice-Based Learning and Improvement: 1. Global Assessment Evaluation. Frequency: Monthly or Per Rotation. 2. PBLI clinical Appraisal Exercise. Frequency: Six or more evaluations per academic year if trainee has a clinical schedule that allows for such evaluations. PBLI Clinical Appraisal Exercise evaluations are not completed on non elective rotations.

Interpersonal and Communication Skills: 1. Global Assessment Evaluation. Frequency: Monthly or Per Rotation. 2. 360 Degree Evaluations. Frequency: Each 360 degree evaluator group evaluates Residents twice a year.

Professionalism: 1. Global Assessment Evaluation Frequency: Monthly or Per Rotation. 2. 360 Degree Evaluation. Frequency: Each 360 degree evaluator group evaluates Residents twice a year.

Systems-Based practice: 1. Global Assessment Evaluation Frequency: Monthly or Per Rotation. 2. 360 Degree Evaluation. Frequency: Each 360 degree evaluator group evaluates Residents twice a year.

Faculty Evaluations:
Faculty (educators) members are scheduled to be evaluated at the end of each rotation assignment (often monthly).

Curriculum Evaluations:
Residents are scheduled to evaluate Physics and Radiobiology educators annually.

Program Evaluations:
Residents are scheduled to evaluate the Program biannually. Faculty members are scheduled to evaluate the program annually.

Summative Evaluations:
The Program Director provides a summative evaluation for each resident upon completion of the Program. The summative evaluation verifies that the resident has demonstrated competence to enter practice without direct supervision.

Biannual Evaluation Meetings:
The Program Director meets with Residents twice a year to review individual rotation schedules, performance, evaluations or evaluation reports and ACGME caselogs.

Education Committee: The Program Evaluation and Improvement Committee (PEIC) meets at least annually. The Program Evaluation and Improvement Committee evaluates the Residency Training Program curriculum and monitors and tracks resident performance, faculty development, graduate performance including performance of graduates on the ABR exam. The Committee also evaluates Program quality and oversees medical student and Clinical Fellow education. The Committee reviews Program and rotation specific rotation Goals and Objectives. Faculty performance in regard to the Residency Training Program, the Residency Program education plan, ABR pass rates, recruitment match results and ACGME survey results and the ACR In-Training exam results are also items the Committee reviews. Based on this review and discussion, the Committee makes recommendations to improve the program and measurement tools. The findings and recommendations of the Committee are communicated to the Executive Committee via the annual Evaluation and Improvement Action Plan. The Program Evaluation and Improvement Committee members include the Program Director, the Long Hospital Site Director, another MD faculty member, a radiation/cancer biologist involved in resident teaching, a faculty physicist involved in resident teaching, a resident representing "senior residents", a resident representing "junior residents"), and the Program Coordinator.

American Board of Radiology certification

All residents are expected to seek and successfully obtain certification in Radiation Oncology from the American Board of Radiology. Residents are advised to keep up to date with current requirements for board certification via the American Board of Radiology web site (www.theabr.org).