

9-2013

AHRC 130.01: Respiratory Care Lab IB

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Arthur, Nicholas J., "AHRC 130.01: Respiratory Care Lab IB" (2013). *Syllabi*. 189.
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The University of Montana – Missoula College
Respiratory Care Program

COURSE NUMBER AND TITLE: AHRC 130 RESPIRATORY CARE LAB 1b

DATE REVISED: Summer 2013

SEMESTER CREDITS: 1

PREREQUISITE: Acceptance into the Respiratory Care program

CLASS MEETS: Thursday, 1330hrs – 1630hrs

FACULTY: Nick Arthur

nicholas.arthur@umontana.edu

243-7836 (office)

Office: Health and Business Building Office

Office Hours: M, W, F, 1200hrs – 1400hrs and by Appointment

RELATIONSHIP TO PROGRAM:

This course provides hands-on experience for students to apply cognitive knowledge from RES 129T to simulated hospital experiences. Psychomotor skills are developed to prepare the student for clinical hospital experience.

COURSE DESCRIPTION:

Basic clinical competencies taught in AHRC 129 are studied in a laboratory setting. Peer and instructor review are included. Students will earn their BLS certification.

STUDENT PERFORMANCE OUTCOMES:

In addition to objectives defined for AHRC 129 Patient Care and Assessment, see topics listed in Course Outline, more specific objectives may be delineated according to topic. SEE: Unit Outlines section for this course.

Develop psychomotor skills and safe clinical practices in accordance with established Clinical Practice Guidelines (www.rcjournal.com/cpgs/index.cfm) and modern safety initiatives.

Prepare the student with a solid foundation of equipment identification by therapy category, common name, brand name, set-up, function, troubleshooting, hazards, limitations, application; indications for change or discontinuance prior to entering the clinical arena.

Demonstrate accuracy in performing basic and advanced patient assessments that include vital signs, pulse oximetry, thoracic x ray interpretation, arterial blood gas acquisition, bedside pulmonary function and spirometric testing, and bronchoscopy assisting.

Handle medical gas cylinders safely and effectively.

Complete BLS certification to include basic airway management.

METHODS OF INSTRUCTION: Lecture, Demonstrations, audio-visuals, hands-on participation and demonstration of basic competencies.

STUDENT ASSESSMENT METHODS AND GRADING PROCEDURES:

Students will be required to exhibit competency in various tasks and procedures. These competencies will be verified by peer and instructor review and a "check off" system utilized. Points will be awarded for successful completion of check offs as well as for midterm and final practicum exams and unannounced quizzes.

Mid/Final Exams: 60%

Check offs 40%
(Approximate Breakdown)

GRADING SCALE:

A =	4.0	95-100%	C =	2.00	74-76%
A- =	3.67	90-95%	C- =	1.67	70-73%
B+ =	3.33	87-89%	D+ =	1.33	67-69%
B =	3.00	84-86%	D =	1.00	64-66%
B- =	2.67	80-83%	D- =	.667	60-63%
C+ =	2.33	77-79%	F =	0.00	

Students in the Respiratory Care Program **must have a "B-" (80% or greater) final grade in order to progress** within the program. Test questions will be based on unit objectives. Unit objectives are to be used as study guides.

METHODS TO IMPROVE COURSE:

Student evaluations and respiratory faculty assessment of course content.

ATTENDANCE: Class attendance is an integral part of this course. Exam dates will be announced. Only legitimate reasons for missing an announced exam will be accepted. Failure to appear for scheduled exams will result in zero points awarded. Expect periodic unannounced quizzes. There is no make-up for missed quizzes.

SEE: TEST/QUIZ MAKEUP

Please refer to your Student Manual for additional Policies and Student Resources.

ACADEMIC INTEGRITY:

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by The University. All students need to be familiar with the Student Conduct Code. The Code is available for review online at http://life.umt.edu/vpsa/student_conduct.php.

