**University of the Philippines Manila**

**College of Medicine**

**Anesthesiology 260 (Internship in Anesthesiology)**

**Course Pack for LU VII AY 2020-21**

1. **Course Catalogue**
   1. Course Number: Anesthesia 260
   2. Course Title: Internship in Anesthesiology
   3. Course Description: Supervised participation in routine post-anesthesia care and the identification and management of postoperative anesthetic complications and resuscitation in the post anesthesia care unit (PACU).
   4. Prerequisite: For UPCM students, Anesthesiology 251; For Post-Graduate Interns, must be a registered intern of the Philippine General Hospital (PGH)
   5. Semester offered: 1st and 2nd semesters, AY 2020-21
   6. Course Credit:
   7. Number of hours:
   8. Meeting Type: Blended, Remote, Online
   9. Course Goals: At the end of the course, the student should be able to diagnose and manage the most common postoperative complications seen in the PACU, and attend a simulation of a critical event (online or face-to-face).
2. **Course Description**

Anesthesiology 260 is a one-week rotation in the Post Anesthesia Care Unit (PACU) which provides the intern (LU VII student) supervised involvement in the monitoring and care of post-operative patients. It provides the intern the clinical experience for the care of patients recovering from general, regional and monitored anesthesia for all types of surgeries and procedures. There are many physiologic disorders which need to be diagnosed and managed in the PACU during emergence from the effects of anesthesia and surgery. Emphasis is given in the recognition and care of post-operative problems as well as learning the various methods of providing adequate postoperative analgesia. The course also provides the student with the opportunity to experience firsthand the principles and practices of Crisis Resource Management (CRM) in a simulated setting.

**Mode of Delivery**

The course has been modified from its original format to adapt to the ongoing COVID pandemic. Sessions will be conducted purely online until such a time that interns are allowed to go into the hospital. Didactics and self-directed learning will be conducted via synchronous and asynchronous meetings per block, during the one week rotation. An online small group discussion will be conducted with the entire block during the rotation, as well as an online simulation/CRM session . This will be scheduled and conducted by the consultant assigned to the block for the week. At the end of the rotation there will be a comprehensive examination on the topics discussed during the week. Synchronous sessions will be conducted via Zoom, and asynchronous sessions will be uploaded to the UP Manila Virtual Learning Environment (UPMVLE) as well as the UP Manila Canvas account for the course. The exam will be conducted via the Canvas account. For those interns without reliable internet access, a flash drive/SD card can be made available for asynchronous sessions.

1. **Learning Objectives and LO to be Addressed per Course Objective and Topic**

**Learning Objectives:**

**General Objective:** At the end of the one week PACU rotation, the intern is expected to have acquired basic knowledge and skill in the care of the post-operative patient recovering from anesthesia.

**Specific Objectives:**

1. To be able to identity the elements of a PACU facility
2. Run through a handover checklist when a patient is admitted at the PACU.
3. Assess a patient’s readiness for PACU discharge based on prescribed clinical criteria.
4. Recognize and institute initial management for the most common post-anesthesia complications seen in the PACU.
   1. Hypoxemia
   2. Hypoventilation
   3. Upper Airway Obstruction
   4. Hypotension
   5. Hypertension
   6. Cardiac Dysrhythmias
   7. Oliguria
   8. Hypothermia
   9. Emergence Delirium
   10. Delayed Awakening
   11. Bleeding Disorders
   12. Pain
   13. Nausea and Vomiting
   14. Shivering
   15. Recurarization
5. Monitor post-anesthesia patients, anticipating possible problems based on type of surgery and anesthesia
6. Outline an evidence-based postoperative pain management plan
7. Application of Crisis Resource Management (CRM) principles (leadership/followership, effective communication) during a simulated clinical scenario.

