CA-3 Curriculum for Clinical Scientist Track
West Virginia University - Department of Anesthesiology

Description of Rotation or Educational Experience

The residency program West Virginia University Hospital is committed to providing training in anesthesiology for its residents in accordance with the guidelines of the American College of Graduate Medical Education (ACGME) and the American Board of Anesthesiology (ABA). The emphasis of the residency program is to provide the opportunity to acquire the necessary clinical skills and medical knowledge to practice the specialty of anesthesia. The program recognizes that basic science and clinical research is an important aspect of residency training and encourages its residents to engage in research activity during the course of the residency.

During the CA-3 year, residents interested in conducting clinical and/or basic science research may elect a Clinical Scientist track. Selected CA-3 residents with research interest will spend a certain period of time in the basic science and/or clinical research as part of their CA-3 Clinical Scientist Track rotation for the purpose of achieving a research experience in a structured investigational environment.

The purpose of the Clinical Scientist Track is to provide appropriate training in the area of basic science that expands on the research interests for CA-3 residents. This track is intended to provide the CA-3 resident a greater exposure to basic science and clinical studies in terms of the reading, complexity, and technical issues relating to the methodology of basic science or clinical investigation.

- To provide rigorous research training with an emphasis on hypothesis-driven basic science and/or clinical research.
- To provide anesthesia-based or multidisciplinary research training and to help in developing individuals with the skills and expertise to explore research problems relevant to anesthesiology
- To develop clinician-scientists who will be leaders in the field of anesthesia research

During the Clinical Scientist Track rotation in anesthesia, residents conducting research will learn to evaluate published literature critically, maintain independence of mind, and scientifically seek an understanding of observations that have no obvious or satisfactory explanation.

The goals during this rotation are to provide practical clinical and/or basic science

research experiences to residents. During the course of this training, residents develop the skills they can use throughout their medical careers to make appropriate clinical decisions regarding the conduct of anesthesia-related clinical or basic science research.

The West Virginia department of anesthesiology strives to provide practical clinical and/or basic science research experiences to residents. Our Clinical Scientist Track rotation, the anesthesia program tries to reach residents during their training and provide them with an overview of how clinical and/or basic science research is conducted. During the course of this rotation participating residents develop skills they can use throughout their medical careers, such as the ability to critically evaluate medical literature, develop study protocols, and conduct research experiments. In addition, residents who might subsequently pursue a career in academic anesthesiology are exposed to research early in their training, while there is still ample opportunity for them to shape their career goals.

The purpose of this rotation is to give the resident a period of time with limited clinical responsibilities in order to conduct a research project of their choice. This rotation allows the residents the ability to become involved in a project which they may continue to pursue during the course of their residency or professional career. The value of this process is to allow the resident to learn about project design, data management and analysis and the presentation of results. The experience is also intended to facilitate the development of a personal research interest if a career in academic anesthesia is planned.

Description of the Rotation
With the guided support of an experienced faculty member, residents participate in six months (Track A) and up to eighteen month (Track B) of research. The resident will select a research project that is potentially amenable to completion within the research training period. In such a collaborative venture, the resident benefits from the mentor's tutorial instruction and guided literature review, which are to be supplemented by the trainee's independent study. In this process, the resident will learn the fundamentals of research. During this research opportunity, the resident may be further encouraged to pursue a career in academic research. A measure of satisfactory performance of the quality and significance of the research work is peer recognition, as indicated by publication of the research results in a respected, peer-reviewed journal, or in their presentation at a national scientific meeting.

Goals
To provide residents with training in research under the advisorship of an experienced faculty researcher.

Duration:
Six (Track A) to eighteen months (Tract B) during the CA-3 year.

Residents electing this track will spend 6 months (Tract A) to18 months (Tract B) conducting research, preferably in the first half of the CA-3 year.

CA-3 Level: Clinician Scientist Track A

- 6 months advanced anesthesia training
- 6 months research training
- Request approval, in writing, > 6 months before CA 3 begins
- Pre-approval required by Chair, Director of Residency, Chair of Clinical Competence Committee
- Research rotations must be set 3 months before CA 3 year begins

CA-3 Level: Clinician Scientist Track B

- Extended research track available as per national guidelines
- Requires 60 month total training in anesthesia.
- Curriculum individualized to accommodate 18 month research commitment
- Pre-approval required by Chair, Director of Residency, Chair of Clinical Competence Committee
- Petition for entry by the end of the CA1 year.

The Clinical Scientist Track must be 6 months of anesthesia research training for Track A and up to 18 months of anesthesia research training for Track B opportunities. One month of leave is allowed in each year of training. Leave in excess of one month, whether for vacation, sickness, parental, or other, must be made up.

Qualification:
Satisfactory clinical competency report filed with the ABA prior to beginning the rotation or approval by the Department of Anesthesiology's Clinical Competency Committee.

