

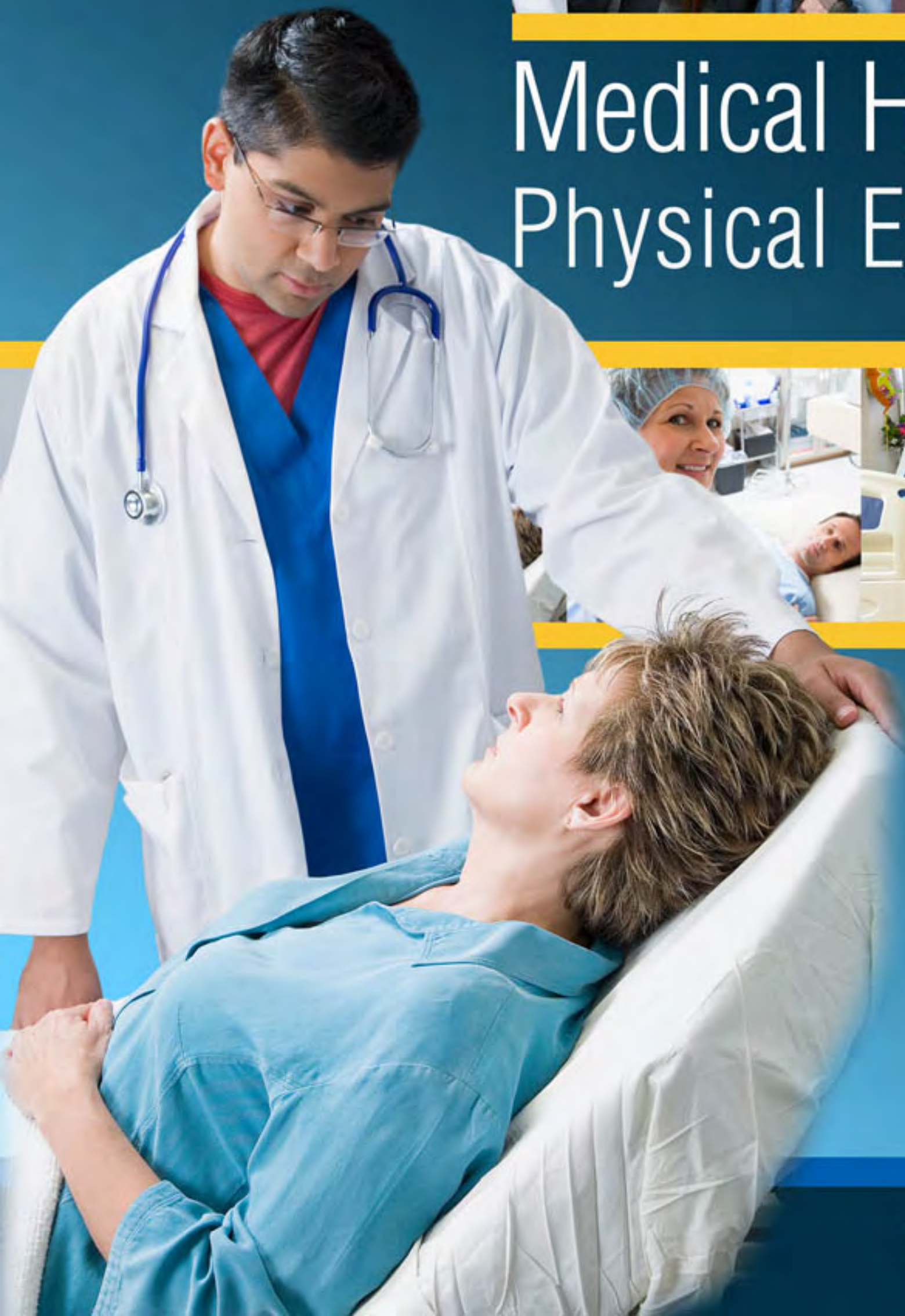
H&P: A Nonphysician's

Guide to the



Medical History and Physical Examination

4th Edition



John H. Dirckx, M.D.

Health Professions Institute

H & P:

A Nonphysician's Guide to the Medical History and Physical Examination

Fourth Edition

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H & P: A Nonphysician's Guide to the Medical History and Physical Examination Fourth Edition

by John H. Dirckx, M.D.

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For Joyce

Foreword

This book will not make a diagnostician of anyone. Its purpose is to acquaint nonphysicians with the nature and nomenclature of the medical history and physical examination as currently performed and recorded by physicians. Although directed principally to medical transcriptionists, it should also be helpful to medical secretaries, nurses, clinical psychologists, social workers, insurance clerks, lawyers, and other nonphysicians who are called upon to handle or interpret medical records.

The importance of the history and physical examination in medical practice can hardly be overstated. Medicine might be defined as an art and science whose goals are the prevention, identification, and treatment of human diseases, including the results of injury, developmental abnormalities, and degenerative and malignant processes. Some diagnosis, at least general or provisional, must precede any rational attempt at treatment. Since both a review of the patient's complaints and some kind of systematic examination are basic and indispensable elements in the diagnostic process, it would be hard to imagine an instance of medical treatment to which history and physical are wholly irrelevant. Moreover, history and physical examination are often performed when no disease is suspected and no treatment is contemplated, as in a routine health checkup or a pre-employment physical.

Whether the history and physical are narrowly restricted to the area of a specific problem, such as a cut finger, or are performed on an elaborate and exhaustive scale, a permanent record must be preserved in writing in either printed or electronic form. The written report of a history and physical examination not only serves to supplement the memory of the treating physician but may also provide essential information to other physicians months, years, or decades later. In addition, it may assume great legal significance, documenting the thoroughness and appropriateness of the physician's evaluation and the accuracy of the diagnosis, providing a basis for health insurance benefit payments, or supplying data for disability determination or workers' compensation.

Medicine, like every other profession, has its own intricate and arcane idiom, some of it formal and recorded in dictionaries and textbooks, some informal, colloquial, and evanescent. Much of this latter kind of jargon pertains to the art of physical diagnosis and is used by physicians in recording historical details and physical findings. A considerable part of this jargon consists of formal terms used in unconventional ways. (For example, the phrase *no pathology in the pelvis* has nothing to do with either the formal subject matter of the





science of pathology or the bones collectively termed the pelvis in anatomy.) Hence, even a person with a thorough understanding of basic medical terminology and access to medical dictionaries and reference works may find some clinical records misleading or unintelligible. The fact that the art of diagnosis has its own special brand of logic, not easily followed by persons who have never practiced medicine, adds further to the difficulties of the lay person who must transcribe medical records from dictation or peruse them in quest of information.

Several features combine to make this book a valuable resource for transcriptionists and other nonphysicians who deal with medical records. I have described each step of the history and physical examination in a separate chapter. Excerpts from a variety of H&P reports (“Key Words and Phrases”) appear in shaded boxes at the bottom of the page following the text to which they refer. In addition, for reference and comparison, relevant words and phrases appear in side bars labeled “For Quick Reference.” Throughout the book, medical jargon is discussed and defined on an equal footing with formal terminology. Words and phrases not found in standard references are defined in a glossary at the end of the book.

