

Virtual Cardiovascular Assessments

CPG: Virtual Health

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Introduction:

Virtual care is healthcare at a distance and many assessments need to be adapted in the absence of a face-to-face interaction¹. Clinical assessments involve the use of tools and instruments which are not available in virtual healthcare settings. Information will need to be gathered in other ways, such as listening to the patient's cough, or the audible presence of adverse breath sounds, such as wheezing. As with conventional assessments, the clinician must determine if the patient is experiencing a particular problem and focus on that area first. If no particular problem is present, complete a generalized assessment of the relevant system².

Assessment Overview:

1. Because the cardiovascular system has several different parts, it makes sense to focus on one section at a time. It may be difficult to assess:
 - Skin colour, temperature, or quality
 - Capillary refill time
 - Peripheral pulses
 - Heart sounds
 - Peripheral edema
 - Blood pressure
2. When conducting a virtual assessment of this system, use careful questioning to gather important information. Keep in mind that the cardiovascular and respiratory systems are closely related, and some of the assessment questions may be appropriate for either body system. As with all major body system assessments, determine first if the patient is experiencing any particular cardiovascular problem. If so, focus on that area first. If not, complete a general assessment of this system².

Virtual Assessments:

Cardiovascular System(2)		
Section	Component	Question
MODIFIED EXAM	Cognitive Function	Is the patient alert?
		Does the patient appear confused?
	Work of Breathing	Does the patient appear to have an increased work of breathing?
		Can the patient complete a sentence without having to stop and take a breath?
		Ask the patient to walk to another part of the room. Listen to their ability to breath and talk while walking.
		After walking, ask the patient if he or she feels short of breath. You will be able to hear or determine this by the patient's ability to talk.

		<p>... to hear or determine one by the patient's ability to talk, walk, or breathe</p> <p>Does the patient feel the need to sit down after walking a short distance?</p>
	Lung Sounds	<p>Ask the patient to take a deep breath in through the nose and exhale through the mouth.</p> <ul style="list-style-type: none"> Are there any audible lung sounds? <ul style="list-style-type: none"> Wheezes? Rhonchi? Does the action of taking a deep breath in and out cause the patient to cough
		<p>Listen to the patient talk and assess if a cough is present.</p> <ul style="list-style-type: none"> If coughing, note if it sounds dry or moist.
	Skin	Assess the patient skin colour
		Assess for peripheral edema
		Assess for bruising or redness on extremities
		Assess for jugular vein distention
FUNCTIONAL INQUIRY	Heart	<p>How would you rate your energy level?</p> <ul style="list-style-type: none"> Good, fair or poor?
		<p>Have you ever been told that you have a heart problem?</p> <ul style="list-style-type: none"> If so, what problem(s)?
		Have you ever had an electrocardiogram (EKG)?
		<p>Have you ever been told that you have an irregular heart rhythm?</p> <ul style="list-style-type: none"> Do you ever feel like your heart skips a beat or "changes gears"? Do you ever feel like your heart is beating fast?
		<ul style="list-style-type: none"> Do you ever feel like there is a bird fluttering in your chest?
		Have you ever passed out (lost consciousness) without any known reason?
		Have you ever had an infection that affected your heart?
		Have you ever had surgery on your heart as an adult or as a child?
		<p>Have you ever experienced chest pain?</p> <ul style="list-style-type: none"> If so, describe the pain.
		<p>Describe the color of the skin under your fingernails.</p> <ul style="list-style-type: none"> Would you say that it is: <ul style="list-style-type: none"> Pink Red

		<ul style="list-style-type: none"> ○ White ○ Pale
	Arterial Circulation	Have you ever been told that you have a problem with any of your arteries? <ul style="list-style-type: none"> ● If so, which ones?
		When was the last time that you had your blood pressure measured? <ul style="list-style-type: none"> ● If so, do you remember what the numbers were?
		Do you ever wake up with a headache?
		Do you ever experience blurred vision?
		Do you ever have nosebleeds? <ul style="list-style-type: none"> ● If so, when was the last nosebleed? <ul style="list-style-type: none"> ○ How long did it last? ○ What did you do to make it stop?
		Have you been prescribed or are taking medication for high blood pressure? <ul style="list-style-type: none"> ● If so: <ul style="list-style-type: none"> ○ What is the name of your medication? ○ How often do you take it? ○ How long have you been taking it? ○ Have you had any problems or side effects from taking this medication?
		Is the color of your lower legs the same color as the rest of your skin?
		Do you have any swelling around your feet or ankles?
		Do you have any numbness or tingling of your feet or hands?
		Do you ever have pain in your calves (the back of your lower legs) when you walk? <ul style="list-style-type: none"> ● If so:
		<ul style="list-style-type: none"> ○ How would you describe the pain? <ul style="list-style-type: none"> ■ (The pain of arterial insufficiency is often described as sharp or stabbing.) ○ Does exercise or walking make it better or worse? <ul style="list-style-type: none"> ■ (Walking will make arterial insufficiency worse.) ○ How long does it last? ○ What do you do to make it stop? ○ Does elevating your legs make the pain better or worse?
		Have you noticed if the amount of hair on your lower legs has changed?
		Does the skin of your lower legs appear shiny?

	Venous Circulation	Does the skin on your lower legs appear shiny?
		Do you smoke cigarettes or use any tobacco products? <ul style="list-style-type: none"> • If so, for how long? (pack years) • How much do you smoke or use tobacco products?
		Is the skin over the front of your lower legs darker in color than the rest of the skin on your legs?
		Do you have any wounds or sores on your legs or ankles? <ul style="list-style-type: none"> • If so: <ul style="list-style-type: none"> ○ How long have you had these sores? ○ What have you been using to treat the sores?
		Do you ever experience swelling of your legs and ankles? <ul style="list-style-type: none"> • If so, does elevating your legs make the swelling go down?
		Do your legs swell if you sit or stand in one position too long?
		How would you rate your activity level? <ul style="list-style-type: none"> • Active <ul style="list-style-type: none"> ○ (participate in sports or other activity daily) • Moderate <ul style="list-style-type: none"> ○ (participate in sports or other activity a few times a week) • Sedentary <ul style="list-style-type: none"> ○ (limited to household chores)
		Do you ever experience pain in your lower legs? <ul style="list-style-type: none"> • If so: <ul style="list-style-type: none"> ○ Describe the pain. <ul style="list-style-type: none"> ■ (The pain of venous insufficiency is often described as a feeling of fullness or aching.) ○ Does walking make the pain better or worse? ○ How long does the pain last? ○ What do you do to make the pain stop or improve?
		Have you ever been diagnosed with varicose veins? <ul style="list-style-type: none"> • If so: <ul style="list-style-type: none"> ○ What treatment have you received, if any? ○ What do you do to reduce the discomfort from the varicose veins?
	Lymphatic System	Do you have any swelling? <ul style="list-style-type: none"> • On your neck? • Around your upper chest/armpits? • One arm or hand? • Groin? • One leg?
		Have you ever been told or diagnosed with a problem with your lymph system or drainage?
		Have you had any surgeries that interrupt lymph drainage such as surgery for breast cancer?
		Do you ever get "swollen glands" with an infection or chest cold?

		Do you ever get "swollen glands" with an infection or chest cold?
		Have you ever had to be hospitalized for the infection and the swollen glands?
		Have you ever been diagnosed or treated for cancer that affects the lymph or glands?
	Blood	Have you ever been told or diagnosed with a problem with your blood?
		<ul style="list-style-type: none"> If so, please describe the problem.
		Have you ever been diagnosed with anemia caused by low iron?
		Have you ever been diagnosed with anemia caused by something else?
		Do you take or have been prescribed medication to treat anemia?
		<ul style="list-style-type: none"> If so: <ul style="list-style-type: none"> What is the name of the medication? How long have you been taking it? How many times a day do you take it? Is it a pill or do you have to get injections?
		Do you ever get short of breath when you do routine activities?
<ul style="list-style-type: none"> (This question might be inappropriate if the patient smokes. If the patient does not smoke, shortness of breath can be an indication of a low hemoglobin level.) 		
Do you take or have been prescribed any medication that makes your blood thinner?		
<ul style="list-style-type: none"> If so: <ul style="list-style-type: none"> What is the name of the medication? How long have you been taking the medication? How many times a day do you take it? 		
Do you ever get any bruises on your skin that just occur without any injury?		
<ul style="list-style-type: none"> Where are these bruises located? How long do they last? Do they routinely reappear? 		
Do your gums bleed easily when brushing your teeth?		
<ul style="list-style-type: none"> How long has this been going on? Have you discussed this with your doctor, dentist, health 		
		care provider?
		When you get a minor cut or scrape of the skin, how long does it take for the area to stop bleeding?
		<ul style="list-style-type: none"> Do you have to apply pressure to the area to make it stop bleeding?
		Have you ever been told or diagnosed with a health problem that affects your blood's ability to clot such as hemophilia?
		<ul style="list-style-type: none"> Do you know the type of hemophilia?

		<ul style="list-style-type: none"> Have you had to be hospitalized for treatment of hemophilia? Do you take medication for hemophilia?
		Do you recall the last time that you had an infection? <ul style="list-style-type: none"> What type of infection was it? Were you prescribed antibiotics for the infection? Has the infection reappeared since the last treatment?
		How often do you experience a fever? <ul style="list-style-type: none"> If frequently: <ul style="list-style-type: none"> Is there a particular time of day when the fever occurs? What do you do to treat the fever? Do you experience extreme sweating when the fever breaks?
		Do you take or have been prescribed a medication called a steroid? <ul style="list-style-type: none"> If so: <ul style="list-style-type: none"> Why were you prescribed this medication? Are you still taking this medication? Can you recall the last time you had to take this medication? How long did you take it?
FOCUSED ASSESSMENT	Chest Pain	Assess the pain for: <ul style="list-style-type: none"> Quality Location Radiation to the arm or jaw area Associated with nausea/vomiting Sweating
		Assess how long it has been going on
		<i>Suspect an acute myocardial infarction if this is a new episode and initiate a 911 response</i>
		<i>Suspect angina if this has happened before</i> <ul style="list-style-type: none"> Assess if patient has medication to treat the chest pain Suggest the patient follow the directions to treat the chest pain
	Dysrhythmia	Assess if the patient has a history of an irregular heartbeat
		Assess if the patient ever feels like the heart is skipping beats
		Assess if the patient has prescribed medication to treat the irregular
		heartbeat
		Assess if the patient is experiencing palpitations or fluttering. <ul style="list-style-type: none"> If so, determine: <ul style="list-style-type: none"> Frequency Time the discomfort has been occurring

		<p>Assess associated factors such as:</p> <ul style="list-style-type: none"> • Occurring after ingesting something containing caffeine (coffee) or chocolate • Occurring during or after smoking
	Heart Failure	Assess if the patient has a history of foot/ankle/lower leg swelling
		<p>Assess if the patient has a cough. Determine if the cough “sounds” productive.</p> <ul style="list-style-type: none"> • If so, ask: <ul style="list-style-type: none"> ○ How long has the cough been occurring? ○ Is there any phlegm produced? ○ The color of the phlegm?
		Assess if the patient has noticed the veins in the neck being more prominent than usual
		Assess if the patient has ever been diagnosed with heart failure
		<p>Assess if the patient takes or is prescribed medications for heart failure.</p> <ul style="list-style-type: none"> • If so, <ul style="list-style-type: none"> ○ What is the name of the medication? ○ How long has the medication been prescribed? ○ How many times a day is the medication taken?
		Assess if the patient is experiencing any new symptoms of heart failure
	Problems with Circulation	Assess if there is a change in the color of the skin over the lower extremities
		Assess if the feet and legs feel cold or warm to touch
		Assess if the feet/legs feel numb
		Assess if the skin appears shiny or if there is a change in the amount of body hair over the lower extremities
		Assess if there is any swelling of the feet/ankles/lower legs
		Assess if there are any wounds on the legs
		Assess if the patient is experiencing any pain with activity and inactivity
		<i>Suspect arterial insufficiency if the skin is red in color and experiences pain with walking or other activity.</i>
		<i>Suspect venous insufficiency if the skin is dark brown and experiencing a feeling of heaviness or fullness of the legs when sitting or standing in the same position</i>
	Swollen	Assess the location of the swollen gland

	Swollen Glands	Assess the location of the swollen gland <ul style="list-style-type: none"> • Neck • Under the arm • Groin
		Assess how long the gland has been swollen
		Assess if the swollen gland is painful to touch
		Assess if the swollen gland can move, or is fixed, or feels like it is sticking to one area
		Assess if the swollen gland feels like rubber, or harder like a marble <ul style="list-style-type: none"> • Suspect an acute infection if the swollen gland is movable and rubbery • Suspect another disease process if the swollen gland is hard and immovable
	New Onset of Morning Headache	Assess where the headache is located? <ul style="list-style-type: none"> • Around the back of the neck • Throughout the forehead
		Assess if the headache gets better as the day progresses?
		Assess what has been done for the headache: <ul style="list-style-type: none"> • Taking over-the-counter medication • Laying down with a cool compress
	Blurred Vision	Assess when the blurred vision first started
		Assess if the patient participates in any activities that could cause eyestrain <ul style="list-style-type: none"> • Needlepoint • Reading small print • Extensive computer work, etc.
		Assess if there are any other eye changes noticed <ul style="list-style-type: none"> • Tearing • Crusting • Redness • Drainage
	Nosebleed	Assess what the patient was doing when the nosebleed started
		Assess how long the bleed lasted
		Assess what was done, if anything, to help stop the bleeding
		<i>Suspect an elevation in blood pressure</i>
	New onset	Assess how long the fatigue has been occurring
	Fatigue	Assess when the fatigue was first noticed

		Assess what is being done about the fatigue
		Assess if the fatigue is associated with any other symptoms, such as: <ul style="list-style-type: none"> • New onset of productive cough • New onset of foot/ankle/lower extremity swelling • Change in amount of urine output • Change in appetite • Blurred vision • Headache • Irritability • Shortness of breath or difficulty “catching the breath” • New onset of numbness or tingling of the feet/hands • Inability to complete activities of daily living without having to stop and rest
		<i>Suspect exacerbation or new onset of heart failure if fatigue is associated with:</i> <ul style="list-style-type: none"> • <i>Productive cough</i> • <i>Lower extremity edema</i> • <i>Change in urine output</i> • <i>Change in appetite</i> • <i>Shortness of breath</i> • <i>Irritability</i>
		<i>Suspect acute elevation of blood pressure if fatigue is associated with:</i> <ul style="list-style-type: none"> • <i>Blurred vision</i> • <i>Headache</i>
		<i>Suspect anemia for the fatigue is associated with:</i> <ul style="list-style-type: none"> • <i>Shortness of breath</i> • <i>Activity intolerance</i> • <i>Numbness/tingling of the hands/feet</i>
	Unexplained Bruising	Assess where the bruises are located
		Assess for the estimated size of the bruises
		Assess if the bruises are: <ul style="list-style-type: none"> • clustered around a joint such as <ul style="list-style-type: none"> ○ Knee ○ Ankle • Scattered over a large area such as <ul style="list-style-type: none"> ○ Over both arms ○ Both legs ○ Abdomen ○ Lower back
		Assess if the patient recalls bumping into anything that could have caused the bruising
		Assess if the bruises are painful
		Assess if experiencing any new onset of bleeding gums, nosebleed.

		Assess if experiencing any new onset of bleeding gums, nosebleeds, or coughing of blood
		<i>Suspect an alteration in platelets/clotting with a new unexplained onset of bruising</i>
	Experiencing Fevers	Assess when the fevers were first noticed
		Assess if the fevers occur during any particular time of day
		Assess if the fevers are associated with any other symptoms or body changes
		Assess what the patient has been doing to treat the fevers
		Assess if the fevers are occurring more or less frequently
	New Onset of Peripheral Edema	Assess the area that is edematous
		Assess if the patient can see an indentation when the swollen area is pressed with a finger
		Assess when patient measured body weight <ul style="list-style-type: none"> Assess if the weight has increased since the last measurement
		Assess if there has been a change in amount of urine voided
		Assess if the patient has increased the amount of salt ingested
		Assess if the patient has noticed tightness or swelling of the: <ul style="list-style-type: none"> Fingers/hands Under/around the eyes
		<i>Suspect acute fluid volume overload (which can be due to heart failure, renal failure, hypertension)</i>

Risk Identification

Traffic light system for identifying risk in cardiovascular patients			
	<ul style="list-style-type: none"> Green Flag - Low Risk Document visit and report as normal 	<ul style="list-style-type: none"> Yellow Flag - Medium Risk Report to Primary Care Provider 	<ul style="list-style-type: none"> Red Flag - High Risk Arrange Transport to Hospital
Colour (of skin, lips, fingers)	<ul style="list-style-type: none"> Normal Colour** 	<ul style="list-style-type: none"> Localized area of painful blisters or rash 	<ul style="list-style-type: none"> Diaphoresis Cyanosis Ashen
Activity	<ul style="list-style-type: none"> Appetite is normal Ability to exercise Normal ADL's No trouble sleeping 	<ul style="list-style-type: none"> Feel more tired Lacking the energy to do daily activities. Finding it easier to sleep by adding pillows or sitting up in a chair. 	<ul style="list-style-type: none"> Syncope Altered level of consciousness
Respiratory	<ul style="list-style-type: none"> Breathing problems have not changed <ul style="list-style-type: none"> SOB Cough Sputum 	<ul style="list-style-type: none"> More short of breath than usual. Dry hacking cough. Difficulty breathing while lying down Pain occurs with deep breathing 	<ul style="list-style-type: none"> Struggling to breathe Shortness of breath does not go away while sitting still.
Circulatory	<ul style="list-style-type: none"> No chest discomfort, pain or pressure. No swelling or increase in swelling to your feet, ankles, legs, or stomach. No weight gain more than 4lbs (2kg) over 2 days in a row, or 5lbs (2.5kg) in 1 week. 	<ul style="list-style-type: none"> Weight gain more than 4 lbs (2 kg) over 2 days in a row or 5 lbs (2.5 kg) in 1 week. Increased swelling in the feet, ankles, legs, or stomach. Change in chest pain pattern in known cardiac patients Chest pain with exertion that is relieved with rest Pain occurs when pressure is applied to the area Intermittent mild chest discomfort with deep productive coughing 	<ul style="list-style-type: none"> Tachycardia that does not resolve with rest Chest pain that is not resolved with rest or medications. New onset continuous or intermittent chest pain, tightness or pressure Heart palpitations Chest pain at rest Repeated shocks and internal defibrillator in place
Other		<ul style="list-style-type: none"> Vomiting and/or diarrhea that lasts more than two days. New onset light-headedness or dizziness Feeling uneasy, like something does not feel right. 	<ul style="list-style-type: none"> New onset confusion

4, 5, 6, 7, 8, 9

* If able to measure using the patient's supplied equipment

** If able to assess using video conferencing tools

Decision and Action

1. All patients with worsening cardiovascular symptoms (yellow) should be referred to their primary care provider for assessment.
2. If the paramedic does not have an existing history with the patient, they should strongly consider emergency transport to hospital for any patients experiencing yellow flag symptoms.
3. Patients with red flag symptoms should be transported to the emergency department for assessment and treatment
4. Medication administration prior to arrival (ASA, NTG)

Additional Treatment Information:

1. Many patients living with heart failure utilize a Heart Failure Zone plan, which is provided by their primary care provider. Patients should be encouraged to follow their action plan when and if they become symptomatic⁹.

References & Further Reading:

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