

**University of California, San Francisco,  
Department of Radiation Oncology  
Residency Training Program  
Head and Neck and Thoracic Service  
Educational Objectives for PGY-3 Residents  
Jeanne Quivey, M.D.**

**Head and Neck Service**

The goal is to assure that all graduates are competent in patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice. This document is to help you understand the skill set you should be expected to have by the end of your residency.

**Patient Care**

PGY-3 residents should try to gain as much experience as possible in the treatment of head and neck cancer patients, with particular emphasis on the skills necessary to productively contribute in the multidisciplinary clinic setting. PGY-3 residents should attempt to conduct a focused yet detailed history and physical examination, discuss appropriate treatment options with the supervising attending, understand how these options interface with complementary or competing surgical and systemic therapy options, work with the attending to design appropriate radiation plans, propose appropriate radiation dosages and discuss the rationale with the supervising attending, help to manage patients during radiation treatment, and assist in providing patient care in follow-up. Residents should strive to attain:

- Increased familiarity with:
- focused site-specific history taking
- fundamentals of head and neck subsite anatomy
- general otolaryngologic and cranial nerve examination

Basics of treatment planning skills including how to:

- perform conventional or CT-based simulation under supervision, with an understanding of isocenter placement, immobilization technique and devices, and surface localization of targeted tissues or at-risk normal structures
- understand how to target and match conventional photon fields
- develop familiarity with how to orient and match electron fields
- develop understanding of orthovoltage applications and technique
- develop familiarity with head and neck brachytherapy techniques
- understand proper use of beam angles, wedges, weighting, and selection of photon/electron beam energies

- understand techniques to minimize dose inhomogeneity and optimize dose distribution, such as skin bolusing, intracavity tissue deficit compensation, surface shielding, and intraoral stenting
- understand concept of 3D dose compensation with field-in-field multileafs
- understand the ICRU 50/62 defined principles of clinical target volume design for the purposes of IMRT treatment planning
- become familiar with image-guided delineation of gross disease and critical normal anatomy, and how to optimally reconcile radiographic findings with clinical examination

Basic indications, treatment outcomes, and expected treatment-related morbidity of radiotherapy in patients with:

- nasopharyngeal carcinoma
- squamous and non-squamous cancers of the oral cavity, oropharynx, larynx, hypopharynx, paranasal sinuses, and nasal cavity
- non-melanoma skin cancers of the head and neck
- melanoma of the head and neck
- major and minor salivary gland neoplasms
- advanced thyroid gland neoplasms
- mesenchymal disease of the head and neck
- orbit and ear-related malignancies
- neurogenic neoplasms of the head and neck, including paragangliomas
- locoregionally recurrent head and neck cancer
- advanced *de novo* head and neck disease or metastatic disease to the head and neck region requiring palliation

Familiarity with the National Comprehensive Cancer Network stage and site-specific practice guidelines for head and neck cancers

Competency in the multidisciplinary setting via:

- effective and collegial communication with referring physicians and other allied providers
- comprehensive oversight of supportive patient care during the course of radiotherapy
- emphasis on compassionate, independent interaction with patients and their families

## **Medical Knowledge**

PGY-3 residents should try to gain a basic understanding of head and neck cancer and the role radiation plays in the management of this disease. The specific areas of medical knowledge are outlined below.

Understand

- head and neck epidemiology and mortality rates

- proper initial work-up and AJCC-defined staging
- head and neck subsite anatomy, including cranial nerve anatomy
- fundamentals of molecular etiology and pathophysiology of disease
- physiologic and functional consequences of both disease and treatment
- head and neck imaging techniques, including tomographic imaging and ultrasound
- multidisciplinary treatment formulation and expected outcomes, as described above
- recommended post-treatment surveillance approaches
- basic techniques behind the design of IMRT-based treatment
- basic techniques behind the design of electron beam treatment
- basic techniques behind the design of orthovoltage treatment
- head and neck brachytherapy indications and techniques

### **Practice-Based Learning and Improvement**

PGY-3 residents are taught to practice evidence-based medicine through clinical case discussion as well as the National Comprehensive Cancer Network practice guidelines.

### **Interpersonal and Communication Skills**

PGY-3 residents are taught to develop effective communication skills in patient care management, communication with other physicians, mid-level providers, and nurses. Communication skills are taught through resident participation in didactic lectures (both departmental and institutional) and during visiting professor sessions.

