PHYSICAL DIAGNOSIS

The history and examination of the patient

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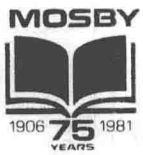
SIXTH EDITION

with **492** illustrations

The C. V. Mosby Company

ST. LOUIS • TORONTO • LONDON 1981



A TRADITION OF PUBLISHING EXCELLENCE

Editor: John E. Lotz
Manuscript editor: Cheryl Zwick
Design: Jeanne Bush
Production: Debbie Wedemeier

SIXTH EDITION

Printed in the United States of America

The C.V. Mosby Company
11830 Westline Industrial Drive, St. Louis, Missouri 63141

Library of Congress Cataloging in Publication Data

Prior, John A.
Physical diagnosis.

Includes bibliographies and index.
1. Physical diagnosis. I. Silberstein, Jack S. II. Stang, John M. III. Title.
[DNLM: 1. Diagnosis. 2. Medical history taking. QB 200 P958p]
RC76.P89 1981 616.07'54 81-38432
ISBN 0-8016-4054-7 AACR2

C/VH/VH 9 8 7 6 5 4 3 2 1 01/B/009

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PREFACE

In planning the sixth edition of this text we have emphasized our attempt to approach the subject from a physiologic standpoint. It is our philosophy that physical diagnosis should be meaningful and practical—not a mere mechanical process. The history and properly performed physical examination should afford the physician an insight as to whether various organs or organ systems are functioning normally or abnormally. At the same time they should provide insight into the patient as a unique and individual person. It is important to understand the physiologic mechanisms responsible for normal functions before we can accurately interpret the disturbed functions that result from disease. Just as animation adds life and interest to a picture, so does a physiologic approach add meaning and practicality to the physical examination.

With practice the physician can learn to identify the first and second heart sounds. However, only when the examiner understands the physiologic mechanisms responsible for the production of these sounds is he or she able to interpret alterations of their functions produced by various disease processes. One must understand why the second heart sound usually splits on inspiration and closes on expiration to diagnose conditions that result in abnormal splitting of this sound. To appreciate the significance of rales and rhonchi in the presence of pulmonary disease, the physician first must have a basic knowledge of respiratory function in the normal lung.

You will note that considerable space has been devoted to the development of the patient's history. It is our opinion that the little space devoted to the history in textbooks of physical diagnosis (none in some) is deplorable. Those of us who teach this course at The Ohio State University College of Medicine believe it *difficult to overemphasize* the importance of a *careful history* in the study of a patient. Therefore, one of our major objectives is to teach the student how to obtain an adequate history. When coupled with examination, the history will enable him to have a reasonably accurate impression of the possible causes of any given illness. It should serve not only as a guide for immediate care but also as an indication of the need for further diagnostic studies. It is well known that in some diseases significant physical findings are sparse or nonexistent. Thus far no substitute has been found for a good history.

A relatively detailed review of body systems has been included. This has been done with two purposes in mind. First, one of the problems confronting the medical student is the large number of clinical terms with which he must become familiar in a short time—terminology that is necessary in medicine for ease of communication. Knowledge of these meaningful terms is a fundamental part of the practice of medicine and an essential tool in the physician's daily work. This review of systems has been designed to serve as a glossary of commonly used medical terms and at the same time to explain the meaning of each term in language that a layman can understand. It is our responsibility to help the medical student become a physician. Second, an attempt has been made to explain the medical significance of the many terms to which the medical student is being introduced. An understanding of the significance of various conditions will thus serve as a guide for further questioning and will indicate body systems that may require particular attention.

Discussion of disease has been kept intentionally at a minimum because, first, we believe that a thorough concept of the normal is essential to the appreciation of the abnormal; therefore, the emphasis at this stage of the student's development should be on (1) the techniques of history-taking and physical examination and (2) the appreciation of the normal. Second, the mere volume of the material presented to the student today in textbooks of physical diagnosis, as well as in all other courses, is virtually overwhelming. Consequently, every effort has been made to maintain the utmost in simplicity and brevity.

