

FELLOWSHIP PROGRAM IN ENDOCRINOLOGY
Section of Endocrinology and Diabetes
Department of Medicine
University of Oklahoma Health Sciences Center
Oklahoma City

Goal: The goal of this Fellowship Program is provide comprehensive training in the pathophysiology, evaluation, diagnosis, and management of the broad spectrum of endocrine diseases, including diabetes. There is a strong emphasis on research and scholarly activity. A third Fellowship year devoted to research is actively encouraged, and a four year, joint, adult-pediatric Fellowship is available. The Program will prepare and qualify trainees for subspecialty Board Certification, and for a successful academic and/or clinical career in Endocrinology.

Methods: The Program seeks applicants with a strong commitment to academic medicine and research. It provides didactic and self-directed teaching for clinical and research skills.

Clinical training. Clinical training in both in-patient and out-patient settings is based on a mentoring system. As experience is gained and proficiency develops, Fellows are permitted greater independence. Every six months, Fellows are provided with an evaluation of their performance; this includes direct feedback and opportunities for discussion to identify areas of strength and weakness. In addition, Fellows provide regular feedback to Faculty about the quality of their educational experience. The six core competencies described for graduate medical education are routinely addressed in clinical settings as well as other venues.

The clinical training program covers all areas of Endocrinology, including thyroid, adrenal, pituitary, and gonadal diseases, and also calcium and bone metabolism, GI hormones, and adipose tissue hormones. There is a major focus on diabetes, dyslipidemia, and obesity. During the Fellowship, one-month elective periods in related areas are encouraged and can be arranged according to the interests of the Fellow; such areas include nuclear medicine, high-risk pregnancy, clinical chemistry, and genetics.

Research training. All Fellows are expected to become involved with the Section's research activities, to publish at least one case report per year, and all are encouraged to present their work at a regional or national professional meeting. An additional (third) Fellowship year for research is negotiable and is strongly encouraged; this research year may be incorporated as the first, second, or third year of the Fellowship. Most research conducted in the Section focuses on the complications of diabetes, but there are also abundant opportunities in other areas. These involve both clinical and laboratory-based research. Clinical research is facilitated by the Section's Clinical Trials Research Center which conducts clinical trials, by the developing Oklahoma Diabetes Center, and by the General Clinical Research Center (GCRC). The GCRC provides nationally unique

resource, the Special Populations Unit, to promote research involving Native Americans and other minorities.

General Internal Medicine: This program recognizes the necessity that its trainees must be well versed in general internal medicine in order to provide effective consultation and care of specific endocrine-related diseases. For this reason, provision is made for primary as well as specialty care of selected patients as part of the endocrine training program.

Joint Adult/Pediatric Endocrine Fellowship: A four-year program leading to Board Certification in both adult and pediatric Endocrinology is available. This program is organized in conjunction with the Section of Pediatric Endocrinology, Department of Pediatrics, at OUHSC.

SPECIFIC PROGRAM CONTENT

A. Clinical Care

Endocrinology and Diabetes

The training program provides opportunities for the Fellow to develop clinical competence in the field of Endocrinology and Diabetes. Clinical experience includes opportunities to diagnose and manage in-patients and out-patients with a wide variety of endocrine and metabolic diseases. As experience is gained, Fellows have the opportunity to function in the role of an endocrinology consultant for other physicians and services in both inpatient and outpatient settings. Specific teaching relating to clinical care is as follows:

1. Fellows receive formal instruction through weekly teaching sessions provided by faculty on:
 - a. Endocrine, paracrine and autocrine dysfunction of endocrine tissues
 - b. Disorders of all endocrine glands, including the parathyroids, pituitary, thyroid, pancreas, adrenal and gonads and endocrine function of brain, kidney, skin and other “non-endocrine” tissues
 - c. Thyroid disorders including:
 - 1) Hyperthyroidism and hypothyroidism
 - 2) Nodular thyroid disease
 - 3) Thyroid cancer
 - 4) Goiter
 - 5) All varieties of thyroiditis, including silent, subacute, autoimmune and chronic thyroiditis
 - 6) Use of thyroid ultrasound for diagnosis and follow-up of thyroid pathology and as a guide to more accurate FNA biopsy of nodular lesions
 - 7) Thyroid storm
 - d. Hypothalamic and pituitary tumors including:
 - 1) Prolactinoma
 - 2) Alpha subunit secreting pituitary tumors
 - 3) Acromegaly
 - 4) Cushing’s disease
 - 5) Gonadotropin-secreting pituitary tumors

