Curriculum

Leadership Sabbatical in Clinical Research Management
National Institutes of Health Clinical Center
2011-2012

Goals

To provide clinical researchers an opportunity to gain additional knowledge and to develop their managerial and leadership skills by exposing them to the foundational elements required to manage a clinical research enterprise using content in all, or selected, modules listed below. It is expected that the experience will provide critical information for managing a clinical research program.

Objectives

- To understand the elements of the critical infrastructure for developing, conducting, and managing a clinical research program;
- To appreciate the unique and expanded functions of selected hospital support services in a clinical research environment;
- To learn about the technical and regulatory aspects of managing in a clinical research environment, including interfacing with regulatory agencies such as FDA and the DHHS OHRP;
- To become familiar with strategies for creating effective outreach and communication plans targeting clinical research participants and other stakeholders;
- To gain exposure to the unique way in which planning, budgeting, and performance/quality measurement are tailored to a clinical research organization; and
- To understand the unique requirements and challenges for conducting clinical research in an international setting.

Target Audience(s)

- Physicians and allied health professionals, such as principal investigators or research officers, who have experience leading clinical research protocols;
- Healthcare management and administrative professionals who want to broaden their scope of knowledge and appreciation for what it takes to manage a comprehensive clinical research program;
- Extramural NIH staff overseeing clinical trials; and
- Intramural NIH investigators

Modules: The program has six core modules: critical infrastructure, support services, legal and regulatory infrastructure, communications and outreach, strategic management, and funding opportunities. It is expected that each participant will have some clinical research experience, and that they will select electives from each module which may be needed to personalize and augment their expertise in order to prepare for a leadership role in a clinical research program.

Guidance will be offered by Clinical Center staff to fit the chosen electives into the participant's and leaders' schedules.

Overview of
CORE MODULES and Electives:

1. Critical Infrastructure
    - Protocol Writing and Protocol Tracking
    - Scientific Peer Review
    - Bioethics
    - Training
    - International Clinical Research
    - National Center for Advancing Translational Sciences, Clinical and Translational Science Awards (CTSA) program

2. Support Services
    - Principles of Clinical Research Data
    - Informatics-Clinical Management
    - Research Nursing
    - Pharmacy
    - Good Laboratory Practice and Development of Biologicals
    - Social Work
    - Nutrition

3. Legal and Regulatory Infrastructure
    - Human Subjects Research Protection
    - DHHS Office for Human Research Protections (OHRP)
    - Food and Drug Administration (FDA)
    - Accreditation
    - Laboratory Testing in a Clinical Research Facility
    - Technology Transfer
        - Part I- Collaboration
        - Part II- Inventions
    - Conflicts of Interest

4. Communications and Outreach
    - Patient Recruitment
    - Media Relations and Communications

5. Strategic Management
    - Planning and Budget Development
    - Clinical Quality and Patient Safety Performance Management- Assessment & Metrics

6. Funding Opportunities
    - Foundations

Detailed Description of
CORE MODULES and Electives:

Module 1:	Critical Infrastructure

Electives:

- **Protocol Writing and Protocol Tracking**
  - 1—6 months, either full- or part-time

  The development of better ways to facilitate clinical research is imperative for the future. Participants will study how the various clinical research modalities can be translated into a web-based, assisted protocol writing system that corresponds to the criteria established by the International Conference on Harmonization. In addition, participants will learn concepts of protocol mapping and adverse events reporting, and how these (as well as other needs) can be formatted into an information system that will be more effective, rapid, and provide greater safety to human subjects.

  Elective Leader: Robert Nussenblatt, MD

- **Scientific Peer Review**
  - 8 hours, plus shadowing opportunities

  It is essential that investigators understand how funding agencies such as the NIH solicit, evaluate and award extramural grants, cooperative agreements and contracts. Clinical investigators, in particular, must be knowledgeable of all pertinent processes and policies that impact their ability to secure and maintain funding for their research programs. Participants will learn about the NIH peer review process and related policies in order to successfully compete for NIH funding. Key differences between investigator-initiated and targeted research, unique elements of various funding mechanisms and special requirements for domestic and foreign researchers will be explained. Issues of particular relevance to clinical research will be highlighted and practical advice on "grantsmanship" will be provided. In addition, because skillful post-award management is critical to the establishment and maintenance of research programs, participants will also learn about their obligations as awardees to comply with NIH policies under terms and conditions of award, thereby preventing delays and disruptions in funding.

