

# OHSU Thoracic Surgery Residency Program

## CORE PROGRAM ORGANIZATION

### 1. DESCRIPTION OF THE THORACIC SURGERY PROGRAM

#### a. Overview

This is the Oregon Health & Science University Thoracic Surgery Residency Program. The overall educational goals of the Thoracic Residency training program are to develop excellence in the provision of thoracic surgical diagnosis and treatment and to provide the ability to critically analyze and advance the field. The scope of excellence includes the recommendation and conduct of procedures outlined in the index case requirements and the appropriate recognition and management of complications and factors bearing on long-term outcome. The educational program is designed to emphasize that thoracic surgeons diagnose and treat lifelong disease states in cooperation with other primary and specialty physicians (*multidisciplinary teams*) and function within a health care system which has economic and long-term outcome goals (*systems-based practice*). These disease states are variably understood and their treatment is in constant evolution driven by basic and clinical research stimulated by knowledge gained from increasing clinical experience (*practice-based medicine*). It is expected that the resident will achieve competence (as defined by the separately developed and attached criteria elaborated in the OHSU physician performance diagnostic index/PPDI) in all major goals outlined in the ACGME outcomes project and will leave the program with the tools for lifelong learning and growth as a person, as a surgeon and as a collaborator in the interdisciplinary system of health care delivery.

#### b. Educational mission and goals

Our educational mission is multifold and has been agreed upon by all members of the thoracic surgery faculty. These goals are to provide:

- ❖ Structured education in all aspects of thoracic surgery so that residents complete their training with exceptional knowledge that will help them practice “evidence-based” thoracic surgery.
- ❖ Coaching to help residents develop technical surgical skills, strategies and judgment that will enable them to confidently, skillfully and thoughtfully make important decisions and engage in the types of complex surgical procedures that comprise the practice of thoracic surgery. We want our residents to become technically competent surgeons by the end of their training.
- ❖ Stimulation of the resident’s ingenuity and creativity such that they will be willing to make contributions to the field of thoracic surgery as leaders, administrators, researchers, teachers and/or clinicians.
- ❖ Guidance for the development of leadership skills so that the residents can learn how to build and engage as participants in (rather than try to control and become divisive with) the kinds of multidisciplinary teams essential to the practice of high quality thoracic surgery. Residents will learn to engage as collaborative rather than as hierarchical leaders.
- ❖ Emphasis on character development such that our residents learn how to embody the qualities of compassionate and congruent human beings. We are interested in nurturing the growth of human beings who practice cardiothoracic surgery.

Our program will strive to achieve these goals in the following ways:

### **Structured Education**

- ❖ Selected assigned reading that will cover all aspects of thoracic surgery. It is our expectation that residents will complete this assigned reading by the completion of their residency training. These readings will relate to a defined curriculum based on the recommendations of the Thoracic Surgery Director's Association (TSDA).
- ❖ Scheduled lectures from attendings and visiting faculty designed to address major topics in all aspects of thoracic surgery.
- ❖ The residents will also be encouraged to “educate themselves” by producing weekly presentations on patients under their care. As part of these teaching rounds, it is expected that the residents will review important recent literature on their selected topic. The residents will thereby become familiar with computer-based presentations (e.g. PowerPoint). Residents will be asked to include information from these presentations in a portfolio that they will maintain throughout their residency.
- ❖ There will be regular quizzes and an organized completion of SESATS.
- ❖ Each resident will produce an annual research project. Their project for the first year of training will involve a practice-based learning exercise in which they will be asked to identify a feature of the “system” in which they work which they believe can be improved. Through research of our system and other systems, the goal of the project is to suggest a change that can be created that will lead to system improvement. In their second year, the resident will produce a clinical research paper (on a topic of their own choosing, and in collaboration with a faculty member/advisor). This project will be presented at surgical grand rounds at the completion of their second year of training and is expected to be of the quality that can result in national presentation and publication in a peer-reviewed journal.
- ❖ Educational conferences are a priority and residents are excused from their clinical responsibilities in order to attend these conferences.
- ❖ Residents will take part in the TSDA Multimedia Education Program, which may eventually phase out the reading syllabus and/or SESATS.
- ❖ We will endeavor to emphasize teaching and learning over “service” and we will take pride in watching our residents grow and develop into competent thoracic surgeons.
- ❖ We emphasize LIFELONG LEARNING as part of this educational process. Nevertheless, we have developed a criterion-based method of evaluation to ensure that residents acquire certain “minimal” skills (competencies) and knowledge as they proceed through the various stages of training.