- 6) Thyrotropin-producing pituitary tumors
- 7) Nonfunctioning tumors
- 8) Metabolically active lesions
- 9) Craniopharyngioma
- e. Type 1 and type 2 diabetes mellitus, including
 - 1) Patient monitoring and treatment objectives in children and adults
 - 2) Acute and chronic complications including:
 - a.) Diabetic ketoacidosis
 - b.) Hyperosmolar coma
 - c.) Hypoglycemia, and
 - d.) Microvascular and macrovascular disease including
 - (1) Diabetic retinopathy
 - (2) Diabetic nephropathy
 - (3) Diabetic neuropathy
 - (4) Diabetic dermopathy
 - (5) Coronary heart disease
 - (6) Peripheral vascular disease
 - (7) Cerebral vascular disease
 - e.) Intensive insulin therapy including insulin pump candidate selection, initiation of pump therapy and adjustments for optimal control.
 - f.) Use of continuous blood glucose monitoring devices.
 - g.) Diagnosis and management of infections common in diabetic patients
 - h.) Diagnosis and management of diabetic foot disease
 - 3) Gestational diabetes mellitus and diabetes mellitus complicated by pregnancy
 - 4) The surgical patient with diabetes
 - 5) Patient education
 - 6) Psychosocial issues
 - 7) Genetics and genetic counseling
 - 8) Hypoglycemic syndromes
 - 9) Dietary principles including caloric restriction, therapeutic diets for dyslipidemia, carbohydrate counting for intensive insulin regimes and adjustments for periods of tube feedings or parenteral nutrition
- f. Disorders of calcium and skeletal metabolism
 - 1) Hyperparathyroidism and other causes of hypercalcemia
 - 2) Hypoparathyroidism and other causes of hypocalcemia
 - 3) Metabolic bone diseases
 - 4) Evaluation and treatment of kidney stones
- g. Disorders of fluid, electrolyte, and acid-base metabolism
 - 1) Hypernatremia and hyponatremia
 - 2) Hyperkalemia and hypokalemia
 - 3) Metabolic acidosis
 - 4) Metabolic alkalosis
 - 5) Disorders of magnesium metabolism
 - 6) Diabetes insipidus, central and nephrogenic
- h. Disorders of blood pressure

- i. Neuroendocrinology and endocrine aspects of psychiatric diseases
 - j. Endocrine aspects of aging, including menopause
 - k. Endocrine emergencies, including:
 - 1) Hypercalcemia and hypocalcemia
 - 2) Thyroid storm
 - 3) Myxedema coma
 - 4) Adrenal insufficiency
 - 5) Pituitary apoplexy
 - l. Nutritional disorders including obesity
 - m. Hormone-producing neoplasms
 - n. Disorders of lipid, carbohydrate and protein metabolism, evaluation and management
 - o. Appropriate use and interpretations of nuclear medicine studies for endocrine disease states
 - p. Endocrine adaptation and maladaptations to systemic diseases
 - q. Disorders of reproductive endocrinology and endocrinologic aspects of sexual dysfunction.
 - r. Genetic disorders of metabolism
 - s. Disorders of growth and development
 - t. Evaluation, diagnosis and management of ambiguous genitalia and other enzyme defects
 - u. Particulars of thyroid disorders and diabetes in children.
2. Fellows are given opportunities to assume responsibility for and follow patients throughout the training period in both inpatient and outpatient settings in order to observe the evolution and natural history of disease, as well as the efficacy of therapeutic interventions. The educational program includes, on average, a minimum of two half-days each week in ambulatory care. Fellows gain experience of patients who have diabetes, as well as thyroid, neuroendocrine, reproductive and metabolic bone diseases and other general endocrine problems.
 3. The curriculum emphasizes biochemistry and physiology, including cell and molecular biology, as they relate to endocrine disorders. The appropriate utilization and the interpretation of clinical laboratory data, radionuclide and radiologic studies for the diagnosis and treatment of endocrine and metabolic diseases are emphasized.
 4. Through the Oklahoma Diabetes Center, Fellows have opportunities to participate in a multidisciplinary diabetes education and treatment program. This experience directly relates to Systems Based Practice Core Competency.

General Internal Medicine

The program provides appropriate and structured opportunities for residents to maintain their skills in general internal medicine. Provision is made for the Fellow to follow specific patients in the Friday General Endocrinology clinic described below. The Fellow schedules the patients specifically for their own time slots and is responsible for their general primary care. After hours call is handled through the regular call schedule shared by the resident physicians on our service and attending staff.

B. Teaching Experience

The program provides Fellows with the opportunity to teach medical students, physicians and other professional personnel.

Methods

The Fellow on the consultation Service will:

- 1) Be responsible for the preliminary review and discussion of consultations seen by students and house staff rotating through the Endocrinology service
- 2) Plan, present and/or discuss the cases at the Endocrinology Clinical Case Conferences.

All Fellows will:

- 1) Present and discuss selected medical literature at Endocrinology Rounds (Tuesdays at 8am) and Endocrinology Research Conference/Journal Club (Wednesdays at 8am).
- 2) Present lectures in the Endocrine Seminar Series for students and house staff taking the Endocrinology elective rotation. This involves preparing the slides and format and giving one of the regular lectures given to house staff and students rotating through the Section. These lectures are rotated every 3 months so by the end of two years, each Fellow will have the experience of preparing and presenting lectures on all major general endocrine topics.
- 3) Participate in the conferences of the Department of Medicine.
 - A. Each 2nd year Fellow is expected to present a noon conference to the general internal medicine residents in the Dept. of Medicine on a preselected endocrine topic. This is part of a series of six lectures given each year as a review course preparing the residents for their ABIM examinations.
 - B. Each 2nd year Fellow, at the discretion of the chief medical resident, will present endocrine-oriented medical grand rounds to the Dept of Internal Medicine. This is an honor accorded to our Fellows in the last 3 years.
- 4) Present research results at Endocrine Research Conference.
- 5) Fellows that have become competent in specific areas, they will assist with instructions of the other Fellow(s) and Residents in those areas.

