

# ***Exam Blueprint and Specialty Competencies***

## **Introduction – Blueprint for the Cardiovascular Nursing Certification Exam**

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The primary function of the Blueprint for the CNA Cardiovascular Nursing Certification Exam is to describe how the exam is to be developed. Specifically, this blueprint provides explicit instructions and guidelines on how the competencies are to be expressed within the exam in order for accurate decisions to be made on the candidates' competence in cardiovascular nursing.

The blueprint has two major components: (1) the content area to be measured and (2) the explicit guidelines on how this content is to be measured. The content area consists of the list of competencies (i.e., the competencies expected of fully competent practising cardiovascular nurses with at least two years of experience), and the guidelines are expressed as structural and contextual variables. The blueprint also includes a summary chart that summarizes the exam guidelines.

### **Description of Domain**

The CNA Cardiovascular Nursing Exam is a criterion-referenced exam.<sup>1</sup> A fundamental component of a criterion-referenced approach to testing is the comprehensive description of the content area being measured. In the case of the Cardiovascular Nursing Certification Exam, the content consists of the competencies of a fully competent practising cardiovascular nurse with at least two years of experience.

This section describes the competencies, how they have been grouped and how they are to be sampled for creating an exam.

### **Developing the List of Competencies**

A working group of six highly experienced cardiovascular nurses from various regions in Canada revised and updated the current list of competencies during a four-day meeting. These competencies were reviewed by a group of seven cardiovascular nurses in Eastern Canada and a subsequent group of six cardiovascular nurses from Western Canada. The existing framework of the competencies was maintained. It consists of an 11-category classification scheme, which is commonly used to organize cardiovascular nursing. The final list of competencies was approved by the Cardiovascular Nursing Certification Exam Committee.

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<sup>1</sup> Criterion-referenced exam: An exam that measures a candidate's command of a specified content or skills domain or list of instructional objectives. Scores are interpreted in comparison to a predetermined performance standard or as a mastery of defined domain (e.g., percentage correct and mastery scores), independently of the results obtained by other candidates (Brown, 1983).

## **Assumptions**

The Cardiovascular Nursing Certification Exam targets the unique body of knowledge representing the basic foundation of practice that the cardiovascular nurse builds upon.

## **The Cardiovascular Nurse**

- The cardiovascular nurse supports initiatives that enhance the unique body of knowledge that is cardiovascular nursing.
- The cardiovascular nurse incorporates the Canadian Council of Cardiovascular Nurses (CCCN) Standards as a basis for his/her cardiovascular practice.
- The cardiovascular nurse is accountable to use evidence-based practice.
- The cardiovascular nurse accesses current information from a variety of sources to keep up-to-date with the continually evolving body of knowledge that impacts on cardiovascular nursing practice.
- The cardiovascular nurse is a highly knowledgeable and skilled health-care professional who maintains competence through continuing education, professional development and quality assurance activities.
- Cardiovascular nursing care activities include health promotion, prevention, acute care and rehabilitation, to assist clients to obtain and maintain optimal cardiovascular health throughout their lifespan.
- The cardiovascular nurse assists the client and family to manage the manifestations of cardiovascular disease.
- The cardiovascular nurse provides comprehensive quality care to individuals, families, groups and communities.
- The cardiovascular nurse is committed to the provision of safe nursing care.
- The cardiovascular nurse works collaboratively with other health-care professionals.
- The cardiovascular nurse values the principles of accessibility, affordability, and self-determination of the client.
- The cardiovascular nurse respects the decisions of the client throughout his/her continuum of care.
- The cardiovascular nurse forms partnerships with clients to achieve an optimal level of autonomy.
- The cardiovascular nurse communicates assessment data, the plan of care, and client responses or outcomes to the client, family and health-care team within a time frame pertinent to the client's condition.

- The cardiovascular nurse develops and documents goals of treatment that are collaboratively developed with the client.
- The cardiovascular nurse develops a therapeutic relationship with the client and family to reduce emotional distress.
- The cardiovascular nurse is a client and family advocate.
- The cardiovascular nurse recognizes gender differences that may be reflected in clients' symptoms and needs.
- The cardiovascular nurse is constantly challenged to provide comfort and to maintain a client's privacy.
- The cardiovascular nurse facilitates the client's and family's ability to cope with stressors related to illness and the environment.
- The cardiovascular nurse uses teaching strategies consistent with the time available, and the readiness and needs of the client and family.
- The cardiovascular nurse strives to provide evidence-based practice and acknowledges a responsibility to promote research within the specialty area.
- The cardiovascular nurse incorporates the appropriate national and international guidelines into practice.
- The cardiovascular nurse responds to ethical, legal and professional issues.
- The cardiovascular nurse responds to environmental, physical and psychosocial stress factors affecting health-care team members in the health-care setting.
- The cardiovascular nurse identifies potential candidates for organ and tissue procurement and supports this process.
- The cardiovascular nurse works as a member of the interdisciplinary health-care team to facilitate timely care/treatment and intervenes to ensure a smooth transition of clients and family along the health-care continuum.

## **The Environment**

- The cardiovascular nurse works in a variety of clinical settings, from urban to rural, with highly variable access to available technologies.
- The cardiovascular nurse recognizes the impact of physical, social and political environmental factors on health and works to reduce their negative effects and maximize their positive influences.

## **The Cardiovascular Nursing Process**

- The cardiovascular nursing assessment is continuous, comprehensive and holistic and maximizes appropriate use of available resources.
- A holistic plan of care includes prioritized goals and interventions developed in collaboration with the client, family and health-care team.
- Interventions are anticipated and implemented for actual or potential life-threatening situations.
- Goals and outcomes of care are evaluated, and the plan of care is revised in response to changes in the client's status.

## **The Client**

- The cardiovascular client includes individuals, family, groups and communities.
- The client's ability to cope with cardiovascular illness is significantly influenced by access to family support and family members' behavioural responses to the illness.
- The client is viewed within the dimensions of biology, psychology, society, culture, developmental stage, environment and spirituality.

## **The Family**

- The family is defined by the client.

## **Health**

- Health is defined by the cardiovascular client and includes a range of physiologic, psychologic, social and spiritual responses to both sudden unexpected and chronic cardiac conditions throughout the continuum of health.

## **Competency Categories**

The competencies are classified under an 11-category classification scheme. Some of the competencies lend themselves to one or more of the categories; therefore, these 11 categories should be viewed simply as an organizing framework. Also, it should be recognized that the competency statements vary in scope, with some representing global behaviours and others more discrete and specific nursing behaviours.

## **Percentage of Competencies in Each Group**

The following table presents the number and the percentage of competencies in each category.

**Table 1: Percentage of Competencies in Each Group**

Category	Number of competencies	Percentage of the total number of competencies
Ischemic Heart Disease	22	13%
Health Promotion, Prevention and Rehabilitation	36	22%
Heart Failure	7	4%
Cardiac Surgical Intervention	23	14%
Percutaneous Cardiac Interventions and Procedures: Angiogram, Percutaneous Coronary Intervention (PCI), Electrophysiological Studies/ Ablation, Valvuloplasty	16	10%
Cardiac Dysrhythmias	9	6%
Valvular Heart Disease	12	7%
Vascular Diseases	15	9%
Heart Disease Related to Inflammatory/Infectious Processes: Pericarditis, Endocarditis, Myocarditis	11	7%
Psychosocial Needs	6	4%
Cardiogenic Shock	6	4%

## Competency Sampling

Using the grouping and guidelines, the Cardiovascular Nursing Certification Exam will consist of approximately 165 questions; the categories have been given the following weights in the total examination.

