

HEALTH & PHYSICAL ASSESSMENT

second edition



BARKAUSKAS
STOLTENBERG-ALLEN
BAUMANN
DARLING FISHER



HEALTH & PHYSICAL ASSESSMENT

second edition

Violet H. Barkauskas, PhD, RN, FAAN

Associate Professor
School of Nursing
University of Michigan
Ann Arbor, Michigan

Kathryn Stoltenberg-Allen, MSN, RN

Formerly Assistant Professor
Department of Public Health Nursing
College of Nursing
University of Illinois at the Medical Center
Chicago, Illinois

Linda Ciofu Baumann, PhD, RN, CS-ANP

Professor
School of Nursing
University of Wisconsin-Madison
Madison, Wisconsin

Cynthia Darling-Fisher, PhD, RN, FNC

Assistant Professor and Coordinator
Family Nurse Practitioner Program
School of Nursing
University of Michigan
Ann Arbor, Michigan

 **Mosby**

St. Louis Baltimore Boston Carlsbad Chicago Minneapolis New York Philadelphia Portland
London Milan Sydney Tokyo Toronto



Vice President and Publisher: Nancy L. Coon
Executive Editor: Sally Schrefer
Associate Developmental Editor: Rae L. Robertson
Project Manager: Deborah L. Vogel
Senior Production Editor: Judith Bange
Layout Artist: Jeanne Genz
Designer: Pati Pye
Manufacturing Manager: Linda Ierardi

SECOND EDITION

Copyright © 1998 by Mosby-Year Book, Inc.

Previous edition copyrighted 1994

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without written permission of the publisher.

Permission to photocopy or reproduce solely for internal or personal use is permitted for libraries or other users registered with the Copyright Clearance Center, provided that the base fee of \$4.00 per chapter plus \$.10 per page is paid directly to the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collected works, or for resale.

Printed in the United States of America
Composition by Clarinda Company
Lithography/color film by Clarinda Company
Printing/binding by Von Hoffmann Press, Inc.

Mosby-Yearbook, Inc.
11830 Westline Industrial Drive
St. Louis, Missouri 63146

Library of Congress Cataloging in Publication Data

Health & physical assessment / Violet H. Barkauskas . . . [et al.]. —

2nd ed.

p. cm.

Includes bibliographical references and index.

ISBN 0-8151-2776-6

1. Nursing assessment. 2. Medical history taking. 3. Physical diagnosis. I. Barkauskas, Violet.

[DNLM: 1. Physical Examination—nurses' instruction. 2. Nursing Assessment. WB 200 H434 1997]

RT48.H38 1997

616.07'5—dc21

DNLM/DLC

for Library of Congress

97-14864
CIP

contributors & reviewers

CONTRIBUTORS

Beverly A. Priefer, PhD, RN
Geriatrics Research, Education, and Clinical Center
William S. Middleton Memorial Veterans Hospital;
Assistant Clinical Professor
School of Nursing
University of Wisconsin–Madison
Madison, Wisconsin
Chapter 26: Aging Clients

Gail Underbakke, MS, RD
Nutrition Coordinator
Preventive Cardiology Program and Department of Family
Medicine
University of Wisconsin Medical School
Madison, Wisconsin
Chapter 5: Nutritional Assessment

REVIEWERS FOR FIRST AND SECOND EDITIONS

Cheryl Anderson, PhD, RN
Department of Obstetrics
University of Texas at Arlington
Arlington, Texas

Gary Arnold, MD, FACS
Assistant Professor
College of Nursing
University of Southwestern Louisiana
Lafayette, Louisiana

Eileen K. Baldwin, MSN, RN
Department of Nursing
Allentown College of St. Francis de Sales
Center Valley, Pennsylvania

Donna H. Bedsole, EdD, RN
School of Nursing
Troy State University
Montgomery, Alabama

Charlotte Breithaupt, MN, RN
School of Nursing
Baylor University
Dallas, Texas

Mary Ann Broda, PhD, RN, CPNP
Assistant Professor, Parent-Child Nursing
University of Michigan
Ann Arbor, Michigan

Pamela S. Brown, MS, RN
Blessing-Rieman College of Nursing
Quincy, Illinois

Brenda Leigh Cameron, MScN, RN
Assistant Professor
Faculty of Nursing
University of Alberta
Edmonton, Alberta

Linda S. Dillion, MS, RN
School of Nursing
Baylor University
Dallas, Texas

Marty Downey, BSN, RN, CCRN
Boise, Idaho

Linda A. Eastham, MSN, RN, FNP
Charlottesville, Virginia

Helen Hansen, MS, RN
Instructor
College of Nursing
University of Tulsa
Tulsa, Oklahoma

