

Fellowship in Clinical Informatics: Radiation Oncology Track

Clinical informatics is the subspecialty of all medical specialties that transforms health care by analyzing, designing, implementing, and evaluating information and communication systems to improve patient care, enhance access to care, advance individual and population health outcomes, and strengthen the clinician-patient relationship.

Clinical Informatics Fellowship Overview

OHSU is recruiting physicians for its newly established Clinical Informatics Fellowship. This fellowship will provide physicians with training in clinical informatics that will enable them to achieve board certification in the new subspecialty of clinical informatics, and will follow the format of the guidelines recently published by the Accreditation Council for Graduate Medical Education (ACGME). The fellowship is currently applying to obtain ACGME accreditation, which will be awarded to programs starting this year. Fellows will divide their time between informatics project work, didactic courses leading to the awarding of the Graduate Certificate in Biomedical Informatics, and clinical practice in their primary specialty.

We currently aim to recruit 1-2 fellows for the 2015 academic year. The fellowship is affiliated with the OHSU Department of Medicine, with additional administrative support provided by the OHSU Department of Medical Informatics & Clinical Epidemiology. Physicians of all medical specialties may apply.

Clinical informatics is the subspecialty of all medical specialties that transforms health care by analyzing, designing, implementing, and evaluating information and communication systems to improve patient care, enhance access to care, advance individual and population health outcomes, and strengthen the clinician-patient relationship. Eligibility for subspecialty certification is not limited to any particular medical specialty. The new specialty was launched in 2013, with physicians already working in the field able to sit for the certification exam by meeting prior practice requirements. Starting in 2018, this "grandfathering" pathway will go away, and only those completing an ACGME-accredited fellowship will be board-eligible.

This new fellowship does not replace any existing OHSU informatics fellowship or other informatics educational program. It is a new addition to the OHSU family of informatics educational opportunities that includes a graduate program, a research fellowship funded by training grants from the NLM and other sources, and clinical fellowships offered by the Portland VA and Kaiser Permanente Northwest.

Radiation Oncology Track Clinical Informatics Fellowship Added Areas of Focus

1. *Electronic Health Records & Clinical Documentation*
 - *Overview of current EHR technology and the existing evidence for benefits/risks*
 - *The value and cost of structured data capture, and how to find the right balance*
 - *The problem of chart bloat and how to use technology to improve (vs. worsen!) clinical communication*
 - *Optimizing workflows and efficiency*
2. *Fundamentals of Computerized Decision Support*
3. *Managing High Risk Therapies*
 - *Using technology to improve the safety of chemo and RT prescription and administration, implement surgical checklists, etc.*
4. *Data Management and Database Technology*
 - *Overview of databases and the Relational Model*
 - *Principles of data warehousing and ETL*
 - *Survey of other database technologies (object-oriented, columnar, no-sql, document, XML, graph, etc.) and their strengths/weaknesses/uses*
5. *Radiation Oncology Specific Informatics Challenges*
6. *Data Mining from Clinical Information Systems for Quality Measurement*
 - *Overview of the challenges involved with defining quality metrics that can be measured from EHR data, and doing the reporting/data cleansing needed to evaluate them*
7. *Data Standards*
 - *Overview of classifications, controlled terminologies, ontologies, etc. and their importance*
8. *National Quality Measurement Programs*
 - *Overview of the national bodies that set standards for quality measurement – e.g. Office of National Coordinator, CMS, AHRQ, NQF, professional societies, Commission on Cancer, etc. – and programs affecting oncology – e.g. Meaningful Use, PQRS, QOPI, NCDB benchmarking, etc.*
9. *Clinical Pathways for Quality Improvement in Oncology*
 - *Review of the technology and evidence for pathways*
10. *Delivering Personalized Care*
11. *Predictive Analytics*
12. *Clinical Research Informatics*
13. *Outcome Measurement*
 - *Clinician-reported and Patient-Reported Outcomes*
14. *Secondary Reuse of Clinical Data*
 - *Registries and Rapid Learning Systems*
15. *Translational Informatics*
16. *Information Security & Privacy*
17. *Imaging Informatics*
18. *Informatics for Oncology Education*
19. *Health Information Technology Policy*
20. *Mathematical Oncology Informatics*

Clinical Informatics Experience

An essential component of OHSU Clinical Informatics Fellowship program is the Clinical Informatics Experience (CIE), which will give fellows real-world experience managing an electronic health record. As part of their CIE, fellows will engage in progressively larger leadership responsibilities for clinical informatics work at OHSU, under the mentorship of practicing informaticians. The outcome of the clinical experience will be a leadership portfolio that will allow the fellow to demonstrate to future employers the type and quality of work he/she has completed. The components of the portfolio will be a series of goal-directed projects that demonstrate the effectiveness of the fellow in real-world experience.

