

ANESTHESIA ROTATION HANDOUT

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ROTATION INTRODUCTION

Although the performance of procedures (intubations, line placement, etc) is an integral daily function of the practicing anesthesiologist, they represent only a fraction of the practice of anesthesia. The participant is expected to achieve knowledge and skills relevant to the practice of anesthesia beyond simply performing procedures. The participant should develop an appreciation for the anatomy, physiology and pharmacology of anesthesiology as well as an understanding of how patient variability and disease processes affect our decisions. Each OR is a highly controlled physiology laboratory and offers an ideal teaching environment. We expect this knowledge of the physiologic effects of surgery and anesthetic drugs, coupled with the procedural skills obtained and refined during the rotation, to serve you well during a long and fulfilling medical career.

Physician Anesthesia Services, P.C. (PAS) is a twenty-two member private corporation serving EWSH for 50 years. Generally, ten anesthesiologists run 22 operating rooms on a given day. Six anesthesiologists will be in an OR and four will generally supervise two or three nurse anesthetists. Anesthetists (CRNA's) are BS-degree nurses (or physician assistants) who have critical care experience, study for a Master of Science degree in anesthesia and pass national board exams.

If you have any questions about the rotation contact Drs. Tratechoud, Krogulecki, Ford, or Kochan, (surgery 364-4022)

ROTATION OBJECTIVES

1. Procedural Skills: Develop techniques for insertion and learn the indications for and the complications of: arterial lines, central venous lines, pulmonary arterial catheters, intravenous lines, airway management, lumbar punctures.
2. Didactic Knowledge:
 - a. Types of anesthetics (general, spinal, epidural, IV, regional, nerve blocks, sedation)
 - b. Pharmacology (narcotics, hypnotics, neuromuscular blocking agents, volatile agents, etc.)
 - c. Physiology (autonomic NS, hemodynamics, disease process)
 - d. Anatomy (larynx, vasculature, nervous system)
 - e. Disease and Anesthesia (Coronary, Cerebrovascular, IDDM, Obesity, Coagulopathy, Prematurity, Shock, etc.)

ROTATION REQUIREMENTS

1. Daily attendance: (0700 to 1630) unless previously excused for a mandatory educational requirement or personal matter.
2. Invasive Procedures: Opportunities to perform invasive procedures will vary with case load and availability of supervision. All rotators are expected to learn the indications for invasive monitoring, demonstrate an understanding of related safety issues, and interpret invasive monitors.
3. Direct a case: At the end of the rotation, the four week rotators will develop an anesthetic plan and execute it with minimal input from the attending anesthesiologist (subject to availability of appropriate case and one on one anesthesiologist supervision).
4. Case Presentation: Subject to appropriate case availability, the rotator will be presented with a patient profile and will prepare a case presentation for the anesthesia staff.
5. End of Rotation Test: All rotators are expected to demonstrate reasonable understanding of anesthetic principles on an end of rotation test that will reflect:
 - i) Assigned reading.
 - ii) Basic clinical principles commonly demonstrated in the OR
 - iii) A test (open book) to help you review and assimilate material presented during your anesthesia rotation. Please return the completed test to the office of the Assistant Dean in the Sparrow Professional Building or to your program advisor.
6. The text will be assigned and can be checked out at the Sparrow Hospital Library
7. All videos to be viewed, reading assignments and tests can be procured from the PAS website as seen on the Sparrow Intranet: paspc.org
8. Rotation objectives will vary by the length of the rotation.
9. All evaluations must be signed by the anesthesiologist you spent the most time with during your rotation and returned to your program coordinator.

WEEKLY SCHEDULE

Week #1:

We expect that you will spend this week:

- learning your way around the surgical suites,
- observing the anesthesia for many types of surgery,
- learning about the anesthesia equipment,
- developing an appreciation for the role of the anesthesiologist and other surgical team members,
- doing basic anesthesia related reading,
- practicing rudimentary skills such as starting IV's, intubating, and mask ventilation, and
- learning indications and complications of invasive lines.

