

Barbara Menard/rs
SEPTEMBER 1990

NUR 403
DOC, #363

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: CARDIOVASCULAR
Code No: NUR 403
Program: RN CRITICAL CARE NURSING PROGRAM
Semester:
Date: SEPTEMBER 6, 1990 TO JANUARY 24, 1991
Author: BARBARA MENARD, MARY RUNDE

New

Revision:

APPROVED
Chairperson

Date

(t
JUL 07 m iD)
i- ^-^U'Li bLL m 1

CARDIOVASCULAR

NUR 403

Course Name

Course Number

COURSE DESCRIPTION:

This unit presents:

^ • Major Disease Processes

Atherosclerosis, angina pectoris, acute coronary insufficiency, myocardial infarction, congestive heart failure, pulmonary edema, pericarditis and hypertension are discussed.

2. Cardiovascular Assessment

An in-depth assessment of the cardiovascular patient, including history taking, observation, palpation, percussion and auscultation will be focused upon.

Cardiovascular Nursing Intervention

This unit includes the care of cardiovascular patients with pathological disorders emphasizing pain management, drug therapy and monitoring of the medical and/or surgical patient, Psychosocial implications and electrical interventions (defibrillation, pacemaker management) are studied.

Cardiovascular Laboratory Skills

Laboratory sessions focus on ECG and hemodynamic monitoring of the cardiovascular patient. Electrocardiographic and pressure waveform analysis is included. Arrhythmia interpretation, management and hemodynamic troubleshooting techniques are discussed.

5 UNITS

- A. CARDIAC PHYSIOLOGY
- B. CARDIOVASCULAR PATHOPHYSIOLOGY
- C. CARDIOVASCULAR ASSESSMENT
- D. Nsg INTERVENTION
- E. CARDIOVASCULAR LAB SKILLS

CARDIOVASCULAR

NUR 403

Course Name

Course Number

COURSE OBJECTIVES

Differentiate between the pressures and flow of the systemic and pulmonary circulatory system.

Outline the different mechanisms that control heart function.

Discuss the factors that regulate the microcirculation

Discuss the conduction system of the heart.

Compare the relationship of pressures in the heart to the mechanical events of the cardiac cycle.

COURSE CONTENT

1. Anatomy and physiology the cardiovascular sy
2. Systemic vs. Pulmonary circulation.
3. Differences in hepatic, renal and cerebral circulation.
4. Structure of arteries, capillaries and veins.
5. Pressures in the heart:
arterial
venous
6. Pressure gradients.
7. Coronary Artery circulation.

1. Control of the heart:
 - a) sympathetic and parasympathetic nervous system
 - b) chemoreceptors
 - c) pressoreceptors
 - d) reflexes:
 - Bainbridge
 - Respiratory

1. Microcirculation
 - a) local regulation:
 - active hyperemia
 - reactive hyperemia
 - b) autonomic regulation
 - c) collateral circulation
 - d) coronary "steal"

1. Conduction System

1. Cardiac Cycle

CARDIOVASCULAR

NUR 403

Course Name

Course Number

COURSE OBJECTIVES

6. Describe the factors influencing ventricular function and their effect on cardiac output.

Outline the electromechanics of the heart muscle.

Systemically assess the cardiovascular system including history taking

COURSE CONTENT

- 1.. Atrial function (including factors influencing atrial function)
 2. Nervous control
 3. Hormonal control
 4. Venous return
 5. Preload
 6. Afterload
 7. Contractility
 8. Influences of age, weight, sex and muscle mass on cardiac mechanics
 - a) properties of heart muscle
 - b) electromechanics
 - c) contractile process
 - d) Frank Starling Law - fibre length
- Pacemaker Cells
Electrophysiology of the Heart:
- Action Potential Curve
 - a) depolarization, repolarization
 - b) cardiac cycle
 - c) conduction system
- History Taking
Observation
 - a) skin
 - b) jugular venous
 - c) distention
 - d) CVP determination
 - e) Hepatjugular Reflux
 - f) extremitiesprecordium
- Palpation
 - a) arteries
 - b) types of pulses:
 - c) - pulsus alternans
 - pulsus paradoxusprecordial pulses at aortic, pulmonic apex areas
- Percussion