Most textbooks of physical diagnosis contain a number of procedures, rarely used, that seldom serve any practical purpose, and it seems justifiable to leave them out of a modern text. This we have done wherever it seemed consistent with modern practice.

Physical diagnosis is not a static subject. As the result of new medical and surgical techniques in diagnosis, certain alterations in body functions assume increasing significance. For example, the growth of vascular surgery has made possible the repair of abdominal aortic aneurysms. As a consequence, such advances necessitate a more thorough consideration of examination techniques as applied to the abdomen. Tracings of heart sounds have resulted in a clearer understanding of the dynamics of production of these sounds. The chapter on the cardiovascular system has incorporated a number of heart sound tracings in order that the student may correlate the physical findings with the tracings. Also included is a more thorough evaluation and explanation of the pulse pressure curve, the understanding of which is absolutely essential to the physiologic interpretation of the various events in the cardiac cycle. Other additions to the current edition include evaluation of hearing from a clinical point of view and bedside tests for venous competency in the extremities. Various chapters, especially those dealing with the mental examination, cardiovascular system, abdomen, musculoskeletal system, and pediatric examination, have been revised considerably to ensure greater ease of understanding.

The use of personal names (eponyms) in medicine serves no purpose and contributes nothing to an understanding of the patient or his disease. As an example, the term "Stensen's duct" is absolutely meaningless until one has first learned that it is the parotid duct—the duct of the parotid salivary gland. This is a needless duplication of learning. Although we have great respect for the observations of the pioneers in medicine, we believe that it is much more important for the student to understand the fundamental principles and normal variations than it is to perpetuate a man's name, which serves no purpose in furthering the student's knowledge. Consequently, every effort has been made to use only *those terms that convey some meaning*. This is in accor-

dance with the recommendations of *The Journal of the American Medical Association*, which has "long waged a fight against eponymic phrases generally in the medical vocabulary."* Therefore, eponyms have been eliminated whenever possible.

If, at the end of the course in physical diagnosis, the student has learned to extract from the patient an *organized, logical history* and to perform a *systematic examination, we believe that our goal has been achieved*. It should be the responsibility of his clinical teachers to instruct him in all the many findings of disease, thus helping him to build diagnostic skill on the fundamentals learned in physical diagnosis.

*Editorial: Meningitic breathing, J.A.M.A. **165**:1568, 1957; editorial: Confusion of tongues, J.A.M.A. **154**:1093, 1954.

We wish to thank the national office of the Arthritis Foundation for the slides in Chapter 19 reproduced from the Clinical Slide Collection on the Rheumatic Diseases, produced by the Arthritis Foundation, New York, 1972.

We are particularly pleased to have Dr. John M. Stang join us in editing this edition of *Physical Diagnosis: The History and Examination of the Patient*. In his usual energetic and well-organized fashion, Dr. Stang brings new and vital ideas to the teaching of physical diagnosis, and we are most happy that he will be assuming the major responsibility for the continuation of our textbook.

John A. Prior
Jack S. Silberstein

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CHAPTER 1

INTRODUCTION

As a medical student you are the physician of tomorrow, and as such you need to understand that the physician is a medical detective. You will obtain information from any and every source possible to enable you to unravel the mystery of the patient's illness.

To solve the crime of murder or robbery the police detective asks many questions, often of many people, examines and photographs the premises (or body, as the case may be), and sends various items, such as blood, bullets, bits of paint, and fragments of clothing, to the crime laboratory for further study. Only after all possible data have been obtained is he in a position to identify the criminal with the greatest accuracy possible.

