CERTIFICATION EXAMINATIONS BLUEPRINT

GENERALIST SONOGRAPHER

December 2017

This Blueprint applies to the examinations that will take place in 2018. It may be modified prior to future examinations, in which case notice will be provided.

INTRODUCTION

As part of the requirements to qualify for the Canadian Registered Generalist Sonographer (CRGS) credential, candidates are required to successfully complete both the Core Sonographic Skills Examination and the Generalist Sonographer Examinations (Obstetrical & Gynaecological Sonography; Abdominal and Superficial Structures Sonography and Generalist Vascular Sonography).

The content of this blueprint is based on the National Competency Profile (NCP) Version 5.0 for the Generalist Sonographer and was revalidated in 2016. This examination blueprint identifies the competencies upon which questions will be based. Numbers and letters that appear in the blueprint refer to the corresponding competencies in the NCP.

This blueprint also identifies the total number of questions in each examination and the approximate distribution of those questions among the examinable competencies.

OBSTETRICAL and GYNAECOLOGICAL SONOGRAPHY

THE OBSTETRIC/GYNECOLOGICAL COMPONENT CONSISTS OF 70 OBS + 30 GYN QUESTIONS. TIME ALLOWED: 100 MINUTES		
	OBSTETRIC SECTION	
2.2 Professional judgement.		**1-3%**
g	Identify and respond to urgent sonographic findings.	
4.2 Use of equipment.		**10-12%**
c	Perform sonographic examinations using pulsed wave Doppler.	
d	Perform sonographic examinations using colour Doppler.	
e	Perform sonographic examinations using power Doppler.	
h	Orient and manipulate transducer	
m	Identify artifacts and adjust instrument controls to optimize image.	
n	Measure structures	
o	Measure M-mode tracings	
p	Measure Doppler Waveforms.	
5.1 Examination planning.		**8-10%**
a	Interpret history, signs & symptoms and other relevant information.	
c	Modify scope of examination based on clinical history.	
d	Formulate sonographic scanning strategies.	
e	Integrate knowledge of anatomy and disease processes.	
5.2 Integration of relevant, available diagnostic data.		**1-3%**
a	Correlate results from laboratory tests.	
h	Correlate results from amniocentesis.	
i	Correlate results from chorionic villus sampling.	
j	Correlate results from chromosome analysis.	
k	Correlate results from dilatation and curettage.	
l	Correlate results from non-stress testing.	
5.3 Image quality.		**7-9%**
c	Evaluate images for orientatin, identification, and labeling.	
d	Evaluate images for quality.	
e	Modify scope of examination based on sonographic findings.	
5.4 Technical analysis.		**16-18%**
a	Differentiate artifact from anatomic and pathologic findings.	
b	Differentiate normal variants from pathology.	
c	Use spatial reasoning to interpret images.	
d	Identify and prioritize differential findings.	
e	Formulate impression based on findings	
7.1 Generalist sonography - obstetrical.		**20-24%**
a	Perform sonographic examination of structures of interest using techniques listed in Appendix 1.1.	
b	Recognize sonographic appearance of normal structures.	
c	Differentiate sonographic appearance of normal structures from anomalous and pathologic conditions.	