**Course Content/Outline:**

1. Introduction to the PACU
2. Monitoring the Post-Operative Patient
3. Effect of Surgery and Anesthesia on Physiology
4. Recovery from Anesthesia and Discharge from the PACU
5. Diagnosis and Management of Common Problems and Complications in the Postoperative Period
6. Acute Postoperative Pain Management
7. Crisis Resource Management in the PACU

**Learning Objectives to be Addressed per Course Objective/Topic**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course Objectives** | **LO** | **Content** | **Activity** | **Resources** |
| To be able to identify the elements of a PACU facility | LO1, LO2, LO3, LO4, LO5, LO6, LO10 | * Definition of PACU * PACU staff requirements * PACU staff duties and responsibilities * PACU location within the hospital * Layout of a properly designed PACU * Equipment needed at the PACU | * Course Orientation * Introduction to PACU Lecture * PACU Walkthrough Video * COVID OR Walkthrough Video | * Computer * Internet Access * Video Recording of Orientation |
| To interpret data from standard PACU monitors and correlate clinically | LO1, LO4, LO6 | Interpretation of:   * + blood pressure   + ECG   + Capnography   + Temperature   + Pulse oximetry | * Monitoring the Postoperative Patient Video * Clinical Vignette Interpretation | * Computer * Internet Access * Video Recording of Lecture * YouTube Videos * Clinical Vignettes |
| To evaluate and manage the most common postoperative complications seen at the PACU | LO1, LO2, LO3, LO4, LO5, LO8 | List of most common postoperative complications:   * Hypoxemia * Hypoventilation * Upper Airway Obstruction * Hypotension * Hypertension * Cardiac Dysrhythmias * Oliguria * Hypothermia * Emergence Delirium * Delayed Awakening * Bleeding Disorders * Pain * Nausea and Vomiting * Shivering * Recurarization   Proper assessment of these complications | * Online lecture: Management of most common postoperative complications * Consultant’s Hour * Small Group Discussion (SGD) * Online Simulation/ Crisis Resource Management (CRM) | * Computer * Internet Access * Video Recording of Lecture * DARTSim (installed in host computer) |
| To assess, formulate a plan, and initiate initial intervention for the management of acute post-operative pain in the PACU | LO1, LO3 | * Definition of acute postoperative pain * Assessment of acute postoperative pain using different grading systems * WHO reverse step-ladder for acute postoperative pain * Commonly used analgesics | * Consultant’s Hour * Barash, P.G. et al. (2015). Management of Acute and Chronic Pain. In Clinical Anesthesia Fundamentals (pp. 699-720). Philadelphia, PA: Wolters Kluwer Health. * Australian and New Zealand College of Anaesthetists and Faculty of Pain Medicine. (2015). Acute Pain Management: Scientific Evidence (4th ed.). Retrieved from: [ACUTE PAIN MANAGEMENT: SCIENTIFIC EVIDENCE](https://www.anzca.edu.au/getattachment/4c3b03b7-52bf-4c10-9115-83d827c0fc38/Acute-Pain-Management-Scientific-Evidence.aspx) | * Computer * Internet Access * Links to Reading materials * Reading materials available on USB |
| To understand the physiology of recovery from anesthesia and surgery and to apply the criteria for discharge of patients from the PACU | LO1, LO2, LO3 | * Physiology of recovery from anesthesia and surgery * Discharge criteria for post-operative patients | * Online Lecture: Discharge from the PACU * Online Lecture: Physiology of Anesthesia Recovery * PACU Handover Video * Bromage Scoring Video * Aldrete Scoring Video * Interns’ handover video assignment | * Computer * Internet Access * Online Lectures * Video Recordings * PACU handover sheet |
| * To Know and apply the principles of Basic Life Support (BLS) * Know and apply the principles of Advanced Cardiac Life Support (ACLS) * Diagnose and treat the underlying complication of a patient recovering at the PACU * Apply the principles of CRM in a simulated clinical scenario | LO1, LO2. LO3, LO4, LO5, LO6, LO7, LO8, LO9, LO10 | * BLS/ACLS * Basics of critical care * Principles of CRM | * Online Simulation/CRM activity * Principles of CRM and the Use of Simulation as a Training Tool Video Lecture * Rall, M. and Dieckmann, P. Crisis Resource Management to Improve Patient Safety. Euroanaesthesia 2005 (Vienna, Austria) | * Computer * Internet Access * Video Recording of Lecture * DARTSim (installed in host computer) |