Evaluation

A senior faculty member will observe each of these prepared lectures and/or seminars and evaluate the Fellow's performance.

Resources

The newly renovated Section of Endocrinology office space in Williams Pavilion 1345 provides fellows with state-of-the-art facilities. This includes ample individual desk space, computing, scanning, projection facilities.

Clinical work is conducted in the OU Medical Centers, and in the neighboring Veterans Affairs Medical Center.

The GCRC is conveniently located on campus.

The Section has approximately 6,000 sq ft of laboratory space in the neighboring Basic Science Education Building.

C. Conferences

Conferences are conducted regularly as detailed below. Clinical Fellows are expected to attend all of these, except the Friday Research Conference, which is optional. Many other meetings and seminars are held on campus which is relevant to the Fellow's education; attendance at these is strongly encouraged.

Endocrine Grand Rounds/Clinical Case conference (Weekly, Tuesdays 8-9 am)

Each Fellow will be responsible for at least one conference every two months. Cases discussed may be those seen on either the consultation or clinic service or during rotations in specialty areas. The Fellow, with the advice of the Attending Physician on the Consultation Service, will prepare and present the case(s) and review the relevant literature. Participation in this activity actively involves multiple Core Competencies. These include Medical Knowledge as the trainee must demonstrate what has been learned about the topic at hand. Clearly, Practice Based Learning is addressed as the topics are selected because of their educational value and interest. Most of these conferences have a direct bearing on the care of endocrinology patients; and, therefore, the Patient Care Core Competency is also a focus. Because trainees present to the group, this conference also can be used to enhance and assess the Interpersonal and Communication Skills Core Competency. Professionalism is assessed by the preparation by the trainee in terms of the knowledge imparted to the audience as well as the nature of the presentation. At the Case Conference format, critical decisions points and patient care matters distinctly involve identification of system errors that potential led to poor outcome in many patients. Thus, the Systems Based Practice Core Competency is commonly addressed. Immediately after each conference by a fellow, the faculty reviews the performance with the fellow and makes recommendations for improvement.

Endocrine Research Conference or Journal Club (Weekly, Wednesdays 8-9 am)

During the hour, a faculty member, post-doc, or Fellow will be assigned to present an in depth discussion of his/her research project, or an article of his/her choice with potential broad interest and/or application. One research project or journal article is examined each session but supporting articles may also be included. The articles are appraised for methods and techniques as well as statistics. Presenters take into account previous and background data as well as other studies and the strengths and weaknesses of the particular article in order to determine the impact on clinical care. Trainees participating in the this conference routine address the Core Competencies Medical Knowledge, Practice Based Learning, Professionalism, Patient Care and Interpersonal Skills and Communication in ways to those described above for Endocrine Grand Rounds.

Combined Endocrinology/Nuclear Medicine Conferences. (Third Wednesday of each month 11:00-Noon)

Faculty, Fellows, residents and students on the Endocrinology elective and Nuclear Medicine rotation (from radiology) are expected to attend. These topics include thyroid, parathyroid and adrenal lesions as well as other relevant endocrine pathology. Patient

Care, Medical Knowledge, Systems Based Practice as well as Interpersonal and Communication Skills are addressed and assessed at this forum.

Monday Research Conference. (Weekly, Mondays 4:00-5:00 pm).

Work in progress in the basic science laboratories of the Section of Endocrinology is presented. Guest speakers are invited about once per month. Fellows are welcome and encouraged to attend.

GCRC Seminar Series. (First Monday of each month, 12:00-1:00 pm).

This monthly meeting provides education and guidance on all aspects of the performance of human subjects clinical research. Additionally, the GCRC provides a seminar series in Biostatistics and Informatics.

Internal Medicine Grand Rounds (Weekly, Wednesdays, 12:15-1:15 pm)

Fellows are **expected** to attend Medicine Grand Rounds, as well as all other general Internal Medicine conferences that address endocrine related topics. During the course of a year, all six Core Competencies are subjects of Medicine Grand Rounds. During a campus-wide End-of-Life issues week, Medical Grand Rounds is devoted to issues surrounding end of life care.

Internal Medicine Resident Core Curriculum Conferences

Selected conferences each year cover specific topics that are to be addressed by the training program; including statistics, ethics, and quality of care issues. Fellows are **expected** to attend these conferences.