**Table 2: Competency Sampling**

Categories	Approximate weights in the total examination
Ischemic Heart Disease	15-25%
Health Promotion, Prevention and Rehabilitation	10-20%
Heart Failure	5-15%
Cardiac Surgical Intervention	5-15%
Percutaneous Cardiac Interventions and Procedures: Angiogram, Percutaneous Coronary Intervention (PCI), Electrophysiological Studies/Ablation, Valvuloplasty	5-15%
Cardiac Dysrhythmias	3-13%
Valvular Heart Disease	1-11%
Vascular Diseases	4-13%
Heart Disease Related to Inflammatory/Infectious Processes: Pericarditis, Endocarditis, Myocarditis	1-10%
Psychosocial Needs	1-9%
Cardiogenic Shock	1-8%

## Technical Specifications

In addition to the specifications related to the competencies, other variables are considered during the development of the Cardiovascular Nursing Certification Exam. This section presents the guidelines for two types of variables: structural and contextual.

**Structural variables:** Structural variables include those characteristics that determine the general appearance and design of the exam. They define the length of the exam, the format and presentation of the exam questions (e.g., multiple-choice) and any special functions of exam questions (e.g., independent questions).

**Contextual variables:** Contextual variables specify the nursing contexts in which the exam questions will be set (e.g., client culture, client health situation or health-care environment).

## Structural Variables

**Exam Length:** The exam consists of approximately 165 multiple-choice questions.

**Question Presentation:** The multiple-choice questions are presented in one of two formats: case-based or independent. Case-based questions are a set of approximately four questions associated with a brief health-care scenario (i.e., a description of the client's health-care situation). Independent questions stand alone. In the Cardiovascular Nursing Certification Exam, 50 to 60 per cent of the questions are presented as independent questions and 40 to 50 per cent are presented within cases.

**Taxonomy for Questions:** To ensure that competencies are measured at different levels of cognitive ability, each question on the Cardiovascular Nursing Certification Exam is aimed at one of three levels: knowledge/comprehension, application or critical thinking.<sup>2</sup>

### 1. Knowledge/Comprehension

This level combines the ability to recall previously learned material and to understand its meaning. It includes such mental abilities as knowing and understanding definitions, facts and principles, and interpreting data (e.g., knowing the effects of certain drugs or interpreting data appearing on a client's record).

### 2. Application

This level refers to the ability to apply knowledge and learning to new or practical situation. It includes applying rules, methods, principles and theories while providing care to clients (e.g., applying nursing principles to the care of clients).

### 3. Critical Thinking

The third level of the taxonomy deals with higher-level thinking processes. It includes the abilities to judge the relevance of data, to deal with abstraction and to solve problems (e.g., identifying priorities of care or evaluating the effectiveness of interventions). The cardiovascular nurse with at least two years of experience should be able to identify cause-and-effect relationships, distinguish between relevant and irrelevant data, formulate valid conclusions and make judgments about the needs of clients.

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<sup>2</sup> These levels are adapted from the taxonomy of cognitive abilities developed in Bloom, 1956.

The following table presents the distribution of questions for each level of cognitive ability.

**Table 3: Distribution of Questions for Each Level of Cognitive Ability**

Cognitive ability level	Percentage of questions on the Cardiovascular Nursing Exam
Knowledge/Comprehension	20-30%
Application	35-45%
Critical Thinking	30-40%

## Contextual Variables

**Client Age and Gender:** Two of the contextual variables specified for the Cardiovascular Nursing Certification Exam are the age and gender of the clients. Providing specifications for the use of these variables ensures that the clients described in the exam represent the demographic characteristics of the population encountered by cardiovascular nurses. These characteristics, listed in Table 4 as percentage ranges, serve as guidelines for test development.

**Table 4: Specification for Client Age and Gender**

Age Group	Percentage of questions on the Cardiovascular Nursing Exam	
	Male	Female
16 to 34 years	1-10%	1-10%
35 to 64 years	30-40%	10-20%
65+ years	10-20%	30-40%

**Client Culture:** The Cardiovascular Nursing Certification Exam is designed to include questions representing the variety of cultural backgrounds encountered while providing cardiovascular nursing care in Canada. Although the exam does not test candidates' knowledge of specific values, beliefs and practices linked to individual cultures, it is intended to measure awareness, sensitivity and respect for diverse cultural values, beliefs and practices. Cultural issues are integrated within the exam without introducing cultural stereotypes.

**Client Health Situation:** In the development of the Cardiovascular Nursing Certification Exam, the client is viewed holistically.

**Health-Care Environment:** It is recognized that cardiovascular nursing is practised in a variety of settings. For the purposes of the cardiovascular nursing exam, the health-care environment is specified only where it is required for clarity or in order to provide guidance to the candidate.

## Conclusions

The Blueprint for the Cardiovascular Nursing Certification Exam is the product of a collaborative effort between CNA, ASI, CCCN and a number of cardiovascular nurses across Canada. Their work has resulted in a compilation of the competencies required of practising cardiovascular nurses and has helped determine how those competencies will be measured on the Cardiovascular Nursing Certification Exam. A summary of these guidelines can be found in the summary chart: Cardiovascular Nursing Certification Exam Development Guidelines.

It is recognized that cardiovascular nursing practice will continue to evolve. As this occurs, the blueprint may require revision so that it accurately reflects current practices. CNA will ensure that such revision takes place in a timely manner and will communicate any changes in updated editions of this document.

# Summary Chart

## Cardiovascular Nursing Certification Exam Development Guidelines

Structural Variables			
Examination Length and Format	Approximately 165 objective questions (e.g., multiple-choice)		
Question Presentation	50-60% independent questions 40-50% case-based questions		
The Cognitive Domain	Knowledge/Comprehension	20-30% of questions	
	Application	35-45% of questions	
	Critical Thinking	30-40% of questions	
Competency Categories	Ischemic Heart Disease (22 competencies)	15-25% of questions	
	Health Promotion, Prevention and Rehabilitation (36 competencies)	10-20% of questions	
	Heart Failure (7 competencies)	5-15% of questions	
	Cardiac Surgical Intervention (23 competencies)	5-15% of questions	
	Percutaneous Cardiac Interventions and Procedures: Angiogram, Percutaneous Coronary Intervention (PCI), Electrophysiological Studies/Ablation, Valvuloplasty (16 competencies)	5-15% of questions	
	Cardiac Dysrhythmias (9 competencies)	3-13% of questions	
	Valvular Heart Disease (12 competencies)	1-11% of questions	
	Vascular Diseases (15 competencies)	4-13% of questions	
	Heart Disease Related to Inflammatory/Infectious Processes: Pericarditis, Endocarditis, Myocarditis (11 competencies)	1-10% of questions	
	Psychosocial Needs (6 competencies)	1-9% of questions	
Cardiogenic Shock (6 competencies)	1-8% of questions		
Contextual Variables			
Client Age and Gender	<b>Male</b>	<b>Female</b>	
	16 to 34 years	1-10%	1-10%
	35 to 64 years	30-40%	10-20%
	65+ years	10-20%	30-40%
Client Culture	Questions are included that measure awareness, sensitivity and respect for different cultural values, beliefs and practices, without introducing stereotypes.		
Client Health Situation	In the development of the Cardiovascular Examination, the client is viewed holistically. The client health situations presented also reflect a cross-section of health situations encountered by cardiovascular nurses.		
Health-Care Environment	It is recognized that cardiovascular nursing is practised primarily in the hospital setting. However, cardiovascular nursing can also be practised in other settings. Therefore, for the purposes of the Cardiovascular Examination, the health-care environment is only specified where it is required for clarity or in order to provide guidance to the examinee.		

