

# **Doctorate of Philosophy in Clinical Diabetes**

## **Introduction**

Welcome to the PhD degree in clinical diabetes research program.

The purpose of this document is to orient trainees to the course program and expected responsibilities during the course. The program is at once demanding, challenging, and immensely rewarding and its goal is to train researchers who have a wide understanding of the content of clinical research, and the required knowledge, skills, and attitudes for diabetes. The curriculum will foster the development of life-long learning skills necessary for effective clinical research.

Our goal is to provide a world-class educational environment for the trainees to learn clinical research in a student-centered curriculum based on best clinical evidences.

Research projects on clinical diabetes provide the chance for the state of art innovations in clinical diabetes.

Our trainees, under close supervision of outstanding faculty members, learn the importance of clinical research and the impact of research out-comes on patient care. Learning opportunities include lectures, seminars, and supervised clinical interactions in OPD clinics, journal clubs, and of course self-learning. Under the guidance of the faculty members trainees learn to apply the fundamental sciences in clinical research as well as the art of understanding and caring for and about patients with diabetes.

Although the students are encouraged to take responsibility for their own learning and learn to be critical thinkers, they are supported to develop attitude which reflect their responsibilities as a competent and skillful researcher. They should remember that they are never expected to deal with everything by their own.

Administrative support is provided by the Course Coordinator, Miss Zahra Emami.

## **Clinical-Research Training Program in Diabetes**

Diabetes mellitus is a prevalent disease that has reached epidemic proportions. Patients and population oriented researchers are mostly required considering the growing trends of diabetes in the country.

Clinical research in diabetes evaluates methods of preventing, diagnosing, and treating diabetes in humans. It requires an increasingly sophisticated knowledge base, acquisition of advanced skills, and collaboration among disciplines.

The training program devoted to clinical research in diabetes accepts two post-doctoral eligible candidates each year, and leads them to the PhD in clinical diabetes.

The goals of the program are:

1. To recruit young trainees from a national pool of talents.
2. To enroll them in rigorous, thesis bearing PhD program in clinical diabetes, in the center for clinical studies in endocrinology and metabolism, Tehran university of medical sciences.
3. To develop creative and successful clinical investigators who can lead and participate in research projects.
4. To provide trainees with the core knowledge, skills, and attitudes for clinical research in diabetes.

The strengths of the clinical research training program are:

1. Outstanding clinical expertise in diabetes.
2. Experienced mentors
3. High number of eligible trainees wanting to pursue clinical research careers related to diabetes.
4. Strong existing diabetes clinics as an excellent resource for clinical research.

The program builds on a strong foundation of interest and expertise in training patient-oriented research at center for clinical studies in endocrinology and metabolism.

In addition, it offers all trainees the core knowledge, attitudes, and skills for lifelong interest in clinical research in diabetes. The program also provides trainees with intensive learning

experiences that prepare them to be high quality clinical researchers and at the same time, teachers of clinical research.

The usual track for the PhD degree is clinical diabetes in four years. Trainees take one full year of diabetic instruction, gaining the scientific grounding for subsequent original research.

During the first year, they have didactic training on clinical research methods, clinical epidemiology , biostatistics, data management, knowledge translation, biomedical writing, and medical ethics.

After successful completion of the first year program, trainees enroll in a rigorous patient-oriented research, guided by experienced mentors from department of endocrinology and metabolism. The faculty advisors will provide academic and career advice.

Students have the opportunity to:

- Discuss the epidemiology and prevention of diabetes
- Focus on established major modifiable risk factors
- Generate new knowledge in clinical diabetes
- Translate new knowledge into clinical practice and into population to improve health.
- Communicate and work effectively with their peers

The program seeks to encourage critical thinking and improve understanding of diabetes and related topics. The students will learn strategies which will be of lasting value in dealing with future advances in therapy.

The course includes lectures from expert faculty members in the center for clinical studies in endocrinology and metabolism:

- Diabetes epidemiology
- Prevention of diabetes
- Pathogenesis of diabetes
- Diagnosis and classification of diabetes
- Interventions which improve diabetes outcomes and QOL of patients with diabetes.
- Diabetes complications, pathogenesis and management
- New treatment modalities and clinical management

Other components of the course are:

- Case based discussion sessions, help the trainees to introduce the key concepts of the topics.
- Group activity aimed at developing students' skills in generating and evaluating guidelines for the care and of people with diabetes.
- Learning portfolio which record and reflect students, progress
- Real life case problems in diabetes clinic
- Engagement in case problems would be highly motivational for students.