Those rotators with us for one week will take a multiple-choice examination based on the assigned reading and experiences on Friday.

Weeks #2:

You will spend more time with individual anesthesiologists following cases through from beginning to end. Pediatric exposure will increase and cases will become more complex. Those rotators with us for two weeks will take a multiple-choice open book examination based on the assigned readings and experiences. The completed test will be returned to your program coordinator.

Weeks #3:

Those participants with us for a month may be invited to come in early to insert invasive lines. The knowledge you acquire from direct observation, reading assignments and lectures will begin to coalesce as you begin to appreciate the "big" picture.

Week #4:

You will become increasingly involved in managing cases. You will interview patients, develop an anesthetic plan, give the anesthetic (as appropriate cases and supervision is available), and follow through in PACU and post-op rounds. You will also take a multiple-choice open book examination covering the rotation to be returned to your program coordinator.

ROTATION COORDINATORS (Surgery 364-4022)

Welcome to the experience of anesthesiology in a large practice that involves essentially every type of anesthesia. Although all anesthesiologists participate in your education while on rotation, the following anesthesiologists are the most involved in education administration and related questions should be directed to them:

Jason Tratechaud, DO
Mendel Ford, MD
Joseph Kochan, MD
Michael G. Krogulecki, DO

GETTING STARTED

This may be your first day and you may have just received this introductory handout and are wondering “now what?” This rotation can be a little challenging to get into the rhythm with, so this section will give you the basics to get through your first day.

1. Arrival
 - a. You should report to the OR by 0700 on the first day
2. The Front Desk
 - a. Go to the OR suite and find the Front Desk in the Neuman Wing. The Front Desk is the primary nursing station and is where “The Board” is located.
 - b. At the Front Desk, introduce yourself (a very good habit for new people in the OR in general) and ask:
 - i. Where the locker room is so you can change into scrubs
 - ii. Show you what locker you can use during the rotation
 - c. After getting into scrubs (remember your ID badge)
 - i. Return to the Front Desk
 - ii. Find the anesthesiologist who is the “board runner” for the day, he/she will make an assignment for you with an anesthesiologist to begin your anesthesia experience.
3. Shadowing – when introduced to one of the anesthesiologists:
 - a. Introduce yourself
 - b. Sign in on the white board in the OR you will be in.
 - c. Feel free to ask questions, but be sensitive to the needs of others.
 - d. On your first day, don’t worry too much about doing procedures, etc. Just relax, shadow one of the anesthesiologists, observe how things work in the OR, and familiarize yourself with the role of the anesthesiologist and associated equipment and procedures.

4. Fill out Activity Chart (also on the website)
 - a. See example, print from the web site and bring with you the first day of your rotation. You will be using this chart to document your experiences .

DAILY PROTOCOL

1. You should arrive daily at 0700 and will generally leave around 1630 hrs.
2. Contact the Board Runner or one of the Rotation Coordinators for your assignment after you get into surgical scrubs.
3. You do not take call (unless you want to).
4. You will only be excused for:
 - a. Medical Students: Wednesday noon lecture and your Friday meetings with your Director.
 - b. Residents: Grand Rounds, your weekly clinic, and Thursday teaching afternoon conferences.
5. Document on your Activity Chart **DAILY** (in the Anesthesia Office):
 - a. Your attendance
 - b. Airway management tasks
 - 1) Mask ventilation
 - 2) LMA placement
 - 3) Intubations
 - c. Invasive procedures
 - 1) Observation
 - 2) Performance
 - d. IVs
 - 1) Class attendance
 - 2) IV placements
 - e. Miscellaneous events
 - 1) Half day on Obstetric Anesthesia Service
 - 2) Visit to pain clinic
 - 3) Other events

SYLLABUS

You will receive 1 book for the rotation. The primary text is “Basics of Anesthesia” by Stoelting and Miller. The test questions at the end of the rotation come directly from the reading. The required chapters of reading depend on the length of your rotation on anesthesia. Although there appears to be an abundance of reading for one and two week rotations, these participants will almost exclusively be residents who will already have some familiarity with some of the subjects. You will be expected to view the assigned videos found on the website as early as possible in the rotation.