DISABILITY ACCOMODATION:

Eligible students with disabilities will receive appropriate accommodations in this course when requested in a timely way. Please speak with me after class or in my office. Please be prepared to provide a letter from your DSS Coordinator. For more information, visit the Disabilities Services website at <http://www.umt.edu/dss/> or call 406-243-2243 (voice/text)

Note: Instructor reserves the right to modify syllabi and assignments as needed based on faculty, student, and/or environmental circumstances.

Cell Phones/Pagers: Due to an increasing number of students, who own and use cell phones and pagers, it has become necessary to institute a policy during class times. As you are aware, these tools are distracting to an entire class. However, some students require them for business, which allows them to further their education. Please follow these guidelines:

If the cell phone/pager is not business or emergency related, please turn it off.

Use the vibrating option on your pager.

Do not listen to the messages in class. Please leave class quietly.

CELL PHONES AND PAGERS MUST BE TURNED OFF DURING EXAM AND CLASS

PRESENTATIONS.

SEATING: Many classrooms have chairs to accommodate persons with disabilities. These chairs will display the international disability symbol and are assigned to a particular student. Please refrain from using these chairs or making adjustments to them unless the chair is assigned to you. If you think you may have the need for a specific chair, please contact Disability Student Services. Thank you for your cooperation.

TEST/QUIZ MAKEUP: Make-up exams and lab experiences **will only be given under extreme circumstances** and then only if: a) permission is granted *in advance* by the course instructor, or b) a written excuse is provided by

a medical doctor. **The burden of proof is on the student**, so you must document and prove a justifiable absence. Not following this procedure prior to the exam will automatically result in a zero points awarded for the exam. Missed tests need to be made up within *one week* of the original date given. You are responsible for contacting the Academic Support Center, 243-7826, to schedule the make-up. Failure to do so will result in a **ZERO** grade for the missed test.

The faculty senate guidelines concerning the issuance of incomplete grades will be followed. Attention to critical dates such as P/NP, drop, etc. is the responsibility of the student. Students wishing to drop the class after the drop deadline will need a documented justifiable reason for doing so. Dropping the class for fear of bad grade or to protect a GPA are **not** justifiable reasons. The principles embodied in the **Student Handbook Code** will be adhered to in this course.

Quizzes: Failure to be present for quizzes will result in a zero being recorded and used in computing your average. There will be no make-up opportunities for missed quizzes.

Homework: **It is the expectation that homework will be turned in when due.** If you are not present, it is your responsibility to see that it is in my mailbox by 4:00 p.m. on the due date **or a zero will be recorded and used in computing your average.**

Student Decorum: All students are expected to conduct themselves in a professional manner at all times in both the classroom and alternative settings. Discussions of an academic nature are encouraged and can enhance student learning. However, social conversation is not appropriate during lectures as it creates a distraction to students and faculty. Respect and courtesy will be shown at all times to peers, faculty, and the general public. **There are no exceptions to this policy at any time or under any circumstances.**

REQUIRED TEXTS:

TITLE: Basic Lab and Clinical Competencies for Respiratory Care, 4th Edition
AUTHOR: White, et al. al.
PUBLISHER: Delmar

TITLE: Clinical Assessment in Respiratory Care, 6th Edition
AUTHOR: Wilkins, et al
PUBLISHER: Mosby, ISBN: 978-1-4160-5923-3

SEQUENCE OF STUDY: The outline presented here will provide a roadmap of the sequence of study, practice and competency demonstration required to pass this course and enter clinical course next semester (AHRC 255). It is imperative that you follow this guideline very closely. Each unit has readings from AHRC 129, Patient Care & Assessment and the required competencies from White's text or this syllabus. **All competency forms must be signed by a peer and a laboratory instructor. The laboratory instructor must also sign the "Check-Off Log Sheet." This must be completed and turned in on The last class meeting of the course. All competencies must be completed by this date in order to matriculate into the next semester of the program.** Over the course of the semester instructors may choose to integrate several competencies into a single patient scenario. These integrated lab scenarios will get you accustomed to the dynamic process of patient care. All competencies must be completed in the scheduled class times. **Friday afternoons are open lab days for practice. An instructor may or may not be present for these times.**