The physician in the same fashion is hunting for his criminal, the disease that makes the patient ill. After the witness (the patient) has told his story in his own way, the medical detective will ask many searching questions to elicit items of information that might otherwise be overlooked, or to more specifically characterize information already given. This may include interrogation of family and friends if the patient will not or cannot give a straight story. The body (of the patient) will be examined meticulously in every way possible by the physician, using all of his God-given senses. Other special investigative aids, such as the chemistry laboratory, x-ray films, and microscope, are called into the chase to add further clues to those that the physician has already uncovered by questioning and examining.

It is only after all the data have been assembled that the medical detective is in a position to begin his analysis. By clear thinking based on the information gathered, the physician is usually able to identify definitely the offending disease and to bring about the most effective remedy possible.

These are the methods that you, the medical detective of tomorrow, will use the rest of your days of practice in the never-ending search for the cause of the patient's illness. In this book you are being introduced to the *two most fundamental skills necessary for the medical investigation—interrogation and examination*. At first these procedures will be difficult for you, but with careful study and diligent practice they can be cultivated until you reach a high degree of proficiency. The development or lack of development of these skills differentiates the top-flight clinician from the mediocre.

CHAPTER 2

INTELLECTUAL PROCESS OF DIAGNOSIS

To obtain a good history requires considerable experience and a fundamental knowledge of medicine. A good case history taken by an experienced clinician is truly an invaluable component of the patient's record. Conversely, a poor history is useless, in fact, may be misleading, and is a detriment to the record. It is extremely difficult for the beginning student to take a history. His knowledge of medicine is naturally limited, and the mere task of eliciting a history is in itself complex. The student is all too acutely aware of his inadequacies in history-taking and requires thoughtful guidance and support as he learns to obtain an accurate medical history. Yet, as with other situations in life, the student must start, even though with faltering steps.

We wish to emphasize that eliciting the history is not a mere patient response to a stereotyped list of specific questions. Each item of information requires clarification and amplification. Furthermore, information must be carefully weighed as to its clinical significance and its possible relationship to the patient's complaints. These facts alone, in our opinion, make the computerized history inaccurate and untenable.

The verbal communication of information from patient to physician is the essential element of a good history. Each item of information requires interpretation that in turn may necessitate a further intelligently guided search for additional data to which the patient must respond as lucidly as possible. To obtain significant information from the patient, the physician must selectively guide him throughout the entire process, although to do so is extremely difficult because it requires a knowledge of the possible final outcome that the physician does not yet possess. The thoughtful and intelligent guidance of the patient is the hard part. In view of this dilemma just how does the beginning student take a history? He may employ four general steps in history-taking:

1. Write a brief, but accurate and comprehensive description of the patient's complaint. (This information is derived from the patient.)

2. List the various diagnoses suggested by the description. (This is a mental exercise on the part of the physician and does not involve participation by the patient.)
3. Ask the patient various questions that are designed to either confirm or exclude the tentative diagnoses. (This involves an interaction between the physician and his patient.)
4. Attempt to predict the positive physical and laboratory findings likely to result, on the basis of the information at hand. (This too is a mental exercise for the physician.)

The student should attempt to follow this step-wise analytic sequence. The expert clinician actually performs these same steps but at a more subconscious level rather than by consciously attempting to do so. The principal differences are that the clinician knows much more about the characteristics of many diseases than does the beginning student and has become skillful in developing the history by his previous experience.

Once having adopted the preceding four basic principles of history-taking, one may then consider the intellectual processes that are involved in establishing a diagnosis.

TAXONOMY OF INTELLECTUAL PROCESSES

The six progressively more complex levels of intellectual functioning are as follows: knowledge, comprehension, application, analysis, synthesis, and evaluation.

1. *Knowledge*. Knowledge is unedited factual information provided by the patient, and as such may not necessarily be accurate or precise. To serve a purpose in establishing a diagnosis facts are merely the foundation for other more complex thought processes.

2. *Comprehension*. Comprehension is understanding the facts as related by the patient to the physician. By means of further discussion the physician must affirm his comprehension of what the patient said. Misinterpretations of the history are so prevalent that two physicians frequently do not obtain exactly the same history from a given patient.

