CERTIFICATION EXAMINATION BLUEPRINT

CARDIAC SONOGRAPHER EXAMINATION

This blueprint applies to the examination as of January 2022 and is based on NCP 6.1

This blueprint may be modified prior to future examinations, in which case advance notice will be provided.

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Purpose of Examination Blueprints

As part of the requirements to qualify for certification as a Cardiac Sonographer, candidates will be required to successfully complete both the Core Sonographic Skills Examination and the Cardiac Sonographer Examination.

Each examination (Core and Cardiac) has a separate Examination Blueprint. The purpose of an Examination Blueprint is to describe how the examination should be developed. Examination Blueprints are based on the Sonography Canada National Competency Profiles (NCP) and identify the competencies upon which questions will be based (these are referred to as "examinable competencies"). Item numbers and references to Appendices (included in this document) that appear in the Examination Blueprints refer to the corresponding items in the NCP. **As of January 2022, the content of each examination is based upon** NCP Version 6.1**.**

The Examination Blueprint also identifies the total number of questions in the examinations, and the approximate distribution of those questions among the examinable competencies. This distribution is listed as a percentage range for each grouping of examinable competencies.

The Cardiac Sonographer Examination consists of 180 questions. The total time allowed is 180 minutes.

How Should Candidates Use the Examination Blueprint?

As described above, examination blueprints are intended to describe how the examination is to be developed. They are not designed explicitly for study purposes but do provide valuable information about the examination content, the number of questions and how content is distributed within the exam. Candidates should refer to the relevant appendices in the NCP for a list of the structures relevant to each content area.

Assessment Environments

The National Competency Profiles (NCPs) designate the *Assessment Environment* for each competency which denotes the educational setting for assessing student proficiency. The appropriate environment is determined by national survey responses. Educators and student assessors are expected to have a comprehensive understanding of the NCPs. Employers should be familiar with the NCPs to manage entry-level expectations.

The following assessment environments are found in the relevant Appendices:

Assessment Environment	Definition	Criterion for Student Success
A (Academic)	Academic education takes place in a classroom or through guided study involving cognitive and / or affective learning.	Academic assessment consistent with the definition of entry-level competence.
S (Simulation)	Simulation involves cognitive, affective and / or psychomotor learning in a setting that simulates a practice activity.	Simulated performance consistent with the definition of entry-level competence.
C (Clinical)	Clinical education involves cognitive, affective and / or psychomotor learning where learners work directly with human patients in a setting designed to provide patient care. Learners are supervised throughout their clinical education, in a manner that facilitates their development of independent clinical abilities while ensuring safe, effective and ethical patient care.	Reliable clinical performance consistent with the definition of entry-level competence.

Cardiac Sonographer Examination Blueprint

The Cardiac Sonographer Examination consists of 180 questions		
Examinable Competencies		**% Range**
2.2	**Professional judgement**	**1-2%**
2.2h	Identify and respond to urgent sonographic findings.	
2.3	**Professional conduct**	**1-2%**
2.3l	Recognize, respond to and disclose adverse events.	
3.2	**Clinical Procedures**	**2-4%**
3.2a	Understand role in interventional procedures.	
3.2b	Understand role in transesophageal echocardiography.	
3.3	**Related techniques and procedures**	**4-6%**
3.3d	Perform provocative / dynamic maneuvers (e.g., Valsalva).	
3.3e	Understand the application of stress echocardiography.	
3.3j	Perform contrast-enhanced imaging.	
4.2	**Operation of Equipment**	**18-22%**
4.2a	Orient and manipulate transducer.	
4.2b	Perform sonographic examination of structures of interest using knowledge of sonographic principles, instrumentation and techniques listed in Appendix E.	
4.2e	Identify artifacts.	
4.2h	Perform sonographic examinations using 3-D imaging.	
5.1	**Examination Planning**	**13-17%**
5.1a	Interpret history, signs & symptoms and other relevant information.	
5.1c	Modify scope of examination based on clinical history.	
5.1d	Formulate sonographic scanning strategies.	
5.1e	Integrate knowledge of anatomy and disease processes.	