OBSTETRICAL and GYNAECOLOGICAL SONOGRAPHY

		GYNAECOLOGY SECTION	
2.2		**Professional judgement.**	**1-3%**
	g	Identify and respond to urgent sonographic findings.	
4.2		**Use of equipment.**	**2-4%**
	c	Perform sonographic examinations using pulsed wave Doppler.	
	d	Perform sonographic examinations using colour Doppler.	
	e	Perform sonographic examinations using power Doppler.	
	h	Orient and manipulate transducer.	
	m	Identify artifacts and adjust instrument controls to optimize image.	
	n	Measure structures.	
5.1		**Examination planning.**	**3-5%**
	a	Interpret history, signs & symptoms and other relevant information.	
	c	Modify scope of examination based on clinical history.	
	d	Formulate sonographic scanning strategies.	
	e	Integrate knowledge of anatomy and disease processes.	
5.2		**Integration of relevant, available diagnostic data.**	**1-3%**
	a	Correlate results from laboratory tests	
	c	Correlate results from radiography.	
	e	Correlate results from computerized tomography.	
	g	Correlate results from magnetic resonance studies.	
	k	Correlate results from dilatation and curettage.	
5.3		**Image quality.**	**1-3%**
	c	Evaluate images for orientation, identification, and labeling.	
	d	Evaluate images for quality.	
	e	Modify scope of examination based on sonographic findings.	
5.4		**Technical analysis.**	**4-6%**
	a	Differentiate artifact from anatomic and pathologic findings.	
	b	Differentiate normal variants from pathology.	
	c	Use spatial reasoning to interpret images.	
	d	Identify and prioritize differential findings.	
	e	Formulate impression based on findings	
7.2		**Generalist sonography - gynecological.**	**10-12%**
	a	Perform sonographic examination of structures of interest using techniques listed in Appendix 1.2.	
	b	Recognize sonographic appearance of normal structures.	
	c	Differentiate sonographic appearance of normal structures from anomalous and pathologic conditions.	

ABDOMINAL SONOGRAPHY, SUPERFICIAL STRUCTURES

THE ABDOMINAL/SUPERFICIAL STRUCTURES COMPONENT CONSISTS OF 100 ABD + 30 SS QUESTIONS. **TIME ALLOWED: 130 MINUTES.**		
	ABDOMEN SECTION	
2.2 Professional judgement.		**1-3%**
g	Identify and respond to urgent sonographic findings.	
3.2 Assistance with clinical procedures.		**1-3%**
a	Assist in interventional procedures.	
b	Assist in contrast-enhanced procedures.	
4.2 Use of equipment.		**7-9%**
c	Perform sonographic examinations using pulsed wave Doppler.	
d	Perform sonographic examinations using colour Doppler.	
e	Perform sonographic examinations using power Doppler.	
h	Orient and manipulate transducer	
m	Identify artifacts and adjust instrument controls to optimize image.	
n	Measure structures	
p	Measure Doppler Waveforms.	
5.1 Examination planning.		**7-9%**
a	Interpret history, signs & symptoms and other relevant information.	
c	Modify scope of examination based on clinical history.	
d	Formulate sonographic scanning strategies.	
e	Integrate knowledge of anatomy and disease processes.	
5.2 Integration of relevant, available diagnostic data.		**3-5%**
a	Correlate results from laboratory tests.	
c	Correlate results from radiography.	
e	Correlate results from computerized tomography.	
g	Correlate results from magnetic resonance studies.	
5.3 Image quality.		**7-9%**
c	Evaluate images for orientation, identification, and labeling.	
d	Evaluate images for quality.	
e	Modify scope of examination based on sonographic findings.	
5.4 Technical analysis.		**20-24%**
a	Differentiate artifact from anatomic and pathologic findings.	
b	Differentiate normal variants from pathology.	
c	Use spatial reasoning to interpret images.	
d	Identify and prioritize differential findings.	
e	Formulate impression based on findings	
7.3 Generalist sonography - abdominal.		**20-24%**
a	Perform sonographic examination of structures of interest using techniques listed in Appendix 1.4.	
b	Recognize sonographic appearance of normal structures.	
c	Differentiate sonographic appearance of normal structures from anomalous and pathologic conditions.	