If medical transcriptionists and health information management personnel find this book helpful, let them take it as a small return for the unpayable debt that physicians and their patients owe these unsung and generally invisible but diligent and indispensable members of the healthcare team.

About the Exercises

This fourth edition of *H&P: A Nonphysician's Guide to the Medical History and Physical Examination* includes a variety of exercises contributed by educators. The student exercises for each chapter as well as the answers appear on the CD-ROM on the inside back cover of this textbook. The exercises are named **IntroExercises.rtf**, **IntroAnswers.rtf**, **Chapter1Exercises.rtf**, **Chapter1Answers.rtf**, etc. The exercises are in rich text format so that you can insert your answers. You can then print the file or e-mail as an attachment if your instructor requests they be submitted for grading. For each chapter except 1 and 19, there are an audio file and a transcript. In addition, there are full History and Physical Examination reports to listen to when you finish the book so that you can see how it all comes together.

As a study technique, it is a good idea to review the exercises on the CD at for each chapter before reading the chapter. If you are an independent study student, don't ignore the group activities; you may be able to adapt some of them to your situation. See the note to independent study students below.

The following headings are a guide to the kinds of questions and activities included:

- Review and Summarize
- Pause and Reflect
- Relate and Remember
- Collaborate and Share
- Explain and Learn
- Relax and Play
- Generalize and Apply
- Compare and Contrast
- Extrapolate and Project

Some activities will require “going outside the text” for more information. Others will draw on your knowledge of anatomy, medical terminology, and disease processes. If you have not yet studied these topics, or are studying them concurrently with this text, you may have a little extra work to do. None of the activities, however, require that you be proficient in medicine in general or any specialties in particular. Since many of the activities involve collaboration with classmates, it is likely that your combined knowledge and experiences will suffice.

The exercises for this book may at first appear redundant, but there is a reason for this. Every attempt has been made to address different learning styles; thus, multiple choice, fill in the blank, and short answer questions may all seem





to relate to the same general topic or point. Both the repetition and the different approaches to the same information help you to remember important points. Activities may be similar as well. Group activities may build on activities designed for individual students. Time and environment may limit completing all activities.

A Special Note to All Students. The questions and activities on the CD-ROM on the inside back cover of this textbook have been designed to appeal to a variety of learning styles, one of which will work best for you. However, no single method of learning will work well for any individual all the time, and no single method of learning is suited to all material to be learned. All students use multiple learning styles to evaluate, digest, and incorporate new information into their experience and make it their own. For most, however, one style will predominate and be more comfortable than others. You are encouraged to stretch yourself beyond your comfort zone and attempt to answer all questions in these exercises, regardless of their form, and to participate in all the activities assigned by your instructor. In that way, you will ensure maximum retention and understanding of the material you are studying. A side benefit will be that you will teach yourself new learning techniques that will improve your performance in all your areas of study and enhance lifelong learning.

With this new edition, we have added yet another feature that will appeal to students who tend to favor an auditory learning style. Hopefully, each of you has at least some element of this learning style since the career for which you are studying is highly auditory. On the CD-ROM on the inside back cover of this book are excerpts from History and Physical Examination reports. For each chapter except 1 and 19, there are an audio file (.wav format) and a transcript (.rtf format), named the same way except for the extension. In addition, there are wav and rtf files which contain full History and Physical Examination reports so that you can see how it all comes together. These audio files are for listening only; you can play them with Windows Media Player, QuickTime, iTunes, or any other wav player. Since you will not be transcribing them, you do not need a foot pedal, but you should use your headset in order to get the highest quality sound.

Play the audio file as you read through the accompanying transcript. Stop and relisten to any words that are unfamiliar to you or that you did not understand. On the transcript, notice the spelling of unfamiliar words. If you do not know the meaning, look the words up in a medical dictionary. Check to see if the words you hear are in the Quick Reference List or Glossary. If not, add them. You may listen as many times as necessary until you can understand every word as well as the content of the excerpt. Do not skip this exercise. You will start training your ear without the stress of transcribing under the pressures of time constraints and trying to coordinate all the skills involved in that process.

Note to Independent Study Students. Many of the group activities are easily modified to allow completion by an individual working alone. For example, if an exercise divides multiple parts of an activity among several students, complete all the tasks yourself. If you are to discuss or explain your findings to

another person or to the group, write your explanation in a journal. You will be able to use this journal later as a study aid. For role-play activities or games, involve friends or family members. If you have Internet access, you can locate other independent study students at a networking Web site for medical transcriptionists and invite them to participate in on-line versions of group activities.

Note to Instructors. Answers to objective questions are included on the CD-ROM. Some of the questions and many of the activities are more open-ended and more subjective. For some of these, some guiding criteria are included. Others are purely subjective and there is no “right” answer. Many of the activities involve bringing in supplies (plain brown paper bags, sheets of butcher paper, colored pencils or crayons, colored dots or stars). When you assign a chapter to be read, you may want to assign the questions for the individual student as homework and plan for the group activities for the next class meeting. You can have the students themselves bring in any necessary supplies, or you may want to start the term with these supplies on hand in the classroom.

You are encouraged *not* to skip over the more participatory activities. Educational research has shown that these types of activities are the most successful for many if not most learners. In general, the activities included under the headings “Generalize and Apply” and “Extrapolate and Project” will be more difficult but will also be a sure gauge to whether (and how much) the students are actually incorporating the material into their experiences and fund of knowledge.

For the group activities, students should be encouraged to change groups and work with different students rather than always being in the same group with the same three or four people. Have students draw their group number from a box or bag. If you have five groups of five students, for example, write number 1 on five small pieces of paper, then 2, 3, and so on, up to 5. Mix the pieces up in a bag and let the students draw. The number they draw is the number of the group.

Another way to sort the students into groups is to use playing cards. Use the Ace, King, Queen, Jack, and 10 from multiple decks, five decks for five groups. Shuffle all the cards together and let the students draw a card. All the Aces become one group, the Kings another group, etc. Similarly, if you wanted only four groups, you could use one deck containing only the number of students you have in class and equal numbers of each suit. Then, all the hearts would go in one group, clubs in another, or use colored pieces of paper or similar objects (like paper clips, pencils, rubber bands, erasers) all placed into a bag from which each student draws or object. Like colors or like objects form a group.

Students, and you, may feel awkward and uncomfortable when first carrying out some of these activities, but soon they will be an important part of your classroom routine and all of you will look forward to them.



*Health Professions Institute
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Art Acknowledgments



Photographic art used as illustrations in this edition was obtained from the *Medical Perspectives* and *Medicine & Health Care* series, available from EyeWire Images, Inc., <http://www.eyewire.com>.

Anatomical images and medical illustrations throughout the book are used with permission from the stock photo Web sites, <http://www.Fotolio.com> and <http://www.Dreamstime.com>.