  Elective Leaders: Anna Ramsey-Ewing, MD and Hortencia Hornbeak, PhD

- **Bioethics**
  - Up to 3 months

  Participants will attend a structured course on the Ethical and Regulatory Aspects of Clinical Research over 8 weeks in the fall. If participants are unable to attend the course in person, the course can also be accessed through video archives. Participants will attend CC Ethics Committee meetings and hear from the clinical bioethics consultation service to learn about resolving ethical dilemmas in clinical research. They will observe NIH institutional review board (IRB) meetings. Finally the participants will participate in discussions and presentations about conceptual or empirical bioethics research projects related to research ethics in the Department of Bioethics, with the possibility of initiating collaborative projects.

  Elective Leader: Christine Grady, RN, PhD

- **Training**
  - Flexible schedule

  Developing a cadre of well-trained clinician-scientists is essential to an institution's research enterprise. Identifying the appropriate clinical research training needs within an organization requires a thorough understanding of the organizational environment. Some of the challenges associated with establishing effective training strategies (e.g. financial constraints, lack of or limitations of an appropriately trained faculty or facilities, time constraints, etc.) can be overcome by establishing strategic partnerships and utilizing information technology resources. Participants will learn the framework for creating successful

clinical research training activities and strategies to support their organization's training mission. In addition, they will learn about components of the core clinical research curriculum at the NIH Clinical Center, which may serve as a template for their organization.

Elective Leader: Frederick Ognibene, MD

- **International Clinical Research**
  - 1 month or more, depending on project

Participants would have the chance to learn about and engage in any one of a number of international clinical research programs, and learn about the elements that go into forging an effective international clinical research team. Experts from the Fogarty International Center who have experience meeting the requirements of both US and host countries laws and regulations will discuss these challenges. The ethical considerations of research in the developing world will be reviewed in conjunction with the CC Department of Bioethics. Potential opportunities exist to spend time on the ground in Mali, Thailand, Argentina and/or South Africa.

Elective Leader: Linda Kupfer, PhD

- ***National Center for Advancing Translational Sciences [Clinical and Translational Science Awards (CTSA) Program]***
  - *1-hour sessions chosen at the discretion of the participants*

Participants have the opportunity to study clinical research management methods, tools, evaluation, and process improvement from leaders in the national CTSA Consortium including 60 academic health centers (AHCs) and affiliate institutions across the US. The program focuses on pre-clinical protocol development, budgeting, contract approval, scientific review, project development, collaboration, recruitment, regulatory knowledge, and clinical research unit management. Each June, informed experts discuss many of these topics at the CTSA Annual Clinical Research Management Workshop; sabbatical participants are welcome to attend.

Elective Leader: Daniel Rosenblum, MD

Module 2:	Support Services

Electives:

- **Principles of Clinical Research Data**
  - 1 hour per week for three weeks

Data systems and standards to support clinical research are inherently different from those required to support reimbursement and the provision of care. Participants will study principles of the collection and representation of clinical research data, including principles for the high-quality controlled terminologies needed for this representation. Participants also will learn design principles behind "warehousing" of clinical research data. Hands on experience with some of the large clinical research data systems at the NIH intramural programs will be possible.

Elective Leader: James J. Cimino, MD

- **Informatics-Clinical Management**
  - 1 week to 3 months

The importance and reliance on Clinical Informatics has significantly increased over the last several years. The Department of Clinical Research Informatics (DCRI) has been instrumental in providing researchers with the right data at the right time in a secure, responsive environment. The department's goal is to deliver high-quality, customer oriented information technology services and support that foster excellence

in clinical care and biomedical research. Participants will have the opportunity to be involved in the evaluation of various components of the electronic medical record and assist in developing improvement strategies from the end-user perspective. Participants will also have the opportunity to be involved in the analysis of the Clinical Research Information System (CRIS) as an entity which includes not only clinical documentation, order entry and result retrieval, but also the ancillary systems that interface with the main clinical system to provide comprehensive patient care and data analysis. Additionally, participants will have an opportunity to understand the concepts of human-computer interaction and work with a variety of departments as they analyze, design, build, implement and evaluate components of the electronic record within CRIS.