CARDIOVASCULAR

NUR 403

Course Name

Course Number

COURSE OBJECTIVES

COURSE CONTENT

- | | |
|--|--|
| <p>Incorporate the use of diagnostic studies into the assessment of the cardiovascular system.</p> <p>10. Relate basic arrhythmias to specific changes in heart sounds.</p> <p>11. Identify pathological changes as determined by inspection, palpation, percussion and auscultation.</p> <p>12. Recognize basic ECG complex and relate it to phases of depolarization and repolarization.</p> <p>13. Demonstrate effective use of vectorcardiography in determining abnormal complexes,</p> <p>14. Define the terms associated with Coronary Artery Disease.</p> <p>15. Describe the evolving process of Atherosclerosis.</p> | <p>1. Diagnostic Studies</p> <p>2. Echocardiography Labor Experience (1-1/2 hours)</p> <p>Auscultation</p> <p>a) positions</p> <p>b) stethoscope</p> <p>c) normal heart sounds and intensities</p> <p>splitting: S 1 '</p> <p>e) paradoxical, wide and fixed splitting</p> <p>f)</p> <p>g) pericardial friction rub</p> <p>h) murmurs</p> <p>1. Pathological Changes</p> <p>2. Cardiology Laboratory Experience {2 hours)</p> <p>Introduction to ECG monitoring</p> <p>a) equipment</p> <p>b) standard leads</p> <p>c) "P Q R S T" in relation to depolarization, repolarization</p> <p>1. Recording of electrical events</p> <p>2. 12 lead ECG</p> <p>Vectorcardiography, electrical axis</p> <p>Coronary Artery Disease</p> <p>Definition of Terms</p> <p>Atherosclerosis</p> <p>a) types</p> <p>b) risk factors</p> |
|--|--|

Course Name

Course Number

COURSE OBJECTIVES

- 16 Discuss the types and precipitating causes of angina.
- 17 Differentiate pain patterns associated with cardiovascular pathology.
18. Discuss complications that occur as a result of infarction.
- 19 List and discuss diagnostic tests related to coronary artery disease, myocardial infarction.
20. Utilize knowledge of the function of the cardiovascular system to implement appropriate nursing care.

COURSE CONTENT

1. Angina
 - a) types
 - b) pathology
 - c) risk factors
 - d) clinical presentation
1. Myocardial Infarction
 - a) causes
 - b) clinical presentation
 - c) pain pattern
2. Angina - pain pattern
3. Pericarditis - pain pattern
1. Complications:
 - a) arrhythmias
 - b) congestive heart failure, pulmonary edema
 - c) cardiogenic shock
 - d) pericarditis
 - e) aneurysm
 - f) Dressier's Syndrome
 - g) ventricular rupture
1. Diagnostic and Laboratory Findings

Nursing management of the cardiovascular patient

 - a) pain management
 - pain pattern differentiation
 - nitrate therapy
 - morphine sulfate
 - b) vaso-active drug therapy
 - Dopamine
 - Dobutrex
 - Nitroprusside
 - NTG gtts.
 - c) thrombolytic drugs
 - streptokinase
 - activase
 - d) angioplasty, coronary artery bypass grafting, intra-aortic balloon pumping

CARDIOVASCULAR

NUR 40 3

Course Name

Course Number

COURSE OBJECTIVES

21. Identify appropriate charting mechanisms.
22. Identify psychological and sociological effects of cardiac pathology in the individual.
23. Participate as a member of the health care team in the care of a patient with cardiac disease.
24. Appropriately interpret basic arrhythmias due to impulse formation and conduction that occur at the SA-node, AV-node, atrial and ventricular conduction pathways.