3. *Application*. Application entails an accurate and well-organized recording of the facts as related by the patient, which facilitates utilization of the knowledge as comprehended by the physician.

The preceding three steps can be performed by any reasonably educated person. The resultant product is a narrative account of an episode in the patient's life, which, if sufficiently accurate, may be of assistance to the physician. However, the next steps, analysis, synthesis, and evaluation, are progressively more complex and sophisticated intellectual processes. They are essential for the full utilization of the medical history in the solution of the patient's problem. It is only after the application of these higher intellectual processes to the history, as previously obtained, that it becomes the true medical history—one that serves as the foundation for accurate diagnosis and effective therapy.

4. *Analysis*. Analysis is sorting out or classification of the obtained data into related categories. The larger the number of abnormal components obtained in the history, the more diagnostic information available to the physician. It is the physician's difficult task to sort out, to weigh, and to differentiate minutiae from the more significant aspects of the narrative history. At this point it is prudent to consider everything that seems to be abnormal and to disregard those aspects that are clearly normal. Significant data must be placed into related categories.

5. *Synthesis*. Synthesis is reassembly of the many components obtained in the history into patterns of recognizable disease. This is much more difficult than analysis because it requires a knowledge of the disease that will best be described by the aggregate of the patient's symptoms. Because the human body is a complex

organism, many diseases are characterized by a mixture of many separate symptoms.

As the result of analysis and synthesis, one may then enumerate the diagnoses suggested by the patient's history (the differential diagnosis). The ability to accomplish this step is made possible by growing experience and further learning.

6. *Evaluation*. Most difficult and important of the intellectual processes is the final step applied to the history and ultimately to the most accurate diagnosis. Specific diagnoses become valid only if they pass the inspection of critical evaluation. This involves two basic steps previously mentioned: asking the patient questions that are designed to either confirm or exclude tentative diagnoses and predicting the likely physical and laboratory findings. As the result of evaluation, one decides whether the available information is compatible with the working diagnosis.

As mentioned previously, the lower levels (knowledge, comprehension, and application) are rather basic and within the capability of any reasonably well-educated individual. In the educational process learning at these lower levels is poorly retained because information tends to be disparate and unrelated rather than utilized as part of a composite unit. Although retention of large bodies of information is necessary in medicine, it clearly involves only the lower levels of thought. The higher levels of the taxonomy of intellectual processes (analysis, synthesis, and evaluation) involve a method of learning that compels information to make sense. Information that has been subjected to analysis, synthesis, and evaluation is apt to be retained for long periods of time, is easily refreshed, and is recaptured with accuracy. It becomes part of an integrated whole and, consequently, is far superior to simple knowledge. Alone, mere memorization of facts may actually defeat the higher intellectual processes of learning that are essential to the finest diagnostic and therapeutic care of the patient.

ESTABLISHING AND TESTING THE DIAGNOSIS

Basic skills and knowledge are mere tools used in the intelligent approach to evaluation and synthesis and ultimately in the solution of medical problems. A skilled clinician has the capability of selecting sometimes seemingly unrelated facts and perceiving their potential relationship. One must learn to deal with facts concerning medicine in accordance with basic scientific methods. It is not sufficient to merely suspect a relationship. The physician actually must establish and test this relationship, which is accomplished by developing a hypothesis (a tentative explanation of the relationship of various facts). The principal value of a hypothesis is that it serves as a guide to permit the recognition of additional pertinent facts. Thus, one must determine which facts are pertinent and which irrelevant. Unfortunately, pertinent facts are not always conspicuous and may require intensive search for their recognition.

The validity of a hypothesis is established by gathering and evaluating information that confirms or opposes the tentative diagnosis. This is the step in diagnosis that is most poorly performed by beginning students. Such a shortcoming is understandable because their experience and knowledge are limited at this point, and they therefore fail to search for relevant data.