LABORATORY ETIQUETTE: Students will work in groups. Prepare and read materials/exercises before class begins. It is important to actively participate with the equipment. Get direct, hands-on experience. Be courteous, the lab will be crowded and cooperation and sharing of equipment is essential. Be attentive to mini-lecture/demonstrations by your instructor. Ask questions. Complete the laboratory exercises in the time allotted and hand it in. **Enjoy the lab setting.** All conditions are controlled and each performance step is outlined on the checklist. Concentrate on the technical skills and equipment – related aspects.

Unit outlines, Objective, and Readings:

Unit I: Patient Safety, Positioning & Transport

Objectives: At the end of this unit the student will be able to:

SEE: page 277 in White's lab text on patient positioning and safety.

Identify when a patient is in optimal vs. suboptimal position.

Discuss "zero lift" concept and methods to save your back.

Discuss patient transport concerns.

Use lab partners to: Perform safe in-bed patient positioning.
 Perform safe bed-to-chair moves.
 Perform safe bed-to-transport gurney & transport gurney-to-bed moves.

Discuss what constitutes patient safety in the environment of care, methods of patient identification, medication administration; confidentiality.

Discuss the rationale for various "CODE" terminologies that may be used in the clinical setting.

Describe ways to get help when indicated.

Reading:

I. White, Chapter 16, p 277 Objectives; pp. 283-285 on Moving Patients & Safety Devices

II. **CPGs:** SCCM Guidelines for Inter- and Intra-hospital Transport of Critically Ill Patients,
 www.rcjournal.com/cpgs/index/cfm

III. **Competencies**
 Patient Positioning, p. 305

UNIT II: Universal Precautions, Asepsis, Infection Control, Equipment Processing

Objectives: Upon completion of this unit the student will be able to:

SEE: Ch. 1, White's lab text objectives for theory, p. 1; proficiency, p. 5; objectives for theory p. 369; proficiency, p. 375

Define "microorganism," "pathogen," "cross-contamination."

Identify major pathogens, modes of transmission, and places commonly found.

Define "universal precautions" and application to the clinical setting.

Identify personal protective equipment, PPE.

Identify types of isolation and what procedures are required:

Demonstrate soap and water hand washing technique. Discuss significant times to do it.

Demonstrate waterless hand disinfection technique and discuss significant times to use it.

Demonstrate – in proper order – aseptic gowning, including protective eye wear.

Demonstrate aseptic application of sterile gloves. Discuss indications for use.

Discuss indications for use of non-sterile gloves and double gloving technique.

Demonstrate/discuss double bagging technique for equipment & supplies.

Demonstrate/discuss use of equipment (stethoscopes, oximeters, etc.) during isolation.

Demonstrate – in proper order – aseptic removal and disposition of isolation attire.

Demonstrate/discuss safe equipment cleaning, disinfection, and sterilization.

Readings:

I. White, Chapter 1, Basics of Asepsis; Chapter 19, Equipment Processing & Surveillance

II. Competencies

Hand washing, p. 11

Isolation Procedures, p. 13

Equipment Processing, p. 381

UNIT III: Vital Signs & Pulse Oximetry

Objectives: Upon completion of this unit the student will be able to:

SEE: White's lab text: Key Terms, Objectives for Theory, pp. 15-16, and Proficiency Objectives p. 22.

Discuss indications for obtaining baseline and trending vital signs.

Identify limitations to obtaining accurate blood pressure, pulse rate, respiratory rate; pulse Oximetry.

Temperature: Discuss various methods of assessing patient temperature.

Prepare and use infrared temporal artery wand to obtain temperature on lab partner.

Identify normal range of body temperature, relative to age, viral vs. bacterial infection.

Blood Pressure (BP): Identify a sphygmomanometer and identify units of measurement.

Discuss BP cuff size limitations, sites for obtaining blood pressure readings.