### **Surgical Skills and Judgment**

- ❖ The residents will be exposed to all aspects of thoracic surgery in an organized fashion so that they can learn skills without being bombarded or confused.
- ❖ The residents will assume graded responsibility such that they will have constant operating room supervision early in the program with transition to more responsibility in subsequent rotations in

their second year of training.

- ❖ Residents will present clinical conferences so that they can think about various options and develop judgment from these thought processes, combined with reading to know and understand available options.
- ❖ Residents will assume greater responsibility for patient management as they proceed through their second year, thereby having opportunities to practice their judgment.
- ❖ We have developed a criterion-based method of evaluation to ensure that residents acquire certain “minimal” skills and knowledge as they proceed through the various stages of training. Our evaluation also includes numerous opportunities for formative feedback to help guide them in this process of growth.
- ❖ Residents will be expected to surpass the minimal requirements established by the ABTS for index cases. In achieving this goal, residents will be given responsibility for performing surgery from the surgeon’s side of the table with the assistance of faculty. This is an expectation of the faculty in the program (to assist residents in doing surgery) and this goal is supported by the commitment and competence of the faculty in this area.

### **Creativity and Ingenuity**

- ❖ Our program is designed to have residents develop questions during their clinical experiences regarding why things are done or not done in certain ways. They are encouraged to research these issues and then use their own questions as a springboard for clinical research. Their research project for the first year of training is a reflection of our commitment to stimulating their imagination and being receptive to their ideas.
- ❖ Residents are part of the process. As they develop ideas that lead to improvements, they are encouraged to voice them (they attend the division meetings) and good suggestions are implemented.
- ❖ As part of “skills” training, residents have an opportunity to develop their own unique approaches to problems. This process is enhanced through a series of simulated experiences that are part of the learning agenda related to competency-based education.
- ❖ The curriculum will include several opportunities each year to explore the ingredients for change. This curriculum is led by a Ph.D. educator and experienced coach who, in collaboration with the program director, will teach the residents the tools for creativity and growth.

### **Leadership**

- ❖ Leadership development is deemed to be one of the unique and important missions of our program. We believe that in the future, surgical leadership will be defined by the ability to guide and work with multidisciplinary teams. This process of leadership development is not innate and can be taught. It involves learning the qualities of emotional intelligence, with attention to self-awareness, awareness of the needs of others and awareness of the context. The residents are exposed to workshops and reading on communication, stress management, conflict resolution, and understanding differences in personality types and styles of leadership that are geared towards valuing rather than controlling people. It is expected that our residents will understand the differences between managing and leading and that they will understand how to employ various styles of leadership appropriately depending on the needs of the system and the capabilities/expectations of the people in the system.

- ❖ Thoracic surgeons have an opportunity to become leaders within a multidisciplinary team. Leadership is something you do *with* people, not *to* people. We want our residents to value the role of true leadership so that they can maximize their potential.
- ❖ If residency can be considered as “growing years,” we want to recognize that the operative word is not “years”! In some programs, residents simply spend some years and finish. We expect our residents to grow. In order to facilitate this, we give “permission to struggle or fail”—and understand that this is inevitable—and thus “permission to learn.” At the same time, we emphasize the importance of consistent supervision by the faculty so that patient care is not compromised by the learning process. We hope to inculcate that learning is part of growing and to keep growing, one must keep learning. We encourage our faculty to model this. This is incorporated into our philosophy regarding lifelong learning and our hope is to teach the “tools” for lifelong learning such as courage (to change) and curiosity and compassion (for oneself as one confronts the struggles that inevitably accompany growth and learning).

### **Character Development**

We emphasize the development of the surgeon as a whole person whose human qualities are as critical as his/her knowledge of how to treat diseases of the thoracic cavity.