Janice Hausauer, MS, RN, CCRN
Adjunct Assistant Professor
Department of Nursing
Montana State University
Bozeman, Montana

Anne Hummer, PhD, RN
University of Detroit
Detroit, Michigan

Mary C. Kavoosi, PhD, RN
Clarion University
Oil City, Pennsylvania

Nancy Lospinoso, MS, RN, ONC
Orange, New Jersey

Meredith A. McCord, MS, RN
Assistant Professor
Adult Health and Illness Nursing
Oregon Health Sciences University
Portland, Oregon

Graham McDougall, PhD, RN, CS
Assistant Professor
Gerontological Nursing
Frances Payne Bolton School of Nursing
Case Western Reserve University
Cleveland, Ohio

Jolyne McGregor, PhD, RN
ADN Instructor
Trinity Valley Community College
Health Science Center
Kaufman, Texas

Donna T. Mitchell, PhD, RN, CS
Associate Professor
Department of Nursing
University of Rio Grande
Rio Grande, Ohio

Joan C. Murphy, MS, RN
Director, College of Nursing
Utica College
Utica, New York

Yvonne G. Newberry, MSN, RN, FNP
Department of Obstetrics and Gynecology
University of Virginia Health Sciences Center;
Clinical Faculty, School of Nursing
University of Virginia
Charlottesville, Virginia;
Clinical Faculty
Medical College of Virginia–Virginia Commonwealth
University
Richmond, Virginia

Alice Palmer, MS, RN, OCN
Program Chair/Assistant Director
Nursing Technology
Health Technologies Division
Cincinnati State Technical and Community College
Cincinnati, Ohio

Marybeth Paradowski, MPH, MSN, RN
Assistant Professor, Nursing
Allentown College of St. Francis de Sales
Center Valley, Pennsylvania

Charlene Pope, MPH, RN, CNM
Clinical Associate Faculty
Women's Health Care/School of Nursing
University of Rochester
Rochester, New York

Deborah A. Raines, PhD, RNC
Maternal Child Nursing Department
School of Nursing
Virginia Commonwealth University
Richmond, Virginia

Patricia K. Reed, MA, RN, CNA
Albany Medical Center
Project Learn
Albany, New York

Cindy Roach, DSN, RN
Associate Professor
Beth-El College of Nursing and Health Sciences
University of Colorado at Colorado Springs
Colorado Springs, Colorado

Julie Sanford, MSN, RN, CCRN
Clinical Assistant Professor
Department of Adult Health Nursing
College of Nursing
University of South Alabama
Mobile, Alabama

Susan D. Schaffer, MS, RN, CFNP
Assistant Professor of Nursing
Old Dominion University
Norfolk, Virginia

Anita Singleton, MSN, EdS, RN
Assistant Professor
School of Nursing
Missouri Southern State College
Joplin, Missouri

Elaine Steinke, PhD, RN
Department of Nursing
Wichita State University
Wichita, Kansas

dedications

To family, friends, colleagues, and students who have extended their love, support, wisdom, encouragement, and perspective during our professional lives and during the development of this book, especially:

Sally Dymek and Sally Ann Dymek
V.H.B.

Lawrence, Laurel, Matthew, and Douglas Allen
Jim and Sadye Stoltenberg
Drs. Mara and Alexandru Nitu
Carolyn Piatek
The women of Hersong
K.S-A.

Alice Simonds, mentor and teacher
L.C.B.

Daniel C., Cara, and Noah Fisher
Elaine C. and R. Clement Darling
Clem and Julie Darling
Wendy and Doug Nickerson
Elisabeth and Michael Botelho
C.D-F.

HEALTH & PHYSICAL ASSESSMENT

preface

Health and Physical Assessment reflects recent changes in the practice of health assessment by nurses. This new edition represents our beliefs in holistic health assessment as the basis for nursing intervention and practice. Health assessment is presented as the systematic collection of data that health professionals can use to make decisions about how they will intervene to promote, maintain, or restore health. Our goal for this text is to provide an innovative product that reflects and anticipates the ways in which nursing practice and health care are changing.

Health and Physical Assessment is designed for students and beginning practitioners. It contains the theory and skills necessary to collect a comprehensive health history and to perform a complete physical examination. These skills can be most effectively mastered when the text is used within a structured learning environment, which includes supervised student practice in skills laboratories or clinical settings. Because *Health and Physical Assessment* contains a great deal of substantive detail on examination techniques and findings, the student is not expected to outgrow the text but to continue to use it as a valuable reference in clinical practice.