# *The Cardiovascular Nursing Certification Exam List of Competencies*

The competencies are divided into categories that are in no particular order of priority but represent broad categories addressing cardiovascular health encountered in current cardiovascular nursing practice.

## **1. The Care of the Person with Ischemic Heart Disease (22 competencies)**

The cardiovascular nurse:

- 1.1 interprets the following data related to ischemic heart disease including the following pathophysiology: atherosclerosis, stable angina, acute coronary syndromes.
  - 1.1a History taking:
    - presenting symptoms (e.g., typical/atypical chest pain, syncope, shortness of breath, fatigue, nausea, vomiting, diaphoresis);
    - past and current medical history (e.g., diabetes, myocardial infarction, stroke, coronary artery disease, peripheral vascular disease, pulmonary disease, thyroid disorders, renal disease, recent cardiac and other diagnostic tests, previous surgeries);
    - cardiac risk factors (e.g., age, gender, family history, smoking, hypertension, diabetes, dyslipidemia, obesity, stress, depression, physical inactivity);
    - discharge planning (e.g., evaluation of social and family support, activities of daily living assessment);
    - medications and alternative therapies (e.g., prescription and non-prescription, herbals, potential interactions [e.g., Viagra]; and
    - psychosocial history (e.g., substance use, occupation).
  - 1.1b pain assessment (e.g., location, duration, radiation, intensity, quality, precipitating/aggravating/alleviating factors, associated symptoms, onset, frequency and changing patterns).
  - 1.1c Physical/System assessment:
    - functional assessment (e.g., activities of daily living, exercise capacity);
    - inspection (e.g., skin colour, diaphoresis, jugular venous distention, peripheral and central cyanosis, shortness of breath, edema);
    - auscultation (e.g., lung sounds, heart sounds, blood pressure, bruits); and
    - palpation (e.g., pulses, thrills).

Diagnostic assessment:

- 1.1d Laboratory investigations (e.g., cardiac biomarkers [troponins and CK], liver function tests [LFT], serum electrolytes, renal function, complete blood count [CBC], coagulation studies [PTT and INR], lipid profile, glucose, thyroid studies, hemoglobin A1c).
  - 1.1e Cardiac and other diagnostic tests (e.g., 12- and 15-lead ECG, exercise test, chemical/nuclear stress test, coronary angiogram, pulse oximetry, echocardiograms, chest x-ray, Holter monitoring, CT, MRI).
- 1.2 selects appropriate nursing interventions to improve coronary blood flow and/or reduce myocardial demand for oxygen related to:
- 1.2a stable angina;
  - 1.2b unstable angina;
  - 1.2c ST elevation myocardial infarction (STEMI);
  - 1.2d non-STEMI; and
  - 1.2e coronary artery spasm.

### Example

The following are potential nursing interventions used to improve coronary blood flow and/or reduce myocardial demand for oxygen related to ischemic heart disease.

- Manage chest pain (e.g., pharmacological and non-pharmacological interventions).
- Monitor oxygenation (e.g., pulse oximetry).
- Monitor hemodynamic status (e.g., fluid balance, blood pressures, heart rate, peripheral perfusion).
- Monitor pharmacological effects/side-effects (e.g., vasodilators, beta blockers, diuretics, calcium channel blockers, angiotensin-converting enzyme inhibitors, angiotensin receptor blockers, anticoagulants, antiplatelets, thrombolytics, nitroglycerin).
- Tailor client teaching to individual and family needs (e.g., chest pain/symptom management, activities, risk factor modification, coping with chronic and acute illness).
- Tailor client teaching to optimize self-management skills.
- Prepare for diagnostic testing, potential treatment options (e.g., thrombolytics) and other potential complications (e.g., bleeding).

- 1.3 selects appropriate nursing interventions for the following potential complications of ischemic heart disease:
  - 1.3a dysrhythmias;
  - 1.3b heart failure;
  - 1.3c cardiogenic shock;
  - 1.3d renal failure;
  - 1.3e systemic embolism;
  - 1.3f pericarditis;
  - 1.3g aneurysms;
  - 1.3h papillary muscle dysfunction;
  - 1.3i ventricular septal defect;
  - 1.3j ventricular rupture;
  - 1.3k stroke;
  - 1.3l myocardial infarction/re-occlusion; and
  - 1.3m post myocardial infarction angina.

## **2. Core Concepts Related to Health Promotion, Prevention and Rehabilitation (36 competencies)**

The cardiovascular nurse:

- 2.1 identifies populations that are at risk of developing cardiovascular disease (e.g., elderly, smokers and those exposed to second-hand smoke, ethnicity, gender, metabolic syndrome, obesity, physical inactivity, diabetes, hypertensive, dyslipidemic, stress, depression).
- 2.2 selects the appropriate nursing interventions to reduce current and potential cardiovascular risks at the following three levels of intervention: primary, secondary and tertiary.

## **Example**

The following are potential nursing interventions to reduce current and potential cardiovascular risks.

- Promote awareness of signs and symptoms of cardiovascular disease.
- Manage the signs and symptoms of cardiovascular disease.
- Identify modifiable risk factors (e.g., diabetes, hypertension, obesity, stress).
- Identify stages of change (e.g., pre-contemplation, contemplation, preparation, action, maintenance).
- Implement/identify programs related to lifestyle such as smoking cessation, weight control, stress management and physical activity programs.
- Promote lifestyle modification strategies.
- Tailor client teaching to optimize self-management skills.
- Encourage discussion of current therapies using evidence-based practice (e.g., antiplatelet agents, lipid management).
- Monitor client progress and compare results to expected time frames for rehabilitation.
- Encourage client to maintain and surpass rehabilitation goals.

- 2.3 interprets the impact of the interdependent and cumulative effects of the following risk factors on the primary and secondary prevention of cardiovascular disease: tobacco products, hypertension, dyslipidemia, physical inactivity, diabetes, obesity, psychosocial factors, substance abuse, stress, depression.
- 2.4 interprets the effects of the following risk factors on the primary and secondary prevention of cardiovascular disease:
- 2.4a tobacco products (e.g., relationship with high-density lipoprotein [HDL]);
  - 2.4b hypertension (e.g., sodium intake, alcohol intake, effects of exercise and weight management);
  - 2.4c dyslipidemia (e.g., results of lipid profile, liver function tests);
  - 2.4d physical inactivity (e.g., effect on lipids, BP, body mass index [BMI]);
  - 2.4e diabetes (e.g., blood sugar control);
  - 2.4f obesity (e.g., waist:hip ratio, body mass index [BMI]);
  - 2.4g psychosocial factors (e.g., stress, anger, lack of social support);
  - 2.4h socio-economic status (e.g., income, drug costs);
  - 2.4i substance abuse (e.g., alcohol, intravenous drug use, inhalants, steroids); and
  - 2.4j depression (e.g., post-cardiac event).