- ❖ Patients who present with diseases of the thoracic cavity often have life-threatening problems and are frightened. They will benefit from supportive and compassionate surgeons who are willing to take the time and the risk to engage patients at this level. We feel it is an essential mission of this program to teach this type of care.
- ❖ Residents will be evaluated using unique tools created by the program directors that will help identify their own unique and individual areas for growth in these skills.
- ❖ Residents will be exposed to workshops and reading, along with the faculty, that will emphasize growth and development of this human element. This is an integral part of the newly designed “skills” curriculum and will include opportunities for personal coaching.
- ❖ Residents will be trained and evaluated with respect to emotional intelligence; this will not only be associated with their growth as leaders, but with their growth as people. They will be trained in developing self-awareness, self-management, social awareness, social management and context awareness and management. Their portfolios will track their growth in these areas and will be evaluated in a criterion-based fashion with “formative” opportunities for continued growth through remediation and an eventual “summative” evaluation of their character as it reflects the qualities essential for professionalism in thoracic surgery.

## **2. PROGRAM DESIGN**

### **Year 1**

During the first year of thoracic surgery specialty training, our goal is that the resident acquire a strong base of knowledge of the many disease processes that are addressed by cardiothoracic surgeons. In addition, we want to provide maturation of their development in the ACGME competencies, since we believe that they will need to become skillful in knowledge, behavior, attitudes and skills to excel as a cardiothoracic surgeon. The first year of training exposes the resident to all aspects of thoracic surgery as well as to all members of our faculty. In four three-

month rotations, the resident participates in general thoracic surgery, adult-acquired heart surgery (including heart transplantation) and congenital heart surgery. There is progressive advancement of responsibility within each rotation and within the year such that most basic diagnostic, patient management, surgical and leadership skills are addressed. The learning effort in the first year is guided by a reading syllabus (compiled, maintained and updated by the faculty) that comprises the basic curriculum of cardiothoracic surgery.

## **Year 2**

The second year of training is intended to refine these skills, and to provide the freedom for individual development and the ability to broaden perspective on thoracic diseases and the health care system. More time is available for personal development and investigation. The rotations concentrate on adult-acquired cardiac and thoracic surgery and transplantation and contain administrative/leadership responsibility. The second-year resident is also encouraged to identify procedures that will complement and advance his/her career objectives. Because of the manner in which rotations are organized, the second-year resident can elect additional time on the university adult cardiac service, the congenital heart service, the general thoracic service or on outside electives (such as aortic surgery). At the conclusion of this second year of training it is anticipated that the resident will be able to perform the more routine and predictable cardiac and thoracic procedures without supervision (competence) and they should be able to perform the more complex procedures with the assistance of the faculty. At the conclusion of the second year, the resident should be able to independently develop diagnostic and treatment plans for all aspects of thoracic surgery. The resident should have both a broad and a deep knowledge base in the fundamental aspects of thoracic surgery, and be able to interact with other providers to provide optimal care for their patients. The proximity of the Portland VA Medical Center (PVAMC) allows us to utilize the unique features of this environment to further the resident's clinical and leadership development and to give the resident perspective on the continuity of care and on his/her interactions with other specialists. The ultimate goals are knowledge, technical skill, collegiality, and the personal ability to deliver both individual and team skills. This requires the thoracic surgery resident to be comfortable with his/her own ability as well as to learn to trust in the ability and dedication of others (teamwork). During the second year, the resident will have administrative responsibility to develop the residents' call schedule and educational conference schedule. The resident will also work with the faculty to learn how to effectively handle the types of system issues that can develop in a university thoracic surgery practice; it is anticipated that this will augment the development of leadership skills.

### **3. INDIVIDUAL ROTATIONS**

#### **Year One**

**First Rotation: General Thoracic Surgery:** *Dr. Sukumar (section chief), Dr. Schipper*

#### **Goals:**

- Full understanding of pre-operative testing and diagnosis of pulmonary, mediastinal and esophageal disorders.
- Appropriate role and performance of rigid and flexible endoscopy, mediastinoscopy (and clinical staging, adjuvant therapy), and traditional as well as video-assisted surgical techniques.
- Advanced understanding of clinical and operative staging and the roles of adjuvant and neoadjuvant therapy in treating thoracic malignancies.
- Understand and gain proficiency in diagnosing and treating esophageal carcinoma as multidisciplinary team, including pre-operative evaluation, esophagectomy, and post operative part of care.

- Learn how to treat esophageal perforation.
- Learn emergency airway management.
- Develop comfort with peri-operative critical care relating to management of hemodynamic and respiratory status.
- Appreciate multidisciplinary nature of patient selection and management.