Discuss use of Doppler (ultrasound) for blood pressure measurements in critical care.

Obtain and record accurate BPs on a lab partner per lab exercises.

Pulse: Obtain and record accurate pulse on lab partner per lab exercises.

Respiratory Rate: Obtain and record accurate respiratory rate on lab partner per lab exercises.

Pulse Oximetry: Identify a pulse oximeter and describe its theory of operation, uses; limitations.

Obtain and record pulse oximetry on lab partner per lab exercises.

Stethoscope: Identify components, uses, trouble shooting, limitations, cleaning & infection control.

Auscultate lab partner for breath sounds using systematic approach. Note differences at trachea, mainstem bronchi, mid-zones and lung bases.

Breath Sounds competency will be in Advanced Patient Assessment unit.

Readings:

I. White, Chapter 2, Basic Patient Assessment: Vital Signs & Breath Sounds. OMIT Measuring Temperature on p. 22; Chapter 10, Key Terms, Objectives; CPGs, pp165-167, and pulse oximetry, pp 168-169.

II. **Competencies:**
Vital Signs, p. 29
Pulse Oximetry Monitoring, p. 175

UNIT IV: Physical Exam of the Adult

Objectives: Upon completion of this unit the student will be able to:

White's lab text: Ch. 2 - Key Terms & Objectives for Theory regarding Breath Sounds, pp.15-16, Objectives for Proficiency, p. 22;

Ch. 3 - Key Terms & Objectives for Theory, pp. 33-34, Objectives for Proficiency, p 40;

Describe normal bony structure and anatomical landmarks of the chest.

Describe terms denoting abnormal skeletal findings.

Identify normal vs. abnormal breathing patterns vs. abnormal rate and rhythm patterns.

Describe types of normal breath sounds and where they are heard.

Describe types of adventitious breath sounds and where they may be heard and may indicate.

Use web-based, or library resources regarding physical assessment and breath sounds to gain a basic knowledge of normal and adventitious sounds.

Use a lab partner; per lab exercises, properly position them for a physical assessment of the chest:

Perform visual exam: Note key landmarks, vertical division lines respiratory rate, rhythm, pattern, skeletal abnormalities. Inspect finger digits.

Perform palpation and percussion, noting both normal and any abnormal findings.

Perform auscultation using systematic (anterior, lateral, posterior) approach. Document types of normal breath sounds and where you find them. Document any adventitious breath sounds.

Listen for heart sounds. "Lub-dub" is normal. Note irregular or adventitious heart sounds.

Using X-Ray view boxes, identify skeletal, soft tissue, and air landmarks of a chest radiograph (CXR).

Identify features of normal vs. abnormal CXRs vs. deceiving artifacts.

Readings:

I. White, Chapters 2, Vital Signs & Breath Sounds; Chapter 3, Advanced Assessment;

- II. **COT Library:** Video, 616.2 SPR Performing Respiratory Assessment:
DVD - Fundamentals of Lung & Heart Sounds
- III. **Web-based:** www.netanatomy.com; <http://science.nhmccd.edu/biol/>;
www.aarc.org/resources/Rapid-Response.
- IV. **Competencies**
Breath Sounds, p. 31
Physical Assessment, p. 45

UNIT V: Bedside Pulmonary Function Tests & Basic Spirometry

Objectives:

SEE: White's lab text, Ch. 5: Key Terms & Objectives of Theory: CPGs, pp. 69-73,
Proficiency Objectives, p. 83

Maximum Inspiratory & Expiratory Pressures: Define terms. Identify units of measurement and normal ranges and what indicates respiratory failure. Identify a manometer. Discuss reasons for testing. Perform tests on a lab partner, emphasizing techniques for reliable & reproducible values via mouth or artificial airways.

Peak Flow Meter: Define peak flow. Identify units of measurement. Identify a peak flow meter. Discuss use of green, yellow and red zones in asthma management. Perform testing on a lab partner.

