

**CA-1 & 2 Curriculum for Post-Anesthesia Care Unit  
(PACU) Rotation  
West Virginia University Department of Anesthesiology**

**Description of Rotation or Educational Experience**

CA-1 & 2 residents will be assigned to the PACU for the two week rotation. The goals for this rotation are to understand the process of recovery from anesthesia, to become proficient at the management of common postoperative problems and emergencies, to manage postoperative pain, to work well with PACU nurses and other medical professionals in the care of postoperative patients, and to understand criteria for discharge of patients from the PACU.

**Patient 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:

- Assess and manage postoperative pain.
- Properly and effectively treat postoperative nausea and vomiting.
- Properly assess and manage delayed emergence including ventilator management and extubation in the PACU.
- Assess and manage postoperative respiratory issues such as obstruction, laryngospasm, bronchospasm and croup.
- Appropriately manage hemodynamic problems such as hypotension, hypertension and arrhythmias.
- Manage fluid and electrolyte problems.
- Manage renal disturbances of retention, oliguria and anuria.
- Recognize and treat postoperative weakness and delirium.
- Assess and treat postoperative shivering, hypothermia and hyperthermia.
- Assist in the management of emergencies in the PACU, such as respiratory and cardiac arrest.
- Perform required procedures as needed in the PACU such as emergency intubation, IV placement, arterial line placement and central line placement.
- Discharge patients using established discharge criteria.

**Competencies**

- Appropriate evaluations of the immediate postoperative patient
- Appropriate patient-specific plans for postoperative pain management
- Appropriate patient-specific plans for postoperative nausea and vomiting
- Appropriate patient-specific management of patients with delayed emergence, postoperative ventilatory support and evaluation for extubation in the PACU
- Appropriate diagnosis and treatment of obstruction, laryngospasm, bronchospasm and croup

- Appropriate evaluation and patient-specific treatment of hypotension, hypertension and arrhythmias
- Appropriate fluid management, including blood and blood product transfusions
- Appropriate evaluation and management of urinary retention, oliguria and anuria
- Appropriate evaluation and treatment of postoperative weakness and post-operative delirium
- Appropriate treatment of postoperative shivering, hypothermia and hyperthermia
- Appropriate evaluation and management of respiratory and cardiac arrest
- Perform emergency intubations if needed
- Placement of peripheral IV catheters, arterial lines and central lines if needed
- Appropriate use of discharge criteria to discharge patients from the PACU

### **Objectives**

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

- Evaluate a minimum 20 patients for post-operative pain and treat appropriately
- Evaluate a minimum 15 patients for post-operative nausea and vomiting and treat appropriately
- Evaluate a minimum of 20 patients using established discharge criteria for discharge from the PACU
- Evaluate and treat a minimum of 5 patients with hemodynamic instability
- Evaluate and treat a minimum of 5 patients with fluid/electrolyte imbalances
- Evaluate and manage a minimum of 2 patients with postoperative respiratory problems
- Evaluate and manage a minimum of 2 patients with shivering/hypothermia
- Have a working knowledge of the evaluation and management of postoperative renal disturbances, hyperthermia, delayed emergence, postoperative weakness, emergence delirium, arrhythmias, respiratory arrest and cardiac arrest
- Successful demonstration of adequate patient care as assessed by faculty on Written Formative Evaluations

### **Medical Knowledge**

#### **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 pharmacology of opioids, opioid antagonists, benzodiazapines, benzodiazepine antagonists, NSAIDS, muscle relaxants and their reversal agents, antiemetics, ionotropes and pressors, local anesthetics. Discuss residual activity and drug interactions.
- Discuss the various treatment options for postoperative pain control
- Discuss the various treatment options for postoperative nausea and vomiting
- Describe the causes and treatment of postoperative shivering and hypothermia
- Detail the signs, symptoms and treatment of malignant hyperthermia
- Discuss the causes and treatment of hypertension in the PACU

- Discuss the causes and treatment of hypotension in the PACU
- Discuss the evaluation and treatment of cardiac arrhythmias
- Discuss the causes and treatment of postoperative fluid and electrolyte imbalances
- Discuss the causes and management of hypoxemia in the PACU
- Describe why airway obstruction occurs in the PACU, and how to manage it
- Describe the causes and treatment of urinary retention, oliguria and anuria in the PACU
- Describe how to evaluate for and treat postoperative weakness
- Describe the evaluation of, causes and treatment of postoperative delirium
- Describe the management of respiratory depression and arrest
- Describe the management of cardiac arrest, including ACLS and PALS protocols
- List the proper equipment and personnel required to manage a PACU
- Describe discharge criteria in the PACU

