

University of Pennsylvania
School of Nursing
Course Syllabus

TITLE: N 580 Pharmacology of Anesthetics and Accessory Drugs I

COURSE UNITS: 1 cu

CATALOG DESCRIPTION:

This course explores the various routes of anesthetic administration addressing the potential benefits and risk of each. Special emphasis is placed on specific anesthetic agents and their appropriate use. The responses and common complications associated with these agents are discussed.

PLACEMENT: Fall, Year I

FACULTY: Dawn E. Bent, CRNA, DNP

PRE-REQUISITE(S): Principles of Basic Nurse Anesthesia Practice (N 617 N657)

CO-REQUISITE(S): None

COURSE OVERVIEW:

This course introduces the student to the various modes and agents utilized in the delivery of anesthesia. The indications and contraindications for each are examined. Common complications associated with the various modes of anesthetic delivery are discussed. An in depth analysis of the indications and management of these modalities is presented.

COURSE OBJECTIVES:

1. Discuss and explore the concepts of pharmacokinetics and pharmacodynamics including volume of distribution, ionization, compartmental models, metabolism, Phase 1 & Phase 2 reactions, first order and zero order kinetics, therapeutic index, effective dose (ED50) versus lethal dose (LD50) and elimination.
2. Describe the mechanisms of action, pharmacokinetic and pharmacodynamics of the various anesthetic agents.
3. Explain the mechanisms of action for each of the adjuvant drugs commonly used to facilitate general anesthesia.
4. Explain the effects and adverse effects of anesthetics on organ system function.
5. Identify the various routes of anesthetic administration.
6. Discuss the indications and contraindications for each type of anesthetic.
7. Review the potential benefits and risks of each type of anesthetic.
8. Explore each mode of anesthetic administration and the particular issues surrounding each method.
9. Discuss the common complications related to anesthetic administration that can occur during the intra-operative phase.
10. Describe the physiologic monitoring of patients receiving various anesthetic agents.
11. Review the role of the nurse anesthetist in managing patients receiving anesthesia.

12. Discuss the uptake and distribution of various inhalational agents and factors which impact that agent's uptake and distribution.
13. Review basic concepts of volume of distribution with regard to the administration of intravenous anesthetic agents.
14. Review basic anatomy and physiology of the neuromuscular junction and alterations associated with the administration of paralytic agents.
15. Review the basic anatomy and physiology of the neuron and the effect of local anesthesia on neuronal function.
16. Review the perioperative management of patients undergoing vascular procedures and removal of pheochromocytoma tumors and their related pharmacological considerations.
17. Review various types of anesthetic agents utilized in cardiothoracic surgery.
18. Discuss the desired effects and adverse effects of various anesthetics; recognize those medications that can cause potential drug interactions (e.g. MAO inhibitors) and the methods utilized to reverse unwanted effects.

TEACHING METHODS:

Lecture, discussion, case study presentation, laboratory simulation

EVALUATION METHODS:

Examination 1 – Pharmacology Principles, IV & Local Anesthetics = 40% 10-15-12

Examination 2 - Inhalational Agents = 25% 11-12-12

Examination 3 – CV Agents, Muscle Relaxants & Reversals = 35% 12-17-12

GRADING POLICY:

A+ 97-100	B+ 87-89	C+ 77-79	F 0-69
A 93-96	B 83-86	C 73-76	
A- 90-92	B- 80-82	C- 70-72	

Rounding will be done as follows

Grades of .5 and above will be rounded up to the next whole number

Grades of .4 or less will be rounded down to the next whole number

The Academic Integrity Code will be enforced during this course and can be viewed in the graduate student handbook at:

<http://www.nursing.upenn.edu/students/handbooks/MSN/2005-2006%20Grad%20Resource%20Guide.pdf>

Any student found responsible for violating the academic integrity code will receive a failing grade for the course.