Respirometer: Define respirometer. Identify units of measurement. Identify a respirometer. Describe what can be measured. Identify limitations & precautions. Perform tests on a lab partner. Discuss techniques for reliable & reproducible values via mouth or artificial airways.

Bedside Spirometry: Discuss the use of basic spirometry in the clinical setting. Identify a basic spirometer and equipment necessary to operate. Perform testing on lab partner.

Discuss techniques for reliable & reproducible values per American Thoracic Society (ATS), standards. Identify units of flow measurement. Identify units of volume measurement. Discuss how a patient's "normal values" are arrived at.

Identify and discuss normal vs. abnormal flow tracings. Discuss pre and post-bronchodilator use and what indicates "reversibility." Discuss bronchial provocation, (challenge testing) methods and significance.

Readings:

- I. White, Chapter 5, Pulmonary Function Testing, but EXCLUDE the Collins system.
- II. **CPGs:** (5) for Pulmonary Function Testing: www.rcjournal.com/cpgs/index.cfm
- III. **Competencies**
Bedside Pulmonary Function, p. 97
Basic Spirometry, p. 99

UNIT VI: Arterial Blood Gas Acquisition

Outline:

1. Indications
2. Contraindications/hazards/complications
3. Assessment of need
4. Monitoring

5. Blood Borne Pathogens: Have completed the U of M Institutional Biosafety Committee Training and exam from the website noted earlier: www.umt.edu/research/ibc/BBP.htm

Objectives:

1. Understand CPGs regarding arterial blood sampling
2. SEE: White's lab text: Ch. 8, Key Terms & Objectives for Theory, p. 127; Objectives for Proficiency, p. 133.
3. Describe pre-analytical, analytical, and post-analytical phases of blood procurement, analysis and reporting. Identify potential errors relative to each phase.
4. Identify anatomical sites
5. Discuss rationale for choosing radial artery site vs. others.
6. Describe complications of arterial puncture.
7. Perform Allen's test on lab partner.
8. Describe purpose of the Allen's test.
9. Describe types of sampling, pre-analytical, errors
10. Discuss use of topical and injectable anesthetics, indications and complications.
11. Describe optional sampling technique and reducing patient anxiety
12. List equipment needed and proper sample handling
13. Describe basics of blood gas sample analysis and reporting
14. Using manikin arms, practice blood sampling, anesthetic use, topical vs. injectable.
15. Identify some brand names of ABG draw equipment and devices.

Readings:

- I. White, Ch. 8, Arterial Blood Gas Sampling
Egan's Fundamentals of Respiratory Care, 8th Ed., Ch. 10, pp. 355-362 and pp. 365-372
- II. **Videos (shown in class):**
Sims Portex (Smiths) –Arterial Blood Sampling
Blood Borne Pathogens, dvd, 616.15, optional to the IBC website noted above.
- III. **Competencies:**
Arterial puncture, p. 139

UNIT VII: Chest X-ray Interpretation

Outline:

1. Using actual case study x-rays, identify skeletal, soft tissue, fluid, and air landmarks of a chest radiograph (CXR).
2. Identify features of normal vs. abnormal CXRs and deceptive artifacts.

Reading: White, Ch. 4

Web-based: www.netanatomy.com

Competency: X-ray Interpretation, p. 67

UNIT VIII: Electrocardiogram Procurement

Outline:

Identify indications for ECG
Place electrodes in proper position for basic ECG
Run ECG tracing
Troubleshoot problems associated with obtaining a quality ECG tracing

Reading: Wilkins, Ch 10 & White, Ch 6

Competency: Electrocardiograms, p. 113

UNIT IX: Bronchoscopy Observation & Assisting

Objectives:

SEE, White's text, Ch. 18, Bronchoscopy Assisting, Key Terms & Objective for Theory & CPG, p. 351-353.

NOTE: We do not have a bronchoscope or a bronchoscopy lab. The competency check-off for this is in this syllabus, See p. 20. The subject matter is discussed in RES 129 Respiratory Care & Assessment, but be sure to get this competency check-off signed by the lab instructor.