When the hypothesis is confirmed, it is elevated to the status of a theory (definite diagnosis). A theory is a reasonably well-established concept that is of value because it permits prediction of as yet unknown future facts (appropriate treatment, response to treatment, and course of the disease).

SELECTED READING

Bloom, B. S., editor: Taxonomy of educational objectives: the classification of educational goals. Handbook I. Cognitive domain, New York, 1956, David McKay Co., Inc.

CHAPTER 3

MEDICAL HISTORY

The problem comes when the physician does not take the time for a careful history and analysis of the pain; then, unfulfilled at finding no cause, he looks for more tests to do or he operates.*

A patient consults his physician because of unpleasant or unusual subjective sensations (symptoms) that interfere with his comfort or productivity. Alterations in function or structure (signs) are produced by disease. Signs are the objective evidence of an illness that the physician detects by physical examination.

It is essential that the physician be familiar with the normal so that he can detect or determine which signs and symptoms are abnormal. Most patients consider all of their symptoms to be abnormal, which in turn gives them reason for concern. Other patients either minimize or fail to recognize important symptoms. For example, some patients with heat intolerance caused by thyrotoxicosis do not recognize this as abnormal, yet they open the windows in a cool room where others are comfortable. Similarly, some patients with obvious pallor, anemia, and shortness of breath fail to report the presence of blood in their stools because they interpret this as being from hemorrhoids rather than a possible carcinoma of the colon. One distinguishing feature of the physician is his ability to elicit symptoms, to accurately characterize them, then to establish a diagnosis and a prognosis, and to institute indicated therapy. What is really meant by a given symptom? The physician must be very clear in his understanding of each symptom so that he can accurately communicate his understanding to all persons associated with the patient's care. The *medical history* should be a chronologic record of the development of a patient's symptoms from the inception of his illness until the time he presents himself to the physician. It includes not only the history of the present illness but also all past illnesses, injuries, and operations, any of which may have an important bearing on the present illness.

An adequate history makes the physical examination more interesting and important and permits the physician to correlate the physical findings with the information previously acquired. Without the history, the physical examination is simply a routine mechanical procedure. The combined data obtained in the history and examination will serve as a guide for

*From Spiro, H. M.: Visceral viewpoints; pain and perfectionism—the physician and the "pain patient," N. Engl. J. Med. 294(15):829, 1976.

additional diagnostic procedures. Finally, on the basis of all the information accumulated, the physician is enabled to make the most accurate diagnosis possible and thus is in a position to treat the patient's illness in the most intelligent and effective fashion. Accurate diagnosis is now and always will be the keystone of rational treatment.

There is no field of medicine in which history-taking is not essential. Since the history will be an integral part of the physician's study of his patients for the rest of his days, the art of history-taking should be cultivated to the highest possible degree.

ROLE OF THE STUDENT

In making the transition from the basic sciences to the clinical years the student must learn to complement his biologic knowledge with an understanding of the psychologic principles which enter into the physician-patient relationship. In the clinical setting the student is confronted with a situation entirely different from any he has previously encountered. For the first time he is charged with the responsibility of caring for human beings. He must learn to relate to people and to have a true understanding of their personalities, their strengths and weaknesses, as well as their medical problems.

The medical student is inexperienced in the art and science of dealing with patients and for all practical purposes is a layman. He usually feels quite insecure in his first patient experiences. However, he need not feel shy or embarrassed. The patient is seeking help, and the student can and does fulfill a very necessary role in the management of the patient. Because the student usually spends more time with the patient than any other member of the hospital staff, he has a great opportunity to develop a truly meaningful relationship with and insight into the patient. An alert, competent student takes advantage of this opportunity, with the result that in many instances his history and physical examination is the most comprehensive recorded on the chart. Most patients recognize the necessity for the educational experience of the student and thus do not resent his role in their management. On the other hand it is the obligation of the student to perform his role in a dignified, skillful, and professional manner.