Requirement:

1. Successful completion of the CA-II Year.
2. The Program Director, in collaboration with the resident, will design the resident's CA-3 year of training. The resident is required to complete a minimum of 6 months (Track A) and up to 18 months (Track B) of clinical and/or basic science research study. The remaining 6 months will be spent doing clinical assignments which will include difficult or complex anesthetic cases.

During the CA-3 year, residents interested in conducting clinical and/or basic science research may elect a Clinical Scientist Track. Residents electing this track will spend 6 months (Track A) to 18 months (Track B) conducting research, preferably in the first half of the CA-3 year. Only one resident at any time may participate in this track. Residents

wishing to pursue this track must inform the Program Director during the first half of the CA2 year so there is adequate time to submit a research proposal for approval. Only residents deemed to have above average clinical and academic performance will be encouraged to participate in this track.

Each resident is asked to fill out a proposal of the project for approval by the program director prior to the initiation of the work.

The program director receives the requests from residents for dedicated time off from patient care responsibilities to engage in basic science or clinical research. Only a limited number of such requests can be accommodated during an academic year and research time will be grated purely on the basis of the merits of the proposed research project. Research time is meant to supplement clinical training and will not be granted if the minimum requirements of residency training are not met. The following guidelines and procedures will be used in determining which residents will quality for the Clinical scientist Track during their residency training:

1. A written request for research time should be submitted to the Department of Anesthesiology Research Committee and residency director.

2. Dedicated research time will generally be granted for basic science and/or clinical research. Exceptions and time frame may be discussed with the research mentor and the program director.

3. Residents engaging in research projects must be in good academic standing with satisfactory to superior evaluations during previous rotations. Residents who are on academic probation will not be able to qualify for research time.

4. The maximum duration of time allocated for research will be six months for Track A and eighteen month for Track B. The resident must demonstrate to the program that the major component of the proposed research, including all of the data collection or laboratory work, can be completed during this time. Only data analysis and writing up of findings may be completed after this period.

5. Basic science or clinical research requires a faculty mentor who is actively engaged in research in the subspecialty of interest. The sponsoring faculty should provide the department with a written commitment stating that the resident will be permitted to engage in the proposed research under his/her supervision.

6. It is the responsibility of the resident to meet with the faculty mentor and develop a formal outline of the proposed research. The outline should be structured to include:

-- Background and significance
-- Review of existing literature

-- Specific objectives of proposed research
-- Study design
-- Methods
-- Data analysis
-- Anticipated time commitment of the resident and the faculty.

This information should be provided in the written request mentioned previously.

7. Be advised that it will likely take few month of planning, preparation to meet with faculty, design a research project, and prepare the proposal in the format specified by the department. The resident must be the person who conducts the major component of the proposed research with clearly specified goals. These tasks should be performed before submitting a request for research time and prior to starting the rotation. In order to insure maximal utilization of rotation time, additional time will not be allocated just to acquire basic science laboratory skills or to contribute time to a project already in progress.

8. All submitted research proposals will be forwarded to the research committee for review. The committee will be blinded to the names of the residents. The following guidelines will apply during the review process:

- Significance of the proposed research
- Completeness of the literature review
- Clearly stated research goals
- Demonstration that the resident will be conducting the major component of the research under the supervision of the faculty.
- Demonstration that most of the research project would be completed within the allowed rotation time.
- Demonstration that the proposed methods would achieve the stated research goals

9. Resident whose research projects are approved will be granted the requested research time with the following stipulations:

- A copy of the research outline will become a permanent part of the resident's file.
- The residents would be required to develop a presentation of the research conducted and relevant findings within two months of completing their research. This presentation will be scheduled during a morning conference and will be evaluated by the audience.
- A summary of the evaluations would be placed in the resident's file.
- The resident is also expected to submit his/her research findings for presentation at the West Virginia University Research Day and other national anesthesia or relevant specialty meetings.

Objectives
Primary Areas of Knowledge

To learn the basics of research: Defining a problem, literature review, hypothesis formulation, development of methods for testing the hypothesis, data collection and analysis, formal write-up of the results, and scholarly presentation.
This should include the following:

- *Project Development:* Initial concept, critical review of the literature, and hypothesis formulation; writing of the research proposal inclusive of statistical methodology; submission of informed consent forms to the Institutional Review Board, and/or animal care protocols to the Animal Care and Use Committee.
- *Implementation:* Recruitment of patients for clinical studies; performance of animal experiments; informed consent, collection and analysis of data; and, if necessary, reformulation of the hypothesis.
- *Presentation and Defense:* Preparation and submission of the manuscript for review and possible publication in a peer-reviewed journal. Revision of the manuscript in response to critical comments of the journal referees. Oral or poster presentation of the results at a scientific meeting.