REQUIRED TEXTS:

Barash, PG, Cullen BF & Stoelting, RK. Eds (2013) Clinical Anesthesia 7th Edition PHila PA Lippincott, Williams and Wilkins (**Barash**)

Nagelhout, J. & Zaglaniczny. K. (2013). Nurse Anesthesia. 5th edition Elsevir Saunders (**Nagelhout**)

Rhoades, Ran & Bell (2013) Medical Physiology: Principles for Clinical Medicine 4th Ed. Philadelphia Lippincott, Williams & Wilkin (**Rhoades**)

Stoelting, R.K. (2006). Pharmacology and Physiology in Anesthetic Practice. 4th Edition. Lippincott, Williams, & Wilkins, Philadelphia, PA (**Stoelting**)

RECCOMENDED TEXTS:

Eger, E.I., Eisenkraft, J.B., & Weiskopf, R.B. (2007). Pharmacology of Inhaled Anesthetics. 4th Edition. (**EEW**)

Morgan, G.E, Mikhail, M.S., & Murray, M.J. (2005). Clinical Anesthesiology. 4th Edition. Lange-McGaw Hill: NY, New York. (**M&M**)

WEEKLY TOPICAL OUTLINE: MONDAY 9am – 12 pm

Date	Topic	Object.	Readings
Week 1 9-09-13 D. Bent	Principles of Pharmacology #1 Volume of distribution	1-5	Stoelting pg chp 1 Nagelhout chp 5- 6
Week 2 9-16-13 D. Bent	Principles of Pharmacology #2 Pharmacodynamic and Pharmacokinetics of various anesthetic agents	1-5	Nagelhout Chp 5 -6 Barash chp 7 Stoelting chp 1
Week 3 9-23-13 P. Conicelli	The Pharmacodynamics and Pharmacokinetics of Intravenous Anesthetic Agents	6-11, 13,15	Stoelting Chps 3-6 Nagelhout Chp 9 and 11 Barash chp 18-19
Week 4 9-30-13 A.DiDonato	The Pharmacodynamics and Pharmacokinetics of Local Anesthetics	6-11, 13,15	Stoelting Chps 7 Nagelhout Chp 10
Week 5 10-7-13 A.DiDonato	The Pharmacodynamics and Pharmacokinetics of Local Anesthetics	6-11	Stoelting chp 2 Nagelhout Chp 10 Barash chp 21
Week 6 10-14-13 D.Bent	EXAM #1 Principles of Pharm, IV Anesthetics and Local Anesthetics		
Week7 10-21-13	BREAK		
Week 8 10-28-13 E. Verbrugie	Inhalation Agent Mechanisms of Inhalational agents Vaporization and delivery of Inhaled agent	6-11	Nagelhout chp 8 Barash chp 17 Stoelting chp 2 EEW Chp 6-11
Week 9 11-04-13 E. Verbrugie	Inhalational Agents Pharmacokinetics of Inhaled Agents Physiologic effects of Inhaled Agents	6-11	Nagelhout chp 8 Barash chp 17 Stoelting chp 2 EEW Chp 12-15
Week 10 11-11-13	Inhalational Agents Measurement of Potency of Inhaled Agent Clinical applications for Inhaled Agents	6-11	Nagelhout chp 8 Barash chp 17 Stoelting chp 2
Week 11 11-18-13 R.Gaiser 9-4pm	Neuromuscular Blocking Agents Review Neuromuscular A&P Mechanism of Action & Side effects of Neuromuscular Blocking Agents Mechanism of action of Anti cholinesterase, & cholinergic Agonists	1-11, 14	Stoelting chp 8-10 Barash chp 15, 20 Rhoades Chp 3
Week 12 11-25-13 D.Bent	EXAM #2 Inhalational Agents ONLY		

Week 13 Y.Augoustides	Cardio Vascular Pharmacology Alpha and Beta Adrenergic Agents Pharmacologic management of Pheochromocytoma & Vascular Procedures	9-11, 16-18	Stoelting chp 14-18 Nagelhout Chp 13,23
Week 14 12-09-13 FINAL	EXAM #3 CV and Muscle relaxants		