Elective Leaders: Patricia Sengstack, DNP, RN-BC and David Herion, MD

- **Research Nursing**
  - Observational experience, flexible schedule, either full- or part-time

The nursing staff represents one of the largest single resources in a clinical setting devoted to research. An invested and highly educated nursing staff can contribute immeasurably to research team effectiveness, study design and development, patient recruitment and retention and coordination of clinical and research activities. Management of this important resource, especially in the context of a national nursing shortage, is important to the viability of a clinical research program. The participant will have didactic and observational experiences with senior nursing leaders and clinical staff to learn successful strategies for nursing recruitment and retention within a clinical research environment, unique competencies required for clinical research nursing, the quantification of resource requirements for nursing care including research-driven patient intensity, and exposure to specific roles that have been developed for nurses within the clinical research environment.

Elective Leader: Clare Hastings, PhD, RN, FAAN

- **Pharmacy**
  - 6-8 weeks

A clinical pharmacy experience will provide exposure to the basics of pharmaceutical development, information management, internal controls and methods for managing pharmaceutical research, integration of pharmaceutical research and research drugs in clinical systems, and an overview of pharmacy systems and methods. Participation in pharmacy activities also should advance practice and follow-through on these areas in the NIH Clinical Center Pharmacy. The pharmacy service provides opportunities for education and practical experience in a) dosage form design and development; b) quality control and drug and dosage form analysis; c) FDA-compliant management of medication supplies; d) protocol development for pharmaceutical research; e) overview of FDA regulatory requirements for pharmaceutical research; f) investigational new drug (IND) development; and g) good manufacturing practice (GMP)-compliance of research pharmaceuticals.

Elective Leader: Robert DeChristoforo, MS

- **Good Laboratory Practice and Development of Biologicals**
  - 3-4 weeks

Participants will a) learn the essentials of development and management of a good laboratory practice (GLP) facility for producing novel therapeutic and diagnostic cellular biologicals for clinical research; b) learn the essentials of development and scale-up procedures for cellular biologicals from the research laboratory bench to final acceptability for human use; c) understand the details of the required approval and regulatory processes involved in preparing novel biologics for clinical research protocols; and d) understand the essentials of a facility Master File for preparing research biologicals for clinical protocols.

Elective Leaders: Harvey Klein, MD and Hanh Khuu, MD

- **Social Work**

- 1 week

The role of members of social work support services is very important in the clinical research setting. A rotation in this area will offer a perspective on social work management/administration, including supervision, consultation, negotiating and monitoring in the clinical research setting; specialized knowledge of how to function within care teams in which various disciplines are involved; research and education; legal, ethical, and professional standards applicable to health care social work practice; policies and regulations that affect social work practice, and patient and family care; information on access to health care for the underserved and marginalized populations; development of and adherence to organizational policies, and procedures, and regulations by staff; methods and techniques for prioritizing need for service; and information on relevant health care social work practice issues in the clinical research arena.

Elective Leader: Adrienne Farrar, PhD

- **Nutrition**
  - 2 days to 2 weeks, either full- or part-time

Participants may elect a practicum that provides training in the management and administration of protocols with diet/nutrition interventions and outcomes. This rotation will offer both didactic and observational experiences by registered dietitians with specialized research training. Experiences will provide an overview of the types of nutrition research conducted at the NIH Clinical Center including: design and conduct of nutrient controlled diets, energy metabolism, body composition assessment, and dietary intake assessment. Participants will gain knowledge of various methodologies and resources used to conduct clinical nutrition research. This rotation will provide participants with the tools needed to determine appropriate staffing, competencies, technologies, and quality assurance to perform clinical nutrition research.

Elective Leader: Madeline Michael, MPH, RD, CSP

Module 3:	Legal and Regulatory Infrastructure

Electives:

- **Human Subjects Research Protection**
  - 1 month

Time spent in the NIH intramural Office of Human Subjects Research (OHSR) will focus on learning and applying ethical principles and regulatory requirements for research involving human subjects. Among other activities, participants will attend institutional review board (IRB) meetings with OHSR staff, and attend OHSR consultations with researchers, IRBs and others. In addition, participants will learn about the functions of Data Safety Monitoring Boards (DSMBs) by directly observing their activities. Upon leaving the OHSR they will be able to methodically review and evaluate the human subjects' protections aspects of any research protocol. Participants will be exposed to the DHHS Office of Human Research Protection and become familiar with the services and requirements of this office.