**Process:**

A dedicated general thoracic surgery rotation is the resident's first rotation assignment in the OHSU Thoracic Surgery Residency program. The resident assigned to the thoracic surgery service will be committed to general thoracic surgery during the first three months of his/her residency training. He/she will participate in the management of all patients undergoing thoracic procedures at the Oregon Health & Science University (OHSU) hospital systems and at the Portland Veterans Affairs Medical Center. He/she will participate in the pre-operative conferences as well as in the pre-operative evaluation of these patients. He/she will be available to scrub on all thoracic surgery procedures and, as his/her skill level increases, it is expected that he/she will perform an increasing number of these procedures so he/she can meet the ABTS index case requirements in thoracic surgery. The service is designed to allow the resident to attend the outpatient clinics so that he/she can identify potential new patients and participate in those patients' preoperative assessment and evaluation of suitability and timing for surgery, as well as in their post hospital, convalescent care. It is expected that during the time the resident is on the thoracic surgery service, he/she will present several patients at the Monday morning case conferences. This will also give the resident an opportunity to do reading and research about the procedures in which he/she is involved so that his/her presentations can enhance the educational process. The resident will include these cases in his/her portfolio. During the days that the resident is not assigned to the operating room in thoracic surgery, it is expected that he/she will be reading from a structured syllabus developed by the faculty. As much as possible, the faculty will avoid calling upon the resident in thoracic surgery to assist in other operations occurring on other services, although this may happen occasionally, especially for unusual or interesting cases. The rotation is designed to illustrate to the resident how a multidisciplinary approach provides the best care to patients with thoracic illness. Through their work with the Division of Oncology (Craig Nichols, M.D., Chief) the residents on the thoracic rotation will be exposed to discussions about a variety of patients receiving care for lung cancer, not all of whom will be candidates for surgery, and several of whom will need a variety of staging procedures and other therapies in conjunction with possible thoracic surgery.

**Criteria for successful completion of rotation:**

At the completion of this rotation, it is anticipated that residents will appreciate the importance of the multidisciplinary approach to patient management. As part of the process of structuring this type of care, residents will go a long way toward completing the ABTS index requirements for thoracic surgery, but our hope is that they will learn much more. At the completion of this rotation, residents are expected to be knowledgeable about staging for lung and esophageal cancer, patient selection for thoracic procedures; be able to perform a thoracotomy, a formal lung resection (with help of an attending), thorascopic resection, and mediastinoscopy; and to understand postoperative management of common thoracic surgery complications. Specifically designed forms to evaluate the resident's competency in these areas will be included in his/her portfolio. Evaluation will be both formative (centered around individual cases during the rotation) and summative (global) related to the resident's performance and growth during the rotation. The resident is expected to achieve a status no lower than "early learner" on any of the evaluation criteria.

**Second Rotation: Adult Cardiac and Thoracic Surgery (VAMC):** *Drs. Ravichandran (Chief), Slater, Song, Schipper and Sukumar*

**Goals:**

- Gain understanding of pre-operative testing and diagnosis of coronary artery disease and valvular heart disease.
- Gain skill in selecting appropriate patients and in developing operative technique(s) for treatment of complex coronary artery disease, valvular heart disease, arrhythmias, and diseases of the thoracic aorta.
- Recognize and learn to apply various options for valve repair and replacement.
- Provide post-operative ICU management of patients following coronary and valvular heart operations is emphasized.
- In addition, the resident will be expected to extend his/her knowledge and skills in the treatment of patients with thoracic diseases.