Chapter	Rotation length		
	1 week	2 weeks	4 weeks
Effect of Inhaled Anesthetics on Ventilation and Circulation		X	X
Intravenous Anesthetics	X	X	X
Opioids	X	X	X
Local Anesthetics		X	X
Neuromuscular Blocking Drugs		X	X
Preoperative Evaluation and choice of Anesthetic Technique	X	X	X
Tracheal Intubation	X	X	X
Spinal and Epidural Anesthesia	X	X	X
Positioning and Associated Risks			X
Monitoring		X	X
Fluid and Blood Therapy		X	X
Cardiovascular Disease			X
Central Nervous System Disease			X
Obstetrics			X
Pediatrics			X
Acute Postoperative Pain Management			X

For those interested in Anesthesia (optional reading)

Anesthesia Systems

Preoperative Medication

Elderly Patients

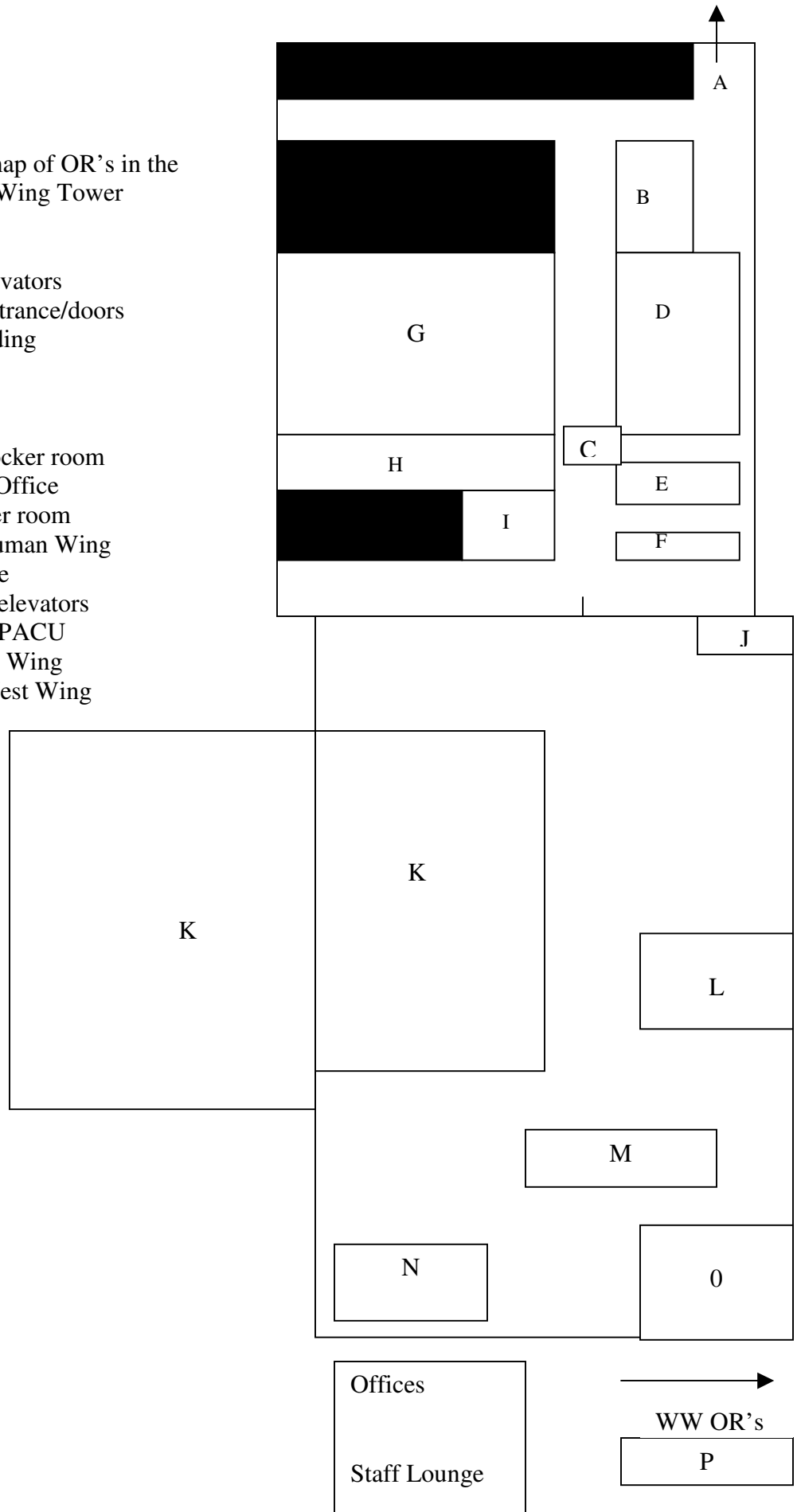
Chronic Pain Management (strongly recommended if spending time at the Pain Center)