- 2.5 selects appropriate primary or secondary prevention interventions for the following risk factors based on practice guidelines and the client's needs, goals and readiness for change:
- 2.5a tobacco products (e.g., refer to cessation programs, pharmaceutical products);
  - 2.5b hypertension (e.g., identifying signs and symptoms, regular visits to health care provider, non-pharmacological and pharmacological interventions);
  - 2.5c dyslipidemia (e.g., pharmacological and non-pharmacological interventions, reduced alcohol consumption, regular follow-up);
  - 2.5d physical inactivity (e.g., provide basic exercise guidelines, refer to rehabilitation program, identify community resources);
  - 2.5e diabetes (e.g., self-monitoring, refer to available resources, nutrition);
  - 2.5f obesity (e.g., identify realistic goals, refer to dietitian, weight loss programs);
  - 2.5g psychosocial factors (e.g., social support, individual family counselling, stress management programs, anger management programs);
  - 2.5h socio-economic status (e.g., appropriate referral, discharge planning);
  - 2.5i substance abuse (e.g., appropriate referral);
  - 2.5j depression (e.g., appropriate referral); and
  - 2.5k non-modifiable health risk factors (e.g., information related to age, gender, ethnicity and genetics/family history).
- 2.6 interprets collected data and information related to functional capacity, psychosocial well-being and perceived quality of life (Question should include four of the nine areas):
- exercise/activity tolerance, activities of daily living, and rest and sleep;
  - occupational and leisure activities (e.g., resuming previous employment, and household and leisure activities);
  - sexuality (e.g., fear, sexual dysfunction, libido, self-concept, expression of sexuality);
  - family and community relationship / support (e.g., impact on family, cultural influences);
  - socio-economic status (e.g., barrier to accessibility of therapeutic interventions);
  - emotional status (e.g., depression, coping strategies);
  - maladaptive behaviours (e.g., substance abuse, anger);
  - spirituality (e.g., religious/philosophical influence); and
  - treatment regimens (e.g., functional capacity).

- 2.7 interprets objective assessment data related to functional capacity:
- 2.7a laboratory investigations (e.g., thyroid function tests, glucose, complete blood count [CBC], Hg A1c); and
  - 2.7b cardiac and other diagnostic tests (e.g., exercise stress test, pulmonary function tests, echocardiogram, ventricular scan, pulse oximetry, Holter monitoring, vocational assessments, quality of life indicators).
- 2.8 selects appropriate nursing interventions to optimize functional capacity and enhance psychosocial well-being:
- 2.8a exercise/activity tolerance, activities of daily living, rest and sleep;
  - 2.8b occupational and leisure activities (e.g., resuming previous employment, and household and leisure activities);
  - 2.8c sexuality (e.g., fear, sexual dysfunction, libido, self-concept, expression of sexuality);
  - 2.8d family and community relationship/support (e.g., impact on family, cultural influences);
  - 2.8e socio-economic status (e.g., barrier to accessibility of therapeutic interventions);
  - 2.8f emotional status (e.g., coping strategies);
  - 2.8g maladaptive behaviours (e.g., substance abuse, anger);
  - 2.8h spirituality (e.g., spiritual counsellor); and
  - 2.8i treatment regimens (e.g., non-adherence and barriers to adherence, functional capacity).

### **Example**

The following are potential nursing interventions to optimize functional capacity and enhance psychosocial well-being.

- Teach and counsel client/family (e.g., education materials).
- Monitor, plan, coordinate and set goals with client.
- Promote health behaviours and wellness.
- Refer to appropriate resources.

## 3. The Care of the Person with Heart Failure (7 competencies)

The cardiovascular nurse:

- 3.1 interprets the following data related to the following pathophysiology: ischemic heart disease, valvular heart disease, hypertensive heart disease, cardiomyopathies, congenital heart defects.
  - 3.1a History taking:
    - manifestations (e.g., shortness of breath, dizziness, paroxysmal nocturnal dyspnea, orthopnea, cough, activity intolerance, fatigue, weight changes, edema, changes in mental status, anorexia, cachexia, palpitations, pain);
    - precipitating factors (e.g., fluid and sodium indiscretion, medication non-adherence, thyroid dysfunction, use of NSAIDs, dysrhythmias, substance use, recent cytotoxic medication);
    - medical history (e.g., acute coronary syndrome, recent pregnancies, exposure to toxic substances, viral/bacterial illnesses, surgical history, sleep-related disorders, cancer);
    - family history (e.g., decision making, coping, travel history); and
    - medications (e.g., prescription and non-prescription, herbals).
  - 3.1b Physical/System assessment:
    - inspection (e.g., skin colour, diaphoresis, jugular venous distention, ascites, edema);
    - auscultation (e.g., lung sounds, heart sounds, murmurs, blood pressure); and
    - palpation (e.g., pulses, apical displacement, organomegaly, edema, hepatojugular reflux).
- Diagnostic assessment:
  - 3.1c Laboratory investigations (e.g., serum electrolytes, renal and liver function, complete blood count [CBC], brain natriuretic peptide [BNP/NT-pro BNP], coagulation studies [PTT and INR], thyroid function, blood cultures).
  - 3.1d Cardiac and other diagnostic tests (e.g., 12-lead ECG, coronary angiogram, echocardiograms, chest x-ray, nuclear scan, Holter monitoring, pulse oximetry, cardiac biopsy).
- 3.2 selects appropriate nursing interventions to optimize heart failure management.

## **Example**

The following are potential nursing interventions to optimize heart failure management.

- Monitor oxygenation.
- Monitor pharmacological effects (e.g., angiotensin-converting enzyme inhibitors [ACE-I], angiotensin II receptor blockers [ARB], diuretics, beta blockers, digitalis, vasodilators, inotropes, antibiotics, antiviral agents).
- Monitor and maintain hemodynamic stability (e.g., fluid balance, inotropes).
- Prepare for diagnostic testing (e.g., angiogram, echocardiogram) and potential treatment options (e.g., angioplasty, cardiac surgery options, BiPAP, cardiac resynchronization therapy, ventricular assist devices, transplant assessment).
- Tailor client teaching to optimize self-management skills (e.g., exercise and rest, salt and fluid restriction, daily weight, medication management, symptom management).

3.3 selects appropriate nursing interventions to optimize functional capacity and enhance psychosocial well-being.

## **Example**

The following are potential nursing interventions to optimize functional capacity and enhance psycho-social well-being.

- Teach and counsel client/family.
- Monitor, plan, coordinate and set goals with client/family.
- Promote healthy behaviours to prevent exacerbations.
- Refer to outpatient heart function clinic for education and follow-up programs.
- Support the client and family through chronic illness/end of life.
- Tailor client teaching to optimize self-management skills (e.g., exercise and rest, salt and fluid restriction, daily weight, medication management, symptom management).