***Legend:*** LO1 Clinical Competence

LO2 Effective Communication Skills

LO3 Leadership and Management

LO4 Generation and Utilization of Relevant Knowledge

LO5 Inter-professional Practice

LO6 System-based Approach to Health Care Practice

LO7 Adherence to Professional and Ethical Standards

LO8 Volunteerism, Nationalism and Internationalism

LO9 Advocacy for Social Accountability

LO10 Effective Teaching and Organizational Skills

1. **Course Materials**

**Course Orientation/Introduction to the PACU**

1. **Study Guide**
   * Target Learning Outcomes
     + Student is familiar with the following aspects of the course:
       - Learning objectives
       - Course Requirements
       - Activities
       - Attendance
       - Course Evaluation
     + Give an overview of the Post Anesthesia Care Unit (PACU)
     + Enumerate the staffing requirements for the PACU
     + Enumerate PACU staff duties and responsibilities
     + Describe the ideal location of a PACU within a hospital
     + Describe the layout of a properly designed PACU
     + Enumerate the equipment needed at the PACU
   * Watch:
     + Introduction to PACU Lecture (Asynchronous/UPMVLE)
     + PACU Walkthrough Video (Asynchronous/UPMVLE)
     + COVID OR Walkthrough (Asynchronous/UPMVLE)
2. **Activity Guide**
   * Attend the course orientation to be given at the start of the rotation (Synchronous/Zoom)
   * Consultant Presence: A consultant (or resident monitor) will be available from 8:00-9:00 on the first day of the rotation to orient the students on the course and answer any questions they may have. Zoom link to be provided to the liaison officer of the block.
3. **Assignment Guide**
   * Task: Submit a written essay on the ideal PACU setup for a COVID positive patient.
   * Procedure: The student will submit an essay detailing the PACU setup needed for a patient who is COVID positive, This essay should include all details of the PACU discussed in the instructional materials (e.g. location, staffing, etc.). This is submitted via email to the course coordinators/resident monitors on the due date.
   * Due Date: Day 5 of the rotation

**Monitoring the Postoperative Patient**

1. **Study Guide**
   * Target Learning Outcome
     + Student must be able to interpret data from standard monitors in a patient recovering from anesthesia
     + Student must be able to correlate the data with the clinical picture of the patient
   * Watch: Monitoring the Postoperative Patient Lecture Video (Asynchronous/UPMVLE)
2. **Activity Guide**
   * Consultant’s Hour: A consultant will be available on the day of the small group discussion (SGD) to answer questions students may have about the topic.
3. **Assignment Guide**
   * Task: Interpretation of monitor data in the postoperative patient
   * Procedure: Students are given clinical vignettes showing abnormalities in the standard parameters that are monitored in the PACU:
     + blood pressure (hyper-/hypotension)
     + ECG changes
     + Temperature abnormalities
     + Capnography/respiratory changes
     + pulse oximetry changes
   * This is in the format of a powerpoint slide with the clinical vignette and pictures showing abnormalities in the monitors. After each vignette, the student is presented with clinical questions which they must answer using a Google Form.

