

Cardiopulmonary Testing (RSPT 1335)



Credit: 3 semester credit hours (2 hours lecture, 2 hours lab)

Prerequisite: RSPT 1329, RSPT 1207, RSPT 2310, RSPT 1113, RSPT 1325

Co-requisite: RSPT 1331, RSPT 1360, RSPT 2353

Course Description

A study of pulmonary testing functions and cardiac dysrhythmias interpretation

Required Textbook and Materials

1. Egan's Fundamentals of Respiratory Care (ISBN # 978-0-323-0367-3)
2. Egan's Fundamentals of Respiratory Care workbook (ISBN # 978-0-323-51880-0)
3. Cardiopulmonary Anatomy and Physiology- DesJarden (ISBN # 978-1-4180-4278-3)
4. EKG Plain and Simple – 3rd edition- Ellis (ISBN # 978-0-13-237729-4)
5. PFT Notes- Gary White (ISBN#978-0-8036-2249-4)
6. DataArc assess
7. #2 Pencils
8. Package of # 882 scantrons
9. Calculator
10. Ruler
11. Web based reading information: www.AARC.org
12. Clinical practice guidelines:
13. Body Plethysmography 2001 – revision and update
14. Capnography/ Capnometry during mechanical ventilation 2003 revision and update
15. Exercise for evaluation of hypoxemia and desaturation 2001 revision and update
16. Methacholine Challenge Testing 2001 revision and update
17. Spirometry 1996 revision and update
18. Single breath carbon monoxide diffusion capacity 1999 revision and update
19. Pulmonary function testing- ATS/ERS standardization
20. ATS statement guidelines for the Six minute walk test

Course Objectives

Upon completion of the course the student will be able to:

1. Explain/identify both normal and abnormal heart conduction.
2. Explain/ identify both normal and abnormal pulmonary function values.
3. Determine indications, describe methods, standards and purpose of monitoring cardiac function and pulmonary function within patient scenarios.

Approved 1/2014

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4. Interpret both cardiac rhythm strips and pulmonary function studies.
5. Determine appropriate response to different patient scenarios involving pulmonary functions studies and cardiac monitoring.

Course Outline

- A. Electrical conduction
/Electrophysiology
 1. The generation of the electrical current in the heart
 2. Electrical current through the four chambers of the heart
 3. Detecting and recording the EKG waves
 4. Time and voltage
- B. Hypertrophy and Enlargement
 1. Atrial enlargement/hypertrophy
 2. Ventricular enlargement/hypertrophy
- C. Conduction Blocks
 1. What is a conduction block
 2. Life-threatening blocks
 3. AV blocks- first degree, second degree (mobitz I and mobitz II), third degree
 4. Bundle Branch Blocks
 5. EKG pacemaker spikes
- D. Disorders associated with abnormal EKG's
 1. MI
 2. Electrolyte imbalances
 3. Drug toxicity
- E. Cardiac procedures
 1. Angioplasty
 2. IABP
 3. LVAD
 4. RVAD
- F. Lung volumes
 1. Equipment
 2. Procedure
 3. Techniques used to determine.
- G. Spirometry and Pulmonary Mechanics
 1. Equipment
 2. Procedure
 3. Review data in patient records (PFT results)
 4. Flow- Volume and Volume-Time
 5. Acceptable Values
- H. Gas Distribution Test
 1. Single-breath nitrogen elimination
 2. Phases of the single breath nitrogen elimination
 3. Procedure
- I. Diffusion
 1. Gases used
 2. Procedure
 3. Equipment
- J. Methacholine and Histamine Bronchial Provocations Testing
 1. Indicators
 2. Inhaled substances
 3. Positive findings
- K. Capnography
 1. Indications
 2. Requirements for CO₂ removal
 3. Situations hindering Co₂ removal
 4. Graphic analysis
 5. Assessing patient response to procedures based off the end-tidal Co₂ results
 6. Calculating V_d/V_T
- L. Indirect Calorimetry
 1. Indications
 2. Contraindicaitons
 3. Hazards and Complications
 4. Assessment of Need
 5. Assessment of Test Quality
 6. Monitoring during indirect calorimetry

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| M. Stress testing | 3. Hazards |
| 1. Indications | 4. Monitoring |
| 2. Contraindications | 5. Positive responses |

Grade Scale

93 – 100	A
85 – 92	B
77 – 84	C
68 – 76	D
0 – 67	F

Course Evaluation

Final grades will be calculated according to the following criteria:

- 4 – 6 EXAMS = 80%
- Homework = 5%
- Lab = 15%

Course Requirements

1. Egan work book Chapter 17- Interpreting the electrocardiogram
2. Egan workbook Chapter 19 – Pulmonary Function Testing
3. Competency in performing bedside mechanics/ spirometry on peers within the laboratory setting.
4. Competency in connecting leads for a 12 lead EKG on a mannequin in the laboratory setting.