Morbidity & Mortality Conference

Fellows attend those dealing with patients involving endocrine problems. This conference has recently been altered in format by the parent internal medicine program such that it now focuses on system errors and their solutions. The Endocrine Program Director is a frequent participant.

Annual Meetings organized by the Section

The Section of Endocrinology and Diabetes organizes three annual meetings, all related to diabetes, as follows:

1. **Diabetes Workshop.** This is held every spring. Its target audience comprises diabetes educators from the state of Oklahoma, to whom it provides education to assist in gaining and maintaining CDE accreditation. Most recent attendance was 120 (2005 meeting). Attendance and participation by Fellows is encouraged. Trainees commonly give presentations at this forum. Thus, the Core Competencies of Medical Knowledge, Professionalism, Interpersonal/Communication Skills, and Systems Based Practice, and Practice Based Learning all come into play.

2. **Diabetes Update.** This regional meeting is held in the fall. Its target audience comprises health care professionals of all types caring for patients with

diabetes. It addresses a theme related to diabetes, e.g. in 2004: Mechanisms and management of complications (300+ attendees); in 2005: Diabetes in At-Risk Populations (target 500+ attendees). Core Competencies addressed include Medical Knowledge, Professionalism, Interpersonal/Communication Skills, and Practice Based Learning.

3. Diabetes Research Retreat. For researchers (faculty, fellows, and students) studying any aspect of diabetes at OU or any other Oklahoma school. There is an external invited speaker. The meeting is held each fall. Oral and poster scientific presentations are made by trainees at this venue. Therefore, Core Competencies include Medical Knowledge, Professionalism, Interpersonal/Communication Skills, and Practice Based Learning.

Fellows are expected to attend and to play an active role in each of these meetings.

Regional and National Scientific Meetings

During the course of the Fellowship Program, each Fellow will be provided with the opportunity to attend one regional and one national scientific meeting or conference. These may include the annual scientific meetings of the Endocrine Society, The American Association of Clinical Endocrinology, the American Thyroid Association, The American Diabetes Association, the Endocrine Society Postgraduate Assembly, and meetings of other research societies (e.g. AFMR, ASCI, AAP and their regional components). The section routinely funds fellow trainees to attend the Southern Society of Clinical Investigation in order to present abstracts, either orally or as a poster. At this meeting, activities related to the Core Competencies of Medical Knowledge, Professionalism, Interpersonal/Communication Skills, and Practice Based Learning are present. Additional conferences may be attended if a mentor provides funding.

D. Procedures

Fellows must develop a comprehensive understanding of the indications, contraindications, limitations, complications, techniques, and interpretation of results of those technical procedures integral to the discipline. Fellows must acquire knowledge of and skill in educating patients about the technique, rationale and ramifications of procedures and in obtaining procedure-specific informed consent. Faculty supervision of Fellows in their performance is required, and each Fellow's experience in such procedures will be documented by the program director.

PROCEDURES and SKILLS

Each fellow must keep a log of thyroid gland biopsies performed (number 1 below) and each Fellow may keep a log of other procedures observed and performed, the indications for the procedure, any complications, and the interpretation of the results (number 2 below).

Indications/	Interpretation	Performed
1. Fine needle aspiration biopsy Of the thyroid gland Under ultrasound guidance?	_____ _____	_____ _____
2. Performance of endocrine stimulation And suppression tests, if indicated		
a)	TRH	_____
b)	GnRH	_____
c)	GHRH	_____
d)	Corticotropin-releasing factor	_____
e)	Insulin hypoglycemia	_____
f)	Arginine-infusion	_____
g)	HCG test for Leydig cell function	_____
h)	ACTH or cosyntropin (Cortrosyn)	_____
i)	Intravenous glucose tolerance test	_____
j)	Metyrapone	_____
k)	Clomiphene citrate test	_____
l)	Dexamethasone suppression	_____
3. Management of devices to deliver hormones (e.g., insulin pumps, GnRH pump)	_____	_____
4. Management of intravenous insulin delivery	_____	_____
5. Continuous Glucose Monitoring Device	_____	_____
6. Supervision of technical aspects of hormone assays	_____	_____
7. Bone biopsy	_____	_____
8. Obtaining endocrine tissue or fluid for Cytologic examination and interpretation		
a)	Seminal fluid evaluation	_____
b)	Breast fluid evaluation for lipid and cytology	_____
c)	Other _____	_____
9. Pituitary tumors (work-up protocol)		
10. Primary aldosteronism (screening and diagnostic work-up	_____	_____
11. Instructions for the 24-hour urine collection	_____	_____
12. Management of diabetic patients	_____	_____
13. Management of diabetic emergencies		
a)	Diabetic ketoacidosis	_____
b)	Hyperosmolar nonketotic coma	_____
14. Management of other endocrine emergencies		

- a) Hypoglycemia _____
- b) Acute adrenal failure _____
- c) Thyroid storm _____
- d) Myxedema coma _____
- e) Hypercalcemia _____
- f) Hypocalcemia _____
- g) Hypertensive crisis _____

E. Critical Assessment and Decision Sciences

Fellows have instruction in the evaluation of medical literature, clinical epidemiology, clinical study design, relative and absolute risks of disease, medical statistics and medical decision-making.