Throughout this text, the consumer of health care is referred to as the *client* because the term implies the ability of a person, whether well or sick, to contract for health care as a responsible participant, along with the providers, in the health care process. Health care providers cannot expect consumers to accept assessment or intervention unless they have been actively included in the process.

■ ORGANIZATION

The content in *Health and Physical Assessment* is organized in four units. Unit I, *Taking the Health History*, introduces the linkages from health assessment to subsequent steps of the client care process—diagnosis, care planning, and implementation. It also consists of thorough discussions of the art and science of effec-

tively taking and recording a comprehensive health history for purposes of health or illness assessment and management. Unit II, *Holistic Assessment*, assists the reader in understanding and assessing a client holistically, with chapters on developmental, nutritional, and sleep assessment and cultural considerations in health assessment.

Unit III, *Physical Assessment*, follows the traditional body-system approach and contains detailed, richly illustrated discussions of the physical examination of body systems or regions. The chapters in Unit III are consistently organized and include the following headings and content:

- Anatomy and Physiology
- Health History
- Preparation for Examination
- Technique for Examination and Normal Findings
- Variations from Health
- Sample Documentation and Diagnoses

The last chapter in this unit assists the reader in bringing together all physical assessment components into a logical system for performing the comprehensive physical examination.

Although this book focuses on the assessment of the healthy adult client, no comprehensive text on health assessment can ignore the special assessment techniques required by clients of other age groups and with special health needs. Thus Unit IV, *Assessing Special Populations*, includes chapters that present assessment techniques unique to pregnant women, children, older adults, and individuals with functional limitations. These client groups are frequently served by nurse practitioners.

■ FEATURES

- **Color photographs** of physical examination techniques are extensively used to enhance learning, and carefully crafted illustrations clarify significant aspects of the discussion, especially anatomy and physiology.

- **Preparation for Examination** boxes quickly present needed equipment and special considerations for preparing the client and setting for an examination.
- **Helpful Hint** boxes provide tips from experienced practitioners for performing a thorough and accurate assessment.
- **Examination Step-by-Step** boxes provide a quick overview of the physical examination discussed in a chapter.
- **Teaching Self-Assessment** is included in all applicable chapters and provides information on health promotion.
- **Cultural Considerations** boxes provide information on variations in findings that may represent cultural anomalies.
- **Sample Documentation and Diagnoses** boxes highlight the importance of documenting assessment findings and formulating nursing diagnoses, and can serve as models for documentation in the clinical setting.
- A **Glossary** is included as a reference at the end of the book and provides definitions of key terms that appear in the text.

■ SUPPLEMENTS

An *Instructor's Manual and Test Bank to accompany Health and Physical Assessment* is available. The *Instructor's Manual* includes, for every chapter in the text, learning objectives and detailed lecture outlines, and the *Test Bank* includes approximately 1000 questions with answers.

A *Student Workbook and Laboratory Manual* is available that includes helpful learning exercises to aid the student in obtaining a thorough understanding of the material covered in *Health and Physical Assessment*. Laboratory checklists and skills checklists are also included to guide the student through learning the components of physical assessment.

■ ACKNOWLEDGMENTS

It is our pleasure to express gratitude to a number of individuals who helped us prepare this publication. Without their support and assistance it would not have been possible. The beautiful color photographs are the products of Don Price, Tim Ford, Joe Welch, and Lin Goings of BMC Photographics, University of Michigan. Illustrations were prepared by Holly Fischer and Valorie Loomis of Biomedical Communications, University of Michigan, and Barbara Cousins. Youngshook Han, of the University of Wisconsin-Madison, greatly facilitated the library research for Dr. Baumann. Ms. Stoltenberg-Allen especially thanks Jean Gittings and Mary Spawn for their assistance with library research and computer searches.

We wish to especially acknowledge the assistance of Rae Robertson and Sally Schrefer from Mosby for making this hard work an enjoyable and rewarding experience.

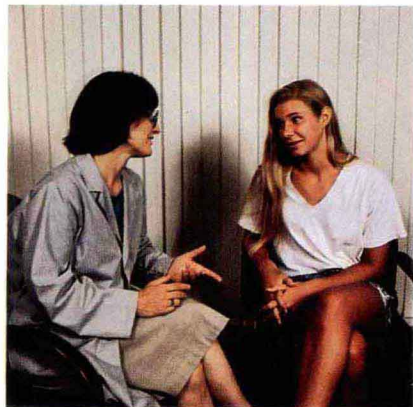
Violet H. Barkauskas
Kathryn Stoltenberg-Allen
Linda Ciofu Baumann
Cynthia Darling-Fisher