3.4 selects appropriate nursing interventions to address the palliative needs of the client with end-stage heart failure (e.g., advance directives, palliative comfort measures, community and home care services, family and caregiver support, spiritual support).

## 4. The Care of the Person who Needs Cardiac Surgical Intervention (23 competencies)

The cardiovascular nurse:

- 4.1 interprets the data in preparation for surgery (e.g., coronary artery bypass, valve repair replacement, congenital heart, heart transplant, ventricular assist devices, ventricular remodelling) for the following disorders: coronary artery disease, vascular disease, cardiac tumours, congenital heart defects, valvular disease, heart failure, trauma.
- 4.1a History taking:
- presenting symptoms/medical diagnosis;
  - cardiac risk factors (e.g., family history, smoking, diabetes, hypertension, dyslipidemia);
  - past and current medical history (e.g., comorbidities, malignant hyperthermia, blood transfusion reaction, dental history, other surgeries, heparin sensitivity, cognitive assessment, thromboembolic disease, cancer, radiation therapy);
  - medications (e.g., prescription and non-prescription, herbals);
  - psychosocial history (e.g., substance use); and
  - discharge planning (e.g., evaluation of social and family support, activities of daily living assessment).
- 4.1b Pain assessment (e.g., ischemic, chronic).
- 4.1c Physical/System assessment:
- inspection (e.g., general appearance, height and weight, signs of infection, jugular venous distention, edema, varicosities);
  - auscultation (e.g., lung sounds, heart sounds, murmurs, blood pressure(s), bruits); and
  - palpation (e.g., pulses, Allen's test).
- Diagnostic assessment:
- 4.1d Laboratory investigations (e.g., serum electrolytes, liver enzymes, renal function, complete blood count [CBC], coagulation studies [PTT and INR], type and cross match, transplant investigations, lipid profile, Hg A1c, urinalysis).
- 4.1e Cardiac and other diagnostic tests (e.g., coronary angiogram, chest x-ray, 12-lead ECG, echocardiograms, pulse oximetry, pulmonary function test, CT scan, carotid Dopplers).
- 4.2 selects appropriate preoperative nursing interventions to enhance recovery and manage potential complications of cardiac surgery.

## Example

The following are potential nursing interventions to enhance recovery and manage potential complications of cardiac surgery.

- Prepare for diagnostic testing.
- Tailor teaching to the individual needs of the client requiring surgery, such as coronary artery bypass, valve repair/replacement, congenital heart, heart transplant, ventricular assist devices, ventricular remodelling (e.g., preparation for surgery, immediate postoperative recovery, monitoring pain, mobilization, chest physiotherapy, respiratory care).
- Prepare client for discharge (e.g., medications, self-care, potential complications, follow-up care).

- 4.3 selects appropriate postoperative nursing interventions to detect, monitor and manage the following early and late potential complications:
- 4.3a bleeding (e.g., chest tube management, anticoagulation, GI);
  - 4.3b hemodynamic instability (e.g., fluid balance, inotropes, vasodilators);
  - 4.3c pulmonary disorders (e.g., effusions, pneumothorax, pulmonary embolism, pneumonia, pulmonary hypertension);
  - 4.3d renal insufficiency/failure;
  - 4.3e pain (e.g., postoperative, pleural, pericardial, ischemic);
  - 4.3f dysrhythmias (e.g., atrial fibrillation);
  - 4.3g GI dysfunction (e.g., nausea, constipation, ileus, ischemia);
  - 4.3h cerebral vascular events (e.g., ischemic or hemorrhagic);
  - 4.3i delirium (e.g., confusion);
  - 4.3j brachial plexus injury/ulnar nerve injury;
  - 4.3k infection (e.g., sepsis, wound infections);
  - 4.3l loss of skin integrity (e.g., pressure ulcers);
  - 4.3m sternal instability;
  - 4.3n peripheral vascular complications (e.g., DVT, ischemic limb);
  - 4.3o hematological disorders (e.g., anemia, heparin-induced thrombocytopenia);
  - 4.3p cardiac (e.g., heart failure, myocardial infarction, rejection, post pericardiotomy syndrome, tamponade, pericarditis); and
  - 4.3q depression (e.g., insomnia, anxiety).

## **5. The Care of the Person Requiring Percutaneous Cardiac Interventions and Procedures: Angiogram, Percutaneous Coronary Intervention (PCI), Electrophysiological Studies/Ablation, Valvuloplasty (16 competencies)**

The cardiovascular nurse:

- 5.1 interprets the following pre-procedure data related to potential complications for the following pathophysiology: ischemic and valvular heart disease, congenital heart defects, dysrhythmias.
  - 5.1a History taking:
    - medical diagnosis/ presenting symptoms;
    - cardiac risk factors (e.g., family history, smoking, diabetes, hypertension, dyslipidemia, obesity, physical inactivity, stress, depression);
    - past and current medical history (e.g., comorbidities, previous vascular and cardiac surgeries, renal function);
    - medications (e.g., prescription and non-prescription, herbals, contrast sensitivity); and
    - discharge planning (e.g., evaluation of social and family support, activities of daily living assessment).
  - 5.1b Pain assessment (e.g., ischemic, chronic).
  - 5.1c Physical/System assessment:
    - inspection (e.g., general appearance, weight and height);
    - auscultation (e.g., lung sounds, heart sounds, bruits, blood pressure(s)); and
    - palpation (e.g., peripheral pulses, Allen's test).

Diagnostic assessment:

  - 5.1d Laboratory investigations (e.g., serum electrolytes, renal function, complete blood count [CBC], blood glucose, coagulation studies [PTT and INR], lipid profile).
  - 5.1e Cardiac and other diagnostic tests (e.g., chest x-ray, 12-lead ECG, exercise stress test, echocardiograms, nuclear stress test).
- 5.2 selects appropriate pre- and post-procedure nursing interventions to enhance recovery and manage potential complications.

## Example

The following are potential nursing interventions to enhance recovery and manage potential complications.

- Prepare for planned procedure and potential treatment options.
- Tailor client teaching to individual needs (e.g., pain and symptom management, activity restrictions and ambulation, medication adherence, planning discharge and evaluation of social support, risk factor counselling, self-management).
- Prepare client for discharge (e.g., medications, self-care, potential complications, follow-up care).

- 5.3 selects appropriate post-procedure nursing interventions to prevent, detect, monitor and manage the following early and late potential complications:
- 5.3a bleeding (e.g., hematoma, tamponade, retroperitoneal);
  - 5.3b embolic/thrombotic (e.g., peripheral, central, cerebral);
  - 5.3c hemodynamic instability (e.g., vasovagal response, reocclusion);
  - 5.3d allergic reaction or anaphylaxis (e.g., contrast media);
  - 5.3e renal dysfunction/failure;
  - 5.3f pain (e.g., ischemic vs. other);
  - 5.3g dysrhythmias;
  - 5.3h hematological disorders;
  - 5.3i vascular (e.g., pseudoaneurysms); and
  - 5.3j infection.