Methods

Each Fellow will

- a) Participate in the presentation and discussion of current literature at Endocrine Grand Rounds and Journal Club.
- b) Write the initial draft of a clinical study in conjunction with the “Science of Clinical Investigation’ course given by Amy Wisniewski, Assistant Professor, Pediatric Endocrinology, and discuss it with other faculty members as appropriate.
- c) Attend the resident’s noon series of lectures (Evaluation of data-based medicine I & II), or attend the 2-day campus-wide seminar ‘How to Apply and Teach Evidence Based Medicine.’
- d) Attend the resident’s introductory lectures on work place safety (OSHA)

References

See References under Research Section.

F. Continuous Quality Improvement

Residents have instruction and experience in the principles, objectives and processes of quality assessment and improvement and risk management.

Methods

Each Fellow will

- a) Attend the Orientation session at which risk management issues are presented and undergo yearly training.
- b) Attend a presentation on the principles of quality assessment and improvement. The Department of Medicine periodically provides seminars on Quality Assessment issues in the hospital and practice setting.

Fellows should:

- 1) Become familiar with the tools of continuous quality improvement.

- 2) Become familiar with the 10 steps listed by the JCAHO for the continuous process of monitoring and evaluation of the quality of care.
- 3) Participate in a quality assessment/improvement project for the division.

References

1. OU Medical Centers Hospital and Clinics Quality Assessment and Improvement Plan 1995.
2. Teichholz LE. Quality, Deming's Principles, and Physicians. Mount Sinai J Med 60:350-358, October 1993.

G. Psychosocial, Economic and Ethical Issues

Training includes cultural, social, family behavioral and economic issues, such as confidentiality of information, indications for life support systems, and allocation of limited resources. Residents must be taught the social and economic impact of their decisions on patients, the primary care physician and society.

Methods

Each Fellow will

- a) Be expected to attend either ethics grand rounds, a local or regional conference on ethics in medicine or write a summary report on a problem relating to medical ethics.
- b) Become familiar with the Project Professionalism manual of the American Board of Internal Medicine.

H. Educational and Counseling Skills

Fellows receive instruction and experience in patient counseling skills and community education. This training emphasizes effective communication techniques for diverse populations, as well as organizational resources useful for patient and community education.

Methods

Each Fellow will attend at least one series of classes given to patients in the *Going for the Gold* classes sponsored by the Oklahoma Diabetes Center.

I. Research

As part of the academic environment, an active research component is included within the subspecialty program. The program ensures meaningful, supervised research experience with appropriate protected time for each Fellow while maintaining the essential clinical. Productivity by Fellows will be required, including publications in peer-reviewed journals. Fellows learn the design and interpretation of research studies, responsible use of informed consent, and research methodology and interpretation of data. The program provides instruction in the critical assessment of new therapies and of the medical literature. Fellows will be advised and supervised by qualified staff members in the conduct of research.

There are abundant opportunities for both clinical and laboratory-based research, as outlined above. Please see individual faculty details for further information on research programs.

CLINICAL RESEARCH

Each Fellow will participate in at least one clinical research study to become familiar with:

Research design

Drafting a research proposal.

Research safety for human subjects, including informed consent, operations of the Institutional Review Board, and ethics of human experimentation.

Fellows will:

- Write draft of application to IRB and informed consent form
- Explain project to research subject and obtain informed consent

Data collection and data analysis

Research ethics and honesty

Peer review process

Educational courses run by the GCRC will be critical in these aspects of the Fellow's education.

Case Studies or Literature Reviews

Each Fellow will write up, for publication, a case study or literature review on a topic of his/her choice.

LABORATORY RESEARCH

As detailed under individual faculty research interests, our Section has a highly active research program, and has obtained 24 new extramural grants in 2 years (2003-2005). There are abundant opportunities for Fellow involvement in this work. We encourage applications for our 3 year, research-orientated clinical Fellowship program.

Bench Research

Each Fellow will become familiar with current methods of hormone assays, including radioimmuno- and immunoradiometric assays.

Research involving animals

Each Fellow participating in research involving animals is required to:

- a) Become familiar with the Animal Care and Use Committee policies and federal guidelines by attending a session of the UMC Symposium on Humane Animal Care and Use or by viewing the videotape of the symposium.
- b) Read the "Guide for the Care and Use of Laboratory Animals"
- c) Become familiar with the pertinent Rules and Regulations of the OUHSC i.e. those relating to "Health and Medical surveillance Program for laboratory Animal Care Personnel" and "Care and Use of Vertebrate Animals as Subjects in Research and Teaching", and ensure appropriate accreditation.

Research involving radioactivity

Each Fellow participating in research involving radioactive materials is required to:

- a) Attend a Radiation Review session and obtain required accreditation
- b) Work with an authorized user and receive appropriate instructions from him/her.