By the end of first year, the trainees need to write a report of approximately 2500 word in standards scientific format that will consist of:

- An introduction, providing the rational for the project
- A review of relevant literature
- A plan outlining how the PhD project may develop over the remainder of the course.

Before final thesis submission, trainees have an opportunity to give a 30 minute presentation to other students and research staffs. The talk should summarize the entire thesis, and will provide a chance to discuss the research project with wider audience including expert faculty members.

Once trainees has selected a super vising professor, and initiated research activities, they will be evaluated by their supervisors at least once every six months, until they have successfully defended their PhD dissertation.

To accomplish this semi-annual evaluation, trainees should submit a written report of progress on their research work to the supervising professors. If progress is unsatisfactory, the super vising professor shall discuss the reason for this decision with the student and develop a plan for remediation.

PhD students will have the opportunity to gain clinical experience, an a weekly basis, similar to medical students. In clinical setting they work with a supervisor expert in the field of diabetes. The purpose of this experience is to allow the student to gain insight regarding the application of biomedical research to patient care as well as to reinforce clinical skills learned during medical school.

In addition, monthly seminars are designed to enrich the trainees' understanding of the professional development and diverse roles of physician-scientist in clinical practice, research, and society.

This activity insures connectivity of students with the program during PhD training, and facilitates interactive group discussion of topics directed at optimizing physician-scientist training.

Monthly journal clubs are focused on state of art research in clinical diabetes. Ttrainees are asked to critically appraise research methods, results, and discussions.

Students are expected to be actively involved in all program activities including weekly clinical settings, scientific seminars, journal clubs, and other events.

They are also asked to provide the documentations of their progress in diverse educational activities in their portfolios.

Attendance requirements have been established to ensure trainees participation in educational events. Absence must be reported in a timely manner to the course director.

The director will review the request and determine if it is excused or unexcused. The students will be notified on the decision.

It is understand that certain absences are unavoidable, such as illness of self or immediate family, and other unforeseen situations.

Students are expected to report these situations in a timely manner.

The PhD program expects students to exhibit the highest standards of conduct, honesty, and professionalism. Academic misconduct includes activities that undermine the academic integrity of the institations.

Any attempt to use or provide unauthorized assistance, materials, information, or access in any form is considered cheating and is forbidden.

A student must not falsify or invents any information or data including, but not limited to, records or report, lab results, data analysis, and citation to the sources of information.

Ideas or materials taken from another source for either written or oral use must be fully acknowledged.

## Learning-Goals

By the end of the course trainees should be able to reach the following basic and clinical goals:

### I) Basic Goals

1. Design standard research projects
2. Important clinical research in diabetes
3. Supervise project management
4. Perform data analysis
5. Explain the principals of scientific writing.
6. Apply research out comes to clinical practice.
7. Explain principals of medical ethics in research.
8. Discuss the principals of meta-analysis and systematic reviews.
9. Apply principals of research in patient education
10. Explain principals of research in health care professional development

### II) Clinical goals

1. Explain pathophysiology, diagnosis and classification of diabetes mellitus.
2. Identify epidemiology and risk factors of diabetes mellitus.
3. Recall presenting symptoms and risk factors of type 1 and type 2 diabetes mellitus.
4. Recognize presenting symptoms and signs of diabetic ketoacidosis and nonketotichyperglycemic coma.
5. Discuss diagnostic criteria for type 1 and type 2 diabetes mellitus, based on history, physical examination and laboratory testing.
6. Discuss diagnostic criteria for diabetic ketoacidosis, nonketotichyperglycemia coma and hypoglycemia coma.
7. Define:
  - Insulin allergy
  - Insulin resistance
  - Brittle diabetes
8. Distinguish laboratory tests needed to screen, diagnose, and follow diabetic patients including:
  - Glucose (FBS, BS2hpp, Premeal, Bedtime and BS levels)
  - Electrolytes, BUN and creatinine