contents

HEALTH & PHYSICAL ASSESSMENT

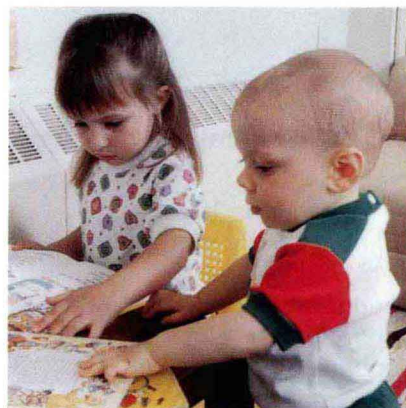
Unit I TAKING THE HEALTH HISTORY

- 1 Clinical Reasoning in Determining Health Status, 1**
 - Clinical reasoning process, 1
 - Influence of theoretical frameworks on clinical reasoning, 4
 - Using a classification system to facilitate clinical reasoning, 7
 - Clinical reasoning and the nursing process, 8
- 2 Interviewing Skills and Techniques, 11**
 - Purpose of the interview, 11
 - Conducting the interview, 14
 - Common errors in interviewing, 18
- 3 The Health History, 21**
 - Purpose, 21
 - Preparation: client and environment, 22
 - Format, 22
 - Organization by functional health patterns, 42
 - Computer-assisted history, 44
 - Written record, 45



Unit II HOLISTIC ASSESSMENT

- 4 Developmental Assessment Across the Life Span, 57**
 - Purpose of developmental assessment, 57
 - Stages of development, 58
 - Selected theories of human development, 58
 - Tools for developmental assessment, 61
 - Infancy: birth to 12 months, 72
 - Toddler years: 1 to 3, 80
 - Preschool years: 3 to 6, 83
 - School-age years: 6 to 12, 85
 - Adolescence: 11-13 to 20, 88
 - Young adulthood: 20 to 30-35, 92
 - Middle adulthood: 30-35 to 65-70, 95
 - Late adulthood: 65-70 to 95+, 99



- 5 Nutritional Assessment, 103**
 - Elements of nutrition screening and assessment, 104
 - Nutrition screening and assessment for specific client populations, 115
 - Referral for in-depth nutritional assessment or follow-up, 122

6 Sleep Assessment, 124

Categories, stages, and cycles of sleep, 124
Health history, 126
Technique for examination and normal findings, 127
Variations from health, 127

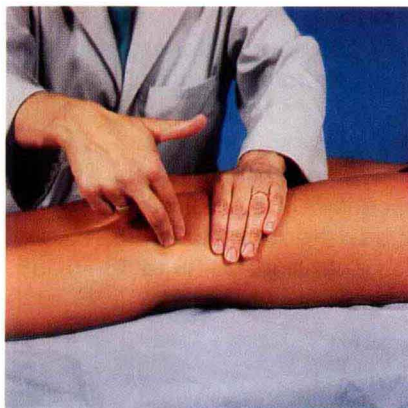
7 Cultural Considerations in Health Assessment, 131

Nursing and culture, 131
Terminology associated with cultural considerations, 132
Major variables in cultural assessment, 135
Cultural assessment considerations, 149

Unit III PHYSICAL ASSESSMENT

8 Assessment Techniques, 152

Purpose of examination, 152
Conducting the examination, 152
Examination techniques, 153



9 General Assessment, Including Vital Signs, 160

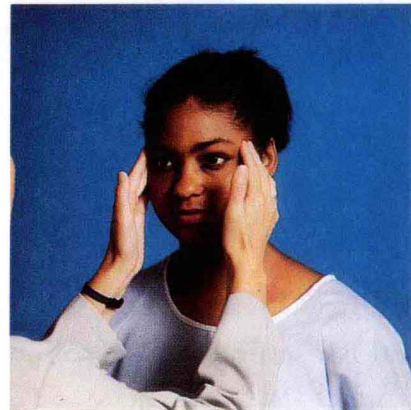
General inspection, 160
Assessment of body morphology and gait, 161
Assessment of general appearance, 164
Assessment of vital signs, 165
Variations from health, 176

10 Skin, Hair, and Nails, 184

Anatomy and physiology, 184
Health history, 187
Technique for examination and normal findings, 190
Variations from health, 207

11 Face, Head, Neck, and Regional Lymphatics, 229

Anatomy and physiology, 229
Health history, 236
Technique for examination and normal findings, 238
Variations from health, 246