Objective of the CIE

Participation in the CIE will develop subject matter expertise and leadership skills of future board certified clinical informaticians through exposure to practical experiences at OHSU in clinical informatics operations, quality management, service excellence, and general management

Operational Informatics Rotations

Operational informatics rotations will be connected to the fellow's home clinical department and will consist of projects mentored by a paired informatics medical director. Certification or proficiency in the Epic electronic health record will be required to ensure the fellow functions at maximal effectiveness throughout the rotation. The program will assist the fellow in obtaining necessary Epic certification.

Leadership Development

Leadership development will consist of formal training and mentorship. Formal training options available to fellows include:

- Participation in the OHSU Pathways to Leadership Program
- Training in the lean improvement methodology
- Participation and leadership of rapid process improvement events
- Completion of the Institute for Healthcare Improvement (IHI) web-based instructional modules on quality improvement (www.improvementskills.org)

Fellowship Clinical Requirements

Year One

Administrative meeting attendance

Attend weekly EpicCare change management meetings

Attend monthly Clinical Decision Support Committee meeting

Attend monthly Health Information Committee meeting

Year Two

Administrative meeting attendance

Attend weekly EpicCare change management meetings

Attend monthly Clinical Decision Support Committee meeting

Attend monthly Health Information Committee meeting

Completion of 24 credits of coursework required for the OHSU Graduate Certificate in Biomedical Informatics (optionally, fellows may choose to pursue a master's degree in Biomedical Informatics)

<http://www.ohsu.edu/xd/education/schools/school-of-medicine/departments/clinical-departments/dmice/educational-programs/index.cfm>

Attendance and presentation of project at Epic Provider Advisory Council

Outcomes

Fellow will have received hands on training in clinical informatics and by the end of their training will be prepared for a position equivalent to a medical director of informatics.

Clinical Informatics Education

Fellows will be expected to participate in classroom experiences that aim to provide mastery of the core content of the field and successfully pass the clinical informatics board certification exam at the end of the program. The default educational experience will be the OHSU Graduate Certificate in Biomedical Informatics program, which provides 24 credits of coursework (8 three-credit courses, with some credit obtained for project work). (In consultation with the program, fellows may optionally pursue a master's degree that is a superset of the Graduate Certificate.) Fellows will also have the opportunity to be involved in clinical informatics education for medical students, residents, and other clinicians.

As OHSU is providing coursework to other informatics programs through its distance-learning program, fellows will be expected to participate in multi-site videoconferences. Fellows will also be expected to participate in weekly OHSU Informatics Conference on Thursdays.

Clinical Practice

Fellows will also be expected to maintain about 20% FTE practice in clinical radiation oncology as an Instructor in the Department of Radiation Medicine. www.ohsu.edu/radmedicine

Radiation Oncology Trainee Selection Criteria

Trainees may be accepted for a Radiation Oncology Fellowship if they have completed a radiotherapy residency of at least three years. International graduates are required to train under the J1 visa and must possess a valid ECFMG certificate to be eligible for consideration, and at least one year of clinical training in the United States is preferable.

OHSU Informatics Program

For more information about specific aspects of the subspecialty or the OHSU informatics program, visit the following Web sites:

- OHSU Informatics Educational Program – <http://www.ohsu.edu/informatics-education>
- OHSU Informatics Educational Program Clinical Informatics Track – <http://www.ohsu.edu/xd/education/schools/school-of-medicine/departments/clinical-departments/dmice/educational-programs/clinical-informatics.cfm>
- ABPM Informatics Certification – http://www.theabpm.org/application/ci_requirements.pdf
- AMIA Clinical Informatics – <http://www.amia.org/clinical-informatics-board-review-course>
- William Hersh, MD, OHSU Informatics Educational Program Director, <http://www.billhersh.info>
- Informatics Professor Blog (Dr. Hersh) – <http://informaticsprofessor.blogspot.com>

Core Competencies of Clinical Informatics Fellowships

The core competencies of clinical informatics fellowships have been developed by the American Board of Preventive Medicine (ABPM), which also has developed and administered the board exam (in cooperation with the American Board of Pathology):

1. Search and appraise the literature relevant to clinical informatics
2. Demonstrate fundamental programming, database design, and user interface design skills
3. Develop and evaluate evidence-based clinical guidelines and represent them in an actionable way
4. Identify changes needed in organizational processes and clinician practices to optimize health system operational effectiveness
5. Analyze patient care workflow and processes to identify information system features that would support improved quality, efficiency, effectiveness, and safety of clinical services
6. Assess user needs for a clinical information or telecommunication system or application and produce a requirements specification document
7. Design or develop a clinical or telecommunication application or system
8. Evaluate vendor proposals from the perspectives of meeting clinical needs and the costs of the proposed information solutions
9. Develop an implementation plan that addresses the sociotechnical components of system adoption for a clinical or telecommunication system or application
10. Evaluate the impact of information system implementation and use on patient care and users
11. Develop, analyze, and report effectively (verbally and in writing) about key informatics processes

Informatics Program Resources

Fellows are provided with numerous specialized resources intended to foster their research. Each fellow is provided with shared office space in the BICC Building or elsewhere on the OHSU campus. Several conferences are available to fellows, including the weekly Thursday noon conference [[link to oninformatics.com](http://oninformatics.com)]. Once a week, the fellows meet to present updates of current trends in informatics, tutorials on topics of interest, and training in areas of special concern such as the ethical conduct of research. Fellows are also encouraged to attend two national meetings where they present their own research and participate in the discussion of research by colleagues, one of which is the annual NLM training program meeting.