## 6. Core Concepts Related to Cardiac Dysrhythmias (9 competencies)

The cardiovascular nurse:

- 6.1 interprets data related to dysrhythmias including the following disorders: sudden cardiac death, ventricular tachycardia, ventricular fibrillation, ventricular standstill, asystole, atrial fibrillation/flutter, tachycardia, heart blocks, bradycardia.
- 6.1a History taking:
- presenting symptoms (e.g. dizziness, pre-syncope, syncope, dyspnea, palpitations);
  - current and past medical history (e.g., pulmonary disease, renal disease, myocardial infarction, stroke, cardiomyopathy, hematological disorders, infection, peripheral vascular disease, thyroid dysfunction, caffeine intake, congenital heart disease);
  - family history of sudden cardiac death;

- cardiac risk factors (e.g., family history, smoking, diabetes, hypertension, dyslipidemia, stress, depression, obesity, physical activity);
- medications (e.g., prescription and non-prescription, herbals);
- psychosocial history (e.g., substance use); and
- discharge planning (e.g., evaluation of social and family support, activities of daily living assessment, driving restrictions, occupation).

6.1b Physical/System assessment:

- inspection (e.g., airway, breathing and circulation, diaphoresis, level of consciousness, capillary refill);
- auscultation (e.g., heart sounds, blood pressure(s)); and
- palpation (e.g., carotid/peripheral pulses).

Diagnostic assessment:

- 6.1c Laboratory investigations (e.g., serum electrolytes, serum magnesium, renal function, blood gases, thyroid function studies, digoxin level, complete blood count [CBC], calcium, drug screen).
- 6.1d Cardiac and other diagnostic tests (e.g., 12-lead ECG, chest x-ray, Holter monitoring, electrophysiological studies, pulse oximetry, echocardiograms, stress testing, loop recorder, tilt table).

- 6.2 selects appropriate nursing interventions related to non-life threatening and/or stable dysrhythmias.

### Example

The following are potential nursing interventions to manage non-life threatening and/or stable dysrhythmias.

- Assess vital signs (e.g., blood pressure, heart rate).
- Recognize and treat associated symptoms (e.g., anxiety, other symptoms).
- Evaluate laboratory and other diagnostic tests.
- Continuous ECG monitoring.
- Correct underlying causes once identified (e.g., hypoxia, electrolyte imbalance).
- Administer appropriate pharmacological agents and evaluate client response.
- Prepare for electrical cardioversion and evaluate client response.
- Prepare client for further diagnostic testing/procedure to identify cause and/or treatment for abnormalities (e.g., ICD, ablation, electrophysiology studies).

6.3 selects appropriate nursing interventions related to life-threatening dysrhythmias.

### **Example**

The following are potential nursing interventions related to life-threatening dysrhythmias.

- Assess and maintain airway, breathing, circulation.
- Assess level of consciousness.
- Initiate call for appropriate emergency medical personnel if required.
- Prepare for emergent interventions (e.g., defibrillation, intubation, pacing).
- Evaluate laboratory and other diagnostic tests.
- Continuous ECG monitoring.
- Correct underlying causes once identified (e.g., hypoxia, electrolyte imbalance).
- Administer appropriate pharmacological agents and evaluate client response.
- Support family during and after critical situation (e.g., family access, privacy, social work, spiritual counsellor).

6.4 selects appropriate nursing interventions for potential complications related to dysrhythmias (e.g., embolic stroke related to atrial fibrillation/flutter, hemodynamic instability arising from non-sustained VT and other conduction abnormalities).

### **Example**

The following are examples of nursing interventions for potential complications related to dysrhythmias.

- Administer appropriate pharmacological agents (e.g., anticoagulants, antiarrhythmics, beta-blockers).
- Prepare for treatment (e.g., beta blockers/synchronous cardioversion, temporary external pacemaker, transthoracic pacemaker, permanent pacemaker or ICD, ablation).
- Monitor client status and outcome of interventions.
- Tailor client teaching to individual needs (e.g., medication and symptom management, activity restrictions and ambulation, medication adherence, planning discharge and evaluation of social support).

6.5 selects appropriate nursing interventions for the client with an electronic device (e.g., ICD, pacemakers).

### Example

The following are potential nursing interventions for the client with an electronic device.

- Promote self-care and independence in clients with electronic devices (e.g., pacemaker, ICD).
- Facilitate optimal level of functioning.
- Monitoring device functioning (e.g., post-procedure functioning and care).
- Tailor client teaching to individual needs (e.g., medication and symptom management, activity restrictions and ambulation, medication adherence, planning discharge and evaluation of social support).
- Prepare client for follow-up requirements and problems relating to technology (e.g., shocks, infection).
- Acknowledge fear, anxiety, and concern from client and family with respect to living with technological devices (e.g., depression, sexuality).

## 7. The Care of the Person with Valvular Heart Disease (12 competencies)

The cardiovascular nurse:

7.1 interprets the following data related to valvular heart disease including the following pathophysiology: congenital (e.g., bicuspid valve, Ebstein's anomaly, Marfan's syndrome); acquired (e.g., rheumatic fever, endocarditis, degenerative, papillary muscle dysfunction).

7.1a History taking:

- presenting symptoms (e.g., dyspnea, chest pain, dizziness, fatigue, pre-syncope, syncope, manifestations of heart failure, activity intolerance, palpitations);
- current and past medical history (e.g., rheumatic heart disease, pulmonary disease, renal disease, myocardial infarction, stroke, cardiomyopathy, hematological disorders, endocarditis, peripheral vascular disease, surgical history);
- dental assessment/intervention;
- cardiac risk factors (e.g., family history, smoking, diabetes, hypertension, dyslipidemia, physical inactivity, stress, depression);
- medications (e.g., prescription and non-prescription, herbals);
- psychosocial history (e.g., substance abuse); and
- discharge planning (e.g., evaluation of social and family support, activities of daily living assessment, addiction counselling).

7.1b Physical/System assessment:

- inspection (e.g., skin colour, diaphoresis, clubbing, jugular venous distention, petechiae, splinter hemorrhages, Janeway lesions);
- auscultation (e.g., lung sounds, heart sounds/murmurs, blood pressure(s)); and
- palpation (e.g., differentiation of peripheral pulses, thrills, heaves/lifts).

Diagnostic assessment:

7.1c Laboratory investigations (e.g., serum electrolytes, renal function, complete blood count [CBC], coagulation studies [PTT and INR], blood cultures).

7.1d Cardiac and other diagnostic tests (e.g., 12-lead ECG, coronary angiogram, echocardiograms, chest x-ray, pulse oximetry, CT, MRI).

7.2 selects appropriate nursing interventions to manage clients with the following potential complications of valvular heart disease:

7.2a infection;

7.2b heart failure;

7.2c embolization;

7.2d dysrhythmia;

7.2e cerebral vascular accident;

7.2f rupture (e.g., valve, aorta); and

7.2g valvular thrombosis.

### Example

The following are examples of nursing interventions to manage clients with potential complications from valvular heart disease.