COURSE CONTENT

1. Charting Drug Therapy
 2. Use of Flow Sheets
1. Psychosocial implications of cardiovascular disorders
 - a) patient teaching
 - pre-op
 - post-op
 - in preparation for discharge or tr.
 - post M.I.
- Monitoring the medical/surgical patient
Cardiovascular surgery
- Sinus arrhythmias
- a) normal sinus rhythm
 - b) sinus tachycardia
 - c) sinus bradycardia
 - d) sinus arrhythmia
 - e) sinus arrest
 - f) sinus block
 - g) wandering pacemaker
- Atrial arrhythmias
- a) premature atrial contraction
 - b) paroxysmal atrial tachycardia
 - c) atrial flutter
 - d) atrial fibrillation
- Nodal arrhythmias
- a) premature nodal
 - b) (junctional) contr[^] i-junctional rhythm
 - c) upper, mid, lower noc...
 - d) junctional tachycardia
junctional escape rhythm

CARDIOVASCULAR

NUR 403

Course Name

Course Number

COURSE OBJECTIVES

COURSE CONTENT

- A-V Blocks
 - a) 1st degree AV block
 - b) 2nd degree AV block
Mobitz I (Wenckebach)
 - c) 2nd degree AV block
Mobitz II
 - d) 3rd degree AV block
(complete heart block)
- Ventricular arrhythmias
 - a) premature ventricular contraction
 - b) ventricular tachycardia
 - c) ventricular fibrillation
 - d) ventricular asystole
- 25. Identify appropriate antiarrhythmic agents for each of the basic arrhythmias.
 - 1. Antiarrhythmic agents
 - a) Lidocaine
 - b) Rhythmolan
 - c) Verapamil
 - d) Quinidine
 - e) Procainamide
 - f) Inacor (Amiodarone)
 - g) Propranolol
 - h) Bretylium
- 26. Outline indications for techniques expected patient response and potential complications of the patient who is defibrillated or cardioverted.
 - 1. Electrical interventions
 - a) defibrillation
 - b) cardioversion
 - 2. Indications, precautions, technique, nursing care
- 27. Formulate a nursing care plan for the patient having a temporary pacemaker inserted, including psychological implications
 - Electrical intervention
 - a) pacemakers:
 - types
 - product code
 - b) pacing, sensing, mode . response
 - c) indications
 - d) method of insertion
 - e) nursing responsibilities
 - f) troubleshooting

CARDIOVASCULAR

NUR 403

Course Name

Course Number

COURSE OBJECTIVES

28. Define inotropic, chronotropic and dromotropic.
29. Describe the action of the autonomic nervous system in relation to these terms.
30. Identify principles of pressure monitoring.
31. Identify the components and functions in a pressure monitoring system.
32. Demonstrate techniques of setting up equipment.
33. Examine the role of the nurse during hemodynamic monitoring and cardiac output measurements, including complications, troubleshooting and interventions.

COURSE CONTENT

1. Terminology
 - a) inotropic
 - b) chronotropic
 - c) dromotropic
 1. Action of the autonomic nervous system.
 1. Pressure measurement concepts
 2. Central venous pressure monitoring
 3. Arterial pressure monitoring
 4. Pulmonary artery pressure
 5. Indications
 6. Pressure waveforms
- Pressure system components
Equipment set-up techniques
- Lab practice session:
- equipment set-up
1. Cardiac output
 2. Complications
 3. Troubleshooting, nursing interventions

CARDIOVASCULAR

NUR 40 3

Course Name

Course Number

METHOD OF ASSESSMENT (GRADING METHOD):

A. TESTS '

1. **Test #1** (20% of final mark)
 - anatomy, physiology
 - control of the heart
 - control of blood pressure
 - electrophysiology, action potential
 - muscle mechanics
 - conduction
 - terms of hemodynamics
 - ventricular function
 - pressure characteristics, interrelationships
2. **Test #2** (20% of final mark)
 - cardiac assessment
 - ECG measurement and interpretation
 - electrical axis
 - coronary artery disease
 - angina
 - M.I.
 - cardiomyopathy
 - pericarditis
 - pain management
 - drug therapy
3. **Test #3** (30% of final mark)
 - ECG arrhythmias
 - electrical interventions
 - aortic aneurysm
 - concepts of pressure measurement
 - pressure monitoring:
 - indications
 - waveforms
 - complications
 - troubleshooting
 - nursing interventions
 - cardiac output, cardiac index

CARDIOVASCULAR

NUR 403

Course Name

Course Number

B. ASSIGNMENTS:

- 1, **Assignment #1** (worth 5% of final mark)
preload, afterload, contractility. Starling Law of the Heart
2. **Assignment #2** (worth 5% of final mark)
report on ultrasound laboratory experience
3. **Assignment #3** (worth 10% of the final mark)
cardiac assessment related to Cardiology Office experience
4. **Assignment #4** (worth 5% of the final mark)
Temporary Pacemaker insertion: Nursing Care Plan including psychological implications

C. CLASS PARTICIPATION, LAB WORK: (5% of final mark)

* A minimum achievement level of 70% is required.