	SUPERFICIAL STRUCTURES SECTION	
2.2	**Professional judgement.**	**1-3%**
g	Identify and respond to urgent sonographic findings.	
3.2	**Assistance with clinical procedures.**	**1-3%**
a	Assist in interventional procedures.	
4.2	**Use of equipment.**	**1-3%**
c	Perform sonographic examinations using pulsed wave Doppler.	
d	Perform sonographic examinations using colour Doppler.	
e	Perform sonographic examinations using power Doppler.	
h	Orient and manipulate transducer.	
m	Identify artifacts and adjust instrument controls to optimize image.	
n	Measure structures.	
p	Measure Doppler Waveforms.	
5.1	**Examination planning.**	**2-4%**
a	Interpret history, signs & symptoms and other relevant information.	
c	Modify scope of examination based on clinical history.	
d	Formulate sonographic scanning strategies.	
e	Integrate knowledge of anatomy and disease processes.	
5.2	**Integration of relevant, available diagnostic data.**	**2-4%**
a	Correlate results from laboratory tests	
c	Correlate results from radiography.	
e	Correlate results from computerized tomography.	
g	Correlate results from magnetic resonance studies.	
5.3	**Image quality.**	**2-4%**
c	Evaluate images for orientation, identification, and labeling.	
d	Evaluate images for quality.	
e	Modify scope of examination based on sonographic findings.	
5.4	**Technical analysis.**	**4-6%**
a	Differentiate artifact from anatomic and pathologic findings.	
b	Differentiate normal variants from pathology.	
c	Use spatial reasoning to interpret images.	
d	Identify and prioritize differential findings.	
e	Formulate impression based on findings	
7.4	**Generalist sonography - superficial structures.**	**3-5%**
a	Perform sonographic examination of structures of interest using techniques listed in Appendix 1.4.	
b	Recognize sonographic appearance of normal structures.	
c	Differentiate sonographic appearance of normal structures from anomalous and pathologic conditions.	

EXTRACRANIAL ARTERIES AND PERIPHERAL VEINS

THE GENERALIST VASCULAR COMPONENT CONSISTS OF 55 EXTRACRANIAL ARTERIES & PERIPHERAL VEIN QUESTIONS. TIME ALLOWED: 55 MINUTES		
	EXTRACRANIAL ARTERIES SECTION	
3.3 Related techniques and procedures.		**1-3%**
d	Perform provocative maneuvers.	
4.2 Use of equipment.		**11-13%**
c	Perform sonographic examinations using pulsed wave Doppler.	
d	Perform sonographic examinations using colour Doppler.	
e	Perform sonographic examinations using power Doppler.	
h	Orient and manipulate transducer.	
m	Identify artifacts and adjust instrument controls to optimize image.	
n	Measure structures.	
p	Measure Doppler waveforms.	
5.1 Examination planning.		**13-15%**
a	Interpret history, signs & symptoms and other relevant information.	
c	Modify scope of examination based on clinical history.	
d	Formulate sonographic scanning strategies.	
e	Integrate knowledge of anatomy and disease processes.	
5.2 Integration of relevant, available diagnostic data.		**3-5%**
d	Correlate results from angiography.	
e	Correlate results from computerized tomography.	
g	Correlate results from magnetic resonance studies.	
q	Correlate results from auscultation	
5.3 Image quality.		**5-7%**
c	Evaluate images for orientation, identification, and labeling.	
d	Evaluate images for quality.	
e	Modify scope of examination based on sonographic findings.	
5.4 Technical analysis.		**11-13%**
a	Differentiate artifact from anatomic and pathologic findings.	
b	Differentiate normal variants from pathology.	
c	Use spatial reasoning to interpret images.	
d	Identify and prioritize differential findings.	
e	Formulate impression based on findings.	
7.6 Generalist sonography - extracranial arteries and peripheral veins.		**18-22%**
a	Perform sonographic examination of structures of interest using techniques listed in Appendix 1.6.	
b	Recognize sonographic appearance of normal structures.	
c	Differentiate sonographic appearance of normal structures from anomalous and pathologic conditions.	