Cognitive and Skills Objectives

By the end of the rotation the resident should:

- Be able to demonstrate a working knowledge of the process of performing a research investigation, from initial idea to formal hypothesis, and to the formulation of an experimental plan by which to test the proposed hypothesis.
- Have acquired in-depth knowledge and experience in a specific area of research.
- Be able to prepare a manuscript summarizing the research effort, and to be familiar with the technology necessary for an effective conference presentation.

Goal:

1. To stimulate the resident towards investigational endeavors.

Objectives:

1. The resident will be assigned to study literature critically, especially with respect to study design, interpretation of results, statistical methods used, validity of the statistical methods, conclusions drawn and the importance of the conclusions drawn.
2. Based upon prior study or observations, the resident should identify an unanswered question or a problem requiring a solution.
3. Based upon the unanswered question the resident should develop a hypothesis that can be tested using the available investigational tools.
4. With the assistance of faculty mentors, the resident should design a study that tests the hypothesis.
5. The resident should be able to submit a proposal of the study and an informed consent form to the IRB for approval.
6. The resident should be able to collect data and organize it for analysis.
7. The resident, with the assistance of the available faculty mentors, should be able to perform statistical analysis and make the data presentable, including graphs and tables.
8. The resident should, with the help of the faculty, be able to present the study at a conference or a peer reviewed journal.

Resident Activities and Responsibilities

Residents work with an advisor or research group (with one faculty assigned to be ultimately responsible). Project proposals are submitted prospectively to the department for review with significant changes allowed only if they are also submitted to the department. The fundamentals of research are taught through didactics, interaction with faculty, self-study, and practical experience. Regular research meetings occur between the resident and faculty advisor and/or group in order to review progress, provide education, and plan subsequent work. The resident is responsible for understanding all aspects of the research process and participates in as many aspects of the project(s) as feasible. He/she is responsible for presenting and defending his/her work for final evaluation.

Residents will be funded to present their research at various national meetings including the American Society of Anesthesiologists, American Society of Critical Care Anesthesiologists, International Anesthesia Research Society, Society of Cardiovascular Anesthesiologists, American Society of Regional Anesthesia, Society of Ambulatory Anesthesia, Society of Education in Anesthesia, the Gulf-Atlantic Anesthesia Residents' Research Conference, and Society of Critical Care Medicine.

Cognitive Objectives:

The resident should achieve an in-depth understanding of:

1. The research methodology
2. Statistical tools for evaluation of data
3. The literature as it relates to an investigational protocol

Skills Objectives:

The resident should be able to:

1. Develop an investigational and innovative research project and independently acquire the data, analyze the data, and write an abstract for presentation.
2. Statistically analyze the data and improve his/her understanding of statistics.
3. Develop the skills to write an abstract and present it with all data acquired at anesthesia conferences and at the West Virginia Research Day following completion of is/her project.
4. Be a role model for the CA-1 and CA-2 residents.

Objectives

1. Create an environment where residents begin to develop an appreciation for the process of clinical and basic science research.
2. Introduce students to mentors who can serve as role models.

Objectives

The objectives of the Clinical Scientist Track are:

- to attract committed young physician-scientists to anesthesia
- to provide mechanisms to sustain research interest, skills, knowledge, and productivity during core anesthesia training
- to offer a means for fostering transition to a physician-scientist career
- to ensure that trainees accomplish the requisite training and acquire the skills to function as competent anesthesia researcher in the independent care of patients.

Educational Objective:

As part of promoting scholarly activity and research skills among trainees, the anesthesiology residency program at West Virginia University Hospital offers the opportunity for residents to pursue a basic science or clinical research rotation for a period of 6 month (Track A) and up to eighteen months (Track B). The specific educational objectives of the research rotation are as follows.

1. Obtain training and experience in basic science or clinical research under the supervision of an experienced investigator.
2. Develop valid hypotheses for experimental evaluation based on current knowledge of the research topic.
3. Review the background and significance of the proposed research by complete review of the literature.
4. Develop a study proposal and submit it for review by the research committee of the department of anesthesiology.
5. Work in a basic science research laboratory or perform clinical studies under the supervision of an experienced investigator for a period of 6 month and up to 18 months.
6. Analyze the experimental data to test the proposed hypothesis.
7. Develop a presentation on the research project and present it at the research conference.
8. Submit an abstract based on the research project to the regional and national anesthesia meetings and other relevant subspecialty professional organizations.