PATIENT FLOW

1. Patients (Adults) coming for surgery, from home, go to OPS (Outpatient Surgery in the West Wing Tower) where they change into patient attire, are prescreened by nursing, have IVs placed, etc. These patients will remain in the OPS until taken directly to the OR. When interviewing the patient, this will take place in the patient's room in the OPSU prior to their coming to the OR.
2. Peds patients are taken to the Neuman PACU
3. Same Day Surgery (SDS) patients will be admitted to the OPSU in the Neuman Wing and transported to the Neuman Wing Holding Area prior to Surgery or to PACU if blocks or invasive lines need to be done.
4. Patients (inpatients) come either to Patient Holding (located close to the Front Desk) or to the PACU (Post Anesthesia Care Unit) if they require a preoperative procedure to ready them for their operation (there is more monitoring equipment and space in the PACU for these procedures)
5. Patients are
 - A. Screened by nursing for a completed surgical consent, etc
 - B. Seen by anesthesia to review the patient's history/labs/studies, perform a directed physical exam, take a directed medical history from the patient, and explain the plan of anesthesia to the patient and/or responsible adult
 - C. Possibly seen by the surgeon (may or may not see the patient prior to their procedure)
6. The patient is taken to the OR after
 - A. The patient has been by all interested parties in patient holding/patient room
 - B. The OR is setup and ready for the patient
 - C. The surgeon is available for the surgical procedure
7. After the surgical procedure, the patient is
 - A. Usually taken to the PACU (Neuman PACU) for recovery before going to their room in the hospital
 - B. Occasionally taken to an intensive care unit directly.
 - C. If the patient will be sent home, he/she will be taken to the WW PACU and then returned to the OPSU

See next page for map of OR's in the Neuman and West Wing Tower

- A Cafeteria
- B Neuman-elevators
- C OR main entrance/doors
- D Patient Holding
- E Front Desk
- F The Board
- G PACU
- H Women's locker room
- I Anesthesia Office
- J Men's locker room
- K OR's in Neuman Wing
- L Staff Lounge
- M West Wing elevators
- N West Wing PACU
- O OPSU West Wing
- P OR Desk West Wing



THE BOARD

1. The Board is a large magnetic wall panel broken into 20 boxes
2. Each box represents one operating room and contains a column of magnetic stickers that summarize the scheduled operations in that OR for the day
3. At the top of each OR box is either a yellow or gold sticker which represents the anesthesia provider for that OR
 - A. The yellow stickers represent Anesthesiologists who are personally performing the anesthesia for that OR
 - B. The gold stickers represent Certified Nurse Anesthetists (CRNAs) that are performing the anesthesia for that room, and are supervised by an Anesthesiologist usually on a 3 to 1 basis
4. The right side of the board contains several yellow stickers with 2 to 4 OR numbers written next to them. These represent the anesthesiologists who are supervising multiple rooms and are assigned names like “Kahuna”, and “Sparky”
5. ORs
 - A. The ORs are numbered 1 to 12, 14-22 (Room 6, 11, 13 are not used)
 - B. Within each OR box are a column of operation magnetic stickers each of which represents a scheduled operation and lists
 - i. Start time of operation
 - ii. Surgeon
 - iii. Type of operation
 - C. Generally, operation magnetic stickers are either blue or pink
 - iv. Blue stickers represent patients who are brought to the Patient Holding area just before being brought to the OR
 - v. Pink stickers represent patients who are brought to the PACU in the Neuman Wing because they require a special procedure (invasive lines, epidural, peripheral nerve block, etc) before going to the OR
6. The Board is very fluid and room assignments and times for operations can change according to the flow of the day
 - A. The Board is the only schedule that reflects these changes throughout the day
8. The other board that is available at the front desk in the Neuman wing and also in the West Wing is a Stat Com which gives the information: where the patient is ie. In Patient room in the OPS, in the OR, in the PACU (either in the Neuman Wing for admitted patients or in the West Wing Tower). This board is kept up to date by the HUCs at the main OR desk. The STAT Com is also in the West Wing Tower as well.