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CD-ROM on inside back cover

Exercises

Answers to Exercises

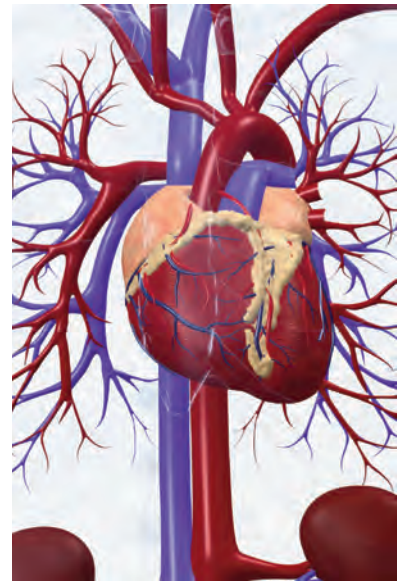
Listening Exercises, Audio Excerpts, and Transcripts
from Authentic Physician Dictations

Review of Systems: Cardiovascular

The cardiovascular system includes the heart with its covering membrane, the pericardium, and all the blood vessels of the body—arteries, arterioles, capillaries, venules, and veins. Disorders of this system can produce a remarkable diversity of symptoms, from cough to ankle swelling and from sudden blindness to sudden death.

Patients' complaints with respect to the cardiovascular system can be divided into three groups: those rightly perceived as related to the heart or blood vessels, such as angina pectoris, an irregular pulse, or varicose veins; those due to heart or blood vessel disease but not so perceived by the patient, such as anorexia, orthopnea, and ankle edema due to congestive heart failure; and those wrongly attributed by the patient to cardiovascular disorders, such as chest pain actually due to indigestion or tingling in the extremities falsely blamed on "poor circulation."

The cardiovascular history begins with a review of past diagnoses of congenital or acquired heart murmurs, rheumatic fever, enlarged heart, coronary artery disease, heart attack, high blood pressure, varicose veins, thrombophlebitis, and treatments, past or present, prescribed for any of these. Note is made of the results of past diagnostic studies such as electrocardiograms, echocardiograms, stress testing, cardiac catheterization, and angiography, and of any surgical procedures, such as pacemaker implantation, valve repair or replacement, and coronary artery bypass graft.



Key Words and Phrases

Cardiovascular: Denies chest pain, palpitation, dyspnea, orthopnea, PND, intermittent claudication, and history of rheumatic fever, heart murmur, hypertension, or heart attack. He was told he had a cardiac murmur of unknown type in high school.

Had MI's 5 and 2 years ago with uneventful recoveries.

Barlow syndrome, mitral valve prolapse with regurgitation
cardiac catheterization

functional, innocent heart murmur	echocardiogram
stress test, treadmill test	ECG, EKG (electrocardiogram)

coronary angiogram, arteriogram

phlebogram, venogram, Doppler ultrasound study

WPW (Wolff-Parkinson-White) syndrome	PAT (paroxysmal atrial tachycardia)
--------------------------------------	-------------------------------------

CABG (coronary artery bypass graft)	valvulotomy
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Learning Objectives

After careful study of this chapter, you should be able to:

Define the scope of the cardiovascular system.

Describe the cardiovascular history-taking process.

Identify complaints related to the cardiovascular system.

Classify cardiovascular conditions by major diagnostic categories.

Name common cardiovascular diagnostic studies and procedures.

For Quick Reference

acquired heart murmur
 angina at rest
 angina decubitus
 angina pectoris
 angiography
 ankle edema
 anorexia
 arterial embolism
 arteriolar disease
 arteriole
 artery
 atypical angina
 Barlow syndrome
 breathlessness
 CABG (coronary artery bypass graft)
 calf claudication
 calf cramps
 capillary
 cardiac catheterization
 claudication
 coldness and pallor in fingers
 congenital heart murmur
 congestive heart failure
 coronary angiogram or arteriogram
 coronary arteriosclerosis
 coronary artery disease
 cramping in the calf
 crushing chest pain
 CVA (cerebrovascular accident)
 delirium
 dementia
 dependent edema
 dermatitis with pigmentation or ulceration
 diffuse arteriolar spasm
 dilated varicose veins
 diversity of symptoms
 DOE (dyspnea on exertion)
 Doppler ultrasound study
 drawing feeling in the calf
 dyspnea
 dyspnea at rest
 ECG, EKG (electrocardiogram)
 echocardiogram
 enlarged heart
 exertional dyspnea
 flip-flop in the chest
 flopping in the chest
 fluttering in the chest
 functional heart murmur
 heart attack
 heart murmur
 heaviness in the calf
 heaviness in the chest
 high blood pressure
 hip claudication
 hypertension
 innocent heart murmur
 intermittent claudication

The physician tends to bracket cardiovascular disorders according to six or seven well-defined diagnostic categories: coronary arteriosclerosis, valvular heart disease, and hypertension, any of which can lead to the group of syndromes called congestive heart failure; pericardial disease; local or generalized arteriosclerosis; and venous disease (varicose veins, phlebitis, thromboembolism).

Because coronary artery disease is a major cause of disability and death, any complaint of **chest pain** must be carefully evaluated to determine whether it represents angina pectoris, the cardinal symptom of coronary disease. The historical elaboration on a complaint of chest pain has been set forth at length in Chapter 1 and will not be reviewed in detail here. A full description of chest pain includes its character, intensity, location, extent, radiation, duration, and frequency of occurrence; the effect of position, movement, breathing, and swallowing; associated symptoms such as shortness of breath, sweating, and cardiac palpitation; the effect of resting or taking medicines such as antacids or nitroglycerin; and triggering factors such as physical exertion, smoking, eating, strong emotion, or exposure to cold.

When shortness of breath is due to **cardiac failure** it is typically less oppressive in the upright position (orthopnea) and may occur in attacks that awaken the patient during the night (paroxysmal nocturnal dyspnea, PND). Orthopnea is graded by the number of pillows needed to avoid respiratory distress. Wheezing, coughing, and exertional dyspnea are common to cardiac and noncardiac disorders. Ankle swelling is a frequent early symptom of cardiac failure but also occurs in other conditions, one of which will be mentioned shortly. Typically the swelling is worst at the end of the day and resolves partly or completely overnight.

The term **palpitation** can indicate unduly forceful heartbeat, unduly rapid heartbeat, irregular heartbeat, or simply an abnormal awareness of one's heartbeat. Even the most skilled interviewer may occasionally fail to determine just

heaviness, pain, pressure, weight on (in) the chest

angina pectoris angina decubitus atypical, unstable, variant angina

angina at rest Prinzmetal angina

recurring episodes of intense, diffuse, crushing chest pain radiating into the neck, jaw, left shoulder, and left arm.