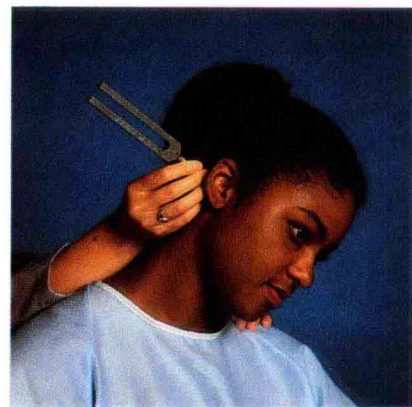


12 Eyes, 252

Anatomy and physiology, 252
Health history, 258
Technique for examination and normal findings, 260
Variations from health, 272

13 Ears, Nose, Mouth, and Throat, 285

Anatomy and physiology, 285
Health history, 291
Technique for examination and normal findings, 293
Variations from health, 301



14 Breasts and Regional Lymphatics, 306

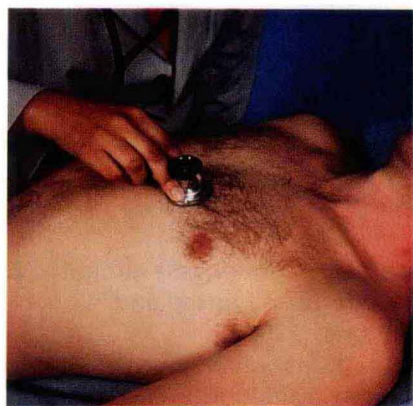
Anatomy and physiology, 306
Health history, 310
Technique for examination and normal findings, 312
Variations from health, 323

15 Respiratory System, 327

Anatomy and physiology, 327
 Health history, 334
 Technique for examination and normal findings, 340
 Variations from health, 355

16 Cardiovascular System, 363

Anatomy and physiology, 363
 Health history, 380
 Technique for examination and normal findings, 383
 Variations from health, 395

**17 Abdomen, 410**

Anatomy and physiology, 410
 Health history, 412
 Technique for examination and normal findings, 415
 Variations from health, 438

**18 Musculoskeletal System, 445**

Anatomy and physiology, 445
 Health history, 453
 Technique for examination and normal findings, 455
 Variations from health, 489

**19 Neurological System, Including Mental Status, 496**

Anatomy and physiology, 496
 Health history, 505
 Technique for examination and normal findings, 506
 Assessment of mental status, 522
 Variations from health, 530

20 Male Genitalia, 535

Anatomy and physiology, 535
 Health history, 538
 Technique for examination and normal findings, 540
 Variations from health, 546
 Assessment of the inguinal area for hernias, 549

21 Female Genitalia, 553

Anatomy and physiology, 553
 Health history, 556
 Technique for examination and normal findings, 560
 Variations from health, 578

22 Anus and Rectosigmoid Region, 580

Anatomy and physiology, 580
 Health history, 582
 Technique for examination and normal findings, 583
 Variations from health, 589

23 Integration of the Physical Assessment and Documentation, 594

Performance of the integrated physical examination, 594
 Documenting the physical examination, 601

Unit IV ASSESSING SPECIAL POPULATIONS

24 Pregnant Clients, 614

Physical changes in pregnancy, 614
Prenatal health history, 617
Technique for examination and normal findings, 625

25 Pediatric Clients, 646

Guidelines for health supervision, 650
Pediatric history, 650
Technique for examination and normal findings, 672



26 Aging Clients, 713

Use and cost of health care, 714
Health history, 714
Technique for examination and normal findings, 720



27 Clients with Functional Limitations, 728

Purpose of functional assessment, 728
Introduction to key terms and definitions, 729
Integrating functional assessment into the routine examination, 730
Functional assessment tools, 734

Glossary, 750

Bibliography, 764

chapter

outline

Process of gathering information, 1
Medical diagnostic reasoning
process, 2
Using a classification system to
facilitate clinical reasoning, 7
Clinical reasoning and the nursing
process, 8

Clinical Reasoning in Determining Health Status

The chapters that follow present methods to collect data when performing a general health assessment. The examiner uses these data to formulate conclusions about the client's health status. To reach a conclusion, or diagnosis, the practitioner uses a process known as clinical reasoning, or decision making. This chapter discusses the process of clinical reasoning and its relationship to the nursing process and nursing diagnosis. In addition, it presents some methods for facilitating decision making.

■ CLINICAL REASONING PROCESS

Process of Gathering Information

The first step in clinical reasoning is gathering information. The general health assessment provides the data or information needed to formulate a diagnosis and eventually a plan of treatment and evaluation. The data-gathering process includes:

1. Data collection
2. Data validation
3. Data organization
4. Pattern identification

Data collection

Data include information gathered from the first encounter with the client and during the health interview and physical examination. Laboratory data, if applicable, are also considered. These components of a database are part of a general health assessment. In later follow-up with a client, the practitioner focuses the assessment by collecting data on a specific problem or concern.