ANESTHESIA DO'S AND DON'TS

DO be vigilant (vigilance is the buzzword of the anesthesia profession).

DO put your name on the board as soon as you enter an OR.

DO introduce yourself in the holding area to every patient with whom you will work.

DO use the side door to the OR (not the hallway door).

DO be courteous to the nurses and scrub techs.

DO always have an alternate plan of action.

DON'T leave any gaps in the anesthesia chart. **Fill in every blank.**

DON'T ever administer a paralyzing agent without first assessing the airway.

DON'T ever use an unlabeled syringe.

DON'T use needles (we have a needleless system).

DON'T recap needles.

DON'T become so transfixed on the charting or equipment that you forget to observe the pt.

ACTIVITY CHART (example)

ACTIVITY CHART		MONTH: January			ROTATOR:		Mouse			
Day	Attendance (√ if present)	Airway mgmt tasks			Invasive Procedures					Misc event
		Mask ventilate	LMA placement	Intubation	Arterial line	Central line	Epidural	Nerve Block	IV	
		(write number performed today)			(number observed [O] or performed [P])					
1					O- /P-	O- /P-	O- /P-	O- /P-	P-	
2	√	0	0	0	O-1/P-0	O-1/P-0	O-2/P-0	O-0/P-0	P-	
3	√	0	1	0	O-2/P-0	O-1/P-0	O-2/P-0	O-0/P-0	P-	
4	√	3	0	1	O-0/P-0	O-0/P-0	O-3/P-0	O-2/P-0	P-	
5	√	2	2	2	O-1/P-0	O-0/P-0	O-0/P-0	O-1/P-0	P-	
6	√	6	3	2	O-0/P-0	O-0/P-0	O-1/P-0	O-0/P-0	P-	
7					O- /P-	O- /P-	O- /P-	O- /P-	P-	
8					O- /P-	O- /P-	O- /P-	O- /P-	P-	
9	√	4	0	4	O-2/P-0	O-2/P-0	O-2/P-0	O-3/P-0	P-	
10	√	2	4	1	O-1/P-0	O-1/P-0	O-1/P-0	O-1/P-0	P-1	IV class
11	√	3	2	3	O-3/P-0	O-2/P-0	O-3/P-0	O-1/P-0	P-0	
12	√	7	5	0	O-0/P-1	O-0/P-0	O-1/P-0	O-2/P-0	P-6	
13	√				O- /P-	O- /P-	O- /P-	O- /P-	P-	
14					O- /P-	O- /P-	O- /P-	O- /P-	P-	
15					O- /P-	O- /P-	O- /P-	O- /P-	P-	
30					O- /P-	O- /P-	O- /P-	O- /P-	P-	
31					O- /P-	O- /P-	O- /P-	O- /P-	P-	

NOTES: January 4th afternoon: observed cardioversions and endoscopies with Dr. Ford

Access your copy from the website

EXPLANATION FOR ABOVE SAMPLE: (actual numbers on the chart are completely theoretical and do not represent expectations)