Attacks of pain are precipitated by exertion or emotional upset, sometimes by a heavy meal, and relieved by rest and sublingual nitroglycerin.

dyspnea, shortness of breath (SOB), breathlessness, short-windedness, respiratory distress

dyspnea at rest DOE (dyspnea on exertion), exertional dyspnea

PND (paroxysmal nocturnal dyspnea) 3-pillow orthopnea

ankle, dependent, pedal edema

flip-flop, flopping, fluttering, palpitations, pounding, thumping in the chest

missing, skipping a beat conscious of his heartbeat at night

TIA (transient ischemic attack)

CVA (cerebrovascular accident), stroke

paroxysmal tachycardia

which of these the patient has experienced. Of cardinal importance regarding palpitation are the frequency and duration of attacks; associated symptoms such as light-headedness, weakness, shortness of breath, or chest pain; and triggering factors such as exertion, eating, smoking, or use of certain medicines.

Peripheral arteriosclerosis causes symptoms by impairing the blood supply to critical organs such as the brain and kidney or to the extremities. Hence the symptoms vary according to the structures affected. **Cerebrovascular disease** can lead to a wide variety of symptoms, including headaches, light-headedness, confusion, drowsiness, sensory or motor impairment, behavioral disorders, delirium, dementia, seizures, transient ischemic attacks, and stroke. These symptoms will usually be considered in the neurologic and psychiatric portions of the history.

Narrowing of a major artery supplying blood to an extremity can cause muscle cramps, weakness, coldness, pallor, and numbness. Intermittent **claudication** (from Latin *claudicare* “to limp”) is the classical symptom of circulatory impairment in the lower extremity. The patient describes intense, disabling cramping in the calf, less often in the foot, shin, or thigh, which comes on with walking and is promptly relieved by rest. Similar symptoms can affect the upper extremity after exertion. Intermittent claudication can be graded according to the distance (e.g., 1 mile, 2 flights of stairs, 3 city blocks) that the patient can walk without symptoms. When vascular obstruction occurs in the distal aorta or common iliac artery, the male patient may experience impotence as well as intermittent claudication (Leriche syndrome).

Coldness, pallor, numbness, and pain in an extremity can also be caused by sudden obstruction of the arterial supply by a traveling clot (arterial embolism), by arteriolar disease, or by diffuse arteriolar spasm (Raynaud phenomenon). Hence the duration, extent, severity, and intermittency of these symptoms must be carefully ascertained.

Varicose veins are dilated, tortuous, sometimes leaking veins, usually in the lower extremities. The condition is common and familial. It can be mild and cause no symptoms other than unsightly bulging of superficial veins, but some persons with varicosities experience ankle swelling, muscle aching, and dermatitis with pigmentation or ulceration.

Thrombophlebitis is the formation of an obstructing clot within the lumen of an inflamed vein. Local injury, oral contraceptives, and sudden immobilization by illness, injury, or surgery are predisposing factors. Thrombophlebitis in a deep vein can cause edema and aching of the extremity, but is often asymptomatic. **Deep venous thrombosis** can result in sudden release of a clot into the circulation, with lethal consequences (pulmonary embolism). For this reason, any complaint of peripheral swelling will prompt a thorough inquiry into its duration, severity, and intermittency, and the presence of any predisposing factors for thrombophlebitis.

For Quick Reference

irregular heartbeat
irregular pulse
leaking veins
Leriche syndrome
light-headedness
local or generalized arteriosclerosis
MI (myocardial infarction)
missing a beat
mitral valve prolapse with regurgitation
motor impairment
muscle aching
orthopnea
pacemaker implantation
pain in the chest
painless edema
pallor of extremity
palpitation of heart
palpitations in the chest
paroxysmal tachycardia
PAT (paroxysmal atrial tachycardia)
pedal edema
pericardial disease
peripheral arteriosclerosis
phlebitis
phlebogram
PND (paroxysmal nocturnal dyspnea)
poor circulation
pounding in the chest
predisposing factors
pressure in the chest
Prinzmetal angina
prolonged standing
Raynaud phenomenon
respiratory distress
rheumatic fever
seizures
sensory impairment
shortness of breath
short-windedness
skipping a beat
SOB (shortness of breath)
stress testing
stroke
sublingual nitroglycerin
thigh claudication
3-pillow orthopnea
thromboembolism
thrombophlebitis
thumping in the chest
TIA (transient ischemic attack)
tingling in the extremities
tortuous varicose veins
transient ischemic attacks
traveling clot
treadmill test
triggering factors
unduly rapid heartbeat
unsightly bulging of superficial veins

intermittent claudication hip, thigh, calf claudication

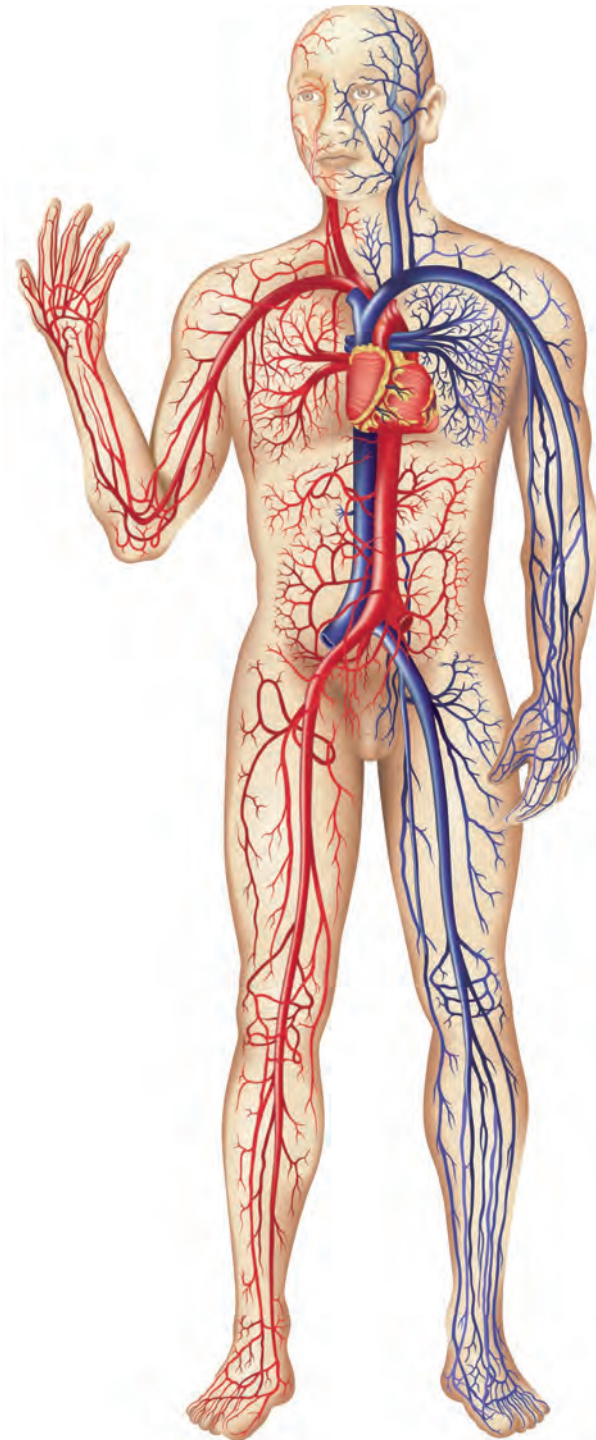
can walk about 4 blocks before pain begins

Calf cramps come on after he has walked about one-half mile and require him to stop and rest.

Raynaud phenomenon

For Quick Reference

unstable angina
valve repair or replacement
valvular heart disease
valvulotomy
variant angina
varices
varicose veins
varicosities
vein
venogram
venous disease
venule
weight on the chest
WPW (Wolff-Parkinson-White syndrome)



She occasionally has spells of extreme coldness and pallor in 3 fingers of the left hand, especially after going outdoors in cold weather.

varices, varicosities, varicose veins

Has had swollen veins in both legs above and below the knees for about 10 years.

These are asymptomatic except for a rare drawing feeling or heaviness in the left calf after prolonged standing.

Noted gradual onset of painless edema in the left foot, ankle, and calf during the past 72 hours.

Exercises for Chapter 8

Review of Systems: Cardiovascular

Review and Summarize

A. Multiple Choice

- ___ 1. Cardiovascular complaints can be divided roughly into three groups which include all the following EXCEPT
 - a. Those perceived to be benign.
 - b. Those perceived correctly as related to heart or blood vessels.
 - c. Those due to the heart but not perceived as such.
 - d. Those incorrectly perceived to be due to the heart.

- ___ 2. Diagnostic categories into which cardiovascular disorders can be divided include all of the following EXCEPT
 - a. Coronary arteriosclerosis.
 - b. Pericardial disease.
 - c. Thrombophlebitis.
 - d. Venous disease.
 - e. Local or generalized arteriosclerosis.

- ___ 3. Peripheral arteriosclerosis involving the cerebral vascular system is likely to be covered under which of these Review of Systems headings?
 - a. Cardiovascular.
 - b. Head, Eyes, Ears, Nose and Throat.
 - c. Musculoskeletal.
 - d. Neurologic.
 - e. Genitourinary.

- ___ 4. Peripheral vascular disease is often mistakenly thought to apply only to the circulatory problems in the extremities but may apply as well to the (Mark two)
 - a. Coronary arteries.
 - b. Kidneys.
 - c. Heart valves.
 - d. Cerebrovascular system.
 - e. Deep veins of the lower extremities.

- ___ 5. Any of the following might be designated palpitation EXCEPT
 - a. Abnormally slow heartbeat.
 - b. Unusually forceful heartbeat.
 - c. Unusually rapid heartbeat.

- d. Irregular heartbeat.
- e. Abnormal awareness of heartbeat.

B. Fill in the Blank

1. Chest pain due to indigestion may be attributed by the patient to _____.
2. Shortness of breath due to cardiac failure is usually less severe in the _____ position.
3. Orthopnea is usually graded by how many _____ are needed to avoid respiratory distress.
4. The symptoms of peripheral arteriosclerosis vary according to the _____ affected.
5. Disabling cramping in the calf due to circulatory impairment is referred to as _____.
6. Coronary arteriosclerosis, valvular heart disease, and hypertension can each lead to _____.

C. Short Answer

1. List the main diagnostic categories given in the text for heart disease.
2. List the parameters that are included in a full description of chest pain.
3. How is claudication graded?
4. Why will any complaint of peripheral swelling prompt a thorough inquiry by the physician?
5. Write a short definition of the following terms. If you can, condense the definition into just a few words or a single synonym that you feel more comfortable with.
 - a. Orthopnea
 - b. Claudication
 - c. Innocent (heart murmur)
 - d. Dyspnea

Pause and Reflect

1. Using different colored highlighters or crayons, underline or highlight important points or main ideas of the chapter. Circle key words. Use symbols (such as stars, asterisks, exclamation point, question mark, etc.) meaningful to you to mark key words and phrases. Summarize the information you thought most important from the chapter. If you had any questions, write those out to share with classmates or to ask your instructor.
2. Draw a mind map to illustrate the various categories of cardiovascular diseases and the symptoms that accompany them.

Relate and Remember

1. Refer to the explanation for a metaphor in the review questions for Chapter 1. Think of a metaphor that completes this statement: The human heart is like a _____. Use a visual or a verbal metaphor. You may fill in the blank with the name of an object or draw (or cut out of a magazine) a picture representing one or more important points. Explain your choice.
2. Using an outline of the human body, list 3 to 5 terms for each area that the physician might use to describe the cardiovascular symptoms experienced by a patient in that area.

Collaborate and Share

After every student has read the chapter, divide into groups of 3 to 5. Divide the chapter so that each group has a portion. Re-read your section. As a group, write questions based on your section. They may be multiple choice, short answer, or fill in the blank. The number of questions will depend on how large a section of the chapter your group is covering, but will probably only be 2 or 3 at most. You may even ask the same question in different ways. A spokesperson for each group may then ask the rest of the class its questions or the instructor can collect them and compile them to be distributed to each student.

Explain and Learn

1. Working in pairs, take turns pointing out and explaining the important points or main idea of each paragraph or section.
2. Type on a separate sheet or handwrite below a sample Cardiovascular Review of Systems for a patient with some form of heart disease. Use as many of the terms in the shaded boxes as appropriate. Explain why you included certain points. Remember to include both positives and negatives.

Relax and Play

1. On a 3" x 5" card, write a question pertaining to the chapter and give it to your instructor. The instructor, using a koosh ball, small stuffed animal, net bath sponge, or some other soft object, asks the question, then tosses the object at random to an individual student who answers the question.

2. Fold a blank piece of paper in half 3 times so that when unfolded there are 8 squares. Write one thing you learned in each square. Move around the room, asking other students to define or explain an item on your sheet. That student then signs the square. The student who gets all 8 squares signed first wins.

Generalize and Apply

Write on a 3" x 5" card a statement of something you learned and how you think this information will help you or a question as yet unanswered. Turn in this card to the instructor as your "ticket out" of class.

Compare and Contrast

1. What is the difference between varicose veins and thrombophlebitis?
2. Compare the heart and the things that can go wrong with it to objects in your environment (plants, rocks, furniture, buildings, etc.). How are they alike? How are they different?

Extrapolate and Project

Since chest pain can be an indication of diseases other than heart disease, such as gastric ulcer, musculoskeletal pain, or pulmonary disease, which do you think should be ruled out first? Why? What might be the consequences of failing to rule out heart disease before exploring other causes of chest pain?

Collaborate and Share

With a partner, role-play doctor and patient, taking each role in turn. As doctor, interview the patient using the information you've gained in the introduction and first two chapters of this book. Take notes. As patient, use the presenting complaint and course of an illness you or someone close to you has actually had. After each of you has played both doctor and patient, type on a separate sheet or handwrite below the Chief Complaint and History of Present Illness for the patient you interviewed.

Explain and Learn

List some of the symptoms that are an indication of illness but are so generalized, appearing with a variety of illnesses, that their presence does not necessarily help elucidate the cause of the illness. Why are they important? Present your answer to the class, to a partner, or a group as directed by your instructor.

Generalize and Apply

What determines whether information appears in the History of Present Illness or somewhere else in the medical history report? Give examples.

Extrapolate and Project

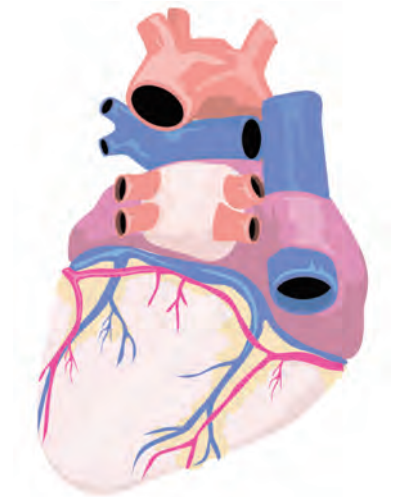
Explain the importance of an accurate History of Present Illness. What might be the consequence of omitted, fabricated, or erroneous details? Give examples. You may use examples from your own experience.

Examination of the Heart

Books much larger than this one have been devoted exclusively to the performance and interpretation of procedures for the assessment of cardiovascular function and the detection of cardiovascular disease. Even a routine physical examination may include many of these procedures, and when cardiac disease is suspected or recognized, many more will be used. Because the circulatory system extends throughout the entire body, tests of its integrity and function are included in the examination of various regions, and so may be found recorded in various parts of the physical examination report. For example, inspection of the retinal vasculature is performed as part of the eye examination, and so recorded. Peripheral pulses are felt as the neck, arms, and legs are being examined, and so on.

Very little information can be obtained about the structure of the heart through direct examination. Virtually the entire cardiac examination consists of observation of the function of the heart—the rate, regularity, and intensity of ventricular contractions, the resulting impulses imparted to the circulating blood and to the chest wall, and the sounds generated by cardiac contraction and the movement of blood. Congenital anomalies, valvular disease, arrhythmias, pericardial effusions and adhesions, ventricular dilatation and hypertrophy, congestive heart failure—all must be detected or inferred by examination of cardiac function. X-rays, cardiograms, and other noninvasive and invasive diagnostic procedures can yield more precise data about structural alterations in the heart and great vessels, but even these depend largely on assessment of cardiac function.

Examination of the heart is ideally carried out with the patient seated and undressed from the waist up. Hence it logically follows the examination of the thorax, breasts, and axillae. The examiner has already noted such findings as pallor, flushing, cyanosis, respiratory distress, and dilated jugular veins. The anterior chest wall is inspected for pulsations and the point at which the cardiac impulse is strongest (point of maximal intensity, PMI) is found by palpation. The examiner's fingers not only locate this point but also detect any abnormalities associated with the heartbeat, such as a heaving of the chest wall due to unduly intense cardiac contractions, thrills due to passage of blood through abnormally narrowed



Learning Objectives

After careful study of this chapter, you should be able to:

List the functions of the heart that can be assessed by observation.

Explain why findings in other body systems relate to assessment of the heart.

Explain the process of palpation and the findings relevant to it.

Name findings obtainable on cardiac auscultation.

Define normal and abnormal heart sounds, giving examples of each.

Discuss the detection of murmurs and their role in assessing valvular anatomy.

Describe other tests of cardiac function that can be performed.

Identify terminology related to the anatomy of the heart.

Key Words and Phrases

Heart: Regular without murmurs, gallops, or rubs.

Examined in recumbent, left lateral, sitting, and standing positions, as well as bending forward and squatting.

precordium

For Quick Reference

A1

accentuated heart sound
 accentuated M1
 aortic click
 aortic valve area
 apex beat
 arrhythmia
 atrial filling impulse
 atrial gallop
 auscultation
 Austin Flint murmur
 backflow
 bigeminy
 bishop's nod
 blowing murmur
 bradyarrhythmia
 breathing cycle
 bruit
 capillary pulsation
 cardiac dullness
 cardiac murmur
 cardiac tamponade
 cardiovascular disease
 carotid sinus massage
 click or snap
 closure of aortic and pulmonic valves
 coarse friction rub
 coarse murmur
 compensatory pause
 congenital anomaly
 congestive heart failure
 cooing-dove murmur
 Corrigan pulse
 coupling
 creaking friction rub
 creaking sound
 crescendo murmur
 crescendo-decrescendo murmur
 cyanosis
 decrescendo murmur
 dextrocardia
 diamond-shaped murmur
 diastolic murmur
 dilated jugular veins
 diminished heart sound
 diminuendo murmur
 distant heart tones
 embryocardia
 extra beats
 extrasystoles
 faint friction rub
 fixed splitting of S2
 flushing
 gallop
 Graham Steell murmur
 grating friction rub
 grating sound
 harsh friction rub
 harsh murmur

valves or other orifices, and shocks from abnormally abrupt closure of valves in hypertension. Percussion can also be used to assess cardiac size and shape, although many examiners doubt the validity of this procedure. (Percussion is described in the next chapter.)

Auscultation provides more information about the heart than any other procedure. Stethoscopes used for cardiac auscultation have two chest pieces: a narrow, cone-shaped “bell” for lower pitched sounds and a wide, flat diaphragm for higher pitched sounds. The examiner changes back and forth from one to the other as needed during the examination. The stethoscope is applied to the chest in specific areas according to a basic routine, which may be varied as circumstances dictate. Four areas of the anterior chest are designated according to the valves whose sounds are best heard there: the mitral area, the pulmonic area, the aortic area, and the tricuspid area. The subject may need to change position, such as by leaning forward or lying on the left side, to enable the examiner to evaluate heart sounds adequately.

On auscultation the examiner hears regularly recurring sounds produced by the rhythmic contraction of the ventricles and associated phenomena. From these the rate, regularity, and intensity of ventricular contractions can be judged. In addition, the examiner listens for abnormal sounds: *murmurs*, caused by abnormal flow of blood through a valve or other orifice; *clicks* or *snaps*, caused by abnormal valve function; *rubs*, creaking or grating sounds caused by friction between the beating heart and an inflamed pericardium; *bruits*, caused by passage of blood through a narrowed artery; and others.

The normally beating heart produces two **sounds** in alternation, traditionally represented as *lub-dup*. The first heart sound, or S1, which is louder, deeper in pitch, and longer, results from contraction of the ventricles and closure of the mitral and tricuspid valves. For practical purposes it is considered synchronous with the beginning of systole (the stage of ventricular contraction, which sends blood through the aorta and pulmonary artery). The second heart sound, S2, results from closure of the aortic and pulmonic valves just after systole ends. S2 is taken as the beginning of diastole (the stage of ventricular relaxation and refilling). The first and second heart sounds heard at specific valve areas are sometimes so designated: A1,

The PMI is in the left fifth interspace at the midclavicular line.

The PMI is palpated 13 cm to the left of the midsternal line.

A precordial thrill is palpable.

left parasternal lift, heave, shock

Precordial palpation reveals a systolic thrill in the upper sternal area.

Palpation of the precordium reveals a sustained ventricular apex beat and an atrial filling impulse.

The left border of cardiac dullness is at the midclavicular line.

dextrocardia situs inversus

(pericardial) friction rub: coarse, creaking, faint, grating, harsh, loud, scratchy, shuffling, soft

pericardial knock

the first heart sound at the aortic valve area; P2, the second heart sound heard at the pulmonic valve area; and so on.

The absolute and relative intensities of S1 and S2 vary from place to place on the chest and may even vary from beat to beat. Either sound can be abnormally accentuated or diminished and either can be reduplicated or split, that is, can consist of two not quite simultaneous components. Splitting of the second sound is often physiologic (normal), in which case it typically disappears during expiration. Two other heart sounds can occasionally be heard in a normal person: S3, due to ventricular filling in early diastole, and S4, due to atrial contraction in late diastole. Accentuation of either or both by disease can alter the regularly recurring *lub-dup* to a more complex sequence of sounds called a gallop. Accentuation of S3 produces what is called a ventricular gallop (something like *lub-dup-uh*), and accentuation of S4 produces an atrial gallop (something like *uh-lub-dup*).

Although an electrocardiogram is needed for precise diagnosis of **arrhythmias** (abnormalities in cardiac rhythm), auscultation can yield much valuable information about the rhythm. A slight or even marked variation in heart rate with the breathing cycle (increase on inspiration, decrease on expiration) is normal and is known as sinus arrhythmia. Occasional extra beats (extrasystoles, premature ventricular contractions) are also normal. Occurrence of a premature beat after each normal beat (coupling or bigeminy) is more ominous. Irregularities of the pulse are designated, somewhat whimsically, as regular irregularities (having a pattern, albeit abnormal) and irregular irregularities (wholly random, without discernible pattern). The examiner can obtain additional information about arrhythmias by correlating auscultatory findings with peripheral pulses. Cautious massage of one carotid sinus (located on either side of the neck near the origins of the internal carotid arteries) normally results in slowing of the pulse and can convert some arrhythmias to normal sinus rhythm.

Cardiac murmurs are produced by turbulence in the flow of blood passing forward through a stenotic valve, leaking back through an incompetent valve, or crossing from a place of higher to a place of lower pressure through an abnormal orifice, such as an interventricular septal defect. The diagnostician characterizes a murmur by recording its location (the point on the chest wall where it is heard best); its radiation or transmission (for example, to the carotid arteries or left axilla); its character, intensity (graded on a scale of 1 to 6; less often, 1 to 4), and duration; and its timing within the cardiac cycle. Valvular clicks and snaps are similarly characterized.

A murmur heard between S1 and S2 is called systolic, and a murmur heard between S2 and the succeeding S1 is called diastolic. Some systolic murmurs are of no consequence (functional or innocent murmurs). A holosystolic or pansystolic murmur lasts all the way from S1 to S2; a shorter murmur may be designated early,

For Quick Reference

high-pitched murmur
 holosystolic murmur
 idioventricular rhythm
 incompetent valve
 increased M1
 inflamed pericardium
 interventricular septal defect
 invasive diagnostic procedure
 left fifth interspace
 loud friction rub
 low-pitched murmur
 lub-dup sound
 machinery murmur
 midclavicular line
 midsternal line
 midsystolic click
 mitral opening snap
 mitral valve area
 muffled heart tones
 murmurs, gallops, or rubs
 musical murmur
 Musset sign
 noninvasive diagnostic procedure
 P2
 pallor
 pansystolic murmur
 paradoxical pulse
 paradoxical splitting of S2
 parasternal heave
 parasternal lift
 parasternal shock
 pericardial adhesion
 pericardial effusion
 pericardial friction rub
 pericardial knock
 pericardial tamponade
 physiologic splitting of S2
 pistol shot pulse
 PMI (point of maximal intensity)
 precordial palpation
 precordial thrill
 precordium
 premature beat
 premature ventricular contractions
 presystolic murmur
 protodiastolic murmur
 protodiastolic rumble
 pulmonic ejection click
 pulmonic valve area
 pulse deficit
 pulse pressure
 pulsus alternans
 pulsus paradoxus
 Quincke pulse
 rasping murmur
 reduced heart tones
 regurgitation
 rhythmic blushing of nailbeds
 RSR (regular sinus rhythm)

A2 is equal to P2.

Heart tones are distant, muffled, reduced, weak.

accentuated, increased M1

fixed, paradoxical, physiologic splitting of S2

embryocardia, ticktock rhythm atrial, ventricular gallop

For Quick Reference

rub
 rumbling murmur
 S1
 S2
 S3
 S4
 scratchy friction rub
 seagull murmur
 shuffling friction rub
 sinus arrhythmia
 sinus bradycardia
 sinus tachycardia
 situs inversus
 soft friction rub
 stenosis
 stenotic valve
 stethoscope
 synchronous
 systolic murmur
 systolic thrill
 tachyarrhythmia
 tachycardia
 ticktock rhythm
 tilt test
 to-and-fro murmur
 tricuspid valve area
 valvular click
 valvular disease
 valvular snap
 venous hum
 ventricular apex beat
 ventricular contraction
 ventricular dilatation
 ventricular gallop
 ventricular hypertrophy
 ventricular refilling
 ventricular relaxation
 water-hammer pulse
 weak heart tones

mid, or late systolic. A murmur can become more or less noticeable after physical exertion or on inspiration, expiration, or change of position (lying on the left side, squatting). A murmur can start soft and grow louder (*crescendo*), start loud and grow softer (*decrecendo*), or become first louder and then softer (*crescendo-decrecendo* or *diamond-shaped* murmur). Some murmurs not associated with valvular lesions are heard with little or no change throughout both systole and diastole (*to-and-fro*, *machinery* murmurs). By considering all the features of a murmur, the diagnostician can generally judge which valve, if any, is the source of the murmur, and whether it results from abnormal narrowing or tightness (*stenosis*) of a valve or backflow (*regurgitation*) of blood through an incompetent one.

Certain other tests of cardiac function and circulation are performed as indicated. In a tilt test, the pulse is counted with the subject in a recumbent position and again immediately after assumption of a sitting position. A significant rise in pulse or drop in blood pressure suggests hypovolemia and impending shock. **Pulsus paradoxus** is an exaggerated drop in systolic blood pressure on inspiration, caused by constrictive pericarditis or pericardial tamponade due to effusion or hemorrhage. The physician tests for pulsus paradoxus by having the subject inspire deeply and noting any weakening in peripheral pulses. In doubtful cases a sphygmomanometer can be used to demonstrate a drop in arterial pressure.