Patient Care

Residents must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. Residents are expected to:

- Communicate effectively and demonstrate caring and respectful behaviors when interacting with patients and their families
- Gather essential and accurate information about their patients
- Make informed decisions about diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment

• Develop and carry out patient management plans
• Counsel and educate patients and their families
• Use information technology to support patient care decisions and patient education
• Perform competently all medical and invasive procedures considered essential for the area of practice
• Provide health care services aimed at preventing health problems or maintaining health
• Work with health care professionals, including those from other disciplines, to provide patient-focused care

Goals

Residents must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. Residents are expected to:

- Become facile in the delivery of general, central, or regional anesthesia for different surgical procedures
- Be conversant in alternative anesthetic techniques for different surgical procedures
- Recognize different disease pathologies and their potential threats to the patient
- Manage the patient during different surgical procedures with general, central, or regional anesthesia

Competencies

- Appropriately directed history and physical examinations
- Develop appropriate patient-specific anesthetic plans for different surgical procedures
- Management of general, central, or regional anesthesia for different surgical procedures

Objectives

By the end of the rotation the resident will accomplish the following

- Evaluate the planned number of patients for the research study and develop an anesthetic plans which are validated by the attending physician
- Successfully perform general, central, or regional anesthesia for different surgical procedures
- During the last week of the rotation pass a written and oral examinations based upon the American Board of Anesthesiology format and scored using ABA criteria demonstrating appropriate patient management
- Successful demonstration of adequate patient care as assessed by faculty on written formative evaluations

Medical Knowledge

Residents must demonstrate knowledge about established and evolving biomedical, clinical, and cognate (e.g. epidemiological and social-behavioral) sciences and the application of this knowledge to patient care. Residents are expected to:

• Demonstrate an investigatory and analytical thinking approach to clinical situations
• Know and apply the basic and clinically supportive sciences which are appropriate to the discipline of
Anesthesiology

Goals

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. Residents are expected to:

- Detail the physiologic changes associated with different disease states and describe the impact of these changes on the conduct of anesthesia
- List the anatomic changes associated with different disease states and describe the impact of these changes on the conduct of anesthesia
- Demonstrate proficiency in anesthetic management related to the anatomic and physiologic changes
- Recognize disease specific pathophysiology
- Become conversant with different anesthesia related topics
- Contrast between different pharmacological agents effects

Competencies

- Be able to list and describe the major anatomic and physiologic changes associated with the cardiovascular system during different disease states and correlate them with the conduct of anesthesia.
- Be able to list and describe the major anatomic and physiologic changes associated with the respiratory system during different disease states and correlate them with the conduct of anesthesia.
- Be able to list and describe the major anatomic and physiologic changes associated with the endocrine function during different disease states and correlate them with the conduct of anesthesia.
- Be able to list and describe the major anatomic and physiologic changes associated with the gastrointestinal system during different disease states and correlate them with the conduct of anesthesia.
- Be able to list and describe the major anatomic and physiologic changes associated with the hematologic system during different disease states and correlate them with the conduct of anesthesia.
- Be able to list and describe the major anatomic and physiologic changes associated with metabolism during different disease states and correlate them with the conduct of anesthesia.
- Be able to list and describe the major anatomic and physiologic changes associated with the renal function during different disease states and correlate them with the conduct of anesthesia.
- Be able to list and describe the major anatomic and physiologic changes associated with the neurologic function during different disease states and correlate them with the conduct of anesthesia.

- Be able to describe different disease states and the impact of these diseases on the conduct of anesthesia.
- Be able to list and describe different disease states complications and the impact of these complications on conduct of anesthesia.
- List and detail the effects of common known pharmacological agents and describe their indications, contraindications, and side effects

Objectives

- During the last week of the rotation pass a written and oral examinations based upon the American Board of Anesthesiology format and scored using ABA criteria demonstrating appropriate medical knowledge.
- Successful knowledge acquisition as assessed by faculty on Written Formative Evaluations
- Complete Portfolio Assignment: Faculty assessment of knowledge exhibited in resident case work up of a patient undergoing a complex surgical procedure with multiple disease co-morbidities. Assessment should include a summary of the patient evaluation and anesthesia plan demonstrating evidenced based medical practice as documented with relevant literature references.

Practice-Based Learning and Improvement

Residents must be able to investigate and evaluate their patient care practices, appraise and assimilate scientific evidence, and improve their patient care practices. Residents are expected to:

- • Analyze, practice, experience and perform practice-based improvement activities using a systematic
- methodology
- • Locate, appraise and assimilate evidence from scientific studies related to their patients' health problems
- • Obtain and use information about their own population of patients and the larger population from which
- their patients are drawn
- • Apply knowledge of study designs and statistical methods to the appraisal of clinical studies and other
- information on diagnostic and therapeutic effectiveness
- • Use information technology to manage information, access on-line medical information; and support their
- own education
- • Facilitate the learning of students and other health care professionals

Goals

Residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life long learning. Residents are expected to develop skills and habits to be able to:

- To be able to identify and access appropriate reference resources to solve anesthesia management problems in a timely manner
- Independently seek answers to previously unencountered clinical questions and incorporate this knowledge acquisition into appropriate management and care plans
- Review the post-anesthetic hospital course of their patients receiving anesthesia for complications or suboptimal outcomes and devise alternative management plans that could have improved outcomes.
- To be able to access online reference sources pertinent to the anesthetic management of their patients

Competencies

- Identify personal strengths, deficiencies and limits in knowledge and expertise related to the field of anesthesia.
- Set learning and improvement goals based on patient and colleague feedback
- Actively participate and seek educational opportunities
- Systematically analyze anesthesia practice, pre-operative and post-operative anesthetic care of patients and restructure anesthetic practice based on improved patient outcomes
- Incorporate formative evaluation feedback into daily practice
- Incorporate pertinent findings and conclusions of scientific studies to improve anesthesia outcomes
- Use information technology to optimize learning
- Disseminate knowledge acquired for the further education of patients, families, students, residents and other health professionals

Objectives

- Portfolio: Case Management: The resident will identify a patient with multiple disease co-morbidities, perform a literature search, identify the references pertinent to the patient and produce a summary of the evaluation, alternatives, their proposed management of the patient, and anticipated possible complications. The resident will review the case with the attending physician and submit copies for inclusion in their portfolio.
- Portfolio: Post-Anesthetic Rounds: The resident will identify a patient on post-anesthetic rounds that he/she feels had suboptimal outcomes. The resident will summarize the anesthetic management of each patient in writing and submit a brief synopsis of alternative management techniques that might have produced more optimal outcome. The residents will review the plans with the attending physician and submit copies for their portfolio.
- During the last week of the rotation pass written and oral examinations based upon the American Board of Anesthesiology format and scored using ABA criteria Demonstrating appropriate strategies for acquisition of additional skills and knowledge for care and management of anesthesia.
- Successful demonstration of adequate practice- based learning and improvement as assessed by faculty on Written Formative Evaluations

Systems Based Practice

Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value. Residents are expected to:

- • Understand how their patient care and other professional practices affect other health care professionals, the health care organization, and the larger society and how these elements of the system affect their own practice
- • Know how types of medical practice and delivery systems differ from one another, including methods of
- controlling care costs and allocating resources
- • Practice cost-effective health care and resource allocation that does not compromise quality of care
- • Advocate for quality patient care and assist patients in dealing with system complexities
- • Know how to partner with health care managers and health care providers to assess, coordinate, and
- improve health care and know how these activities can affect system performance

Goals

Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care. Residents are expected to:

- Be able to prioritize the delivery of anesthesia and analgesia based on the acuity of the patient in consultation with surgical care providers.
- Function as a member of a care team with nurses, surgeons, technicians and other medical staff.

Competencies

- Work effectively with nurses, surgeons, technicians and other medical staff to deliver timely and effective anesthetic care
- Coordinate patient care within the health care system relevant to the anesthesia needs
- Incorporate considerations of risk-benefit analysis in patient care
- Advocate for quality patient care and educate nurses, surgeons, technicians and other medical staff of the anesthetic implications to patient well being
- Participate as part of inter-professional team to enhance patient safety and improve patient care quality
- Participate in identifying systems errors and in implementing potential systems solutions

Objectives

- Overall satisfactory performance on a 360 evaluation demonstrating satisfactory

performance as part of the patient care team.

- Successful acquisition of patient information from hospital based systems as documented in the resident's Portfolio of patient case presentation.
- During the last week of the rotation pass written and oral examinations based upon the American Board of Anesthesiology format and scored using ABA criteria demonstrating appropriate utilization of hospital based resources in preparation and management of anesthesia.
- Successful demonstration of adequate systems based practice as assessed by faculty on Written Formative Evaluations

Professionalism

Residents must demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population. Residents are expected to:

- • Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that
- supersedes self-interest; accountability to patients, society, and the profession; and a commitment to
- excellence and on-going professional development
- • Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care,
- confidentiality of patient information, informed consent, and business practices
- • Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities

Goals

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. Residents are expected to:

- Provide the highest possible quality anesthesia care
- Provide a role model to students and related practitioners as to commitment and professional conduct in the care of patients
- Discuss ethical challenges in the care of patients
- Express sensitivity to the particular needs of the patient that has suffered an unfavorable loss or outcome

Competencies

- Demonstrates Courtesy and Respect for patients, nurses, physicians, and ancillary staff
- Demonstrates Compassion and Integrity for others
- Responds to patient requests in a timely manner that supersedes self-interest
- Completes patient care tasks and provides appropriate follow-up and feedback to patient and staff
- Acts in the best interest of the patient
- Advocates quality and timely patient care

- Respects patient privacy and autonomy
- Accountable to patients, society, and the profession
- Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in age, culture, race, religion, disabilities, and sexual orientation