- Prepare for diagnostic testing and potential treatment options.
- Monitor pharmacological effects (e.g., beta blockers, anticoagulants, diuretics, vasodilators).
- Monitor hemodynamic status.
- Monitor neurological status for possible stroke (e.g., aphasia, ataxia, facial droop, visual disturbances, weakness/dizziness, gag reflex).
- Tailor client teaching to individual needs (e.g., heart failure management, surgical repair options, anticoagulation management, prophylactic antibiotics).
- Manage dysrhythmias.
- Promote preventive measures (e.g., prophylactic antibiotics, dental care, early treatment of infections, addiction counselling).

## 8. The Care of the Person with Vascular Diseases (15 competencies)

The cardiovascular nurse:

- 8.1 interprets the following data related to peripheral vascular diseases including the pathophysiology of arterial and venous vascular disease.
- 8.1a History taking:
- presenting symptoms of arterial occlusion (e.g., resting limb pain, limb numbness, tingling and coldness, claudication, tight shiny skin);
  - presenting symptoms of venous occlusion (e.g., lower extremity aching and fatigue, alteration in skin integrity, warmth, mottling, swelling);
  - current and past medical history (e.g., ischemic heart disease, pulmonary disease, renal disease, stroke/transient ischemic attack [TIA], hematological disorders, deep vein thrombosis, surgical history);
  - cardiovascular risk factors (e.g., age, family history, smoking, diabetes, hypertension, dyslipidemia, obesity, physical inactivity);
  - medications (e.g., prescription and non-prescription, herbals);
  - psychosocial history (e.g., substance use, travel history); and
  - discharge planning (e.g., evaluation of social and family support, activities of daily living assessment, occupation).
- 8.1b Pain assessment (e.g., location, duration, radiation, intensity, quality, precipitating/aggravating/alleviating factors, associated symptoms, onset, frequency and changing patterns).
- 8.1c Physical/System assessment to identify arterial and/or venous occlusion:
- inspection (e.g., skin changes, skin colour, hair loss, nail bed alterations, clubbing, shiny skin, tissue necrosis, bilateral limb comparisons, presence of varicosities, edema);
  - auscultation (e.g., diminished or absent peripheral pulses, bilateral limb blood pressure assessment, bruits); and
  - palpation (e.g., diminished or absent peripheral pulses, skin temperature changes, edema, capillary refill, Allen's test, bilateral limb circumference).
- Diagnostic assessment:
- 8.1d Laboratory investigations (e.g., coagulation studies [INR and PTT], lipid profile, complete blood count [CBC], D-dimer, inflammatory markers).
- 8.1e Cardiovascular and other diagnostic tests (e.g., ankle-brachial index, chest x-rays, 12-lead ECG, Doppler ultrasounds, venogram, angiogram, CT, MRI).

- 8.2 selects appropriate nursing interventions to improve peripheral blood flow and prevent complications of peripheral vascular diseases including:
- 8.2a arterial occlusion; and
  - 8.2b venous occlusion.

### **Example**

The following are potential nursing interventions to improve peripheral blood flow and prevent complications of peripheral vascular diseases.

- Prepare for diagnostic testing and potential treatment options (e.g., surgery).
- Monitor pharmacological effects (e.g., antiplatelets, anticoagulants, analgesics).
- Promote rest and limb repositioning and use of supporting devices (e.g., support stockings and sequential pneumatic compression device used for venous disease).
- Tailor client teaching to individual needs (e.g., self-management, modifying risk factors, exercise, medication management, symptom management, activities of daily living, infection and progression of disease, sexual issues).

- 8.3 interprets data related to aortic aneurysms or aortic dissection including the following.
- 8.3a History taking:
    - presenting symptoms of thoracic aneurysm (e.g., dyspnea, cough, hoarseness, dysphasia, hemoptysis);
    - presenting symptoms of abdominal aneurysm (e.g., often asymptomatic, GI symptoms, oliguria, hematuria, anuria);
    - presenting symptoms of aortic dissection (e.g., acute back, abdomen and chest pain, syncope, diaphoresis, cold limb(s));
    - current and past medical history (e.g., hypertension, trauma injuries, coarctation of the aorta, Marfan's syndrome, ischemic heart disease, pulmonary disease, renal disease, stroke/transient ischemic attack [TIA], hematological disorders);
    - cardiovascular risk factors (e.g., gender, smoking, age, family history, diabetes, hypertension, dyslipidemia, obesity);
    - medications (e.g., prescription and non-prescription, herbals);
    - psychosocial history (e.g., recent accidents, falls, substance use); and
    - discharge planning (e.g., evaluation of social and family support, activities of daily living assessment, occupation).
  - 8.3b Pain assessment (e.g., location, duration, radiation, intensity, quality, precipitating/aggravating/alleviating factors, associated symptoms, onset, frequency and changing patterns).

- 8.3c Physical/System assessment to identify location of aneurysm or aortic dissection:
- inspection (e.g., pulsatile mass, abdominal distention, skin colour changes (mottling), jugular venous distention, level of consciousness);
  - auscultation (e.g., diminished or absent peripheral pulses, bilateral limb blood pressures(s), bruits, lung sounds, changes in heart rate, bilateral pulse comparisons, pulsus paradoxus); and
  - palpation (e.g., diminished or absent peripheral pulses, skin temperature changes, edema, capillary refill, pulsatile mass).

Diagnostic assessment:

- 8.3d Laboratory investigations (e.g., complete blood count [CBC], coagulation studies [INR and PTT], type and crossmatch, electrolytes, renal function, lipid profile, blood gases, cardiac biomarkers).
- 8.3e Cardiovascular and other diagnostic tests (e.g., chest and abdominal x-rays, echocardiograms, computerized tomography [CT] scan, magnetic resonance imaging [MRI], 12-lead ECG, angiograms, Doppler ultrasound, pulse oximetry, abdominal ultrasound).
- 8.4 selects appropriate nursing interventions to maintain client's condition with:
- 8.4a aortic dissection/rupture;
- 8.4b abdominal aneurysm; and
- 8.4c thoracic aneurysm.

### **Example**

The following are potential nursing interventions to maintain a client's condition with an aortic dissection or an aneurysm.

- Prepare for diagnostic testing and potential treatment options.
- Monitor oxygenation.
- Monitor and maintain blood pressure within parameters.
- Monitor pharmacological effects (e.g., antihypertensives, beta blockers, diuretics, analgesics).
- Monitor peripheral pulses.
- Monitor lab values (e.g., CBC, creatinine, BUN).
- Monitor levels of consciousness.
- Monitor fluid balance.
- Tailor client teaching to individual needs (e.g., modifying risk factors, medication regimen management, symptom management, activities of daily living, exercise).