### **Competencies**

- Be able to discuss the pharmacology of anesthetic drugs and other drugs used during surgery and in the PACU, their residual activities and any drug interactions
- Be able to discuss various drugs used for postoperative pain management
- Be able to discuss drugs and other treatment modalities used to treat postoperative nausea and vomiting
- Be able to discuss the causes and treatment of postoperative shivering and hypothermia
- Be able to describe in detail the signs, symptoms and treatment of malignant hyperthermia
- Be able to discuss the causes and treatment of postoperative hypotension and hypertension
- Be able to discuss the causes, diagnosis and treatment of fluid and electrolyte imbalances
- Be able to list the causes of hypoxemia in the PACU and give treatment options
- Be able to list the signs and symptoms of airway obstruction, and give treatment options
- Be able to list the causes of renal dysfunction in the PACU and give treatment options
- Be able to discuss the evaluation and treatment of postoperative weakness
- Be able to describe the causes, evaluation and treatment of postoperative delirium
- Be able to evaluate EKG's for arrhythmias and list causes and treatment options
- Be able to describe the management of postoperative respiratory depression and arrest
- Be able to list ACLS and PALS protocols for the management of cardiac arrest
- Be able to describe the equipment and personnel required to manage a PACU
- Be able to list established discharge criteria

### **Objectives**

- Pass written examination on post-anesthesia care at the completion of the rotation

- Show acquisition of medical knowledge in case scenario discussions with faculty members
- Successful knowledge acquisition as assessed by faculty on Written Formative Evaluations

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

### **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 postoperative management problems in a timely manner
- To independently seek answers to clinical questions and incorporate this knowledge acquisition into appropriate management and care plans
- To be able to access computer-based reference sources pertinent to the management of postoperative patients

### **Competencies**

- Actively participate and seek educational opportunities
- Systematically analyze anesthesia practice with the post-anesthetic assessment of patients, using quality improvement methods, and restructure anesthetic practice based on improved patient outcomes

### **Objectives**

- Keep a log of problems managed, including etiology, treatments and results
- Successful demonstration of adequate practice-based learning and improvement as assessed by faculty on Written Formative Evaluations

## **Systems Based Practice**

### **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 evaluation and treatment of postoperative problems based on the severity and acuity of the problems
- Function as a member of a care team with surgeons, nurses, respiratory technicians and consultation physicians
- Understand when utilizing consultation physicians is appropriate

### **Competencies**

- Advocate for quality patient care and optimal patient care systems
- Work in interprofessional teams to enhance patient safety and improve patient care quality

**Objectives**

- Successful demonstration of adequate systems based practice as assessed by faculty on Written Formative Evaluations
- Demonstrates satisfactory performance as a team member in the 360 degree evaluation

**Professionalism****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 care
- Provide a role model to students and related practitioners as to commitment and professional conduct in the care of patients

**Competencies**

- Compassion, integrity and respect for others
- Respects patient privacy and autonomy

**Objectives**

- Successful demonstration of adequate professionalism as assessed by faculty on Written Formative Evaluations
- Positive assessment of professionalism on 360 degree evaluation

**Interpersonal and Communication Skills****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 postoperative information from the intraoperative anesthesia care team and PACU nurses
- Effectively discuss postoperative problems with the patient, family, surgeon and consultation physicians
- Discuss treatment plans with the PACU nurse caring for the patient

**Competencies**

- Communicate effectively with patients and families across a broad range of socioeconomic and cultural backgrounds
- Communicate effectively with physicians, other health professionals and health-related agencies
- Maintain comprehensive, timely, and legible medical records

**Objectives**

- Successful demonstration of adequate interpersonal and communication skills as assessed by faculty on Written Formative Evaluations

- Positive assessment of interpersonal and communication skills on 360 degree evaluation

### Teaching Methods

What teaching methods are you using on this rotation or educational experience?

- Didactic lectures
- Postoperative discussion of pertinent physiologic changes and case management
- Case scenario discussions
- Review and discussion of log book
- Suggested readings

### Assessment Method (residents)

- Written Examination
- Chart Stimulated Recall (implementing)
- Global Rating Scale
- 360 Degree Evaluation (implementing)

	Patient Care	Med Knowledge	Practice Based Learning	System Based Practice	Professionalism	Communication
Global Rating Scale	Weekly	Weekly	Weekly	Weekly	Weekly	Weekly
Chart Stimulated Recall (proposed)	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly
Written Examination	Monthly	Monthly				
360 Degree Evaluation (implementing)					Monthly	Monthly

### Assessment Method (Program Evaluation)

- Performance of residents on written and oral examinations
- Performance on the post-anesthesia care subset of questions in the In-Service Examination administered by the American Board of Anesthesiology
- Performance on the post-anesthesia care subset of questions in the Anesthesia Knowledge Test
- Review of resident evaluations of faculty performance
- Review of resident program evaluations

### Level of Supervision

Directly supervised by Charge Anesthesiologist

### Educational Resources

Recommended readings and references:

Clinical Anesthesia Fifth Edition. P Barash, B Cullen, R Stoelting.

Postoperative Recovery, pp 1379-1404  
Management of Acute Postoperative Pain, pp 1405-1440  
Cardiopulmonary Resuscitation, pp 1499-1520  
Appendix. Electrocardiography, pp 1539-1549  
Comprehensive Postanesthesia Care. M Brown, E Brown.  
ASA Standards for Postanesthesia Care:  
<http://www.asahq.org/publicationsAndServices/standards/36.pdf>

## **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.

Written by Melanie B McMurry, MD, February 8, 2007  
Approved by the Anesthesiology Education Committee 2-26-2007