Facilities and Resources of the Department of Radiation Medicine

The Department of Radiation Medicine at the Oregon Health & Science University (OHSU) Knight Cancer Institute occupies 17,000 square feet on the fourth floor of the Kohler Pavilion, the most recent addition to the University Hospital.

The Department provides radiation oncology and medical physics services to OHSU and two off-campus sites. The main Marquam Hill campus department opened in June 2007 and has four vaults. One vault was recently equipped with an Elekta Versa HD linear accelerator (2014) with onboard imaging, 4D cone-beam CT capability, robotic table top and flattening filter free high-dose rate photon beams. A second vault is scheduled to be equipped with a second Versa HD in 2015 and is currently commissioned with a Varian Trilogy linear accelerator. A third dedicated stereotactic linear accelerator has been commissioned for clinical service since early in 2008. The department also commissioned a Tomotherapy HD treatment unit in 2011. Additional technology includes Calypso 4D, VisionRT, and the BrainLab Exactrac. The Department also features dual dedicated intraoperative radiotherapy programs, including an Intrabeam unit (primarily for breast cancer cases) and a latest generation Mobetron. We also have a HDR (high-dose rate) brachytherapy system, a 16-slice Philips simulator with 4DCT (four-dimensional computed tomography) capability, and a TOF CT-PET (time-of-flight computed tomography-Positron emission tomography) scanner. One of the two satellite facilities is equipped with a newly upgraded Elekta Infinity linear accelerator, the other with the new Elekta Infinity linear accelerator, and both with 4D cone-beam CT capability. Treatment modalities include 3D-CRT (three-dimensional conformal radiotherapy), IMRT (intensity-modulated radiation therapy), IGRT (image-guided radiation therapy), SRS (stereotactic radiosurgery), SBRT (stereotactic body radiation therapy), total body irradiation, total skin electron, hyperthermia and intra-operative radiotherapy. Treatment planning systems include Eclipse, Pinnacle³, BrachyVision, Variseed, BrainLab's iPlan, TomoPlan and Elekta Monaco. The Department is clearly equipped with cutting-edge technology where students can undertake original research projects under the mentorship of a program faculty.

The Department's faculty is also involved in teaching one or more courses in its Radiation Therapy Technologist program and its Graduate Medical Physics program that is being run in conjunction with the Department of Nuclear Engineering and Radiation Health Physics at OSU in Corvallis. We should note here that the Graduate Medical Physics Program was recently accredited by the Commission on Accreditation of Medical Physics Educational Programs, Inc.

(CAMPEP). In addition, the faculty also trains prospective medical physicists and radiation oncologists in its Medical Physics and Radiation Oncology postgraduate training programs. The Department has multiple American Board of Radiology (ABR) B. Leonard Holman Pathway residents in its postgraduate training program at the present time. Nearly three-fourths of the Department's house staff has received competitive extramural funding since 2007 and 11 OHSU School of Medicine students have received competitive extramural research grant funding in the Department since 2008. Many faculty collaborate with other programs at OHSU that broaden the research experience, such as the Oregon Clinical & Translational Science Institute (OCTRI, OHSU's Clinical & Translational Science Award [CTSA] center), the Knight Cancer Institute (OHSU's National Cancer Institute-funded comprehensive cancer center), and the OHSU Health System (OHSU's clinical enterprise). Some faculty also have cross-appointments at the Portland Veteran's Administration Medical Center (PVAMC) and Oregon State University, bringing access to their attendant research and/or clinical programs.

Research

The principal activity of OHSU's fellows is learning the skills and responsibilities of research as apprentices to junior and senior faculty. The major portion of the time spent by the fellows is in the research laboratories of the BICC and its collaborating scientists. While fellows may launch their own research projects, every effort is made to have them connect with a faculty member's personal interests for optimal mentoring. Fellows are therefore encouraged to involve themselves with the ongoing faculty projects described here, or with projects related to their main research interests and that are sponsored by other faculty at OHSU.

Additional Information

<http://www.ohsu.edu/xd/education/schools/school-of-medicine/departments/clinical-departments/dmice/educational-programs/clinical-informatics-fellows.cfm>

Application Contact Information

Charles R. Thomas, Jr., Chair, Dept. of Radiation Medicine (503-494-1998; email: thomasch@ohsu.edu)

William Hersh, MD, Fellowship Program Director & Chair, DMICE (Dept. of Medical Informatics & Clinical Epidemiology)

Thomas Yackel, MD, MPH, MS, Associate Program Director, Clinical Informatics Fellowship

Vishnu Mohan, MD, MBI, Associate Program Director, Clinical Informatics Fellowship

Andrea Ilg, Program Coordinator, Clinical Informatics Fellowship