EXTRACRANIAL ARTERIES AND PERIPHERAL VEINS

	PERIPHERAL VEINS SECTION	
3.3 Related techniques and procedures.		**1-3%**
d	Perform provocative maneuvers.	
4.2 Use of equipment.		**3-5%**
c	Perform sonographic examinations using pulsed wave Doppler.	
d	Perform sonographic examinations using colour Doppler.	
e	Perform sonographic examinations using power Doppler.	
h	Orient and manipulate transducer.	
m	Identify artifacts and adjust instrument controls to optimize image.	
5.1 Examination planning.		**7-9%**
a	Interpret history, signs & symptoms and other relevant information.	
c	Modify scope of examination based on clinical history.	
d	Formulate sonographic scanning strategies.	
e	Integrate knowledge of anatomy and disease processes.	
5.2 Integration of relevant, available diagnostic data.		**1-3%**
a	Correlate results from laboratory tests	
d	Correlate results from angiography.	
e	Correlate results from computerized tomography.	
g	Correlate results from magnetic resonance studies.	
5.3 Image quality.		**3-5%**
c	Evaluate images for orientation, identification, and labeling.	
d	Evaluate images for quality.	
e	Modify scope of examination based on sonographic findings.	
5.4 Technical analysis.		**3 -5%**
a	Differentiate artifact from anatomic and pathologic findings.	
b	Differentiate normal variants from pathology.	
c	Use spatial reasoning to interpret images.	
d	Identify and prioritize differential findings.	
e	Formulate impression based on findings.	
7.6 Generalist sonography - extracranial arteries and peripheral veins.		**5 -7%**
a	Perform sonographic examination of structures of interest using techniques listed in Appendix 1.6.	
b	Recognize sonographic appearance of normal structures.	
c	Differentiate sonographic appearance of normal structures from anomalous and pathologic conditions.	

The table below applies to Specific Competency 7.1.a, and lists the techniques the practitioner should be able to utilize when examining the structures and characteristics noted.

STRUCTURE / CHARACTERISTIC	real time assessment (transvesical)	measure (2D)	endovaginal	transperineal	Doppler assessment	measure (Doppler)	M-mode
Maternal Pelvis							
Cervix	C	C	C	A			
Fallopian tubes	C		C				
Gestational sac	C	C	C				
Ligaments	C		C				
Membranes	C		C				
Ovaries	C	C	C				
Relational anatomy	C		C				
Uterine vessels	C		C		A		
Uterus	C	C	C				
Vagina	C						
Yolk sac	C	C	C				
Determination of fetal age							
Abdominal circumference (AC)	C	C					
Biparietal diameter (BPD)	C	C	A				
Embryo: crown rump length	C	C	C				
Estimated fetal weight (EFW)	C	C					
Femur length (FL)	C	C					
Gestational sac size	C	C	C				
Head circumference (HC)	C	C					
Humerus length (HL)	C	A					
Fetal Head							
Anterior ventricles (AV)	C	A					
Cavum septum pellucidum	C						
Cerebellum	C	C					
Cerebral vessels	A				A		
Choriod plexus	C						
Cisterna magna (CM)	C	C					
Falx cerebri	C						
Posterior ventricles (PV)	C	C					
Skull	C						
Thalamus	C						
Third ventricle	C						
Spine							
Cervical spine	C						
Lumbo-sacral spine	C						

Thoracic spine	C						
Fetal Face							
Facial profile	C						
Mouth / lips	C						
Nasal bones	C	A					
Orbits	C	A					
Fetal Neck							
Nuchal fold	C	C					
Nuchal translucency	C	A					
Fetal Chest / Thorax							
Diaphragm	C						
Lungs	C						
Thoracic shape	C						
Fetal Heart							
4 Chamber fetal heart	C						
Aortic arch	C						
Heart rate	C		C				C
Long axis	C						
Outflow tracts	C						
Short axis	C						
Fetal Abdomen							
Adrenals	C						
Aorta	C						
Bowel	C						
Gallbladder	C						
Kidneys	C	C					
Liver	C						
Renal pelvis	C	C					
Spleen	C						
Stomach	C						
Umbilical cord	C			A	A		
Fetal Pelvis							
Bladder	C						
Genitalia	C						
Fetal Skin							
Contour	C						
Thickness	C	A					
Fetal Musculoskeleton							
Feet	C						
Femurs	C	C					
Fibula	C	A					
Hands	C						
Humerus	C	A					
Radius	C	A					
Ribs	C						
Tibia	C	A					
Ulna	C	A					
Determination of:							
Aminiotic fluid pocket depth	C	C					
Amniotic fluid index (AFI)	C	C					
Chorio-amnionicity	C		A				
Cord insertion	C						
Fetal lie	C						
Fetal presentation	C						
Number of fetuses	C		A				