Data are collected using a system or framework. In the physical examination, the examiner can collect data using several organizing principles: head-to-toe, regional areas of the body (e.g., pelvic examination), or body systems (e.g., cardiovascular or neurological). Each of these methods provides a logical, organized framework for collecting physical assessment data. The practitioner's decision about which method to use is influenced by both priority needs of the client and personal preference. For example, if you see a client for a periodic health examination, you would use a head-to-toe approach. However, if a client who appears in acute distress stated she had just injured her hand, you would begin the assessment by focusing on the body region affected.

As you develop expertise as a practitioner, you will

develop your own approach to data collection that is appropriate to the circumstances, such as the client's age, sex, emotional state, and acuity of the health problem or concern. Whatever approach is used, you must think about the range of possibilities and develop a sensitivity to the possible meaning of all signs and symptoms.

Data validation

Validation is the process of making sure the data collected are accurate. Data obtained using an instrument with a measurement scale can be validated by repeating the measure. For example, if a weight on the clinic scale indicates a 10-pound weight loss since the last visit, you can repeat the weight to validate this measure. Verify information with the client by direct observation or interview. Preferably, validate information yourself, rather than relying on information obtained by others, especially if it involves subjective data open to interpretation. Strategies to validate data include the following:

1. Recheck your own data. Go back to an area of the physical examination that you need to palpate or observe again.
2. Be sure other factors did not influence the accuracy of the data (e.g., while in a hurry to obtain a blood pressure, you used the wrong-size blood pressure cuff).
3. Always recheck information that is grossly abnormal. For example, repeat a systolic blood pressure reading of 260 mm Hg.
4. Ask someone, preferably more experienced, to collect the same data. If you hear a grade III systolic heart murmur on physical examination, have another clinician also listen to the heart.
5. Recheck previous documentation yourself or with other clinicians to see if abnormal findings were previously recorded.

Data organization

Data are organized by clustering. The ability to do this efficiently depends on the examiner's knowledge, skill, and preference. Theoretical frameworks help to organize data and are discussed in more detail later in this chapter. The different chapters in this book present various frameworks for health assessment. For example, Chapter 16 presents a systems approach (cardiovascular). Chapters 4 and 26 present a developmental approach that modifies the health history and physical examination for the client's age.

Pattern identification

The examiner analyzes the data to determine if gaps exist or if more data are needed to make a diagnosis. For example, if a client states he has a loss of appetite, obtaining a weight is critical to determine if weight loss has occurred. You would compare the current weight with

previous weights to determine if a pattern of weight change is evident. If no previous weights were recorded, you and the client would plan to obtain weight data at a designated frequency over the next month. You would then assess these data to detect any pattern of weight change.

Medical Diagnostic Reasoning Process

Many investigators have studied how physicians diagnose illness. By comparison, few studies concern nursing decision making. However, some of the research that has been done suggests that physicians and nurses use similar clinical reasoning processes. This conclusion seems reasonable, since researchers have suggested that both tradition and necessity require nurses to make both medical and nursing judgments.

The medical diagnostic reasoning process includes four major steps (Table 1.1).

Cue recognition

In the first phase of diagnostic reasoning, the practitioner must recognize that a cue is significant. A cue is a piece of information. It can consist of either subjective or objective data. For example, a subjective cue might be the client's statement, "I feel nervous." In contrast, an objective cue might be observing a client's hand tremor.

Whether a cue is considered significant depends on the practitioner's ability to distinguish between normal and abnormal behavior, physical characteristics, and diagnostic findings. This ability, in turn, depends on the

table 1.1 Stages of Diagnostic Reasoning

Stage	Example
Cue recognition	Look at client's face—notice cyanosis as abnormal
Hypothesis formulation	Client is experiencing impaired gas exchange
Hypothesis testing	Arterial blood gas result: pH 7.32, PCO ₂ 55 m, PO ₂ 65. The client appears restless and confused. Weak cough effort
Hypothesis evaluation	Do enough data exist to confirm the diagnosis of impaired gas exchange? If yes, then diagnosis is made. "Impaired gas exchange related to . . ."

examiner's knowledge base and expertise. You must stay attuned to even slight variations of normal findings, since they may have a significance that is not at first obvious. A knowledgeable and experienced practitioner, for example, might note the slight pallor of a client's nail beds and consider the diagnosis of anemia. In contrast, an inexperienced student might not even notice the subtle change in nail bed color.

In summary, during the first phase of diagnostic reasoning, cue recognition, the practitioner receives thousands of pieces of information. Next, he or she begins to sort the data, keeping some pieces of information and ignoring others. This process of sorting information is called clinical judgment. The remaining data or cues serve as a more efficient resource for the next step in the process: hypothesis formulation.