Objectives

- Demonstration of professionalism on 360 degree evaluation
- During the last week of the rotation pass written and oral examinations based upon the American Board of Anesthesiology format and scored using ABA criteria demonstrating appropriate interpersonal interaction strategies for dealing with anesthesia faculty and residents, nursing staff, surgical team, secretarial staff or other support staff.
- Successful demonstration of adequate professionalism as assessed by faculty on Written Formative Evaluations

Interpersonal and Communication Skills

Residents must be able to demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, their patients families, and professional associates. Residents are expected to:

- • Create and sustain a therapeutic and ethically sound relationship with patients
- • Use effective listening skills and elicit and provide information using effective nonverbal, explanatory,
- questioning, and writing skills
- • Work effectively with others as a member or leader of a health care team or other professional group

Goals

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates. Residents are expected to:

- Effectively obtain pertinent medical history from the patient
- Effectively describe available anesthetic options at appropriate age and education specific levels
- Obtain informed consent for anesthesia and explain related risks including the potential anesthetic impact the patient well-being
- Provide sensitive reassurance while performing sedation or regional anesthesia

Competencies

- Communicate effectively with patients and families across a broad range of socioeconomic and cultural backgrounds
- Communicate effectively with physicians, nurses, and ancillary staff
- Work effectively as a member of the health care team
- Act in a consultative role to other physicians and health professionals

- Maintain comprehensive, timely, and legible medical records

Objectives

- Positive assessment of interpersonal and communication skills on 360 degree evaluation
- During the last week of the rotation pass written and oral examinations based upon the American Board of Anesthesiology format and scored using ABA criteria demonstrating appropriate communication skills.
- Successful demonstration of adequate interpersonal and communication skills as assessed by faculty on Written Formative Evaluations
- Demonstrate effective written communication skills on Portfolio entries

Teaching Methods

During the West Virginia University anesthesiology 48 month residency training the residents will achieve competency in the following six areas: 1) Patient care, 2) Medical knowledge, 3) Practice-based learning and improvement, 4) Interpersonal and communication skills, 5) Professionalism, and 6) Systems-based practice.

The residency program with the oversight of the education committee of the anesthesiology department, and input from the faculty, nurses, peers and patients, will utilize the following evaluation tools:

- 360-Degree evaluation instrument
- Oral examinations for residents
- Written in-training examinations
- Faculty evaluations
- Case logs
- Resident summary portfolio
- Scholarly/ research activity
- Case presentations
- Patient satisfaction/dissatisfaction survey data
- Journal Clubs

The Clinical Competence Committee will review monthly, biannually, annually and at the end of the 48-month training continuum data from the above noted evaluation tools to determine whether an individual resident has achieved mastery of the six general core competencies and in each of the specified rotational competencies.

Teaching methods to be used on the Clinical scientist Track rotation:

- Didactic lectures
- Review and discussion of preoperative evaluations and anesthetic plans
- Intraoperative discussion of physiologic changes and case management
- Review and discussion of post-anesthetic evaluation
- Case Scenario discussions
- Portfolio assignments
- Suggested Readings

Assessment Method (residents)

At the conclusion of the rotation, the responsible faculty prepares a written evaluation of the resident's performance.

- Portfolio Entries

	Patient Care	Med Knowledge	Practice Based Learning	System Based Practice	Profess-ionlism	Communi-cation
Portfolio (proposed)	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly

Evaluation

Mentors will be required to fill out an evaluation form at the end of the rotation.

Resident mentor also evaluates the performance of residents based on their enthusiasm for learning, attendance and participation in educational activities, completion of the rotation manual, and understanding of assigned reading materials.

After completion of the rotation, the principle investigator is asked to write a letter discussing the resident's performance during the rotation.

A supervisory/review committee must be established by the residency program and the research mentors to ensure that each trainee is meeting the requirements of training and is successfully completing each experience to be continued in the pathway. The general anesthesiology program director must provide careful evaluation of clinical training to determine whether the resident is attaining the knowledge and experience necessary to provide independent care of patients. A research mentor must oversee the research experiences to ensure that the trainee is accomplishing pathway goals. The committee should meet at least every three months to evaluate and advise the resident. Meetings and evaluations must be documented.

These evaluations should be regularly discussed with the resident and must be kept on file and available for review. Final evaluation should include the approval of a summary progress report of the resident's research experience by the program director or mentor.

Assessment Method (Program Evaluation)

- Assessment of successful patient care competency by faculty evaluations regarding observations of the resident clinical practice.
- Performance of residents on written and oral examinations
- Performance on the research-based and statistics subsets of in-service

examinations administered by the American Board of Anesthesiology
- Performance on the research-based and statistics subset of anesthesia knowledge test
- Performance of program graduates on the research-based and statistics subsets of the written examination of the American Board of Anesthesiology
- Review of resident evaluations of faculty performance
- Review of residency program evaluations
- Post-graduate assessments of adequacy of training

This rotation is evaluated by the participating residents so that their feedback may be used for program improvement.

