

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 July^_19_88__
Author: WENDY MALESH

New: X Revision

APPROVED:

Chairperson

Chairperson

for U.P.

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CARDIOVASCULAR

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COURSE DESCRIPTION:

This unit presents:

1. 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.

3. 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.

4. 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.

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COURSE CONTENT

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

Anatomy and physiology of the cardiovascular system, Systemic vs, Pulmonary circulation.
Differences in hepatic, renal and cerebral circulation.
Structure of arteries, capillaries and veins.
Pressures in the heart:
arterial
venous
Pressure gradients.
Coronary Artery circulation.

Outline the different mechanisms that control heart function.

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

Discuss the factors that regulate the microcirculation

Microcirculation
a) local regulation:

- active hyperemia
- reactive hyperemia

 b) autonomic regulation
c) collateral circulation
d) coronary "steal"

Discuss the conduction system of the heart.

Conduction System

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

Cardiac Cycle

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

7. 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 exercise.

1. Cardiac Muscle Mechanics
 - a) properties of heart muscle
 - b) electromechanics
 - c) contractile process
 - d) Frank Starling Law - fibre length
2. Pacemaker Cells
3. Electrophysiology of the Heart:
 - Action Potential Curve
 - a) depolarization, repolarization
 - b) cardiac cycle
 - c) conduction system

1. History Taking
2. Observation
 - a) skin
 - b) jugular venous distention
 - c) CVP determination
 - d) Hepatajugular Reflux
 - e) extremities
 - f) precordium
 Palpation
 - a) arteries
 - b) types of pulses:
 - pulsus alternans
 - c) - pulsus paradoxus
 precordial pulses at aortic, pulmonic apex areas
 Percussion

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COURSE CONTENT

- | | |
|--|---|
| Incorporate the use of diagnostic studies into the assessment of the cardiovascular system. | 1. Diagnostic Studies
2, Echocardiography Laboratory Experience (1-1/2 hours) |
| 10. Relate basic arrhythmias to specific changes in heart sounds. | 1. Auscultation
a) positions
b) stethoscope
c) normal heart sounds and intensities
d) splitting: S2 2
e) paradoxical, wide and fixed splitting
f) ^3 .S4
g) pericardial friction rub
h) murmurs |
| 11. Identify pathological changes as determined by inspection, palpation, percussion and auscultation. | 1. Pathological Changes
2, Cardiology Laboratory Experience (2 hours) |
| 12. Recognize basic ECG complex and relate it to phases of depolarization and repolarization. | Introduction to ECG monitoring
a) equipment
b) standard leads
c) "P Q R S T" in relation to depolarization, repolarization |
| 13. Demonstrate effective use of vectorcardiography in determining abnormal complexes. | 1. Recording of electrical events
2. 12 lead ECG
Vectorcardiography, electrical axis |
| 14. Define the terms associated with Coronary Artery Disease | Coronary Artery Disease:
Definition of Terms |
| 15. Describe the evolving process of Atherosclerosis. | Atherosclerosis
a) types
b) risk factors |

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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
- Diagnostic and Laboratory Findings
- 1* 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

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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 transport
 - post M.I.
-
1. Monitoring the medical/surgical patient
 2. 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 {junctional} contraction
 - b) junctional rhythm
 - c) upper, mid, lower nodal junctional tachycardia
 - d) junctional escape rhythm

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COURSE CONTENT

25. Identify appropriate antiarrhythmic agents for each of the basic arrhythmias.
26. Outline indications for technique, expected patient response and potential complications of the patient who is defibrillated or cardioverted.
27. Formulate a nursing care plan for the patient having a temporary pacemaker inserted, including psychological implications
- 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
- Antiarrhythmic agents
- a) Lidocaine
 - b) Rhythmodan
 - c) Verapamil
 - d) Quinidine
 - e) Procainamide
 - f) Inocor (Amiodarone)
 - g) Propranolol
 - h) Bretylium
- Electrical interventions
- a) defibrillation
 - b) cardioversion
- Indications, precautions, technique, nursing care
- Electrical intervention
- a) pacemakers:
 - types
 - product code
 - b) pacing, sensing, mode of response
 - c) indications
 - d) method of insertion
 - e) nursing responsibilities
 - f) troubleshooting

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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
1. Pressure system components
2. Equipment set-up techniques
1. Lab practice session:
 - equipment set-up
1. Cardiac output
2. Complications
3. Troubleshooting, nursing interventions

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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

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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)

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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. 116-118
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: Calculate Electrical Axis Text: pg. 168-174
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	