- Mr. Mouse’s first day was January 2nd, and he has documented his attendance for his first two weeks
- On his first day (January 2nd), he observed one arterial line, one central line, and two epidural placements
- On January 3rd Mr. Mouse placed his first LMA
- On January 4th Mr. Mouse was able to accomplish his first intubation, and successfully mask ventilate 3 patients. Additionally, Mr. Mouse made a special request to see some offsite procedures with Dr. Ford which he documented under “NOTES”
- On January 10th, he took the IV class and placed his first IV
- On January 12th, he placed his first arterial line

Give completed sheets to the program director/mentor at end of rotation

CHECKLISTS

Holding Area in the Neuman Wing or OPSU in the West Wing Tower patient room

1. Review medical history including: Indication for operation, co-existing diseases, ALLERGIES, medications and surgical concerns.
2. Check Lab Values: Potassium, hemoglobin, B-HCG, ECG, Coagulation studies, Cardiac Studies, PFTs, etc.
3. Interview the patient: ALLERGIES, Problems in the past with anesthesia? NPO Status? Recent upper respiratory infection? Does the patient have GERD? How well controlled is the patient's GERD.
4. Examine heart, lung, and airway (dentition, Mallampatti class, thyromental distance, range of neck motion).
5. Discuss the anesthetic plan with the patient.
6. Advise patient of risks of anesthesia.
7. Check status of IV lines.

Operating Room:

Observe only until told otherwise

1. Prepare drugs in advance:
 - A. 2% Lidocaine: 50 mg (2.5 ml)
 - B. Propofol 200 mg (20 ml)
 - C. Fentanyl 100 mic (2 ml)
 - D. Neuromuscular Blocker
 - 1) Succinylcholine 120 mg (6 ml)
 - 2) Rocuronium 50 mg (5 cc)
 - E. Ephedrine: 50 mg (diluted in 5 ml saline)
 - F. Atropine 0.4 mg (1.0 ml)
2. Check the anesthesia machine, breathing circuit, laryngoscope, and LMA, endotracheal tube, etc.
3. Check the suction.
4. Check the IV.
5. Apply monitors (BP cuff, pulse oximeter, EKG leads) and document baseline vital signs.
6. Apply pre-cordial stethoscope.
7. Circulating nurse ready and surgeon nearby.
8. Begin the anesthesia induction (only in presence of anesthesiologist)

Induction:

1. Pre-oxygenate
2. Push induction agent (propofol, Etomidate, thiopental, etc)
3. Assess the airway (can you mask ventilate the patient?)
4. Ventilate the patient
5. Push the NMB agent (only after confirm can mask ventilate the patient,

exception is during RSI [Rapid Sequence Induction])

6. Administer volatile agent as indicated (ensure patient remains asleep while relaxed)
7. Tape the eyes
8. Monitor vitals frequently
9. Assess the neuromuscular, blockade
10. Intubate
11. Check breath sounds, chest movement, CO₂, lung compliance.
12. Tape the endotracheal tube
13. Check the vital signs
14. Insert the esophageal stethoscope (if using one)
15. Position the patient
16. Put up the drapes.
17. Observe the incision and its physiologic effects
18. Perform appropriate charting (only after ensure patient stable and anesthetized)

During the Case:

1. Accurate charting of five-minute vitals
2. Monitor blood loss and urine output closely
3. Know what the surgeon is doing at all times

Emergence:

1. Check neuromuscular blockade (must have at least 1-2 twitches before attempting reversal of neuromuscular blockade)
2. Administer reversal agents (usually neostigmine and glycopyrrolate)
3. Establish spontaneous ventilation
4. Remove esophageal stethoscope
5. Place bite block
6. Suction oropharynx
7. Remove eye tape
8. Extubate usually awake/occasionally asleep
9. Extubate at the end of inhalation (with full lungs)
10. Gently suction oropharynx
11. Check vital signs
12. Remove monitors and go to PACU

Arrival in the PACU:

1. Help the nurse to apply the monitors
2. Give nurse report including
 - a. Patient's name
 - b. Surgical procedure
 - c. Type of anesthesia