**Process:**

The adult cardiothoracic surgery service at the VAMC contributes a major portion of the resident's training and development as a cardiothoracic surgeon. The resident will spend three months at the VAMC during the first year of his/her training and will finish his/her training with six additional months running the VAMC cardiothoracic service at the completion of the residency training program. The service responsibilities are organized in a manner that allows the resident to participate in relation to his/her increasing experience. The resident's first exposure to the adult cardiac surgery service will be during this second three-month block of his/her residency education. The resident will be assigned to the VA service, which will expose him/her to predominantly straightforward cases of coronary artery disease and valvular heart disease. Because of the nature of the VA system, which includes both cardiac and thoracic patients on the same service, the resident will also be able to use the skills he/she acquired in thoracic surgery to participate in the thoracic portion of the VA service. It is anticipated that the resident at this time will have sufficient skills to manage a service. However, it is understood that this will be his/her first exposure to managing a cardiothoracic service; for this reason the first-year resident at the VA will be closely supervised by the faculty attending VAMC service chief. The resident will be expected to participate in the pre-operative evaluation and management of patients, in their intra-operative management and in their postoperative care (including convalescent visits in the weekly clinic. The resident should be able to open and close sternotomies—including exhibiting the judgement necessary to make decisions, and they should be able to safely cannulate a patient for cardiopulmonary bypass. In addition, they are expected to be able to do some, if not most, of the critical components of selected, uncomplicated adult cardiac cardiac surgical cases. The resident is also expected to show improvement of the technical skills and judgment they learned in their first rotation related general thoracic surgery.

During this time, the resident is expected to attend and participate in adult cardiac care conferences as well as in designated teaching conferences. It is expected that the resident will be given time during the week to read about topics of adult cardiac surgery from a syllabus developed by the faculty. This reading is essential for the resident's frequent case presentations on Monday mornings where it is expected that he/she will be able to associate this reading with his/her clinical experience to further ingrain the knowledge of thoracic surgery relating to adult cardiac procedures.

### **Criteria for successful completion of rotation:**

By the end of the first adult cardiac rotation, it is expected that the resident will be able to run the administrative aspects of the service and make management decisions in an independent fashion, and that he/she will be able to open a non-redo sternotomy and have a strategy for the procedure. It is expected that he/she will be able to cannulate and decannulate the patient for CPB and safely and consistently takedown an internal mammary artery graft. It is anticipated that, with faculty assistance, he/she will be able to perform a straightforward coronary bypass grafting procedure.

### **Third Rotation: Pediatric (Congenital) Cardiac Surgery: Drs. Ungerleider (chief) and Welke**

#### **Goals:**

- Demonstrate understanding of pre-operative testing and diagnosis of congenital heart disease in neonates, children and adults.
- Develop a comprehensive understanding of the anatomy and physiology of congenital defects, and the nature and timing of their palliation or correction.
- Learn a variety of techniques and skills required to repair complex congenital heart defects and how to relate these skills to the practice of other aspects of thoracic surgery.
- Understand and appreciate the impact of extracorporeal circulation on the patient and various methods for harnessing the potentially damaging effects of CPB.
- Develop an understanding of the factors that interact during the convalescence of a patient following cardiac surgery and how to recognize and treat these problems.
- Learn to value the multidisciplinary nature of peri-operative management and decision-making is emphasized.
- Develop an understanding of how to manage patients on extracorporeal life support systems (ECMO, VAD).

#### **Process:**

The pediatric cardiac surgery rotation is the final three-month rotation of the resident's first year of training. At this time, it is expected that the resident will have achieved sufficient technical skills that he/she will be able to perform some of the more delicate pediatric procedures that are necessary in order to meet ABTS index case requirements. The pediatric cardiac surgery rotation is a teaching rotation in which the resident will participate in all daily pediatric ICU rounds as well as in the pre-operative decision-making on all patients (weekly pediatric cath conference). Additionally, the resident will participate in the surgical procedures and the postoperative management of all patients. During his/her time on the pediatric rotation, the resident will be responsible for decision-making (in conjunction with the surgical attendings and ICU faculty) on management of all postoperative patients and will learn how to direct a multidisciplinary team that consists of pediatricians, cardiologists, residents, nurses and support staff (e.g. respiratory therapists). The resident will have reading assigned from a syllabus compiled by the faculty and will be responsible for presenting selected cases at Monday morning teaching conference. Residents interested in the field of pediatric cardiac surgery can elect to spend additional time on the pediatric service in October-December of their second year. Residents who spend this additional time will be given more responsibility (if warranted) in the operating room with opening and closing chests, cannulating and decannulating patients for CPB and performing cases, under faculty supervision, that are within their capabilities. During this time, the resident will be able to present pediatric cases at Monday teaching conference which will expand his/her review of relevant literature and familiarity with the practice of pediatric cardiac surgery.