Placenta grading	C					
Placental location	C		A	A		
Placental thickness	C	A				
Biophysical Profile						
Amniotic fluid	C	C				
Breathing	C					
Fetal movement	C					
Fetal tone	C					

The table below applies to Specific Competency 7.2.a, and lists the techniques the practitioner should be able to utilize when examining the structures and characteristics noted.

STRUCTURE / CHARACTERISTIC	TECHNIQUES				
	real time assessment (transvesical)	measure (2D)	endovaginal	Doppler assessment	sonohysterography
Adnexa	C		C		
Cervix	C		C		
Cul-de-sacs	C		C		
Endometrium	C	C	C		A
Fallopian tubes	C		C		A
Muscles & ligaments of the female pelvis	A		A		
Ovaries	C	C	C	C	
Relational anatomy	C		C		
Urinary bladder	C				
Uterus	C	C	C	A	A
Vagina	C				
Vasculature of the female pelvis	C		C	A	

The table below applies to Specific Competency 7.3.a, and lists the techniques the practitioner should be able to utilize when examining the structures and characteristics noted.

STRUCTURE / CHARACTERISTIC	real time assessment	measure (2D)	Doppler assessment	measure (Doppler)	transrectal
	TECHNIQUE				
Abdominal aorta	C	C	A		
Abdominal wall	C				
Adrenal glands	A				
Biliary System	C	C			
Celiac trunk	C				
Chest and thorax	A				
Common iliac arteries	C	C	A		
Common iliac veins	A		A		
Gastrointestinal tract	A				
Inferior vena cava	C		A		
Kidneys, ureters	C	C			
Liver - lobes, segments	C				
Liver- capsule, parenchyma	C				
Liver - vasculature	C		S		
Pancreas	C	A			
Peritoneal, retroperitoneal cavities / spaces	C				
Renal arteries and veins	S				
Spleen - capsule, parenchyma	C	C			
Spleen - vasculature	S		A		
Superior mesenteric artery	C				
Urinary bladder	C	A			
Male pelvis - prostate, seminal vesicles	C	C			A

The table below applies to Specific Competency 7.4.a, and lists the techniques the practitioner should be able to utilize when examining the structures and characteristics noted.

STRUCTURE / CHARACTERISTIC	real time assessment	measure (2D)	Doppler assessment	
Breast	S			
Groin	A			
Parathyroid / neck	A			
Salivary glands	A			
Scrotum	C	C	C	
Superficial tissues	A			
Thyroid	C	C	C	

The table below applies to Specific Competency 7.6.a, and lists the techniques the Generalist Sonographer should be able to utilize when examining the structures and characteristics noted.

STRUCTURE / CHARACTERISTIC	real time assessment	measure (2D)	pulsed wave Doppler assessment	measure - pulse wave Doppler	colour Doppler assessment
Extracranial arteries					
Common carotid artery	S		S	S	S
Internal carotid artery	S		S	S	S
External carotid artery	S		S	S	S
Vertebral artery	S		S	S	S
Subclavian artery	S		S	S	S
Peripheral veins, upper extremity, for DVT					
Jugular vein	S		S		S
Innominate vein	S		S		S
Subclavian vein	S		S		S
Axillary vein	S		S		S
Brachial vein	S		A		S
Basilic vein	S		A		S
Cephalic vein	S		A		S
Peripheral veins, lower extremity, for DVT					
Common femoral vein	C		C		C
Femoral vein	C		C		C
Popliteal vein	C		C		C