Examinable Competencies		% Range
5.2	**Correlation of relevant diagnostic data**	**6-10%**
5.2a	Correlate results from laboratory tests, aspirations and biopsies.	
5.2b	Correlate results from diagnostic imaging (radiography, computerized tomography, nuclear medicine and magnetic resonance studies).	
5.2d	Correlate results from cardiac testing (ECG, Holter monitoring, stress ECG).	
5.2e	Correlate results from oximetry and / or auscultation.	
5.3	**Examination**	**33-37%**
5.3e	Evaluate images for orientation, identification, and labeling.	
5.3f	Evaluate images for quality.	
5.3g	Recognize sonographic appearance of normal structures.	
5.3h	Recognize artifacts and normal variants.	
5.3i	Differentiate artifact and normal variants from anatomic and pathologic findings.	
5.3j	Recognize and investigate abnormal findings.	
5.3k	Modify examination based on sonographic evidence, clinical information, resource implications and other contextual factors.	
5.3l	Ensure all applicable components of examination are complete.	
5.4	**Technical analysis**	**10-14%**
5.4b	Formulate impression based on findings.	
5.4c	Understand the variables and their relationships within calculations.	
5.4d	Use spatial reasoning to interpret images.	
5.4e	Identify and prioritize differential findings.	

Appendix E: Examination Techniques for the Cardiac Sonographer

*The table below applies to competency **4.2b** and lists the techniques a practitioner should use when examining the structures and characteristics noted. Within this appendix, each technique is assigned an appropriate assessment environment. These are not intended as scanning protocols.*

STRUCTURE / CHARACTERISTIC	TECHNIQUE											
	2-D real time assessment	measure (2D)	M-mode	measure - M-mode	colour Doppler assessment	measure colour Doppler	pulsed wave (PW) Doppler assessment	measure PW Doppler	continuous wave (CW) Doppler assessment	measure CW Doppler	tissue Doppler assessment	measure - tissue Doppler
Abdominal situs	C											
Cardiac position	C											
Chest & thorax (adjacent, extra-cardiac)	C											
Coronary vessels	A	A			A							
Hepatic veins	C				C		C	C				
Outflow tracts	C	C			C		C	C	C	C		
Pulmonary veins	C				C		C	C				
Wall layers (endo, myo, pericardium)	C	C	S	S								
Wall segments	C	C	S									
Aorta												
Arch & branches	C	C			C							
Ascending	C	C			C				C	C		
Descending	C	C			C		C	C	C	C		
Root	C	C	S	S	C							
Atria												
Left	C	C	S	S	C							
Right	C	C			C							
Left Atrial Appendage	C											
Right Atrial Appendage	A											
Pulmonary artery												
Main pulmonary artery	C	S			C		C	C	C	C		
Bifurcation	C				A		A	A	C	A		
Septa												
Atrial	C				C		C	C	C	C		
Ventricular	C	C	S	S	C		C	C	C	C		

STRUCTURE / CHARACTERISTIC	TECHNIQUE											
	2-D real time assessment	measure (2D)	M-mode	measure - M-mode	colour Doppler assessment	measure colour Doppler	pulsed wave (PW) Doppler assessment	measure PW Doppler	continuous wave (CW) Doppler assessment	measure CW Doppler	tissue Doppler assessment	measure - tissue Doppler
Valves												
Aortic	C		C		C	C	C	C	C	C		
Mitral	C	S	C		C	C	C	C	C	C		
Mitral (annulus)	C										C	C
Pulmonic	C				C		C	C	C	C		
Tricuspid	C				C		C	C	C	C		
Tricuspid annulus	C		C	C							C	C
Vena cava												
Inferior	C	C	C	S	C							
Superior	A				A							
Ventricles												
Left	C	C	S	S	C							
Right	C	C	S	S	C							