The success of the program is evidenced by the number of residents who have successfully completed projects leading to abstracts and manuscripts. This has enhanced further their competitiveness for fellowship positions.

Evaluations of the pathway and faculty are required of the resident.

Level of Supervision

Supervision
The supervising faculty is responsible for overseeing the resident's education on the rotation (including the initial project proposal that is submitted for review to the department) and providing monthly and final evaluations that are submitted to the department's evaluation committee.

The primary teaching in this rotation is accomplished through the guidance and mentoring of the principle investigator of the project. There may be an educational interaction with a variety of other members of the university depending on the project. These other teachers may include post-doctoral fellows, clinical fellows and laboratory technicians.

Choosing Mentor
1. A list of mentors who are basic scientists or clinician-scientists is provided and approved by the program director.
2. Whenever possible and/or appropriate the students will choose a mentor/subspecialty that is related to their proposed research.

The training faculty may include both clinician-scientists and basic scientists as potential mentors.

- Residents are supervised 1:1 by an attending anesthesiologist with sub-specialty training or documented subspecialty interest in the proposed anesthesia field of interest.

Expectations of Mentors

1. Constructively challenge resident's knowledge of current research literature.
2. Practice evidence based medicine.
3. Help the resident gain skills in the development and conduction of anesthesiology research..

Record Keeping:

Residents will keep track of all their data and prepare a written abstract/presentation draft in consultation with their primary mentor and the research committee of the department of anesthesiology.

Educational Resources

References:

1. Project-related references will be assigned to each resident by his/her responsible faculty.
2. Urquhart: Anesthesia Viva: Physiology, Pharmacology and Statistics. Greenwiel Medical Media, 1999.
3. Cruickshank S: Mathematics and Statistics in Anesthesia. Oxford University Press, 1999.
4. Miller D R (ed): Anesthesia, 6th ed. Churchill-Livingstone, 2006.
5. Stoelting R K, Handbook of Pharmacology and Physiology in Aneshetic Practice. 2nd ed. Lippincott/Williams and Wilkins, 2005.

Recommended readings and references:

PRIMARY TEXT:

REFERENCE TEXT:

WEB REFERENCES:

- American Society of Anesthesiologists
  http://www.asahq.org.

- The Office of Research Integrity (ORI)
  http://ori.dhhs.gov/

- International Committee of Medical Journal: Uniform Requirements for

Manuscripts Submitted to Biomedical Journals: Writing and Editing for Biomedical Publication, *February 2006*
http://www.icmje.org/index.html#top

- The Journal of the American medical Asssociation JAMA: Instructions for Authors
http://jama.ama-assn.org/misc/ifora.dtl

- Barrett, Alan <barrett@lucy.ee.und.ac.za> *MLA citation style for internet documents?* Article <3phppu$t6k@lucy.ee.und.ac.za> in Usenet newsgroup alt.usage.english, 19 May 1995.

- Berners-Lee, T., Masinter, L. & McCahill, M. [ed.] *Uniform Resource Locators (URL)* Request for Comments 1738, Network Working Group <ftp://ftp.demon.co.uk/pub/doc/rfc/rfc1738.txt> Dec. 1994. (Accessed 3 Feb. 1995)

- *Chicago Manual of Style: For Authors, Editors and Copywriters* (14th edition), University of Chicago Press, 1993, ISBN-0-226-10389-7, pp. 633-4

- Gibaldi, Joseph *MLA Handbook for Writers of Research Papers* (Revised Fourth Edition), Modern Language Association of America, 1995, ISBN 0-87352-565-5, pp. 160-67, 176-78

- Horton, M. & Adams, R. *Standard for interchange of USENET messages* Request for Comments 1036, Network Working Group <ftp://ftp.demon.co.uk/pub/doc/rfc/rfc1036.txt> Dec. 1987 (Accessed 19 June 1995).

- *Publication Manual of the American Psychological Association* (Fourth Edition), American Psychological Association, 1994, ISBN 1-55798-241-4, pp. 218-222.
http://apastyle.apa.org/

- Wainwright, Mark <markw@harlqn.co.uk> *MLA citation style for internet documents?* Article <D8Gv79.IMB@harlequin.co.uk> in Usenet newsgroup alt.usage.english

Social Justice

West Virginia University is committed to social justice. We concur with that commitment and expect to maintain a positive learning environment based upon open communication, mutual respect, and non-discrimination. Our University does not discriminate on the basis of race, sex, age, disability, veteran status, religion, sexual orientation, color, or national group. Any suggestions as to how to further such a positive

and open environment in this rotation will be appreciated and given serious consideration.