Hypothesis formulation

During the second phase of diagnostic reasoning, the practitioner decides on possible explanations for the cues recognized in the previous step. This phase is often referred to as hypothesis formulation. Inference is the process of perceiving and interpreting a cue. The examiner must be a critical observer to pick up all cues available. Before making any conclusions, the examiner first clusters or links the cues to determine any patterns. One cue, in isolation, is rarely enough to suggest a particular hypothesis or diagnosis. Rather, the presence of several cues that are usually or always associated with a specific problem helps indicate what other further information is necessary before arriving at a conclusion.

As in the first phase, an examiner's knowledge and expertise strongly influence the diagnostic reasoning process. The practitioner's knowledge influences the interpretation and relative importance of the remaining

cues. Often the novice jumps to early and erroneous conclusions because he or she misinterprets cues, focuses on only one cue, or fails to eliminate irrelevant cues from the cues considered. As a practitioner gains knowledge and experience, he or she builds associations between cues and clinical situations. These associations enable the examiner to cluster cues into meaningful groups and formulate hypotheses.

The formulation of hypotheses or tentative conclusions helps focus further data collection efforts on a manageable group of possibilities. However, the examiner must be careful not to limit further investigation to only one hypothesis, since the likelihood of an accurate final diagnosis increases when several explanations are considered. The examiner must think about the more likely problems, since common problems occur with more frequency, while at the same time entertaining the probability that a rare problem might be presenting itself.

Hypothesis testing

During the third stage of diagnostic reasoning, the practitioner focuses on gathering data to support or reject the previously generated hypotheses. This phase is called hypothesis testing. Examiners use many different data collection strategies during this stage. Tables 1.2 and 1.3 list methods of continued inquiry. One or more of these techniques may be appropriate for a given clinical situation. In addition, the practitioner may be more comfortable using some methods rather than others.

Throughout the hypothesis testing phase, the practitioner needs to guard against having biases about hypotheses. Some of these biases may lead to prematurely accepting a possible explanation or prematurely rejecting an explanation (Table 1.4).

table 1.2 General Strategies for Hypothesis Testing

Approach	Explanation	Example
Cue based	Explore each aspect of initial cues until all facets are covered	Facial cyanosis—mucous membranes, ears, skin color
Hypothesis driven	Investigate the defining characteristics to confirm their presence or absence	Hypoxia? Hypercapnia? Restlessness? Confusion? Irritability? Inability to move secretions?
Systematic	Review body systems	Start with respiratory system, then move to cardiovascular system, etc.
Hit or miss	No recognizable strategy	Ask client when last bowel movement took place

table 1.3 Hypothesis Testing Strategies Used by Experts

Strategy	Explanation
Confirmation	Seek data to confirm hypothesis
Elimination	Eliminate hypothesis based on absence of key signs and symptoms (defining characteristics)
Discrimination	Investigate defining characteristics that separate diagnoses with similar signs and symptoms (i.e., look for those characteristics that are different)
Exploration	Consider investigation of diagnoses with similar manifestations

HELPFUL HINT *To minimize bias in hypothesis testing:*

- *Don't maintain a narrow focus.*
- *Don't jump to conclusions.*
- *Do explore alternative explanations.*
- *Do keep an open mind.*
- *Do take your time.*

Hypothesis evaluation

After the practitioner has investigated all reasonable explanations for the initial set of cues, he or she must evaluate each hypothesis in light of the new evidence collected and reach a final diagnosis or conclusion. Hypothesis evaluation requires synthesis of all data that have been collected, since information obtained to refute one hypothesis may support another. You might also find that the data suggest that more than one problem exists.

Careful recording of data collected is crucial. Failure to document data fully increases the chance that information necessary to evaluate the hypothesis will be lost or forgotten. Missing data, in turn, can lead to erroneous conclusions. Chapter 23 contains an example of one form that can be used to record data during the assessment process.

During this phase of diagnostic reasoning, the practitioner determines which explanation has the most sup-

table 1.4 Biases Affecting Diagnosis

Bias	Explanation
Frequency of occurrence	If the diagnosis being considered has been made frequently, it has a higher probability of being chosen.
Recency of experience	If the clinician has made the considered diagnosis in the recent past, the clinician may be more familiar with this diagnosis than with other related diagnoses.
Profoundness of memory	Vivid impressions of cases in which a certain diagnosis was made can influence decision making in favor of this diagnosis.

porting data and chooses this hypothesis as the diagnosis. In some cases, however, the examiner can merely eliminate hypotheses until only the one with the highest probability remains.