Elective Leader: Charlotte Holden, JD

- **DHHS Office for Human Research Protections (OHRP)**
  - To be determined

The success of the research enterprise depends on the protection of human subjects of research. While this protection is a responsibility shared by many people, at the research institution it is primarily that of investigators, institutional officials, and Institutional Review Boards. OHRP has oversight responsibility for all nonexempt research involving human subjects that is supported or conducted through HHS funds. Participants will learn about the HHS/OHRP regulations and guidance that pertain to human subject protection and examine major issues related to clinical trials and human research subject protections.

This elective will be designed to match the needs of the individual participants, and may include readings, didactic training, shadowing office staff members, and carrying out specific projects, including contributing to the regular work of the office. Depending on the individual fellow, such participation would involve interactions with staff in the Divisions of Policy and Assurances, Education and Development, Compliance Oversight, or the Office of the Director. The elective experience may also involve participation in meetings with other federal agency representatives, within or outside of the Department of Health and Human Services.

Elective Leader: Ivor Pritchard, PhD

- **U.S. Food and Drug Administration (FDA)**
  - 8 weeks (minimum rotation)

Participants would have the chance to learn about essential regulatory requirements that impact on the translation of preclinical discovery and characterization of drugs and biologics into initial safety and pharmacological activity (proof-of-concept) trials in human subjects. Guidance will be provided by the Clinical Pharmacology Program at the NIH Clinical Center working in collaboration with the Office of Clinical Pharmacology, Center for Drug Evaluation and Research (OCP/CDER) at the Food and Drug Administration. Participants will be tutored on the writing of an Investigational New Drug Application (IND) and the elements of Phase I-II (learning), Phase III (confirming), and Phase IV (post-marketing) drug development trials and will also have the opportunity of taking selected modules of the "Principles of Clinical Pharmacology" course offered at the NIH Clinical Center. Special rotations may be arranged at OCP/CDER based on the fellow's area of interest.

Elective Leader: Juan Lertora, MD, PhD

- **Accreditation**
  - To be determined

Participants will have the opportunity to learn about the complex legal and regulatory issues inherent in the modern clinical research environment. Regulatory oversight from a variety of organizations (e.g., Department of Health and Human Services Office of Human Research Protections; the Office of Scientific Integrity; NIH institute regulatory oversight organizations, such as the National Cancer Institute's Cancer Treatment Evaluation Program; the Food and Drug Administration; the Nuclear Regulatory Commission; the recombinant DNA Advisory Committee; the Association for the Accreditation of Human Research Protection Programs; and the Joint Commission on Accreditation of Healthcare Organizations) has increased substantially over the past 15 years. Participants will learn about these issues in order to become familiar with the requirements for the effective management of the interface between investigators and regulatory organizations.

Elective Leader: Laura Lee, RN

- **Laboratory Testing in a Clinical Research Facility**
  - To be determined

Testing in the research environment that involves laboratories, other than those used for clinical care, is an important issue particularly in light of Clinical Laboratory Improvement Amendments passed in 1988 (CLIA88). Topics that will be addressed include a) assay standardization and inter-laboratory variation; b) sample collection and processing; c) reference ranges and clinical decision levels; d) laboratory accreditation and differences between clinically approved and research-use only assays (this would be CLIA88 focused); e) estimating costs for laboratory tests; f) specimen banking; and g) laboratory data systems and capacity for data extraction and analysis.

Elective Leader: Thomas Fleisher, MD

- **Technology Transfer**
  - 2 days to 4 weeks, either full- or part-time

Part I - Collaboration

Participants will have the opportunity to learn how to establish collaborations between federal and extramural clinicians as well as the various methodologies for sharing clinical discoveries with the outside medical community. While peer-reviewed publications and presentations at meetings have been efficacious in the past, the passage of the Bayh-Dole, Stevenson-Wydler, and Federal Technology Transfer Acts, all allowed increased incentives to establish collaborative projects between the scientific community and the business community. Participants will learn about the various agreements that govern external collaborations, including material transfer agreements, confidential disclosure agreements, clinical trial agreements, and Cooperative Research And Development Agreements. The opportunity to observe negotiations will be included.

Part II - Inventions

Participants will have the opportunity to learn about the patent review process. They will learn basic principles of patent law, how NIH's patent reviewers evaluate inventions, and how to make (or break) a case for patentability. In addition, participants will explore how NIH handles licensing and marketing of new technologies, with particular emphasis on clinical development. Practical experience in following an invention through the patent and licensing process will be included. Participants will also learn about the USPTO's new initiatives, such as accelerated patent prosecution, and an experimental wiki-enabled online review system.