Pulse pressure is the arithmetical difference between systolic and diastolic pressures. Hence if the patient's blood pressure is 148/68, the pulse pressure is 80. A "wide" pulse pressure can result from various causes, including hypovolemia, vasodilatation, and aortic regurgitation. It may be manifested as a visible jerking of the head or extremities synchronous with heartbeat. On palpation, the peripheral pulses have a particularly thumping or bounding character, the so-called *Corrigan* or *water-hammer* pulse. Capillary pulsations (*Quincke* pulse) may be evident in the nail beds and elsewhere as a rhythmic blushing synchronous with heartbeat.

RSR (regular sinus rhythm)

sinus arrhythmia, bradycardia, tachycardia *pulse deficit*

bigeminy, coupling compensatory pause

pulsus alternans

bradyarrhythmia, tachyarrhythmia carotid sinus massage

idioventricular rhythm

precordium apex base

On auscultation there is a short, high-pitched murmur best heard along the left sternal border.

A grade 2 blowing holosystolic murmur best heard along the left sternal border and disappearing after exercise.

Auscultation reveals a systolic murmur with a crescendo-decrescendo configuration beginning after S1, loudest in the right second intercostal space parasternally, which radiates to the neck, left sternal border, and apex.

best heard in the left lateral decubitus position

transmitted to the apex, axilla, base, carotids, neck

murmur: blowing, coarse, cooing-dove, crescendo, decrescendo, *diamond-shaped*, diminuendo, harsh, high-pitched, low-pitched, musical, rasping, rumbling, seagull

murmur: diastolic, presystolic, protodiastolic, systolic

(proto)diastolic rumble aortic, pulmonic ejection click

a loud midsystolic click and a late systolic murmur

Graham Steell murmur Austin Flint murmur

mitral opening snap venous hum

Tilt test is negative.

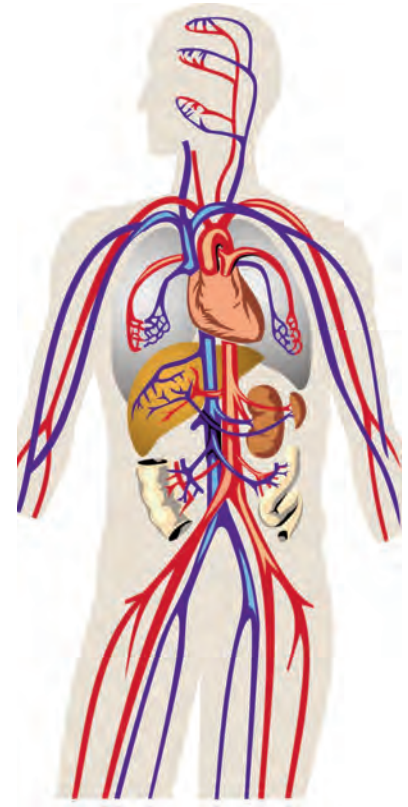
paradoxical pulse, pulsus paradoxus

cardiac, pericardial tamponade

bishop's nod Musset sign

Corrigan, water-hammer pulse pistol shot pulse

Quincke pulse, capillary pulsations



Exercises for Chapter 23

Examination of the Heart

Review and Summarize

A. Multiple Choice

- ___ 1. Which technique provides more information about the heart than any other?
- Auscultation.
 - Percussion.
 - Chest x-ray.
 - Electrocardiogram (EKG).
- ___ 2. A sound caused by the abnormal flow of blood through a valve or other orifice is known as a
- Murmur.
 - Thrill.
 - Gallop.
 - Snap.
- ___ 3. A slight or marked variation in heart rate with the breathing cycle is known as
- Tachycardia.
 - Bradycardia.
 - Extrasystole.
 - Sinus arrhythmia.
- ___ 4. Heart murmurs are most often graded on a scale of
- 1 to 2.
 - 1 to 4.
 - 1 to 6.
 - 1 to 10.

B. Fill in the Blank

- The first heart sound is also known as _____.
- _____ is the stage of ventricular contraction that sends blood through the aorta and pulmonary artery.
- Massage of the _____ sinus can slow the pulse and sometimes convert abnormal rhythm to normal rhythm.
- The _____ are traditionally represented as “lub-dup.”

C. Short Answer

1. The 4 areas of the anterior chest are designated according to which valves?
2. What is the difference between a crescendo murmur, a decrescendo murmur, and a crescendo-decrescendo murmur?
3. Write a short definition of the following terms. If you can, condense the definition into just a few words or a single synonym that you feel more comfortable with.
 - a. Click
 - b. Rub
 - c. Apex
 - d. Paradoxical
 - e. Bigeminy
 - f. Idioventricular
 - g. Precordium
 - h. Crescendo
 - i. Gallop

Pause and Reflect

Type on a separate sheet the physical examination of the heart for a fictitious patient, using the criteria described in this chapter. Use as many terms as appropriate from the word list in the chapter. Be sure to indicate pertinent negatives as well as positive findings.

Relate and Remember

Take a sheet of paper and draw lines to create 4 columns, labeled A through D. List 5 important things to remember about the chapter. Put these in column A. In column B, next to each of the items to remember, write the name of an object that might help you to remember the fact. In column C, write the name of a place that might help you to remember the fact. In column D, write a description of a visual image with which you can associate the fact in column A.

Collaborate and Share

After you have read the chapter, form groups of 3 to 5. Divide the chapter so that each group has a portion. Re-read your section. As a group, write questions based on your section. They may be multiple choice, short answer, or fill in the blank. The number of questions will depend on how large a section of

the chapter your group is covering. Pass your questions to the next group, working clockwise around the room, until every group has had the opportunity to answer all the questions.

Explain and Learn

In groups of 3 to 5 students, with each group assigned a different section of the chapter, discuss and agree on the important points or main ideas. Put them into your own words. Select one person to present your summary to the class.

Relax and Play

1. With students divided into groups, each group selects a different game show (“Who Wants to be a Millionaire,” “Jeopardy,” “Hollywood Squares,” etc.) and creates an “episode” using questions and answers related to this chapter. The games are presented using contestants from other groups. The class then votes on the best game presented.
2. Fold a blank piece of paper in half 3 times so that when unfolded there are 8 squares. Write one thing you learned in each square. Move around the room, asking other students to define or explain an item on your sheet. That student then signs the square. The student who gets all 8 squares signed first wins.

Generalize and Apply

Tests of the integrity and function of the cardiovascular system are reported in various parts of the physical examination report. Obtain a dozen or more sample H&P reports and circle every reference to the cardiovascular system made outside of the actual heart exam. Summarize these references below.

Compare and Contrast

Compare and contrast these abnormal heart sounds: murmurs, clicks or snaps, rubs, and bruits. How do they differ from each other in origin and in sound? How are they similar?

Extrapolate and Project

Although new medical and surgical treatments have reduced the number of deaths attributed to it, heart disease remains the leading cause of death in the U.S. There are risk factors outside of a patient’s control—age, family history, and personal history of heart disease—but there are other risk factors within a patient’s control. Identify these risk factors and discuss how patients can work in partnership with their physicians to reduce the incidence of heart disease. Use your other textbooks and outside resources as necessary.