- d. Significant medical history
 - e. Problems during case
 - f. Narcotics, anti-emetics, analgesics given
 - g. Which analgesics are ordered for PACU
3. Monitor and document the PACU vital signs
 4. Complete the anesthesia chart (anesthesia end time, anything else to complete chart)
 5. Write the PACU orders (if not done preoperatively)

MOST COMMON ANESTHETIC DRUGS AND DOSAGES USED AT EWSH

Neuromuscular Blocking Agents (induction doses, not maintenance doses):

Mivacurium (Mivacron) 0.2 mg/kg

Rocuronium (Zemuron) 0.6 mg/kg

Pancuronium (Pavulon) 0.1 mg/kg

Succinylcholine (Anectine) 1-2 mg/kg

Narcotics:

Fentanyl (Sublimaze) 1 mcg/kg [unit dose]

Morphine Sulfate 0.1 mg/kg [unit dose]

Hydromorphone (Dilaudid) 0.5 - 2.0 mg

Narcotic Antagonist:

Naloxone (Narcan): adult 0.04-0.4 mg (usually administered 0.04 mg at a time until desired effect), kids 1 - 10 mcg/kg. Not benign, can be dangerous.

Non-narcotic Analgesics:

Ketorolac (Toradol) 15-30 mg IV NSAID (15 mg for elderly or chronic renal disease).

Acetaminophen (Tylenol) 20-30mg/kg (max. 2 G). PO preop for kids

Antiemetics:

Metoclopramide (Reglan) 10-20 mg - dopamine antagonist

Droperidol (Inapsine) 0.01 mg/kg – butyrophenone (requires postop ECG monitoring)

Ondansetron (Zofran) 0.05 mg/kg - serotonin antagonist

Local Anesthetics:

Xylocaine (Lidocaine) - amide, local administration toxic level 4.0 mg/kg without epinephrine, 7.0 mg/kg with epinephrine

Bupivacaine (Marcaine) - amide, local administration toxic level 2.5 mg/kg without epinephrine, 3.0 mg/kg with epinephrine

Tetracaine (Pontocaine) - ester

Anticholinergics:

Atropine 0.01 mg/kg

Glycopyrrolate (Robinul) 0.01 mg/kg - minimal vagolytic effects

Anticholinesterases:

Neostigmine (Prostigmin) 0.057 mg/kg (5 mg maximum dose)

Edrophonium (Tensilon) 0.5-1.0 mg/kg- fast onset but expensive (40 mg maximum dose)

Hemodynamic Modulators:

Epinephrine (Adrenaline) - 1.0 - 5.0 mics/min, mixed agonist

Dopamine - 2 -20 mics/kg/min, mixed agonist

Dobutamine (Dobutrex) 2 - 20 mics/kg/min, mixed agonist

Norepinephrine (Levophed) - 2-20 mics/min, alpha agonist

Nitroprusside (Nipride) - 0.5 - 8.0 mics/kg/min, vasodilator

Labetalol (Trandate, Normodyne) - up to 1 mg/kg, mixed antagonist

Phenylephrine (Neosynephrine) 25-200 mics/min, pure alpha agonist•

Esmolol (Brevibloc) - 50-200 mics/kg/min, short acting beta antagonist at usual dosing

Ephedrine 5-10 mg, indirect synthetic sympathomimetic

Induction Agents:

Propofol (Diprivan) 2 mg/kg bolus, 25-160 mics/kg/mm - benzyl alkaloid induction agent

Etomidate (Amidate) 0.3 mg/kg imidazole induction agent - minimal cardiac effects

Ketamine (Ketalar) 1-2 mg/kg - phencyclidine derivative - Sissociative

Sodium Pentothal 4-7 mg/kg - ultra short-acting barbiturate

Anxiolytics:

Midazolam (Versed) 1 -2 mg

Lorazepam (Ativan) 1-4 mg (rarely used in OR)

Diazepam (Valium) 2-10 mg (rarely used in OR)

Benzodiazepine Antagonists:

Flumazenil (Romazicon) – 0.1mg-0.5 mg. Not benign, can be dangerous.