Depending on the time of year, a participant may be able to participate in the FAES (Foundation for Advanced Education in the Sciences) Technology Transfer courses held at the NIH.

Elective Leader: Steve Ferguson, MS, MBA, CLP

- **Conflicts of Interest**
  - 4 hours

Participants will learn how to manage conflicts of interest involving clinical trials and technology transfer. They will explore issues related to individual conflicts related to personal investments, consulting or managerial relationships with commercial entities. They will also determine what constitutes an institutional conflict for investments, corporate relationships, and technology transfer ventures.

Elective Leader: Lisa Marunycz, RN, MBA

Module 4:	Communications and Outreach

Electives:

- **Patient Recruitment**
  - 6-8 hours, up to 1 week

According to Centerwatch, a trials listing service, about 80 percent of current clinical trials are delayed at least one month because of unfulfilled enrollment. Recruiting patients for clinical trials is increasingly competitive, time-consuming, and expensive. Participants will be involved in the design, implementation, tracking and evaluation of effective protocol recruitment plans. In addition the participant will also address issues pertaining to protocol design, communication and outreach, screening, and referral and the relationship these have in enhancing patient recruitment and retention.

Elective Leader: Dinora Dominguez, RN

- **Media Relations and Communications**
  - 2 hours to 2 days

Exposure to the communications aspects of a clinical research enterprise would include a) orientation to applicable federal programs and laws, including the Freedom of Information and Privacy Acts; b) strategies for proactive media programs in the federal environment; c) establishing and cultivating media contacts and serving as a source for external news media; d) working with the media, including special considerations to specific types of organizations (such as trade/professional media, lay journalists, print/broadcast/online media); e) internal communications; and f) community-based communications program--how to be a resource for local media and why it's important.

Elective Leader: Sara Byars

Module 5:	Strategic Management

Electives:

- **Planning and Budget Development**
  - 1-2 hours

Implementing new clinical research programs and meeting the changing requirements of existing protocols require a structured planning and budget development process. Successful implementation is dependent on an ongoing dialogue among hospital leadership, providers of clinical research support services, the clinical investigators writing the studies, and senior scientific administrators. An understanding of the plans and the types of resources needed to support studies (including facilities) drives the development of an adequate funding plan. Participants will be made aware of the Clinical Center/Institute planning and budget development process and learn how the idea for a new program becomes a reality.

Elective Leaders: Maureen Gormley, MPH, RN, and Maria Joyce, CPA, MBA

- **Clinical Quality and Patient Safety Performance Management – Assessment and Metrics**
  - Flexible schedule

An essential component of an effective clinical research program is the design and implementation of a system to continually monitor the performance and quality of the clinical research enterprise. The performance measurement system should assess the following program elements: a) the subjects' perceptions of their experiences participating in the clinical research process (e.g., the informed consent process, available information and educational resources, reasons for participating in clinical research, patient safety concerns); b) the investigators' perceptions of the organization's support and infrastructure for the program; c) the occurrence of adverse events in clinical research; d) the occurrence of medical errors that impact clinical research studies; e) the effectiveness of patient recruitment and retention programs; and f) the operational activity of the clinical research program (e.g., the protocol portfolio, accrual data, program costs). Participants will be provided information about/experiences with: a) evaluating a clinical research program for measurement opportunities; b) designing measures to assess the performance of the program; c) identifying/developing tools and information systems to support data collection; d) using data to drive improvement in the clinical research program; and e) effectively disseminating data and improvements to the organization and the human subjects (e.g., data presentation tools, report-writing and Board presentation techniques).

Elective Leader: Laura Lee, RN

Module 6:	Funding Opportunities

Elective:

- **Foundations**
  - To be determined

Participants would have the chance to learn about and engage in contact with representative(s) from the Foundation for the NIH (FNIH) or other philanthropic entities to learn about the options for partnerships and collaborations to fund and support clinical research. These non-profit entities are potential partners for funding support of clinical and translational research. Understanding the differences between funding opportunities and processes from philanthropic sources compared to public (NIH and other governmental) and industry sources will be the focus of this element.

Elective Leader: Ann Ashby, MBA