Attached Addenda

Addendum 1: Clinical scientist Track Content Outline
Addendum 2: Educational Experience Checklist
Addendum 3: Clinical scientist Track Evaluation Forms

Curriculum Timeline

Written by Fikry Attaallah, MD, 2-23-2007
Approved by the Anesthesiology Education Committee on 2-26-2007

Addendum 1

CA-3 Content Outline for Clinical Scientist Tract
Department of Anesthesiology
School of Medicine
West Virginia University

The educational content of this rotation is the experience of conducting a research project. The specific content will be dependent on the project chosen, but will often be related to the concepts of study design, research methodology, data management and statistical analysis. Both basic research and clinical research projects are available; with the specific research methodologies learned being dependent upon the nature of the project.

The ancillary educational materials are variable depending upon the project, but will always include a review of the literature appropriate to the clinical problem as well as to the specific methods used. It is also likely that methods of statistics will need to be reviewed from an appropriate source.

The curriculum and agenda of the Resident Clinical Scientist Tract rotation is as follows:

1. Reading the Medical Literature
   A. Structure of medical writing
   B. Approaching an article
      1. Read only what is interesting and useful
      2. Scan for a quick overview
      3. Concentrate on methods and results
      4. Reserve the right of final judgment

2. Concentrating on Methods and Results (Study Designs)
   A. Experiments
      1. Randomized clinical trials
      2. Nonrandomized clinical trials
   B. Observational analytic studies
      1. Cohort
      2. Case-control
      3. Ecological
   C. Meta analysis and reviews
   D. Case reports and series

3. Statistics: Concentrate on Methods and Results
   A. Define patient populations (epidemiologically)
   B. Describe subject populations (statistically)
      1. Normality
      2. Central tendency

3. Variation
C. Draw inferences from populations
1. The nature of hypothesis testing

4. Statistics: Concentrating on Methods and Results
A. Categorical data
1. Chi-square
2. Fisher's Exact
3. Sensitivity, Specificity, Predictive Value
B. Continuous Data
1. Student's t-test
2. ANOVA
C. Multivariate analysis
1. Regression
2. Correlation
D. Interpretation
1. Significance
2. Power
3. Type I and Type II errors
4. P-values and confidence intervals

5. Research Projects
A. Design protocols
1. Experimental
2. Observational / Epidemiological
B. Conduct studies
C. Authorship
D. Submission for publication/presentation
E. Ethics

BIBLIOGRAPHY
Variable, dependent on each research project.

Lecture Courses

- Introduction to the Anesthesiology Clinical Scientist track residency rotation course

- The role of clinical research in medicine

- Ethics and clinical research
- Components of research protocols
- The function of the Institutional Review Board
- Study designs: Overview of case controlled studies, randomized clinical trials, epidemiology studies
- Meta-analysis
- Statistical Methods
- Analyzing study results
- Roundtable Discussion with Research Professor
- Research as part of an academic career: funding, publication, and self-promotion
- Advanced cardiovascular Physiology
- Advanced respiratory Physiology

Addendum 2

CA-3 Clinical scientist Tract Educational Experience Check List
Department of Anesthesiology
School of Medicine
West Virginia University

Resident_____ Rotation Date_____

	Staff	Resident	Date
Materials:			
Assigned Reading	_____	_____	_____
Curriculum	_____	_____	_____
Didactic Lectures:			
Introduction	_____	_____	_____
Role of research	_____	_____	_____
Ethics	_____	_____	_____
Protocols	_____	_____	_____
IRB	_____	_____	_____
Study designs	_____	_____	_____
Meta-analysis	_____	_____	_____
Statistical Methods	_____	_____	_____
Analyzing results	_____	_____	_____
Roundtable discussion	_____	_____	_____
Academic career	_____	_____	_____

Cardiovascular Phys _____ _____ _____

Respiratory Phys _____ _____ _____

Assessment:

Case Logs _____ _____ _____

Oral Exam _____ _____ _____

Written Exam _____ _____ _____

Portfolio (1) _____ _____ _____

Portfolio (2) _____ _____ _____

Section Chief _____ Date_____

Addendum 3

CA-3 Evaluation of the Clinical scientist Track Rotation
Department of Anesthesiology
School of Medicine
West Virginia University

Mentor_____

Resident_____

Outstanding Poor

The resident was able to effectively integrate current scientific knowledge into the development of a research plan. 1 2 3 4

The resident conducted effective literature searches for the specific research topic. 1 2 3 4

The resident demonstrated progress in mastering research skills. 1 2 3 4

The resident displayed enthusiasm for current research project. 1 2 3 4

The resident was able to conceptualize research questions that integrated current literature and disease states. 1 2 3 4

The resident challenged you scientifically in an appropriate manner. 1 2 3 4

Overall evaluation Fail Pass Honors

I have discussed this evaluation with the resident. Ye No

Comments: