Acknowledgements

RN.com acknowledges the valuable contributions of…

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Purpose & Objectives

The process of oxygenation is what keeps each and every cell in our body alive. If there is a disruption to this process, the whole body suffers. This course discusses specific cardiovascular history questions and exam techniques for your adult patient. Physical exam techniques such as inspection, palpation, percussion, and auscultation will be highlighted. Additionally, throughout the course, you will learn how alterations in your cardiovascular assessment findings could indicate potential cardiovascular problems.

After successful completion of this course, the participant will be able to:

1. Outline a systemic approach to cardiovascular assessment.

2. Discuss history questions that will help you focus your cardiovascular assessment.

3. Recognize abnormal cardiovascular assessment findings associated with inspection, auscultation, percussion, and palpation.

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Cardiovascular disease is the United State’s leading killer for both men and women among all racial and ethnic groups. According to the Centers for Disease Control (CDC) studies among coronary heart disease patients have shown that 90% have had prior exposure to at least one heart disease risk factor that contributed to their disease. A thorough cardiovascular assessment will help to identify significant factors that can influence cardiovascular health such as high blood cholesterol, cigarette use, diabetes, or hypertension (CDC, 2006). Therefore, a cardiovascular exam should be a part of every abbreviated and complete assessment.

A focused cardiovascular assessment is usually indicated after a comprehensive assessment indicates a potential cardiovascular problem. The focused cardiovascular assessment is also indicated when an interval or abbreviated assessment shows a change in status from your previous assessment or the report you received, when a new symptom emerges or the patient develops any distress. An advantage of the focused assessment is that it allows you to ask about symptoms and move quickly to conducting a focused physical exam. Based upon the results of your assessment, you may choose how often to perform interval assessments to monitor the patient’s identified problem. Keep in mind that all assessments should consider patient’s privacy and foster open, honest patient communications.

**Internal View of the Heart**

- Pulmonary valve
- Aorta (arch)
- Pulmonary arteries
- Pulmonary veins
- Left atrium
- Mitral valve
- Right atrium
- Tricuspid valve
- Right ventricle
- Aortic valve
- Left ventricle
History

The purpose of the cardiovascular health history is to provide information about your patient’s cardiovascular symptoms and how they developed. A complete cardiovascular history will give you indications to potential or underlying cardiovascular illnesses or disease states. Obtaining a cardiovascular history will guide you through your focused physical exam. In addition to obtaining data about the patient’s cardiovascular status, you should obtain information about other factors that can impact physical status including spiritual needs, cultural idiosyncrasies, and functional living status.

Past Health History

It is important to ask questions about your patient’s past health history. The past health history should elicit information about the following issues: hypertension, elevated blood cholesterol or triglycerides, heart murmurs, congenital heart disease, rheumatic fever or unexplained joint pains as a child or youth, recurrent tonsillitis and anemia. You will also want to ask about the patient’s history of heart disease, when and how it was treated, last EKG, stress tests, and serum cholesterol levels. Ask the patient the reasons for any previous hospitalizations and the nature of the treatments received while in the hospital. Ask about cardiac catheterizations, echocardiograms, stress tests, and cardiac surgeries (Jarvis, 1996).

Current Lifestyle and Psychosocial Status

Current lifestyle and psychosocial issues to explore when conducting your focused cardiovascular health history include:

- **Nutrition:** Have your patient describe their daily diet. Ask about their usual weight and any recent weight gain or weight loss.

- **Smoking:** Ask your patient if they smoke cigarettes or other tobacco. Ascertain the pack per year smoking history. This is done by multiplying the number of years your patient has smoked with the number of packs per day they have smoked. If you smoked for 30 years, a pack a day, you would have a 30-pack-year history. You could also have a 30-pack-year history if you smoked 2 packs per day for 15 years or 3 packs per day for only 10 years (Cancer Treatment Centers of America, 2004).

- **Alcohol:** Ask how much alcohol the patient normally drinks per day or per week. Ask about when the last drink was and the usual number of drinks per episode.

- **Exercise:** Ask about your patient’s activity level and usual amount of exercise done daily or weekly. Ask what type of exercise they participate in.

- **Drugs:** Ask your patient about all medication they take including anti-hypertensives, beta-blockers, calcium channel blockers, digoxin, diuretics, aspirin, anticoagulants, over-the-counter drugs, herbal supplements, or street drugs.

<table>
<thead>
<tr>
<th>Smokers Pack Per Day History</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 packs per day x 10 years = 20 pack-year history</td>
</tr>
<tr>
<td>1 pack per day x 20 years = 20 pack-year history</td>
</tr>
<tr>
<td>3 packs per day x 7 years = 21 pack-year history</td>
</tr>
</tbody>
</table>
Family History

Family history is an important factor used in identifying your patient’s risk for certain cardiovascular diseases (Shaw, 1998). Ask your patient about any cardiovascular family history such as hypertension, obesity, diabetes, coronary artery disease, or sudden death.

Review of Cardiovascular Signs and Symptoms

When examining the cardiovascular system, ASK about the following:

Chest Pain

The pneumonic, PQRST, is very useful in assessing chest pain. It provides a methodology in which communication to other healthcare providers will be most efficient and informative. Assess the following characteristics with each new report of pain and following any intervention (Shaw, 1998):

- **Provocative or Palliative**: What makes the symptom(s) better or worse?
- **Quality**: Describe the symptom(s).
- **Region or Radiation**: Where in the body does the symptom occur? Is there radiation or extension of the symptom(s) to another area of the body?
- **Severity**: On a scale of 1-10, (10 being the worst) how bad is the symptom(s)?
- **Timing**: Does it occur in association with something else (e.g. eating, exertion, movement)?

**Provocative or Palliative Factors:**

Ask the patient about what starts or worsens the pain. Chest discomfort provoked by exertion is a classic symptom of angina, although esophageal pain can also result from exertion. Other factors that may provoke ischemic pain include:

- Cold
- Emotional stress
- Sexual intercourse
- Smoking
- Meals

However, discomfort that reliably occurs with eating is most likely related to an upper gastrointestinal disease. Pain made worse by swallowing is likely of esophageal origin.
Factors that influence pain should also be established. Pain that responds to sublingual nitroglycerin or cessation of activity strongly suggests a cardiac ischemic etiology, while pericarditis pain typically improves with sitting up and leaning forward.

**Quality of Pain**

The patient with myocardial ischemia often denies feeling chest “pain” and may delay seeking treatment. Typical descriptions include:

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Squeezing</td>
<td>A band-like sensation</td>
</tr>
<tr>
<td>Tightness</td>
<td>Knot in the center of the chest</td>
</tr>
<tr>
<td>Pressure</td>
<td>Lump in the throat</td>
</tr>
<tr>
<td>Constriction</td>
<td>Ache</td>
</tr>
<tr>
<td>Strangling</td>
<td>Heavy weight / elephant on the chest</td>
</tr>
<tr>
<td>Burning</td>
<td>Like a bra too tight</td>
</tr>
<tr>
<td>Heartburn</td>
<td>Toothache</td>
</tr>
<tr>
<td>Fullness in the chest</td>
<td>The “Levine sign” (places fist in the center of chest)</td>
</tr>
</tbody>
</table>

**Region or Radiation**

Pain that localizes to a small area of the chest is more likely to be related to a chest wall or pleural origin rather than the heart. Ischemic cardiac pain is a diffuse type of nonlocalized pain. The pain of myocardial ischemia often radiates to the neck, throat, lower jaw, teeth, upper extremities, or shoulder. If the chest pain is radiating to several areas, there is an increased chance that the patient is having a Myocardial Infarction (MI).

**Severity and Associated Symptoms**

Using a 10-point numeric pain rating scale or visual analog scale often helps patients describe the intensity of pain. The 10-point score grades pain in severity ranging from 0 (no pain) to 10 (most excruciating). The severity of pain does not necessarily correlate with the degree of ischemia. As many as 1/3 of myocardial infarctions may go undetected by the patient. Some patients have difficulty putting a number on the pain in which case an adjective rating scale may be most helpful. The Numeric Pain Scale below is a representation of one such numerical scale (McCaffery & Pasero, 1999).

**Numerical Pain Scale**

![Numeric Pain Scale Diagram](image)

Children or persons with cognitive impairment may better quantify their pain using a faces pain rating scale instead of a numeric scale. A faces pain scale allows the patient to express their pain using graphical representations of their pain instead of numbers. The Faces Pain Scale is an adaptation from Wong and Bakers Faces of Pain Scale and is an alternative to the numerical scale (Wong, 1997).

**Faces Pain Scale**

![Faces Pain Scale Diagram]


Other symptoms that may be associated with myocardial ischemia include nausea, vomiting, diaphoresis, syncope, palpitations, fatigue, weakness, dizziness, light-headedness, and exertional dyspnea. Keep in mind that dyspnea that accompanies chest pain may also be due to a number of pulmonary disorders.

**Timing**

Knowing the onset of chest pain is important to help to determine the cause and treatment of the pain. Ischemic pain is most often gradual with an increasing intensity over time. A crescendo pattern of pain can also be caused by esophageal disease. Pain associated with pneumothorax, aortic dissection, or acute pulmonary embolism typically has an abrupt onset with the initial sensation being the most intense.

Understanding the duration of pain and any patterns are also helpful. The pain from myocardial ischemia generally lasts for a few minutes whereas the pain from an MI may be more prolonged. Chest discomfort that only lasts for a few seconds or pain that is constant for days or weeks is not generally due to ischemia. Myocardial ischemia may have a circadian pattern. It is more likely to occur in the morning than in the afternoon, correlating with an increase in sympathetic tone. However, this pattern may not be exhibited in patients with diabetes or patients taking beta-blockers as the patient’s sympathetic tone is altered.

If the patient is unable to qualify and quantify their pain, the following questions may be useful in getting needed information regarding their pain.

- “What gets the pain started?”
- “What helps the pain stop (rest, sitting up and leaning forward)?”
- “Would you describe it as more of a dull pressure or squeezing or more of a sharp, stabbing, or ripping feeling?”
- “Does this pain feel similar to when you had your previous heart attack?”
• “Is the pain mostly in one area or do you feel it up into your neck and arms?”
• “With ‘0’ being no pain and ‘10’ being the most excruciating pain ever, what number would you give the pain to describe the severity?”
• When applying a number is difficult: “Would you describe the pain as mild, moderate, or severe?”
• “Are you feeling nauseous, dizzy, lightheaded, short of breath, or tired?”
• “Does the pain start off gradually and get worse, or vice versa?”
• “How long does the pain last?”
• “When does the pain usually occur – morning, afternoon, or night?”

It should be noted, however, that typical clinical manifestations such as chest pain occur in only 50% of elderly patients with coronary artery disease (CAD) (Milner, 2001). When pain is present in an older patient, it is frequently vague and poorly localized or localized to the abdomen or epigastric area rather than the substernal area. Elderly patients experiencing angina or myocardial ischemia may describe their symptoms simply as: exertional dyspnea (most common), fatigue, syncope, nausea, anorexia, confusion, or dyspnea at rest.

**Dyspnea**

Ask your patient the following questions related to dyspnea:

• Do you ever get short of breath?
• What types of activity and how much activity brings on the shortness of breath?
• Does the shortness of breath come on suddenly or unexpectedly?
• Does the dyspnea come and go or is it constant?
• Is the shortness of breath associated with change in position?
• Does the shortness of breath wake you up at night?
• Does the shortness of breath interfere with activities of daily living (Jarvis, 1996; Shaw, 1998)?

**Orthopnea**

Ask your patient how many pillows he or she sleeps on at night. Orthopnea is the inability to breathe when in a lying position.

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**Practice Pearl**

Paroxysmal nocturnal dyspnea (PND) occurs at night with congestive heart failure. Laying down increases the volume of thoracic blood. The weakened heart cannot accommodate this greater volume. Your patient will complain of sleeping for about two hours and then arising suddenly needing “fresh air.”
**Cough**

Does your patient have a consistent cough? Have the patient describe the frequency, timing, severity of cough, and any sputum production. If the patient does have sputum production ask about the color of the sputum, if it has an odor, and if it is blood tinged (Jarvis, 1996; Shaw, 1998).

**Fatigue**

Ask your patient if they tire easily. Can they keep up with their family and friends? If they do fatigue easily, ask about when the fatigue started. Was it sudden or gradual? Has there been any recent change in energy level? Also ask about the time of the day the fatigue is related to, e.g. all day, morning or evening (Jarvis, 1996; Shaw, 1998).

**Edema, Cyanosis, and Pallor**

Does your patient have any swelling or skin color changes? Cyanosis or pallor occurs with myocardial infarction or low cardiac output. If the patient has swelling ask about its location. Is it in the feet and legs? If so, when was it first noticed? Ask about any recent change in the swelling, if it is unilateral or bilateral, and if the swelling subsides after sleeping or resting with feet up. Also ask about any associated symptoms with the swelling such as dyspnea (Jarvis, 1996; Shaw, 1998).

**Nocturia**

Does your patient get up at night to urinate? Ask how long this has been occurring and if there have been any recent changes in this pattern (Jarvis, 1996; Shaw, 1998).

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**Practice Pearl**

Hemoptysis is often pulmonary in nature, but may occur with cardiogenic pulmonary edema.

Cardiac related edema is worse in the evening and better in the morning after resting with the feet up.

Cardiac related fatigue is worse in the evening. Fatigue to anxiety or depression occurs all day or is worse in the morning.

Cardiac related edema is worse in the evening and better in the morning after resting with the feet up.

Recumbency promotes fluid re-absorption and excretion. Nocturia occurs with heart failure in the patient who is ambulatory during the day.
Pediatric, Pregnant, and Aging Patients

Additional history questions you may wish to ask regarding your infant, pediatric, pregnant, or aging patient are listed in the table below:

<table>
<thead>
<tr>
<th>Additional History for Infants</th>
<th>Additional History for Children</th>
<th>Additional History for Pregnant Patients</th>
<th>Additional History for Elderly Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother’s health during pregnancy? – Unexplained fever or rubella in the first trimester? Other infections, hypertension, drugs taken?</td>
<td>Activity – Is the child able to keep up with same-aged playmates? Is the child willing or reluctant to play? Does the child prefer “quiet play”? Does the child ever have “blue spells”?</td>
<td>Blood Pressure - Did you have high blood pressure in this or other pregnancies? What was your blood pressure before your pregnancy? Has your pressure been monitored in this pregnancy?</td>
<td>Heart and Lung disease – hypertension, coronary artery disease, emphysema, bronchitis?</td>
</tr>
<tr>
<td>Ever noticed any cyanosis while feeding, nursing or crying?</td>
<td>Any unexpected joint pain or unexplained fever?</td>
<td>Any protein in the urine?</td>
<td>Do you take any medications for your illness?</td>
</tr>
<tr>
<td>Does the baby eat or play without tiring?</td>
<td>Does the child have frequent headaches or nose bleeds?</td>
<td>Any excessive weight gain?</td>
<td>What are the side effects of the medication(s)?</td>
</tr>
<tr>
<td>Is the baby growing according to normal for age and gender?</td>
<td>Does the child have frequent respiratory infections? Any proven to be strep infections?</td>
<td>Have you had any swelling in the feet, legs or face?</td>
<td>Have you recently stopped taking any of your medications? If so, which ones and why?</td>
</tr>
<tr>
<td>Were the baby’s motor milestones achieved as expected</td>
<td>Any family history of congenital diseases?</td>
<td>Have you experienced any faintness with this pregnancy?</td>
<td>Do your illnesses interfere with your activities of daily living?</td>
</tr>
<tr>
<td>How many naps per day and length of naps?</td>
<td>Anyone in the family with chromosomal abnormalities?</td>
<td>Have you experienced any dizziness with this pregnancy?</td>
<td>Does your home have any stairs? How often do you need to climb them?</td>
</tr>
</tbody>
</table>

(Jarvis, 1996)
The Physical Exam

When assessing the cardiovascular system, **EXAMINE** the following:

**The Neck Vessels**

**Inspection**

When you are using inspection, you are looking for any abnormalities you can observe with your eyes, ears, or nose. Areas for evaluation you may inspect include skin color, location of any lesions, bruises or rash, symmetry of motion, size of body parts, and any abnormal findings, sounds, and odors.

Inspect the jugular venous pulse. From the jugular veins, you can estimate central venous pressure (CVP) and estimate the heart’s efficiency as a pump. At a glance, if the patient is sitting in the supine position at 45 degrees or higher, you should not be able to see jugular venous pulsations, unless there is underlying pathology.

**Auscultation**

When auscultating, ensure your room is quiet, auscultate over bare skin, and listen to one sound at a time. Your bell or diaphragm should be placed on your patient’s skin firmly enough to leave a slight ring on their skin when removed. Be aware that your patient’s hair may also interfere with true identification of certain sounds. The diaphragm is used to listen to high-pitched sounds and the bell is best used to identify low-pitched sounds (Shaw, 1998). Also, remember to clean your stethoscope between patients.

Auscultate the carotid arteries in persons middle aged or older, or those with a history of cardiovascular disease. You are listening for the presence of a bruit, which is a blowing or swishing sound, indicating turbulent blood flow. You may need to ask your patient to hold their breath for a short time so that you do not confuse tracheal breath sounds with a bruit. Typically, a bruit is absent.

**Palpation**

Palpation, another commonly used physical exam technique, requires you to touch your patient with different parts of your hand using different strength pressures. During light palpation, you press the skin about ½ inch to 3/4 inch with the pads of your fingers. When using deep palpation, use your finger pads and compress the skin about 1½ inches to 2 inches. Palpation allows you to assess for texture, tenderness, temperature, moisture, pulsations, masses, and internal organs (Shaw, 1998).

Palpate the carotid arteries very gently, and never at the same time. Feel the contour and amplitude of the pulse. Normally, the contour is smooth with a rapid upstroke and normal strength (+2). Findings should be similar bilaterally.
The Precordium

**Inspection**

Inspect the anterior chest for pulsations. You may or may not see the apical pulse. If it is visible, you will see it in the fourth or fifth intercostals space.

**Auscultation**

Before you begin your auscultation of the precordium, preface your exam by telling the patient you will be listening in many different places for what might be a while. It does not mean that anything is wrong. Then, you must identify the areas you need to auscultate. You may want to inch your stethoscope in a “Z-pattern” across the precordium, from the base of the heart to the apex. Concentrate to the sound of the “lub” and the “dub.” The “lub” or first heart sound is known as $S_1$. The “dub” or the second heart sound is known as $S_2$.

$S_1$

$S_1$, the “lub” of the “lub-dub,” is produced by the closure of tricuspid and mitral valves. Alterations you may auscultate that involve $S_1$ are as follows:

- $S_1$ is accentuated in exercise, anemia, hyperthyroidism, and mitral stenosis.
- $S_1$ is diminished in first degree heart block.
- $S_1$ split is most audible in tricuspid area (T-lub-dub) (American Association of Critical Care Nurses, 1998).

$S_2$

$S_2$, the “dub” of the “lub-dub,” is produced by the closure of aortic & pulmonic valves. Alterations you may auscultate that involve $S_2$ are as follows:

- Normal physiological splitting of $S_2$ is best heard at pulmonic area. It occurs on inspiration (“lub-T-dub, lub-dub”).
- Splitting of $S_2$ can indicate pulmonic stenosis, atrial septal defect, right ventricular failure, and left bundle branch block (“lub-T-dub”) (American Association of Critical Care Nurses, 1998).
Other often abnormal, extra heart sounds are described below:

**S₃**

S₃ is also known as a ventricular gallop (“lub-DUB-ta” or “Ken-tuc’-ky”). S₃ is heard in early diastole. It is normal in pregnancy, children, adults less than thirty years old, during exercise, anxiety, or anemia. It occurs early in diastole during rapid ventricular filling or when blood rapidly flows into a ventricle that is not completely empty. It is heard best at the apex in the left lateral decubitus position, using the bell. Pathologic S₃ occurs in people over the age of 40, usually due to myocardial failure.

**S₄**

S₄ is also known as an atrial gallop (“ta-lub-DUB” or “Tenn-es-see”). It is typically heard in late diastole before S₁. It results when ventricular resistance to atrial filling is increased from either decreased ventricular compliance or increased ventricular volume. It is low pitched and best heard with the bell. It is often normal in older adults and is heard best at the apex in the left lateral decubitus position. It may be caused by coronary artery disease, hypertension, cardiomyopathy, or aortic stenosis.

**Summation Gallop**

A summation gallop is produced when S₃ & S₄ merge into one sound. It often occurs at rates greater than 100 beats per minute. It may occur in heart failure and pericarditis. Summation gallops occur in 15% of all myocardial infarctions and are common following cardiac surgery. They are best heard with patient leaning forward, holding breath after full expiration.

**Opening Snap**

At the end of ventricular systole, when the aortic and pulmonic valves close, S₂ is produced. Immediately after S₂, the heart relaxes, and ventricular pressure falls below that of atrial pressure. This allows the atrioventricular valves to open. This is the start of diastole. Normally, you cannot hear these valves open. However, if the mitral valve becomes stenotic or abnormally narrowed they will create an opening snap. This sound usually precedes the development of a diastolic murmur associated with mitral stenosis. Once the valve becomes seriously impaired and inflexible, the opening snap disappears (Kowalak, Johnson & Sussman, 2002).

**Ejection Click**

Similar to an opening snap, an ejection click is caused by stenotic valve leaflets. This sound is produced when the aortic or pulmonic valves open at the beginning of systole. It is a brief high frequency sound best heard with the diaphragm over the aortic or pulmonary artery or Erb’s point, or near the apex over the mitral area (Kowalak, Johnson & Sussman, 2002).

**Mid-systolic Click**

A mid-systolic click occurs when the mitral valve’s leaflets and cordae tendenae tense. The anterior or posterior or both leaflets can prolapse. Every once in a while multiple clicks occur. They are heard in mid to late systole. They are best heard over the tricuspid area and towards the mitral area. They are crisp, high frequency sounds (Kowalak, Johnson & Sussman, 2002).
**Pericardial Friction Rub**

A pericardial friction rub is usually heard best and is sometimes palpable over the tricuspid and xiphoid areas. It occurs when inflamed pericardial surfaces rub together. The rubbing of these surfaces produce the characteristic, high-pitched, grating noises. To differentiate a pericardial friction rub from a pleural friction rub, have the patient hold his or her breath. When they do this, a pericardial friction rub will continue, a pleural friction rub will cease (Kowalak, Johnson & Sussman, 2002).

**Mediastinal Crunch**

A mediastinal crunch is produced due to displaced air under the surface of the skin near the mediastinum. Patients with mediastinal crunch often have subcutaneous emphysema. You can assess for this by palpating crepitation in the neck. The noise has a crunching quality and is heard best along the left sternal border. It may be louder on inspiration (Kowalak, Johnson & Sussman, 2002).

**Murmurs**

A murmur is an abnormal heart sound caused by turbulent blood flow. The sound may indicate that blood is flowing through a damaged or overworked heart valve, that there may be a hole in one of the heart's walls, or that there is a narrowing in one of the heart's vessels. Some heart murmurs are a harmless type called innocent heart murmurs which are common in children and usually do not require treatment. If you auscultate a murmur, you need to assess the following:

**Timing:** Are they systolic or diastolic?

**Anatomical location of maximum intensity:** Where is the murmur best heard?

**Frequency:** What is the pitch of the murmur?

**Radiation:** Can you hear the murmur in other locations such as the neck or upper chest?

**Quality:** Is the murmur harsh, soft, or blowing?

**Intensity:** Describe the loudness of the murmur on a scale of 1 to 6, as indicated by the following scale:

Aortic murmurs are heard best in full expiration with patient leaning forward and mitral murmurs are heard best after exercise in left side lying position.
Murmur Scale

<table>
<thead>
<tr>
<th>Grade</th>
<th>Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Very Faint - Easily Missed</td>
</tr>
<tr>
<td>2</td>
<td>Quiet – Barely Audible</td>
</tr>
<tr>
<td>3</td>
<td>Moderately loud – but easily heard – same intensity as $S_1$ or $S_2$</td>
</tr>
<tr>
<td>4</td>
<td>Loud, but usually no thrill present</td>
</tr>
<tr>
<td>5</td>
<td>Very loud, thrill present</td>
</tr>
<tr>
<td>6</td>
<td>Heard with stethoscope off chest – Thrill present</td>
</tr>
</tbody>
</table>

(American Association of Critical Care Nurses, 1998)

The following table depicts the timing and quality of common murmurs.

<table>
<thead>
<tr>
<th>Murmurs and Extra Sounds</th>
<th>Systolic Ejection</th>
<th>Pansystolic</th>
<th>Systolic Click</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Innocent/Physiologic</td>
<td>$S_1$ $S_2$ $S_1$</td>
<td>$S_1$ $S_2$ $S_1$ Mitral/Tricuspid Regurgitation</td>
</tr>
<tr>
<td></td>
<td>Aortic/Pulmonic Stenosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early Diastolic</td>
<td>$S_1$ $S_2$ $S_1$</td>
<td>$S_1$ $S_2$ $S_1$ Mitral/Tricuspid Stenosis</td>
<td>$S_1$ $S_2$ $S_1$ Mitral Stenosis</td>
</tr>
<tr>
<td>Aortic Regurgitation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mid Diastolic</td>
<td>$S_1$ $S_2$ $S_1$ Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mitral/Tricuspid Stenosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ejection Sound</td>
<td>$S_1$ $S_2$ $S_1$</td>
<td></td>
<td>S3Low</td>
</tr>
<tr>
<td>Aortic Valve Disease</td>
<td></td>
<td></td>
<td>$S_1$ $S_2$ $S_1$ Normal in Children</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Heart Failure</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>S4Low</td>
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<td></td>
<td>$S_1$ $S_2$ $S_1$ Physiologic</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Various Diseases</td>
</tr>
</tbody>
</table>

Crescendo-Decrescendo
Decrescendo
Continuous
Crescendo
Palpation

Palpate the apical pulse, normally in the fourth or fifth intercostal space, mid-clavicular line. It should be felt as a short, gentle tap. It can be palpated in about half of people. It is more difficult to palpate in obese patients or those with thick chest walls. Stress, fever, anxiety, hyperthyroidism, and anemia may increase the amplitude and duration of the apical pulse. When the apical pulse is palpated lower in the thoracic cage and has a greater amplitude than expected, it is often due to cardiac pathology.

Percussion

You may use percussion to outline the cardiac border. Typically, however, a chest x-ray can reveal the same results. There are times, however, that chest x-rays are not available and percussion may be one of your only tools to assess cardiac size. Shaw (1998) best describes the method of percussion, in Assessment Made Incredibly Easy.

“Press the distal part of the middle finger of your non-dominant hand firmly on the body part. Keep the rest of your hand off the body surface. Flex the wrist, but not the foreman, of your dominant hand. Using the middle finger of your dominant hand, tap quickly and directly over the point where your other middle finger contacts the patient’s skin, keeping the fingers perpendicular. Listen to the sounds produced” (pp. 27). Dullness should be heard over the area where the heart is located.

Peripheral Vascular Assessment

Peripheral vascular assessment begins by assessing the patient’s general skin color, appearance, and posture. The skin should be warm, with good turgor and texture. Because normal skin color varies from person to person you should ask your patient if their skin color is normal for them. In dark-skinned people, inspect the oral mucous membranes for cyanosis that may not be readily apparent on the skin. Note any cyanosis. Examine underneath the tongue, inside the cheeks, and the nail beds for signs of peripheral cyanosis.

Two types of cyanosis may occur with patients: central and peripheral. Central cyanosis is consistent with reduced oxygen intake or transport from the lungs. Peripheral cyanosis suggests constriction of the peripheral arteries. This is usually from stress, cold, or anxiety. It may also be from hypovolemia, shock, or vasoconstrictive diseases.
Arterial Pulses and Circulatory Assessment

**Inspection**

Assess arterial perfusion to the lower extremities. Have your patient lie supine on a flat surface and elevate one of his legs above his heart for about one minute. You may need to assist him with this. Then ask him to sit up and dangle his legs over the bed. Inspect the color of both legs. The leg that was elevated should show slight pallor in comparison to the other leg. The color of both legs should be about the same in about ten seconds, once the veins have had time to fill.

Inspect the patient’s skin for warmth and moisture. Cool, clammy skin results from vasoconstriction. Warm, moist skin results from vasodilation. Flushing of a patient’s skin may be due to medications, excess heat, anxiety, or fear. Pallor can result from anemia or increased peripheral vascular resistance caused by atherosclerosis. Dependant rubor (redness) may be a sign of chronic arterial insufficiency.

Note any edema. Edema can result from many disease processes including heart failure, liver failure, or by venous insufficiency, varicosities, and thrombophlebitis. Inspect your patient’s hair distribution on their skin. Lack of hair may indicate arterial insufficiency.

**Palpation**

Palpate the peripheral arteries. These include the brachial, radial, femoral, popliteal, dorsalis pedis, and posterior tibial. Note the contour and amplitude of each pulsation. These should feel similar bilaterally. As you move away from the core of the body, you may notice that the contour or upstroke of the pulsation is less rapid. This is normal. It is important, however, that the arteries have similar strength bilaterally.
**Auscultate**

Auscultate your patient’s blood pressure. The systolic reading reflects the pressure exerted by the left ventricle during contraction. The diastolic reading reflects the pressure in the arteries when the heart is at rest. Blood pressure is lowest in the newborn, and rises with age, weight gain, stress, anxiety, and during exercise. When auscultating blood pressure, be sure to choose an appropriate size cuff to avoid false readings. Some helpful hints when assessing blood pressure include:

1. Never take a blood pressure in an arm on the same side as a mastectomy.
2. Never take a blood pressure in an arm with an arteriovenous fistula or shunt, or in an arm with a peripherally inserted central catheter.
3. If either the systolic BP is over 140 or the diastolic pressure is over 90 on repeated measurements, the patient is considered to have Stage 1 Hypertension (high blood pressure).
4. Hypertension is risk factor for heart disease, stroke and kidney disease.
5. Diet, exercise, and, when necessary, medications can control blood pressure.

**Assess for Orthostatic Hypotension**

Orthostatic hypotension is defined as a decrease of at least 20 mm Hg in systolic blood pressure, or an increase in heart rate by 20 beats per minute or more when your patient moves from a supine position to a standing position. Cardiovascular causes of orthostatic hypotension may be related to heart failure, reduced intravascular volume, venous pooling, or a medication side effect.
Conclusion

Integrating the cardiovascular health history and physical exam takes practice. It is not enough to simply ask the right questions and perform the physical exam. As the patient's nurse, you must critically analyze all of the data you are obtaining, synthesize the data into relevant problem focus, and identify a plan of care for your patient based upon this synthesis. As the plan of care is being carried out, reassessments must occur on a periodic basis. How often these reassessments occur is unique to each patient, based upon their physical disorder.

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References


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