### **Professionalism**

Every resident completes mandatory computer-based training in ethics and discrimination and work place professionalism.

### **System-Based Practice**

Individual faculty members teach system-based practice issues. Didactic lectures concerning system-based practice are also provided by visiting professorships and discussion at departmental meetings.

## **Thoracic Service**

The goal is to assure that all graduates are competent in patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice. This document is to help you understand the skill set you should be expected to have by the end of your residency.

### **Patient Care**

PGY-3 residents should try to gain as much experience as possible in the treatment of thoracic cancer patients, with particular emphasis on the skills necessary to productively contribute in the multidisciplinary clinic setting. PGY-3 residents should attempt to conduct a focused yet detailed history and physical examination, discuss appropriate treatment options with the supervising attending, understand how these options interface with complementary or competing surgical and systemic therapy options, work with the attending to design appropriate radiation plans, propose appropriate radiation dosages and discuss the rationale with the supervising attending, help to manage patients during radiation treatment, and assist in providing patient care in follow-up. Residents should strive to attain:

Increased familiarity with:

- focused site-specific history taking
- fundamentals of thoracic subsite anatomy
- general chest wall and lung examination

Basics of treatment planning skills including how to:

- perform conventional or CT-based simulation, with an understanding of isocenter placement, immobilization technique and devices, and surface localization of targeted tissues or at-risk normal structures
- understand principles of 4D CT simulation and other techniques for motion correction in radiation planning and delivery
- understand how to target and match conventional photon fields
- develop familiarity with how to orient and match electron fields
- understanding of endobronchial and esophageal brachytherapy techniques
- understand proper use of beam angles, wedges, weighting, and selection of photon/electron beam energies
- employ techniques to minimize dose inhomogeneity and optimize dose distribution, such as heterogeneity corrections, tissue compensation, and internal target volume creation
- understand principles of linac-based and CyberKnife stereotactic body radiation therapy
- understand concept of 3D dose compensation with field-in-field multileafs
- understand the ICRU 50/62 defined principles of clinical target volume design for the purposes of IMRT treatment planning

- become familiar with image-guided delineation of gross disease and critical normal anatomy, and how to optimally reconcile radiographic findings with clinical examination

Basic indications, treatment outcomes, and expected treatment-related morbidity of radiotherapy in patients with:

- early-stage non-small cell lung cancer
- advanced-stage non-small cell lung cancer
- limited- and advanced-stage small cell lung cancer
- thymic tumors and malignancies
- chest wall and intrathoracic sarcoma
- mesothelioma
- carcinoid and neuroendocrine tumors
- malignancies of the esophagus and gastroesophageal junction
- locoregionally recurrent thoracic tumors
- metastatic disease to the lungs or brain requiring palliation

Familiarity with the National Comprehensive Cancer Network stage and site-specific practice guidelines for thoracic malignancies

Competency in the multidisciplinary setting via:

- effective and collegial communication with referring physicians and other allied providers
- articulation of clinical literature in a tumor board setting
- emphasis on compassionate, independent interaction with patients and their families

## **Medical Knowledge**

PGY-3 residents are required to gain a basic understanding of thoracic cancers and the role radiation plays in the management of these diseases. Critical review of historical and current thoracic cancer literature will be emphasized. The specific areas of medical knowledge are outlined below.

Understand

- lung cancer epidemiology and mortality rates
- proper initial work-up and AJCC-defined staging
- thoracic subsite anatomy, including nodal anatomy
- fundamentals of molecular etiology and pathophysiology of disease
- physiologic and functional consequences of both disease and treatment
- thoracic imaging techniques, including 3D and 4D tomographic imaging and PET
- multidisciplinary treatment formulation and expected outcomes, as described above
- recommended post-treatment surveillance approaches
- basic techniques behind the design of stereotactic body radiotherapy
- basic techniques behind the design of complex 3D- or IMRT-based treatment
- basic techniques behind the design of complex electron beam treatment
- endobronchial or esophageal brachytherapy indications and techniques

### **Practice-Based Learning and Improvement**

PGY-3 residents are taught to practice evidence-based medicine through clinical case discussion as well as the National Comprehensive Cancer Network practice guidelines.

### **Interpersonal and Communication Skills**

PGY-3 residents are taught to develop effective communication skills in patient care management, communication with other physicians, mid-level providers, and nurses. Communication skills are taught through resident participation in didactic lectures (both departmental and institutional) and during visiting professor sessions.

### **Professionalism**

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