REFERENCES

1. Kahn CR. Picking a Research Problem: the Critical Decision. *New Engl J Med* 330:1530-1533, May 26, 1994.
2. Dingell JD. Shattuck Lecture - Misconduct in Medical Research. *New Engl J Med* 328:1610-1615, June 3, 1993.
3. Kassirer JP. The Frustrations of Scientific Misconduct (editorial). *New Engl J Med* 328:1634-1646, June 3, 1993
4. Turner JA, Deyo RA, Loeser JD, Von Korff M and Fordyce WE. The importance of Placebo Effects in Pain Treatment and Research. *JAMA* 271:1609-1614, May 25, 1994/
5. U.S. Department of Health and Human Services. Applications for Public Health Service Grant (including Research Career Development Awards and Institutional National Research Service Awards).
6. Endocrine Society: Introduction to Molecular and Cellular Research.
7. Bailar JC and Mosteller F. Medical Uses of Statistics.
8. Rothman KJ and Michels KB. The Continuing Unethical Use of Placebo Controls. *New Engl J Med* 331:394-398, August 11, 1994.

J. Specific Curriculum of the Fellowship:

Academic year: July 1st to June 30th unless previous agreement is made.

Outpatient months: Minimum 12 in two years.

Inpatient consultation: 6-8 months in first year, 4-6 months in second year for clinical Fellows, or 2-4 months in 2nd year for Fellows doing a 3yr research-oriented Fellowship)

Methods:

Daily responsibilities

Inpatient Consultation Rounds

Goal: To provide an experience in in-patient consultation for patients with general endocrine or severe hypertensive diseases.

Sites: OU Medical Center (including adolescent and pediatric units) and the VAMC, and affiliated rehabilitation or research units.

Time: 2 hrs on a daily basis, M-F and on weekend if necessary.

Patient material: Referral patients and patients admitted from the Endocrine clinics. This may include patients with diabetic ketoacidosis in the intensive care units, patients with complicated endocrine problems, and patients with complicated or confusing

diagnostic or management problems. The Fellow will keep a logbook of patients followed on consult. Copies of consultation reports and correspondence with referring physicians will be kept in the patient's chart.

All six Core Competencies are addressed while a fellow is participating on the in-patient consult service. Perhaps Medical Knowledge and Patient Care are obvious. These Competencies are a universal part of the discussion about patients that occurs between the trainee and the attending physician. All patients are seen in a consultative role. Thus, Systems Based Practice is almost always a part of the process in that as a consultant, the Endocrinology service must work with the primary team. Naturally, such also involves direct and chart communication with other physicians and health care workers tending to the patient. Thus, the Interpersonal and Communication Skills Core Competency is a part of the experience. Frequently complicated patients are encountered and their care involves review of pertinent medical literature. Thus, Practice Based Learning is addressed. Finally, as in all activities Professionalism is part of this aspect of the training. Fellows must interact with the primary team, nursing personnel as well as patients and their families in a professional manner. The attending physician directly observes this activity in most cases.

Teaching Style:	Supervised primary patient contact.
Supervisors:	Senior Endocrinology staff on monthly rotation.
Text:	<i>Williams Textbook of Endocrinology</i> , others in Section Library.
Evaluation:	Written evaluation semiannually.

Weekly Clinics

General Considerations for all clinics: The clinic experiences address the six core competencies at almost every patient encounter. These six competencies are as follows:

1. **Medical knowledge** is assessed by direct observation of the attending faculty who observed the trainee presenting patients and by review of chart notes. Virtually every patient encounter expands upon and tests the trainees' medical knowledge. Much of the teaching in the clinic by attending physicians is directly related to this competency.
2. **Interpersonal skills and the ability to communicate** with patients, families, staff and other physicians are evaluated by direct faculty observation as well as feedback solicited from staff, students, and patients including informally and as part of 360 degree evaluations. Similar to the Medical Knowledge Core competency, this Core Competency is addressed at virtually every patient encounter in the clinics as well as interactions with nursing and ancillary personnel as well as with other physicians. There is a wide range of socioeconomic status represented in our clinics such that trainees must learn to communicate with individuals of various backgrounds.
3. **Professionalism** is assessed by direct faculty observation in both the clinic settings, and by observing the trainee's performance in the academic setting. The comments of staff, students and peers are weighed in

evaluating a trainee's professionalism. Many patients are seen together with faculty physicians at whom the Professionalism Core Competency can be assessed directly.