### **Criteria for successful completion of rotation:**

At the completion of this rotation, the resident will demonstrate ability to work as a collaborative team member during pre-operative decision-making conferences and during the convalescent care of the patient in the ICU and on the ward. He/she will be able to perform a sternotomy on a pediatric patient and to routinely close the chest in these patients. The latter requires that the resident exhibit judgment in awareness of the patient's often changing hemodynamic state during chest closure and that he/she knows when the patterns are abnormal and require calling for help or simply "reopening" the sternum. The resident should be able to perform a PDA ligation, a coarctation repair (in a non-neonate) and cannulate a child for CPB. The resident should be able to safely open a redo sternotomy (with supervision). The resident should be able to provide capable assistance on complex cases for which he/she is not the primary surgeon - since this reflects an ability to "engage" and be aware of what is happening in the operation. With the assistance of the faculty, the resident should be able to perform simple congenital procedures (e.g. ASD closure, VSD closure in older children, PA banding, aortopulmonary shunt, repair of vascular ring, etc).

**Fourth Rotation: Adult Cardiothoracic Surgery (OHSU):** *Drs. Slater (section chief), Ravichandran, Song, Ungerleider, Schipper and Sukumar*

### **Goals:**

- Advanced understanding of adult-acquired cardiac surgery. This third three-month rotation introduces the resident to the more complex types of cardiac cases that comprise the patient population at the University Hospital. The resident will be involved in seeing consults and in helping to determine the surgical planning for patients with the supervision of the faculty attending service chief.
- He/she will participate with the multidisciplinary ICU care team and take a leadership role in the postoperative care of the University patients (with the guidance of the ICU and CT surgery attendings).
- The resident will gain experience with more complex issues such as cardiac transplantation and ventricular assist devices (VAD). He/she will participate in more sophisticated valve operations such as Ross procedures and mitral valve repair. There will be an opportunity to participate in cases that relate to trauma, thoracic aorta disease and congenital heart disease presenting in adults.
- The resident will be expected to attend weekly clinics and patient management conferences.
- The resident will become an integral part of the OHSU foregut surgery service which combines the efforts of both the general surgery and thoracic surgery services in treating diseases of the esophagus. As the most experienced resident member of this team, the resident is expected to take a leadership role in working with the general surgery residents assigned to these patients as well as in helping coordinate the collaboration between the various services.

### **Process:**

The OHSU adult cardiothoracic surgery rotation is the second three-month rotation on cardiac surgery and is intended to augment the resident's exposure to the breadth of cardiac surgical problems. This rotation is sequenced after the VAMC cardiac rotation with the expectation that the resident will learn basic skills at the VA and then be able to expand them as he/she gains exposure to more complicated cases at the University service. The resident will be assigned to run the "University (OHSU) Service" and will have guidance and supervision from Drs. Slater and Song to ensure that his/her developing organizational abilities are appropriately directed. Since OHSU is a nationally recognized center of excellence for transplantation and the use of ventricular support devices, the University Service has a higher percentage of more complicated cardiac procedures, including complex valve operations (Bentall, Ross procedure, homografts, endocarditis, valve repair)

as well as thoracic aneurysm surgery and complex coronary surgery. The transplant volume is such that it is possible for our residents achieve UNOS certification for heart transplantation during their residency. In order to do this, we will make an effort to involve a thoracic resident in every transplant as the primary surgeon for both procurement and implantation. The clinical services will be flexible to support this. The resident will be responsible for managing these patients after surgery. Because of the complexity of many of the University cases, the amount of time the resident will spend as primary surgeon vs. first assistant will be variable, depending on the skill of the resident and the nature of the cases. This can be helpful to the resident who has already had an opportunity to perform some straightforward cardiac cases at the VAMC. The resident will attend the University cardiac catheterization conference on Friday afternoons and will be able to listen to and participate in discussion regarding patient management. In addition, the resident will become intricately connected to the adult foregut service, which includes members of both the general surgery department and the thoracic surgery division who share an interest in treatment of disorders of the esophagus. Furthermore, they will help manage the University thoracic surgery service and by this time, it is anticipated that they will possess the skills needed to enable them to participate in a meaningful way in virtually every thoracic surgical case. In this three- month period, the resident will be exposed to the entire range of the demanding University cardiothoracic surgery service.