Course Policies

1. No food or drink, or use of tobacco products in class
2. Beepers, telephones, headphones, and other electronic devices must be turned off while in class
3. On days of test, you will place personal items at the front of the classroom, No electronic devices may be used during an exam. If you have a electronic device during an exam you will receive a 0 for that exam.
4. No children allowed in the classroom
5. No late assignments will be accepted
6. Comply with LIT policies and policies in the Respiratory Care Handbook
7. Comply with course and/or instructor policies, distributed on the first class day

Disabilities Statement

The Americans with Disabilities Act of 1992 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. Among other things, these statutes require that all students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodations for their disabilities. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator at (409) 880-1737 or visit the office in Student Services, Cecil Beeson Building.

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Course Syllabus

Course Schedule

Week	Topic	Required reading
1	Spirometry	Egan Chapter 19, DesJardin Chapter 12
2	Spirometry	Egan Chapter 19, DesJardin Chapter 12
3	Lung volume	Egan Chapter 19, DesJardin Chapter 12
4	Lung volume/ diffusion	Egan Chapter 17, DesJardin Chapter 12
5	Exam #1- Egan Homework Chapter 19 due/ Methacholine-BPT	Egan Chapter 17, DesJardin Chapter 12
6	Metabolic Studies/ End tidal Co2	Egan Chapter 17, DesJardin Chapter 18
7	Stress testing	Egan Chapter 17, DesJardin Chapter 18
8	Review	Egan Chapter 17, DesJardin Chapter 12
9	Exam #2 Basics of EKG	Egan Chapter 17, DesJardin Chapter 12, 13 EKG- Plain and simple Chapter 1-6
10	Atrial Rhythms	EKG- Plain and simple Chapter 7
11	Junctional rhythms	Egan Chapter 17, DesJardin Chapter 13 EKG- Plain and simple Chapter 9
12	Ventricular rhythms	Egan Chapter 17, DesJardin Chapter 14 EKG- Plain and simple Chapter 10
13	EKG review/ Exam #3	Egan Chapter 17, DesJardin Chapter 14 EKG- Plain and simple Chapter 13
14	Blocks	Egan Chapter 17, DesJardin Chapter 14 EKG- Plain and simple Chapter 11
15	Cardiac disorders/ balloon pups, angioplasty	Egan Chapter 17, DesJardin Chapter 12 EKG- Plain and simple Chapter 1
16	Exam #4- Egan homework	Egan Chapter 19, DesJardin Chapter 4 Final

Lab schedule:

Week	Topic	Required reading
1	Performing bedside spirometry/ Pulmonary mechanics	Chapter 11
2	Height and weight nomogram (getting predicted values)	Egan Chapter 17, DesJardin Chapter 14
3	Water seal spirometer, pneumotach	Egan Chapter 17, DesJardin Chapter 14
4	Calculations of Tangents, Hand calculations of FVC, FEV1, FEF 25-75%	DesJardin Chapter 13
5	Interpretation of PFT	Egan Chapter 19, DesJardin Chapter 4
6	End- tidal Co2 monitoring	Egan 18, page 1121-1124
7	Counting rates, regular vs irregular rhythm,	Egan Chapter 17, DesJardin

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Week	Topic	Required reading
	measuring voltage	Chapter 12, 13
8	Counting rates, regular vs irregular rhythm, measuring voltage	EKG- Plain and simple Chapter 1-6
9	12 lead viewing, V1- V6, AVR, AVF, AVL, I, II, III	EKG- Plain and simple Chapter 7
10	12 lead viewing, V1- V6, AVR, AVF, AVL, I, II, III	Egan Chapter 17, DesJardin Chapter 13
11	Interpretation of atrial disturbances	EKG- Plain and simple Chapter 9
12	Interpretation of atrial disturbances	Egan Chapter 17, DesJardin Chapter 14, EKG Ch9
13	Interpretation of ventricular disturbances	Egan Chapter 17, DesJardin Chapter 14
14	Interpretation of ventricular disturbances	Egan Chapter 17, DesJardin Chapter 14
15	Interpretation of WPW, LGL, Hypertrophy and enlargement	EKG- Plain and simple Chapter 10
16	Putting it all together	

Contact Information:

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