For most students physical diagnosis is their first clinical experience on the hospital ward or in the clinic. It is in this setting that they are first exposed to a patient as well as to the various members of the hospital staff. Here, the students have an opportunity to observe the medical team in operation. Most important, each student has the privilege of interviewing and examining the patient and following the course of the patient's illness during hospitalization. In addition the student has the opportunity of hearing staff discussions and conferences regarding the diagnosis and management of the patient. The student can learn much about the hospital procedure by merely being observant at all times.

Just as a student's first exposure to the ward is a unique experience for him, so too is a patient's first stay in the hospital a novel event. Being admitted to the hospital requires a major adjustment for the patient. The entire hospital schedule and environment are vastly different from those which he experiences in his home and in the course of his daily life. The patient has little or no privacy in a hospital, he is separated from his family, the food is different, many new personnel are encountered, and the entire milieu seems strange. Superimposed on all of these inconveniences and oddities is his concern about his illness, financial matters, the welfare of his family, and many other personal details. Thus, it is important to utilize all the means necessary to make a patient feel secure and comfortable. Conscious striving to establish a good physician-patient relationship goes a long way toward accomplishing this goal.

It is important to observe how the patient

reacts to the medical and nursing staff, to the various procedures, to other patients on the ward, and to his family and visitors. The student should respect his patients and in turn command and deserve their respect. It is essential to be orderly, neat in appearance, mild in manner, but at the same time firm and secure. The student must pursue his work on the ward in a dignified, mature, and serious manner. He must be interested in all aspects of his patient and his care, be sensitive to his concerns and frustrations, and by all means be kind and gentle. With few exceptions patients of all economic and educational statuses will readily sense the compassionate and sincere feelings of a dedicated physician.

It is the physician's duty and moral obligation to observe and maintain the patient's right to privacy. Only those matters that directly relate to the patient's illness should be discussed with other qualified professional members of the hospital staff. Failure to preserve the patient's privacy is a serious breach of medical ethics.

Frequently the patient has visitors or members of his family at his bedside—a delicate situation and one that is often highly charged emotionally. History-taking and physical examination of the patient under these circumstances require considerable time if they are to be done properly. The student should inform both the patient and the visitors that the procedure will require an approximate period of time and ask the visitors if they will leave while the examination is being conducted. He should always be considerate and tactful in this situation. The history-taking and physical examination are strictly private affairs and should not be conducted before members of the family or other visitors.

The student should also be considerate of other personnel responsible for the patient's care. In order that his procedure does not conflict with meals, x-ray studies, or laboratory or other diagnostic tests, he should inform the charge nurse regarding the time he plans to examine the patient.

COMPUTERIZED MEDICAL HISTORY

In this age of mechanization and industrialization the computer has assumed a major role in scientific investigation and application. During the past few years there has been considerable research involving the use of computers in medical history-taking. Studies have shown that some medical-history data can be obtained from patients by various questionnaires based either on the paper-and-pencil medium or on data-processing equipment with the use of computer terminals. In regard to certain aspects of the history there is good correlation between the records derived from questionnaires and those obtained by physicians using the traditional methods of personal interview. In other areas of the medical history the correlation is not good and leaves much to be desired.

It is both possible and probable that in the future more refined techniques will be developed in this area, in which case computerized medical histories will become routine procedures. However, for the present it is advisable to retain the time-proved method of personal interview.

If one accepts the fact that in the near future the computer will become an integral factor in the physician's environment, he must then agree that it is essential to develop better-organized medical records. With this thought in mind Weed has conceived and developed the problem-oriented technique of recording medical data. Weed's method necessitates that each medical record have a complete list of all the patient's problems, including both clearly established diagnoses and all unexplained findings that are not clear manifestations of a specific diagnosis, such as abnormal symptoms or physical findings. This results in a dynamic, not static, list of problems on the patient's chart that can be challenged and altered as the situ-