#### **Criteria for successful completion of rotation:**

The resident will understand sophisticated decision making for patients with coronary artery disease and demonstrate an ability to work as a team member in the pre- and postoperative care process. He/she will show competency in cardiac surgery as an assistant and will be able to perform the entirety of a coronary bypass graft using saphenous veins, internal mammary arteries or free arterial grafts. He/she will demonstrate ability to manage difficult postoperative problems and make decisions in a timely manner so that patients benefit. He/she will be able to do at least parts of (if not all of) a valve replacement procedure and will understand the conduct of valve surgery. The resident will have participated in organ procurement for transplantation and understand the process of evaluating organs for transplant. He/she should have the skills to be the primary surgeon for organ implantation. The resident will demonstrate the ability to manage patients on a VAD. The resident will demonstrate competence in managing patients with thoracic trauma. The resident will understand the multidisciplinary nature of esophageal surgery and be able to make decisions for managing these patients pre and postoperatively. The resident will now be a skillful thoracic surgeon who can perform many of the procedures on the lung and esophagus required in the practice of thoracic surgery.

#### **Expectations at completion of Year One:**

The resident will be evaluated on specific cases (formative evaluation) four to eight times during each rotation and at the completion of each rotation, the resident will receive a final, summative evaluation related to the goals and objectives of the rotation. He/she will also receive a 360° evaluation at the end of each rotation from various, interdisciplinary team members assessing his/her performance in non-medical competencies. (The program director has participated in the development of a Web-based e-learning module that can teach evaluators a “common language” and shared cognitive schemas to help guide this evaluation process). The resident will have performed self-assessment using the PPDI, will have evaluated the program, each rotation they have been on, and the faculty.

- The resident will have completed a Practice-based Learning project based on his/her experience within the system and he/she will present this project at an educational conference.
- The resident will have completed the reading in the core curriculum syllabus.

- The resident will receive a “passing” score on the ABTS in-service training exam.
- He/she will have obtained a level of “early learner” or “competent” in all major PPDI categories.
- He/she will have completed the web based e-learning project on the competencies and will have shared his/her journal entries with the program director.
- He/she will have attended the educational conferences and will have participated in the SESATS reviews.

The areas of “deficiency” noted on the in-service training exam taken near the end of the first year will be used to tailor and guide his/her learning process for the next year. Any areas of major limitation with respect to the ACGME competencies, or with respect to the knowledge and skill base necessary to perform cardiothoracic surgery will have been identified by the program director and will be addressed.

## **Year Two**

### **First Rotation: Portland VAMC Adult Cardiac Rotation: Drs. Ravichandran (chief), Slater, Song**

#### **Goals:**

- Gain increasing independence as the resident begins the second training year managing and concentrating on the cardiac service at the VAMC. The service chief will provide backup and support, but this is an opportunity for the resident to demonstrate how his/her education during the first year of training has enabled him/her to mature into a surgeon who can lead a cardiac service.
- The resident will be primary surgeon for the majority of the cardiac cases performed at the VAMC.

#### **Process:**

During this three-month, second-year rotation, the resident will have “administrative” responsibility for the deployment of general surgery residents assigned to the VAMC cardiothoracic service, and for the assignments of non-accredited fellows. The resident will be responsible for working with Dr. Schipper (education director for the residency program) on developing the educational schedule. He/she will be expected to present cases from the VAMC cardiac service at the Monday morning teaching conferences. There will be a first-year cardiac surgery resident assigned to the VA thoracic cases and it is expected that the second-year resident assist his/her first-year colleague as they become oriented to the VA and to thoracic surgery. This VA cardiac rotation will provide the resident an opportunity to perform the majority of the surgical cases. He/she will be involved with the Thursday morning case conferences where pre-operative decisions are made, with the ICU and wards (for patient care) and with the clinics for postoperative patient follow-up and care. The resident should begin working on his/her research project (required for presentation at Surgical Grand Rounds at the completion of training) at this time if he/she has not already started.

#### **Criteria for successful completion of the rotation:**

During this second rotation on adult cardiac surgery at the VAMC, it is anticipated that the resident will have acquired sufficient skills that he/she will be able to perform more complicated cases, including valve replacements and complex coronary artery bypass grafting procedures (including redos). He/she should be able to perform the entirety of a straightforward case with the faculty involved only during the critical portions of the procedure. The resident should be exhibiting

maturity as a leader and should be a prominent contributor at the Thursday morning cath conferences as well as at the Friday afternoon adult cardiac cath conference at the University, which he/she should attend when he/she is not involved in patient care at the VAMC. He/she should provide positive energy to the team care in the CICU (adult cardiac ICU) and should be able to direct the deployment of the general surgery residents assigned to the service in a manner that enhances their education. The resident should begin displaying a facile ability to “manage” by running the resident call schedule as well as the thoracic educational conference (in collaboration with Dr. Schipper).