■ INFLUENCE OF THEORETICAL FRAMEWORKS ON CLINICAL REASONING

Although nurses and physicians seem to use the same general clinical reasoning process, these two groups of professionals reach conclusions that are quite different. The reason for this difference stems from each profession's focus of concern.

Medical and Nursing Concerns

The focus of medicine is the diagnosis and treatment of disease. The knowledge base physicians use is derived, in part, from cell and germ theories. The organizing framework for the biomedical model is biochemical or biophysical systems. As a result, physicians concentrate their investigations on biological abnormalities and on identifying the cause of such disorders. Traditionally, how human psychosocial and socioeconomic factors have an impact on health has not been a focus of medicine.

In contrast, nursing's primary focus is the diagnosis of human responses to actual or potential health problems. These responses may result in health problems but

may not be disease states. Nursing assessment focuses on the client's physical, psychological, and spiritual reactions to illness and the environment. Nurses use many theoretical frameworks to explain these phenomena. Some examples are Roy's adaptation model, Orem's self-care model, and the unitary person framework proposed by the North American Nursing Diagnosis Association (NANDA).

Theory-Based Clinical Reasoning: The Unitary Person Framework

Using a framework to guide assessment and decision making is beneficial because it helps organize knowledge and provides direction for further investigation of initial cues. A framework also provides practitioners with specific terminology, which facilitates more effective communication between members of the same discipline. NANDA has been instrumental in providing a common language to communicate nursing findings and a common framework to explain the phenomena nurses observe. The language provided by NANDA consists of nursing diagnoses arranged in a taxonomy, or meaningful pattern, based on the unitary person framework.

NANDA Taxonomy: A Nursing Classification System

The NANDA taxonomy is a nursing diagnosis classification system arranged in a hierarchy from the general to the specific based on the unitary person framework. The unitary person framework suggests that a person's health status is manifested by observable phenomena that can be classified into nine human response patterns. The most general concept of the system is the unitary person. A slightly more specific concept is health. Health, in turn, is determined by functioning within the nine human response patterns. The nine response patterns have subcategories that identify specific human patterns and behaviors within each particular response pattern. These nine human response patterns act as the major categories for the NANDA taxonomy of approved nursing diagnoses (see box above, right).

The next level of this system consists of nursing diagnoses and other subcategory headings that NANDA's Taxonomy Committee has determined to be related to a particular pattern. The boxed material on pp. 6-7 shows diagnoses arranged according to the nine human response patterns of the unitary person framework.

The NANDA taxonomy can be used to guide clinical decision making. A practitioner can select the general response pattern and assess for signs and symptoms associated with that response pattern. Response patterns are broad and can be further defined.

For example, the examiner wishing to evaluate the

Nine Human Response Patterns of the Unitary Person Framework

1. Exchanging: Mutual giving and receiving
2. Communicating: Sending messages
3. Relating: Establishing bonds
4. Valuing: Assigning worth
5. Choosing: Selection of alternatives
6. Moving: Activity
7. Perceiving: Reception of information
8. Knowing: Meaning associated with information
9. Feeling: Subjective awareness of information

From Sparks SM, Taylor CM: *Nursing diagnosis reference manual*, Springhouse, Pa, 1991, Springhouse Corp.

exchanging pattern might start by assessing the client's elimination, since "altered elimination" is one diagnosis found in this pattern.

The examiner then decides which type of elimination to evaluate first—bowel or urinary. He or she chooses bowel elimination.

Next, the examiner looks for signs and symptoms of diarrhea, constipation, or incontinence. Nursing diagnoses have been defined and determined to have certain signs and symptoms, called defining characteristics. These defining characteristics are cues for diagnostic reasoning.

Occasionally, the examiner can make even more specific diagnoses (e.g., "colonic constipation" [see box on p. 6]).

A practitioner can also use the NANDA taxonomy to investigate a specific finding, such as an abdomen that is firm to palpation. Other cues may be associated with this finding (e.g., the client's complaint of a feeling of abdominal fullness). Based on these cues, the examiner makes a tentative diagnosis of constipation. The practitioner then tests this diagnosis by searching for the presence of its other defining characteristics, such as client reports of no bowel movement for 3 days. If several of these signs and symptoms are present, the examiner can make the diagnosis of "constipation."

The predictive relationships between defining characteristics and nursing diagnoses are not perfect. These relationships are initially based on the observations of experienced clinicians who propose new nursing diagnoses. Much research is currently being conducted to validate the defining characteristics of the diagnoses accepted by NANDA. Although the association of a cluster of signs and symptoms with a nursing diagnosis may be strong, no single group of characteristics ever absolutely indicates a particular nursing diagnosis.