ENDODONTICS RESIDENCY + DOCTORATE DUAL DEGREE PROGRAM

Program Overview

Endodontics Residency + Doctorate Dual Degree Program (https://www.pacific.edu/dental/academic-programs/endophd/)

The Department of Endodontics offers a Certificate in Endodontics – PhD conjoint program. This five-year, full-time, self-funded program provides a unique opportunity for clinician-scientists to hone their skills and excel both in their advanced clinical training in endodontics, but also cutting-edge research, which prepares them for both specialty practice and the academic world.

The first three years of this program are dedicated to the PhD program, which is offered in association with the Department of Chemistry, and the subsequent two years focus on advanced training in endodontology. Students will have an outstanding opportunity to develop their knowledge, scientific and laboratory skills on several cutting-edge research projects helping to further the Department of Endodontics' goals.

As one of the select few clinician-scientists with advanced training in endodontology and a PhD, you become ready for both clinical practice and an educator/scientist track. There is also ample opportunity in industry for candidates who have an interest in entrepreneurship. During the PhD program, you will also be exposed to the classic and recent science in endodontics. You will have the opportunity to attend classes with the endodontic residents. You will also engage in the simulation laboratory and didactic education of the pre-doctoral students during your program.

Chemistry Department Outcomes

I. Critical Thinking/Analytical Skills

A. Identify and apply relevant fundamental concepts to solve a variety of problems of different complexity.

B. Analyze theories and methods for both strengths and weaknesses.

C. Respond to analysis of one's own work, theories and/or methods.

II. Laboratory and Research Skills

A. Basic analytical and technical skills necessary to work effectively in fields of chemistry.

B. Perform accurate quantitative measurements using modern chemical instrumentation. Interpret experimental results, perform calculations with these results, and draw reasonable scientific conclusions.

C. Synthesize, separate, and characterize compounds using modern methodologies and techniques.

D. Knowledge and understanding of safety: chemical regulations, laboratory safety, best/safe practices and chemical disposal.

III. Quantitative Reasoning Skills

A. Accurately collect and interpret numerical data.

B. Solve problems competently using mathematical methods such as extrapolation, approximation, and limiting behavior, as well as understand of concepts such as precision, accuracy, estimation, and statistical validity.

C. Proficiency in the scientific method.

IV. Knowledge of Chemical Facts and Information

A. A working knowledge of the chemical principles appropriate for a degree in chemistry: thermodynamics, equilibrium, kinetics, quantum mechanics, structure of materials, reactivities, and synthesis.

B. A broad set of chemical factual knowledge with respect to the properties of substances, molecules, atoms, and elements.

V. Computer, Library and Information Skills

A. Make effective use of the library and other information resources in chemistry. Understand the primary literature, tabulated data, and secondary sources (such as the Internet).

B. Make effective use of chemical software applications including symbolic mathematics, chemical word processing, and data presentation/ interpretation software.

C. Describe, perform, and interpret basic molecular modeling and quantum chemical calculations using common software packages.

VI. Oral and Written Communication Skills

A. Skill in technical writing and oral presentations, including electronic slideshows.

B. Communicate chemical research and results in both oral and written formats to both technical and non-technical audiences.

Endo Residency Competency Statements

Graduates of Advanced Education Program in Endodontology will:

- Achieve a full range of endodontic care experiences, including but not limited to diagnosis and treatment planning for patients of all ages.
- Be equipped with the necessary manual and cognitive skills for the changing marketplace in private practice now and in the foreseeable future.
- Incorporate during their practice an in-depth knowledge of the biologic and technical aspects of maintaining, replacing, and enhancing the natural dentition, including mechanisms for enhanced tissue healing and tissue regeneration on areas relevant to endodontics.
- Emphasize the interrelationship among the biomedical and clinical sciences and their application to clinical practice.
- Be prepared to practice evidence-based endodontics in both simple and complex cases.
- Exercise the five principles of ethics in their practice.
- Have detailed knowledge in:
  - Anatomy (gross and micro) of soft and hard tissues of the head and neck relevant for endodontic diagnostics, successful anesthesia and surgical procedures.
  - Pathophysiology of the pulpal/periradicular disease
  - Infectious and immunologic processes in oral health and disease
  - Embryology
  - Wound healing
  - Oral medicine and oral pathology
  - Pharmacotherapeutics
  - Research methodology and statistics

    - Neurosciences
    - Biomaterials
- Have in-depth proficiency in:
    - Diagnosis, treatment planning and prognosis
    - Non-surgical and surgical endodontic treatment and retreatment
    - A variety of endodontic techniques
    - Outcome evaluation
    - Radiography and other diagnostic imaging technologies
    - Management of endodontic treatment of medically compromised patients
    - Emergency treatment for endodontic conditions for consultations and treatment if needed.
    - Management of patients with orofacial pain and anxiety
    - Preparation of space for intraradicular restorations in endodontically treated teeth
    - Communication with patients and health care professionals to effectively and formally verbalize knowledge of endodontics, clinical therapies, treatment plans and related diseases to others
    - Use of magnification technologies such as operating microscopes and cameras for documentation.
- Have in-depth proficiency in:
    - Vital pulp management
    - Endodontic management of developing permanent teeth
    - Revascularization/regenerative endodontics
    - Intracoronal bleaching procedures
    - Endodontic management of traumatic dental injuries
- Have in-depth competency in:
    - Diagnosis and treatment of periodontal disease and defects in conjunction with the treatment of the specified tooth undergoing endodontic therapy; treatment provided in consultation with the individuals who will assume the responsibility for the completion or supervision of any additional periodontal maintenance or treatment
    - Placement of intraradicular restorations and cores in endodontically treated teeth; and when the patient is referred, this treatment is accomplished in consultation with the restorative dentist
    - Implant dentistry
    - Extrusion procedures
- Have in-depth knowledge of the:
    - History of endodontics
    - Teaching methodology
    - Jurisprudence and risk management
    - Practice management
    - Medical emergencies
- Acquire in-depth knowledge of classic and contemporary literature to help graduates critically evaluate the dental literature and provide theoretical bases for diagnostics, techniques and procedures, management, successes, and failures/complications in the clinical practice of non-surgical and surgical endodontic therapy.
- Make or respond to all appropriate consultation requests and demonstrate professionalism, rapport and cooperation with professional colleagues.
- Maintain a patient list in the approved electronic health record for follow-up of patients to enable graduates to assess the outcome of their treatment.
- Demonstrate competency in using clinical management software like axiUm to maintain a comprehensive records of history, diagnosis and treatment of each patient.
- Teach endodontics to predoctoral and/or postdoctoral students in a clinical setting.
- Possess sufficient knowledge and clinical experiences to become proficient in diagnostic data collection, pulpal and periradicular diagnosis treatment planning and treatment sequencing for complicated patients.
- Accomplish a research project and present a thesis monograph in written form, submitted for publication in a peer-reviewed endodontic journal and present a summary of the findings in oral form and defense of the thesis in a colloquium
- Develop and update treatment approach documents for each of the board case categories that must be evidence based.
- Submit 10 board level cases that follows current ABE criteria; both an electronic and a print-out version
- Be eligible to sit for the certifying Boards of the American Board of Endodontics