4. **Patient care** is evaluated by direct faculty observation in the clinic and listening to presentations of patients to the attending. At every patient encounter the Patient Care Core Competency is addressed and assessed.
5. **Practice based learning** is evaluated by direct observation by attending faculty who correlate the trainee's recognition of areas that need improvement with subsequent performance on the in the clinic throughout the year. Computers are available in the clinics for contemporaneous searches of Medline via OVID, Online Inheritance in Man (OMIN), and Web of Science (among others) via direct connection to the OUHSC Bird Library. In addition, internet access is available for resources such as thyroidmanager.com and other on-line resources.
6. **Systems based practice** is assessed by faculty with input from other members of the healthcare team including clinic supervisors, and nursing staff. Familiarity with systems of care including order writing, accessing assistance from nursing and ancillary staff, obtaining physician and ancillary consultations, and obtaining diagnostic tests. In addition, familiarity with the systems available to obtain medications for patients across the insurance spectrum - from no insurance to Medicare part D is assessed throughout the fellowship. Frequently trainees coordinate care with not only referring primary care physicians but also with surgical disciplines. For example in order to facilitate care for patients, trainees commonly contact neurosurgeons for patients with pituitary disease, ORL surgeons for patients thyroid or parathyroid disease, and urological surgeons for patients with adrenal disease. Many patients undergo nuclear medicine studies and these physicians are also routinely interacted with.

Complicated Type 2 Diabetes Mellitus: VA Medical Center

Goal: This is a consultative practice on patients referred from primary care physicians. Patient issues include poor glycemic control, complications of diabetes, and establishment of a rational therapeutic program. During the second year, the Fellow will supervise at least one student or resident evaluated patient per session to develop teaching skills. A faculty member passively observes this interaction to provide a second layer of control over patient care. Care of diabetes patients in this setting requires a team effort such that the Core Competencies of Systems Based Practices and Interpersonal and Communications Skills are addressed routinely.

Site: VAMC subspecialty clinic
Time: 8-12 Monday mornings
Patient material: Patients with type 2 diabetes referred from primary care sites in the VAMC.
Teaching Style: Supervised primary patient contact.

Supervisor: Niyaz Gosmanov, MD, Assistant Professor of Medicine and Michael Bryer-Ash, MD, Professor of Medicine
Text: *Joslin's Diabetes Mellitus*, 13 Ed. and other text as appropriate.
Evaluation: Biannual written evaluation.

General Endocrinology Clinic: VA Medical Center

Goal: To develop experience and skills in a primarily consultative service for diabetic patients and those with other endocrine disorders within an adult population. During the second year, the Fellow will supervise at least one student or resident-evaluated patient per session to develop teaching skills. A faculty member passively observes this interaction to provide a second layer of control over patient care. As discussed above, all six Core Competencies are addressed with most every patient encounter.

Site: VAMC subspecialty unit
Time: 8-12 Thursday mornings
Patient material: Adult veterans. While predominantly male, the number of female patients is increasing rapidly as the US army is incorporating and subsequently discharging more females.
Teaching Style: Supervised primary patient contact.
Supervisors: Endocrinology senior faculty on monthly rotations.
Text: *William's Endocrinology*, 9th Ed, *Principles and Practice of Endocrinology and Metabolism*, 2nd Ed.
Evaluation: Biannual written evaluation.

General Endocrinology Clinic: OU Medical Centers

Goal: To develop experience and skills in a primarily consultative service for patients and those with other endocrine disorders within a mixed adult population. Primary care experience with selected patients will also be established during the two years of Fellow contact with this clinic. During the second year, the Fellow will supervise at least one student or resident-evaluated patient per session to develop teaching skills. A faculty member passively observes this interaction to provide a second layer of control over patient care. Again, all six Core Competencies are addressed in this clinic.

Site: The OU Medical Center subspecialty Clinic.
Time: 8-12 Friday mornings
Patient material: This population is a mixture of males and females referred from primary and consultative practices from the whole state of Oklahoma.
Teaching Style: Supervised primary patient contact.
Supervisors: Endocrinology senior faculty on monthly rotations.
Text: As above.
Evaluation: Biannual written evaluation.

Other Weekly Clinics (available):

Scheduled Rotations:

Obstetrics and Gynecology:

Obstetrical Diabetes

Goal:	To obtain experience in intensive management of pregnant diabetic patients.
Site:	The Presbyterian Professional Building
Time:	½ day per week (Monday afternoon) for minimum of 3 mos.
Patient material:	Pregnant Type 1 and 2 diabetic patients requiring intensive insulin management. Follow-up evaluation of neonatal outcome for those babies delivered during this experience.
Teaching style:	Mentored, algorithm-based direct patient contact.
Supervisors:	Jean Goodman, MD Assoc. Professor, Ob/Gyn
Resources:	Sally Nordstram, RN, CDE
Evaluation:	Written evaluation by primary supervisor in clinic

Reproductive Endocrinology

Goal:	To become familiar with the evaluation therapy of infertility and infertility-related diseases in women.
Site:	Center for Reproductive Health, PC
Time:	½ day per week (Tues. afternoon) for minimum of 2 mos.
Patient material:	Private patients seen in an affiliated private clinic office.
Teaching Style:	Mentored care
Supervisors:	Karl Hansen, MD, Asst. Professor of Ob/Gyn
Resources:	A complete Reproductive Endocrinology Laboratory for evaluation of women with infertility or reproductive endocrinology problems.
Evaluation:	Written evaluation by primary supervisor.
Recommended Text:	Speroff, Glass and Case. Clinical Gynecologic Endocrinology and Infertility (5 th Ed)

Pediatric Endocrinology

Genetics, Endocrinology, and Metabolism Clinic

Site:	The Childrens Hospital
Time:	½ day per week (Wed morning or afternoon) for minimum of 3 mos.
Patient material:	age 0-18 yrs.
Teaching Style:	Direct patient contact, mentoring, algorithm directed.
Supervisors:	Kenneth Copeland, MD, Professor of Pediatrics Piers Blackett, MD, Professor of Pediatrics John Mulvihill, MD, Professor of Pediatrics, Kimberly V. Talley Professor of Genetics
Resources:	The only pediatric endocrinology clinic in the state, thereby drawing a large patient population. Access to a genetic karyotyping and screening laboratory.
Evaluation:	Written evaluation by Clinic supervisor.