## 9. The Care of the Person with Heart Disease Related to Inflammatory/Infectious Processes: Pericarditis, Endocarditis, Myocarditis (11 competencies)

The cardiovascular nurse:

- 9.1 interprets the following data related to the impact of the inflammatory/infectious process in the heart including the following disorders: pericarditis, endocarditis, myocarditis.
- 9.1a History taking:
- presenting symptoms (e.g., dyspnea, fatigue, activity intolerance, malaise and unexplained fever, night sweats, recent symptoms of viral illness, joint pain, weight loss, chest pain, manifestations of heart failure);
  - current and past medical history (e.g., past history of valvular heart disease or endocarditis or presence of a prosthetic valve, childhood murmurs, congenital heart disease, recent dental and other invasive procedures, recent cardiac surgery, renal disease, recent myocardial infarction, viral illness, autoimmune syndromes, chest trauma, radiation therapy, pregnancy);
  - cardiovascular risk factors (e.g., gender, smoking, age, family history, diabetes, hypertension, dyslipidemia, obesity);
  - medications (e.g., prescription and non-prescription, herbals);
  - psychosocial history (e.g., intravenous drug use); and
  - discharge planning (e.g., evaluation of social and family support, activities of daily living assessment, occupation).
- 9.1b Pain assessment (e.g., pleuritic-type pain, pain on inspiration, increased pain in supine position, location, duration, radiation, intensity, quality, precipitating/aggravating/alleviating factors, associated symptoms, onset, frequency and changing patterns).
- 9.1c Physical/System assessment:
- inspection (e.g., lethargy, joints, petechiae, splinter hemorrhages, temperature);
  - auscultation (e.g., heart sounds, pericardial friction rub, murmurs, lung sounds, blood pressure(s)); and
  - Palpation (e.g., pulses).
- Diagnostic assessment:
- 9.1d Laboratory investigations (e.g., blood cultures, complete blood count, sedimentation rate, electrolytes, coagulation studies [PTT and INR], renal function, creatine kinase [CK], C-reactive protein, viral titres, MRI).
- 9.1e Cardiac and other diagnostic tests (e.g., 12-lead ECG, echocardiograms, chest x-ray, CT scan, cardiac biopsy).

- 9.2 interprets the following data related to endocarditis assessment including:
- 9.2a embolic sequelae:
- cerebral (e.g., changes in level of consciousness, visual disturbances, headaches);
  - splenic embolization (e.g., upper left abdominal pain);
  - renal embolization (e.g., hematuria and oliguria, renal function);
  - peripheral embolization (e.g., change in peripheral pulses and joint tenderness); and
  - cardiac embolization (e.g., heart block, dysrhythmias, myocardial infarction).
- 9.3 interprets the following data related to pericarditis/pericardial effusion assessment including:
- 9.3a manifestations of tamponade (e.g., dyspnea, hemodynamic instability, jugular venous distention, pulsus paradoxus).
- 9.4 interprets the following data related to myocarditis assessment including:
- 9.4a manifestations of acute heart failure.
- 9.5 selects appropriate nursing interventions for the following inflammatory/infectious diseases of the heart including:
- 9.5a pericarditis;
- 9.5b endocarditis; and
- 9.5c myocarditis.

### **Example**

The following are potential nursing interventions for managing inflammatory/infectious diseases of the heart.

- Manage pain (e.g., cardiac, pleuritic, joint).
- Maintain hemodynamic stability (e.g., fluids and inotropic agents).
- Monitor temperature and ECG.
- Arrange for appropriate venous access if long-term antibiotics are required.
- Assess for manifestations of heart failure.
- Assess nutritional status.
- Refer for dental assessment.
- Prepare for diagnostic testing and potential treatment options (e.g., cardiac biopsy, ventricular assist device, transplant).
- Tailor client teaching to individual needs (e.g., antibiotic prophylaxis, social support, steroids, addiction counselling, self-management).

## 10. Core Concepts Related to Psychosocial Needs (6 competencies)

The cardiovascular nurse:

- 10.1 Interprets data related to the psychosocial needs based on the client's:
  - emotional response to the cardiovascular illness (e.g., denial, anger, depression, anxiety, coping skills, vulnerability, sexuality);
  - perceived experience with the health-care system (e.g., waiting times, complications);
  - perceived current and past experiences (e.g., similar illness in a family member or friend);
  - perceived/actual support (e.g., family, social and occupational support, caregiver support);
  - treatment adherence (e.g., medications, appointments, treatments);
  - cultural and spiritual values/beliefs; and
  - financial situation (e.g., lack of insurance, sick benefits).
- 10.2 selects appropriate interventions to promote holistic care:
  - 10.2a assisting clients and their families to make informed choices about their care;
  - 10.2b providing appropriate support for the client and family members based upon their perceived needs and goals for treatment, recovery, rehabilitation, palliation and end of life (e.g., autonomy, disability, advance directives, organ donation); and
  - 10.2c providing crisis intervention as needed (e.g., social worker, spiritual counsellor, crisis intervener, mental health professional).
- 10.3 selects appropriate interventions to promote comfort including:
  - 10.3a implementing non-pharmacological methods to manage the manifestations of pain, anxiety, stress, disruption in sleep patterns, depression and fear (e.g., therapeutic communication, complementary therapies, noise control, music therapy, visualization, relaxation techniques, family involvement); and
  - 10.3b implementing pharmacological agents to manage the manifestations of pain, anxiety, stress, disruption in sleep patterns, depression and fear (e.g., analgesics, sedatives, anxiolytics).

## 11. Cardiogenic Shock (6 competencies)

The cardiovascular nurse:

- 11.1 interprets the following data related to cardiogenic shock.
- 11.1a History taking:
- presenting symptoms (e.g., chest pain, respiratory distress, low cardiac output state, cardiac arrest, poor hemodynamic status, decreased level of consciousness);
  - past and current medical history (e.g., recent cardiac event(s), trauma, failed reperfusion strategies, late presentation for treatment, valvular heart disease, travel history);
  - cardiac risk factors (e.g., age, gender, family history, smoking, hypertension, diabetes, dyslipidemia, obesity);
  - medications and alternative therapies (e.g., prescription and non-prescription, herbals); and
  - psychosocial history (e.g., substance abuse).
- 11.1b Physical/System assessment:
- inspection (e.g., skin colour [mottling], diaphoresis, jugular venous distention, level of consciousness);
  - auscultation (e.g., lung sounds, heart sounds, new murmurs, blood pressure(s)); and
  - palpation (e.g., peripheral pulses, skin temperature, capillary refill).
- 11.1c associated findings (e.g., reduced urinary output, oliguria/anuria, altered level of consciousness, absence of peristalsis).
- Diagnostic assessment:
- 11.1d Laboratory investigations (e.g., serum electrolytes, renal and liver function, lactate, complete blood count [CBC], coagulation studies [PTT and INR], blood gases, biomarkers, such as troponins, CK, brain natriuretic peptide [BNP]).
- 11.1e Cardiac and other diagnostic tests (e.g., 12-lead ECG/continuous cardiac monitoring, echocardiograms, chest x-ray, pulse oximetry, coronary angiogram, pulmonary artery pressure assessments).
- 11.2 selects appropriate nursing interventions related to cardiogenic shock to re-establish hemodynamic stability.

**Example**

The following are potential nursing interventions related to cardiogenic shock to re-establish hemodynamic stability.

- Maintain airway, breathing, circulation.
- Optimize oxygenation and hemodynamic status (e.g., fluids, titrate inotropes, intra-aortic counter pulsation).
- Continuous ECG monitoring.
- Monitor pharmacological effects of vasopressors and inotropes.
- Prepare for diagnostic testing and potential treatment options (e.g., temporary pacemaker, ventilation, intra-aortic counter pulsation, angiogram, PCI, cardiac surgery options, ventricular assist device, transplant).
- Support family in crisis (e.g., social work, spiritual counsellor, family access to client).