UNIT X: BLS CERTIFICATION

Objectives:

1. Attain the necessary skills to earn BLS certification
2. Complete the self contained certification course
3. Successfully demonstrate the need for interventions, i.e., basic airway management and chest compressions required by the BLS instructor for certification according to AHA guidelines
4. Pass the required examination

Reading:

- I. BLS course materials
- II. Competency: BLS Manual Resuscitation p. 409

Clinical Performance Evaluation **BRONCHOSCOPY OBSERVATION**

Student Name: _____ Name of Clinical Affiliate: _____

Clinical Preceptor: _____ Date of Observation: _____

COT Lab instructor: _____ Date of course instruction: _____

- This replaces Bronchoscopy Assisting in White's Lab Competencies as more relevant to the Respiratory Care student in Clinical I at The University of Montana College of Technology.

PATIENT PREPARATION: Site of entry = _____
Anesthetic agent(s): _____
Sedative agent(s): _____
Reversal agents on hand: _____
Oxygen: initial liter flow = _____ route of administration = _____

LOCATE EMERGENCY EQUIPMENT: Crash cart _____, Bag Valve Mask _____

MONITORING EQUIPMENT: _____

PATIENT DIAGNOSIS: _____ **REASON FOR BRONCHOSCOPY:** _____

DIAGNOSTICS: Was Bronchial Alveolar Lavage, BAL, performed? _____ Mucolytics? _____

Sputum for culture and stain? _____ Suspected microorganism? _____

Tissues obtained for biopsy? _____ Is guided fluoroscopy required? _____

Instruments used to obtain specimens: _____

How are tissue samples prepared? _____

Airway stents placed? _____ Where? _____

Laser ablation required? _____ Laser safety requirements: _____

Other findings: _____

PATIENT VITAL SIGNS: Stable? _____ Abnormal? _____

How are abnormal vitals handled? _____

POST PROCEDURE MONITORING: is patient stable after procedure? _____

Bronchodilator or other medications required? _____

SIGNIFICANT LEARNING: _____

SIGNATURE OF CLINICAL PRECEPTOR: _____

AHRC 130/150 – COMBINED LABORATORY COMPETENCIES - CHECK-OFF LOG

STUDENT NAME _____

BRING THIS TO ALL LAB & Turn in by **final lab meeting**

UNIT #	COMPETENCY – Page # in White's text	Date Completed	INSTRUCTOR SIGNATURE
I	Patient Positioning - page 335		
I	Hand washing - page 15		
I	Isolation Procedures - page 17		
I	Equipment Processing - page 407		
II	Vital Signs - page 33		
II	Pulse Oximeter Monitoring – page 193		
II	Breath Sounds (auscultation) - page 35		
II	Physical Assessment - page 49		
III	Humidity and Aerosol - page 299		
III	Small Volume Nebulizer - page 301		
III	MDI Administration - page 279		
III	DPI Administration - page 281		
IV	Bedside Pulmonary Function Testing - page 105		
IV	Basic Spirometry - page 107		
V & VI	Oxygen Supply Systems - page 237		
VI	Liquid Oxygen Systems - page 238		
V & VI	Oxygen concentrations - page 239		
VI	Oxygen Administration- page 261		
VII	Incentive Spirometry - page 371		
VII	IPPB - page 373		
VII	CPAP - page 629		
VIII	Chest Percussion - page 337		
VIII	PEP Therapy - page 339		
VIII	IPV - page 375		
VIII	Flutter valve/Acapella - page 341		
VIII	HFCWO (vest) – page 343		
VIII	Adjunctive Breathing (pursed-lip, directed cough, quad cough) -page 347		
IX	Arterial Puncture – page 153		
X	BLS Manual Resuscitation - Certification		
XI	Chest X-Ray Interpretation - page 73		
XI	Electrocardiograms – page 125		
XII	Bronchoscopy Observation – RES 130 Syllabus		