GRADING SCALE:

| | |
|-----|----------------------------|
| A+ | 90-100% |
| A | 80- 89% |
| * B | 70- 79% |
| C | 60- 69% |
| R | Repeat: Objectives Not Met |

NOTE; Tests are the property of Sault College.

HOURS: 10 WEEKS (58 HOURS)
(9 weeks x 6 hours ~ 54 hours)
(1 week x 4 hours = 4 hours)

CARDIOVASCULAR

NUR 403

Course Name

Course Number

TEXTBOOKS:

Alspach, J., Williams, S. Core Curriculum For Critical Care Nursing, 3rd Edition, W.B. Saunders Co., Toronto, 1985.

Harvey, M.A. Study Guide to Core Curriculum for Critical Care Nursing, W.B. Saunders Co., Toronto, 1986.

METHODOLOGY: Consists of:

- Lecture
- Audiovisual
 - Slide/Tape
 - Video
 - Overheads
 - Filmstrip
- Tests (3)
- Assignments (4) Graded
 - Lab Work, Demonstration, Practice
 - Homework and Reading Assignments

SAULT COLLEGE
 CRITICAL CARE NURSING PROGRAM
 NUR 403 - CARDIOVASCULAR

CLASS SCHEDULE

READING/HOMEWORK ASSIGNMENTS

WEEK

| | | |
|---------|--|---|
| I | Lesson 1. - Course Review - Anatomy, Physiology - Coronary Artery Circulation - Cardiac Conduction Lesson 2. * Oxygen Saturation Assignment - Microcirculation - Control of the heart, blood pressure - muscle mechanics - electrophysiology of muscle cells | Assignment: Oxygen Saturation Text: pg. 103-113 Text: pg. 113-118 pg. 118-120 |
| WEEK II | Lesson 3. - Action potential curve - Polarization - Depolarization - ECG waveform - Terms of hemodynamics - Atrial, Ventricular function | Text: Review pg. 116-113 |
| WEEK IV | Lesson 7. * Assignment ECG Interpretation - Recording of electrical events {12 leads) - Electrical axis, interpretation of vectors Lesson 8. - Electrical axis, vectors, continued - Coronary Artery Disease | Text: pg. 153-164 Text: pg. 164-168 * Assignment: Calcula Electrical Axis Text: pg. 158-174 |
| WEEK V | Lesson 9. * Electrical Axis Assignment - Coronary Artery Disease - Angina - Myocardial Infarction | Assignment: Report on Ultrasound Lab Experience * Assignment: Angina Text: pg. 191-193 pg. 182-185 pg. 178-182 * Assignment: ECG Interpretation ST Segments |

CLASS SCHEDULE

READING/HOMEWORK ASSIGNMENTS

| | | |
|------|----------------------------|---------------------------|
| | Lesson 10. | |
| | * Angina Assignment | * Assignment: |
| | - Pain Management | Cardiomyopathy |
| | - Drugs | |
| | - Cardiomyopathy | Text: pg. 139-145 |
| | * ECG Interpretation | |
| | ST Segments Assignment | |
| WEEK | Lesson 11. | * Assignment: ECG |
| VI | * Cardiomyopathy | Interpretation (6 strips) |
| | Assignment | |
| | - Arrhythmias | Text: pg. 174-178 |
| | - Antiarrhythmic Agents | |
| | Lesson 12. | |
| | * ECG Interpretation | Assignment: Nursing Care |
| | Assignment: | Plan for the Patient With |
| | A. Tach | Temporary Pacemaker |
| | Sinus Arrest | |
| | Sinus Arrhythmia | |
| | Wandering Pacemaker | |
| | A. Fibrillation | |
| | A, Flutter | |
| | Electrical Interventions | |
| | Defibrillation | |
| | Pacemakers | |
| WEEK | Lesson 13. | |
| VII | TEST | |
| | - Electrical Interventions | |
| | (continued) | |
| | - Cardioversion | |
| | - Aortic Aneurysm | |
| | Lesson 14. | * Assignment: ECG |
| | - Concepts of Pressure | Interpretation (x 4) |
| | Measurement | |
| | - CVP Monitoring | |