* Due Date: On the last day of the rotation

**Diagnosis and Management of the Most Commonly Encountered Problems and Complications in the Postoperative Period**

1. **Study Guide**
   * Target Learning Outcomes
     + Student must be able to diagnose and manage the most common PACU complications:
       - Hypoxemia
       - Hypoventilation
       - Upper Airway Obstruction
       - Hypotension
       - Hypertension
       - Cardiac Dysrhythmias
       - Oliguria
       - Hypothermia
       - Emergence Delirium
       - Delayed Awakening
       - Bleeding Disorders
       - Nausea and Vomiting
       - Shivering
       - Recurarization
   * Read: Heitz, James W. Post-Anesthesia Care: Symptoms, Diagnosis, and Management. Cambridge University Press, 2016.
   * Watch: Management of Postoperative Complications Video Lecture (Asynchronous/UPMVLE)
2. **Activity Guide**
   * Consultant’s Hour: A consultant will be available on the day of the small group discussion (SGD) to answer questions students may have about the lecture, and any clarifications about diagnosis and management.
   * Prepare questions that you want to ask regarding the lecture prior to the consultant’s hour
   * Online Small Group Discussion (SGD): The students are given a topic for an SGD which will be conducted with the consultant for the week. Usual topics are management of postoperative pain, postoperative nausea and vomiting, management of hyper-/hypotension, fluid replacement, but any topic related to the postanesthetic management of the patient may be discussed. Attendance and active participation are required and students will be evaluated for this activity.
     + Date: On the 5th day of the rotation (or a date agreed upon by both parties)
     + Duration: Approximately 1 hour
     + Medium: Zoom
     + Procedure: At the start of the rotation, the students will be given a predetermined topic for discussion in an online SGD. They will prepare an SGD for presentation with the consultant presiding and will be graded for their efforts. All students are enjoined to actively participate and they will be graded for their efforts.
   * Online Simulation: An online simulation using the DARTSim Program will be conducted on the 5th-7th day of the rotation, to be conducted by the LUVII consultant coordinators. This will cover the diagnosis and management of one of the complications outlined above, as well as Crisis Resource Management (CRM) skills. Greater details can be found in the section *Crisis Resource Management in the PACU.* 
     + Date: TBD by LUVII Simulation Consultant for the week
     + Duration: Approximately 1 hour 15 minutes
     + Medium: Zoom
     + Procedure: Students will be given the zoom link for the simulation at least a day in advance of the actual activity. The block should be divided into two groups, and each group will undergo the simulation activity one after the other. The group not participating will be passive observers for that session, and roles will be reversed afterwards. Debriefing sessions will follow immediately after the simulation.
3. **Assignment Guide**
   * Task: Prepare for the online SGD and attend on the day of the session.

**Crisis Resource Management in the PACU**

1. **Study Guide**
   * Target Learning Outcomes
     + Know and apply the principles of Basic Life Support (BLS)
     + Know and apply the principles of Advanced Cardiac Life Support (ACLS)
     + Diagnose and treat the underlying complication of a patient recovering at the PACU
     + Apply the principles of CRM in a simulated clinical scenario
       - Know the environment
       - Anticipate and plan
       - Call for help early
       - Exercise leadership and followership
       - Distribute the workload
       - Use all available information
       - Communicate effectively
       - Use cognitive aids
       - Re-evaluate repeatedly
       - Use good teamwork
   * Read: Rall, M. and Dieckmann, P. Crisis Resource Management to Improve Patient Safety. [Euroanaesthesia 2005 (Vienna, Austria)](https://www.guysandstthomas.nhs.uk/resources/education-training/sail/reading/crisis-mgt-pt-safety.pdf)
   * Watch: Principles of CRM and the Use of Simulation as a Training Tool Video Lecture (Asynchronous/UPMVLE)
   * Watch: DART ECG Simulator <https://youtu.be/_xV7_SBHkW0> (Asynchronous/YouTube)
2. **Activity Guide**
   * Online Simulation: An online simulation using the DARTSim Program and/or standardized patients will be conducted on the 5th-7th day of the rotation, to be conducted by the LUVII consultant coordinators. This will cover the diagnosis and management of one of the complications outlined above, application of BLS and/or ACLS guidelines, as well as Crisis Resource Management (CRM) skills.
     + Date: TBD by LUVII Simulation Consultant for the week
     + Duration: Case simulation - 10-15 minutes, Debriefing - 20 - 30 minutes, total duration for one block approximately 1 hour 30 minutes
     + Medium: DARTSim through Zoom
     + Procedure: Students will be given the zoom link for the simulation at least a day in advance of the actual activity. The block should be divided into two groups, and each group will undergo the simulation activity one after the other. The group not participating will be passive observers for that session, and roles will be reversed afterwards. Debriefing sessions will follow immediately after the simulation.
3. **Assignment Guide**
   * Task: Participate in an online PACU critical event simulation session.