Pediatric and Adolescent Diabetes Clinic

Site: The Childrens Hospital
Time: ½ day per week (Thurs afternoon) for minimum of 2 months.
Patient material: Young diabetic patients, predominantly type 1, but with an increasing frequency of type 2
Teaching style: Direct patient contact, mentoring, algorithm directed
Supervisors: Kenneth Copeland, MD, Professor of Pediatrics
Piers Blackett, MD, Assoc. Professor of Pediatrics
Resources: Several RNs, CDEs
Evaluation: Written evaluation by Clinic Supervisor

Nuclear Medicine

Nuclear Medicine Physics

Goal: Become licensed for radionuclide diagnosis and I¹³¹ therapy for hyperthyroidism.
Site: Dept. of Radiologic Sciences
Time: Didactic lectures of radiologic sciences
Robert Chu, PhD, course coordinator
Nuclear Medicine lab sessions:
J.R. Sonnad, Ph.D. instructor
(Fulfills requirements for NRC license)
Text: *The Essential Physics of Medical Imaging*. Bushberg et al
Evaluation: NRC test for licensure

Clinical Nuclear Medicine

Goals: Become familiar with the diagnosis and therapy of patients with thyroid neoplasms and those with hyperthyroidism. Observation of RAI Rx of > 10 patients with hyperthyroidism. Examination and reading of > 50 thyroid scans.
Site: Nuclear Medicine, the OU Medical Centers and the VAMC
Time: ½ day per week (min 2 mos)
Patient material: Patients referred with thyroid abnormalities
Teaching Style: Mentoring, review of thyroid imaging teaching file
Supervisor: Charles Arnold, MD, and other staff from Radiology and Nuclear Medicine
Resources: Nuclear imaging laboratory with Anger Camera, Spect imaging, etc.
Evaluation: Written evaluation by Supervisor.

Endocrinology and Metabolism

Metabolic Bone Disease

Goal: To become familiar with the technology and application of bone densitometry to osteopenic conditions. Interpretation of > 50 vertebral and hip scans.

Site: Bone densitometry Unit, Section of Endocrinology and Diabetes, Dept. of Medicine, OUMC

Time: ½ day per week for one month

Patient material: Patients referred for bone densitometry from the clinics; participants in clinical studies.

Teaching Style: Didactic instruction in the physics, performance, and analysis of DEXA scanning techniques of lumbar, hip and whole body densitometry. Faculty lectures on osteopenic syndromes, self study of scan teaching files.

Supervisor: Mary Zoe Baker, MD, Professor of Medicine and Endocrinology, and Director, Metabolic Bone Laboratory.

Resources: Elaine Clay, Bone densitometer technician.
Hologic QDR 2000 instrument with software for vertebral, hip and whole body scanning.

Text: *Osteoporosis*, 1st ed. Marcus, Feldman, and Kelsy, Editors.
Primer on the Metabolic Bone Diseases and Disorders of Mineral Metabolism, 3rd Ed, ASBMR

Evaluation: Proof reading of scan interpretations by supervisor. Written evaluation by supervisor.

Community Practice of Endocrinology

Goal: To observe and experience a general Endocrinology practice in the community.

Site: The Endocrine Group, N. Portland Ave, OKC, OK

Time: One day per week for one month, in the 2nd year.

Patient material: Patients referred to a general endocrine practice.

Teaching Style: Supervised primary patient contact.

Supervisors: James Males, MD, Clinical Professor of Medicine & Endocrinology
Ronald Painton, MD, Clinical Professor of Medicine & Endocrinology
Cheryl Black, MD, Clinical Asst. Professor of Medicine & Endocrinology

Evaluation: Written evaluation by supervisor at the end of the rotation.

Urology

Male Reproductive Clinic

Goal: To become familiar with evaluation of male reproductive abnormalities and treatment of abnormalities of male potency and libido.

Site: The Dept. of Urology Clinic, The Healthy Living Center

Time: ½ day per week (Thurs Afternoon) for 2 months

Patient Material: Patients referred to the Urologic Clinic for evaluation of impotence.

Teaching Style: Mentored direct patient care.

Supervisor: Dan Culkin, MD, Professor and Chief, Dept of Urological Surgery.

Resources: A private clinic atmosphere.

Evaluation: Written evaluation by the supervisor