CLASS SCHEDULE

READING/HOMEWORK ASSIGNMENTS

| | | |
|--------------|---|--|
| WEEK VIII | Lesson 15. * ECG Interpretation Assignment A. Fib (with PVC) Tachy. (with PVC, PAC) Sinus arrhythmia Bigeminal PAC's - Pressure monitoring - Arterial lines - Pressure components Set Up - Lab Practice: CVP | Text: pg. 151-153 * Assignment: ECG Interpretation |
| | Lesson 16. * ECG Interpretation Assignment - Arterial Waveforms - Lab Practice - Pulmonary Artery Monitoring - Indications, Methods | |
| WEEK IX | Lesson 17. - P.A. Cath Uses - P.A. Cath Insertion - P.A. Cath Waveforms - Equipment Set-Up - Troubleshooting | |
| | Lesson 18. - Cardiac Output - Cardiac Index - Derived Formulas - Final Review | |
| WEEK X | (4 Hours) Lesson 19. - Course Summary - Evaluations - Test - Outstanding Assignments Due | |
| | Lesson 20. - Test Takeup - Marks - Experiences at: a, Cardiologist (2 hours) b. Ultrasound (1-1/2 hours - Return of All Assignments | |

Class Schedule

Reading / Homework

Assignments

Sept 6; Lesson 1

Assignment 1:
terms of hemodynamics

Course review
Anatomy / Physiology
Ordinary Artery Circulation
Micro-circulation
Control of heart and blood pressure
Muscle Mechanics
Electrophysiology of Muscle Cells
Cardiac Cycle
Action potential curve
Polarization and Depolarization
Electromechanics of Heart Muscle
Atrial/ventricular function

Read: text pg. 103-113
AACN: pg, 433-503

Library Slides
Heart-anatomy

For next class
- stethoscope &
- bathing suit

Sept- 13 : Lesson 2

Cardiologist Visit
Assignment 2

Coronary Artery Disease
Angina
Cardiovascular Assessment
Films; Heart Assessment - 35 min
How to assess chest pain - 30 min
How to assess heart sounds - 30 min

Read; text pg. 131-193
182-185
AACN pg. 572-595

Slides at Library

Sept 20; Lesson 3 PMPH

Read:
axial determinants

Test 1

Guest Speakers;
2D echo
Cardiac catheterization
CAD

Review ECG waveform
Read:
AACN: pg. S35-5S

Sept 27: Lesson 4

Cardiac Conduction - ECG waveforms
Electrical axis
Vectors
Sinus rhythm
Recording of electrical events- 12 leads
Groups practice
Film: Reading ECG's - :30 min
Slides; Sinus rhythm

Assignment-:
ECG strips

Text: pg. 139-145

Oct 4: Lesson 5

Myocardial Infarction

- pathophysiology
- signs - Diagnosis
- pain management
- initial diagnosis
- thrombolytic therapy
- complications
- drug therapy
- discharge teaching

Films: Aspirin - 30 min
Activase - 27 min
Heart Surgery - 12 min
Cardiac Emergencies - 30 min

Reading:

AACN: pg 139-145

Text: pg 139-145

Oct 11: Lesson

Peterson's Field Trip

Accompanying with list of objectives

Assignment 3:

Nursing Care Plan

Oct 10: Lesson 8

Cardiomyopathy

Transplant

Artificial Heart

Aortic Aneurysm Repair

Reading:

Text: pg 174-173

AACN; pg 62~G35

Test

Oct Lesson 9

ECG strips

Ventricular arrhythmias

Code Blue protocols ~ drug therapy

Defibrillation, cardioversion

Antiarrhythmias

Films: HP defibrillator

ACLS megacode - 20 min

Code - Cardiac Arrest - 30 min

Nov 1; Lesson 10

Endocarditis
Valve Disease
Atrial arrhythmias
Nodal arrhythmias
Films; protocols - SVT
Drug therapy

ECG strips

AACN's Chapter 24
pg 636

Nov Lesson 11

Heart Blocks
- protocols
- significance in M.I.'s
Temporary pacemaker
Fertiant-Pacemaker
NTP
Nursing Diagnosis

Pacemaker Clinic
- 1 hour

EuG strips

Nov 15; Lesson

Arrhythmias simulator
EP studies
Implantable defibrillators
Arrhythmias monitoring
Problem solving: In arrhythmias
Code--Cardiac Arrest-
Miscellaneous ECG changes
— hypertrophies: Bundle Branch Block
Film: Identifying Dysrhythmias - 30 min

ECG strips

Assignment 4!
arrhythmias

Nov Lesson 13

Concepts of Pressure Measurements
Review terms - glossary
CLP
Arterial Lines - arterial waveform
blood samples
removal of lines
nursing implications

Nov 29: Lesson 14

- Cardiogenic Shock-patho
- Indications for PA monitoring
- Swan Gang Catheter ~ lumens
- Insertion of PA catheter
- Waveforms: Nursing care
- Films: Hemodynamic Monitoring
- Prep and insertion - 30 min

Dec 5: Lesson 15

Troubleshooting
Complications
Film: troubleshooting - 30 min
Baxter slides

Dec 12: Lesson 16

Cardiac output
Cardiac index
OBTived formulas
Drug therapy
Nursing Diagnosis
Film: Significant Interventions - 30 min

Sudden death in CCU
~ family
" staff support

Jan 4 or 11: Lesson 17 PMPH

Simulator - PA insertion
Cardiac output
Lab practice
Patient in CCU or ICU
CCU tour Zi overview

Jan 17 or 17: Lesson 18

Evaluation
Final Exam - test 3
All assignments due

CARDIOVASCULAR

Assignments

Assignment 1 -

A 2* P

Assignment 2 -

cardiac assessment

Assignment 3 -

Nursing care plan

Assignment 4. -

arrhythmia package

Class Participation^ Lab Work (5% of final mark >

i' A minimum achievement level of 70% is required

Grading Scale

A+ 90-100%

A 80-89%

B 70-79%

C 60-69%

R ' F' Repeat: Objectives Not Met

Note: Tests are the property of Saul- College

18 lessons = 54 hours

angiography = 1 hour

pacemaker clinic = 1 hour

cardiology office visit = 2 hours

overall total = 58 hours

CARDIOVASCULAR

TEXTBOOKS;

Ai spach, T., Williams, S. Core Curriculum For Critical Care Nursing, 3rd edition, W. G. Saunders Co., Toronto, 1985.

Harvey, M. A. Study Guide to Core Curriculum for Critical Care Nursing. W.B Saunders Co., Toronto; 1986.

Kenny, R., Marguerite. AACN's Clinical Reference for Critical Care Nursing 2nd Edition; McGraw, Hill Book Company, 1988

METHODOLOGY; Consists of:

- Audiovisual
•e/Tape
- •heads
- Flipstrips
- Television (3)
- Assignments (4.) Graded
 - Lab Work, Demonstration, Practice*
- Homework and Reading Assignments
- Fieldtrips

SAULT COLLEGE

Library Slide presentation
Cardiac Catheterization
Cardiac Pacing
CPR
~ Cardiovascular System Physiology
- Heart Anatomy

- Heart - Physical Assessment Heart and Lungs
- Heart - Inspection and palpitation of anterior chest
- Heart - auscultation (heart murmurs and heart sounds)
- Heart failure CHF

Bookstore:

Nurse Handbook of Health Assessment - Janet Weber *22.00
AACN's -- *31.00
ACLS - *25.50
Common Sense Approach to Coronary Care *47.00 (must be ordered)