**Management of Postoperative Pain**

1. **Study Guide**
   * Target Learning Outcomes
     + Know the definition of acute postoperative pain
     + Learn how to assess acute postoperative pain using different grading systems
     + Apply the WHO reverse step-ladder approach for acute postoperative pain
     + Commonly used analgesics
   * Read: Barash, P.G. et al. (2015). Management of Acute and Chronic Pain. In Clinical Anesthesia Fundamentals (pp. 699-720). Philadelphia, PA: Wolters Kluwer Health.
   * Deep Dive: Australian and New Zealand College of Anaesthetists and Faculty of Pain Medicine. (2015). Acute Pain Management: Scientific Evidence (4th ed.). Retrieved from: [ACUTE PAIN MANAGEMENT: SCIENTIFIC EVIDENCE](https://www.anzca.edu.au/getattachment/4c3b03b7-52bf-4c10-9115-83d827c0fc38/Acute-Pain-Management-Scientific-Evidence.aspx)
   * Watch: Pain Assessment Video (Asynchronous/UPMVLE)
2. **Activity Guide**
   * Consultant’s Hour: A consultant will be available on the day of the small group discussion (SGD) to answer questions students may have about acute postoperative pain, and any clarifications about its diagnosis and management.
3. **Assignment Guide**
   * Task: Submit a comprehensive postoperative pain management plan for a patient with acute pain at the PACU
   * Procedure: Students will be given a case scenario of a patient with acute postoperative pain. They are required to submit a written case discussion on the pain management of the patient. The discussion should contain these elements:
     + History/Physical Examination (what other questions would the student like to ask the patient)
     + Laboratory Examinations (what other laboratory examinations, if any, should be done)
     + Pain assessment
     + Pain physiology and pathophysiology
     + Pain management

* Due date: On the last day (Day 7) of the rotation.

**Recovery from Anesthesia and Discharge from the PACU**

1. **Study Guide**
   * Target Learning Outcomes:
     + Familiarize oneself with the handover procedure for patients coming into the PACU from the operating room
     + Familiarize oneself with the discharge criteria from PACU
     + Assess adequacy of recovery from anesthesia and suitability of discharge from PACU
   * Read: Longnecker, D.E et al. (2017) Postoperative Care of the Anesthesia Patient. In Anesthesiology, 3rd Edition, McGraw-Hill Education, pp 1212-1222
   * Watch:
     + Recovery of patient from anesthesia and PACU discharge criteria video lecture (Asynchronous/UPMVLE)
     + PACU Handover Video (Asynchronous/UPMVLE)
     + Bromage Score Assessment Video (Asynchronous/UPMVLE)
2. **Activity Guide**
   * Consultant’s Hour: A consultant will be available on the day of the small group discussion (SGD) to answer questions students may have about the topic.
3. **Assignment Guide**
   * Exercise on PACU Handover:
     + Task: The student will run through a handover checklist, ensuring that all information is complete
     + Procedure: Students will work in pairs to complete this task. They need not be together and may perform the handover simulation online. They will simulate a handover of a postoperative patient from a “anesthesiologist” to a receiving intern at the PACU using the PACU endorsement sheet. One intern will act as the endorsing “anesthesiologist”and the other will be the receiving intern. No role reversal is necessary and only one video will be submitted per pair. They will record their short simulation session and upload to Canvas
     + Material/s needed: PACU handover video, copy of PACU endorsement sheet

* Due Date: On the last day (day 7) of the rotation

**REFERENCES**

Heitz, James W. *Post-Anesthesia Care: Symptoms, Diagnosis, and Management*. Cambridge University Press, 2016.

Gaba, D.M., Fish, K.J., Howard, S.K., & Burden, A.R. (Eds). (2015). *Crisis Management in Anesthesiology, 2nd Ed.* Elsevier Saunders

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