### **Second/Elective Rotation:**

#### **Goals:**

The three-month period beginning in October of the resident’s final year of training is allocated to elective study/training. This time affords the resident an opportunity to continue his/her exposure to the complex adult cardiac volume on the OHSU University service, or to acquire further exposure to general thoracic or pediatric cardiac surgery. The intention of this rotation is to enable the resident to expand knowledge and skills in the area that he/she is hoping to pursue after training. It is also possible for the resident to craft an elective rotation at an outside institution, either locally or nationally. Elective rotations must be approved by the program director and must provide an educational curriculum that can be evaluated and from which there are clear goals and criteria for achievement. They can include time spent on non-surgical specialty services such as in the cath lab, echo lab or in esophageal manometry if consistent with their career goals and if the training period and curriculum will help them develop the knowledge and skills they need to be successful as a cardiothoracic surgeon.

#### **Process:**

This period of time for an elective rotation is chosen since the resident should now be ready to explore options for his/her career. He/she should have achieved enough technical and leadership maturity to be able to make this a positive experience. Furthermore, whatever area the resident chooses to pursue will not interfere with the training of the first-year resident who will be on the VAMC cardiothoracic service. It is hoped that the resident will pursue options at OHSU (because the small nature of the program makes service coverage more difficult when the resident is “off-site”). However, it is possible for the resident to elect to pursue training at remote institutions through special arrangement. A faculty mentor will be intimately involved with the resident’s training during this elective time.

#### **Criteria for successful completion of rotation:**

Criteria will be developed on an individual basis between the resident and his/her faculty mentor on the rotation he/she chooses. The resident will be responsible for achieving these criteria which will be designed to measure growth of his/her abilities as a CT surgeon.

**Final Rotation: PVAMC Cardiothoracic Rotation (service chief):** *Drs. Ravichandran (chief), Slater, Schipper, Song, Sukumar*

**Goals:**

This final six-month rotation on the adult cardiothoracic surgery service will be an opportunity for the resident to completely manage the service for the PVAMC. It is anticipated that the resident will have sufficient skills to perform any and all cases on complex cardiac and thoracic surgery patients.

**Process:**

The resident will be given more freedom in opening and closing cases (including difficult redos), as well as cannulating patients for and commencing cardiopulmonary bypass without the presence of the faculty (implying that the resident has learned how to perform all the preliminary steps required for a specific procedure). The faculty will still be present during the critical portions of each procedure, but usually in an assistant role. The resident will be able to instruct general surgery residents on how to open a sternum or chest and will be encouraged to learn how to teach operative skills in cardiothoracic surgery. The resident will see patients prior to surgery and review their data as well as participate with the surgical attendings and cardiologists in the decision-making. Under the current structure of this program, it is the expectation that the resident completing this final adult cardiothoracic rotation will be preparing to enter the field of cardiothoracic surgery and that he/she feels comfortable with the responsibilities and expectations for the next phase of his/her career. At the completion of this final rotation on the adult cardiac surgery service, the resident will present a clinical research project at Surgical Grand Rounds.

**Criteria for successfully completing rotation:**

The resident will be a self-sufficient cardiothoracic surgeon who can function, if necessary, in routine circumstances without constant supervision by the faculty.

**Expectations at Completion of Year Two:**

The resident will have completed the portfolio assignments necessary to indicate growth and development of his/her competency-based education and will be considered by ALL members of the faculty to be ready for advancement into the field of cardiothoracic surgery. The resident must be considered competent in all ACGME competencies and will be considered to have the tools for lifelong learning necessary to advance in these areas. The resident will demonstrate the ability to use judgment and most importantly, to recognize his/her strengths and limitations (tools for this are a part of the curriculum), and to know when to ask for help. The resident will have completed a research project that is well presented at Surgical Grand Rounds. The resident will pass the ABTS in-service training exam. The faculty will complete an end-of-training evaluation that documents what the resident can do without supervision and where supervision may still be necessary, and the resident will be informed of this evaluation.