- Serum ketones
  - Arterial blood gas
  - Glycosylated hemoglobin (HbA1c)
  - Urine glucose, ketones, albumin/protein and urine microalbumin
9. Discuss non-pharmacologic and pharmacologic treatment for glycemic control and prevention of target organ damage
  10. Explain the specific components of medical nutrition therapy.
  11. Discuss basic management of diabetic ketoacidosis and nonketotichyperglycemic states including the similarities and differences in fluid and electrolyte replacement.
  12. Determine major causes of morbidity and mortality in diabetes mellitus and its complications.
  13. Explain the importance of glucose intolerance, interventions and prevention of diabetes mellitus.
  14. Discuss way in which the following commonly concurrent conditions may impact on the patient with type 2 Diabetes:
    - Hypertension
    - Acute infection
    - Alcoholism
    - Obesity
    - Renal failure
    - Steroid therapy

**Topics to be Covered in monthly seminars:**

1. Diagnosis and Classification of Diabetes
2. Glucose monitoring and Glycemic goals
3. Medical nutrition therapy
4. Diabetes self-management education (DSME)
5. Social support
6. Pharmacological approach to treatment; OGLDs (I & II)
7. Pharmacological approach to treatment; Insulin (I & II)
8. Hypoglycemia
9. Obesity and bariatric pressure control
10. Lipid Management
11. CHD, Screening and treatment

12. Nephropathy, screening and treatment
13. Retinopathy, screening and treatment
14. Neuropathy, screening and treatment
15. Foot care
16. Diabetes care in children and Adolescents
17. Diabetes care in hospital
18. Diabetes ketoacidosis and Hyperosmolar coma



# EVALUATION FORM

## STUDENT INFORMATION

Name: \_\_\_\_\_ Level: \_\_\_\_\_

Supervising Professor: \_\_\_\_\_

## STUDENT SELF-ASSESSMENT

Please provide a brief overview of your research project and major accomplishments from the past 6 months.

---

---

What hypotheses are you testing? List them along with a brief rationale, significance, and innovation for each.

---

---

Briefly describe your methods and results for each above indicated hypothesis.

---

---

Where do you anticipate you will find yourself with respect to the progress made towards your research in 6 months?

---

---

**Publications**             Yes             No

If yes, please list. For each publication, list PubMed number, title, author(s), journal, volume, page number.

---

---

**Presentations**             Yes             No

If yes, please list. For each listing include date, meeting, location, and presentation title.

---

---

**Seminar Presentation**     Yes             No

If yes, please list. For each presentation include date, seminar, location, and presentation title.

---

---

**Honors/Awards**             Yes             No

If yes, please list. For each listing include date, name/title and description.

---

---

**New areas of research or technical expertise acquired.**

---

---

**Teaching**             Yes             No

**Clinical Activity**             Yes             No

**Other professional activity not identified above:**     Yes             No

**Are there any obstacles to your research productivity?**     Yes             No

If yes, please describe.

---

---

**STUDENT RESEARCH AND TRAINING PLANS FOR THE NEXT SIX (6) MONTHS.**

Research project and professional development goals.

---

---

Anticipated publications (indicate project authors, titles, and journal)

---

---

Anticipated meeting(s) or workshop(s) to be attended:

---

---

---

Other activities with professional relevance:

---

---

---

**STUDENT CAREER GOALS**

Describe your long-term career goals:

---

---

---

Describe additional research activity or other training is needed to prepare you for long-term goals:

---

---

---

What are your current plans with respect to your search for an appropriate residency?

---

---

---

**SUPERVISING PROFESSOR’S ASSESSMENT OF STUDENT PERFORMANCE**

**TO BE COMPLETE BY SUPERVISING PROFESSOR AND REVIEWED WITH STUDENT**

Please provide a synopsis of where the student is with respect to his/her project and research (e.g., are timelines and goals being met, how far along is the student with his/her specific aims, etc.):

---

---

---

Rate the student's performance in the following areas:

	Expectations not Achieved	Meets Expectations	Exceeds Expectations	Distinguished	Cannot Assess
Overall knowledge of:					
Project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Literature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Methods/Lab	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Techniques/Equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Productivity/Quality of work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Data:					
Management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Analysis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interpretation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Application of data/Extension of Findings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Teaching/mentoring/supervisory skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Problem Solving/Critical Thinking Skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Innovation/Original Ideas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Independence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Communication:					
Oral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Written	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Additional Comments:

---



---



---



---