

THE ORIGIN OF THE FIELD OF DERMATOLOGY AND ITS APPLICATION TO PRACTICE

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Annotation: Dermatology, medical specialty dealing with the diagnosis and treatment of diseases of the skin. Dermatology developed as a subspecialty of internal medicine in the 18th century; it was initially combined with the diagnosis and treatment of venereal diseases, because syphilis was an important possible diagnosis in any skin rash. Modern dermatology emerged in the early 20th century, after the discovery of an effective drug therapy for syphilis.

Key words: dermatology, symptoms, Hebra, Ferdinand, biochemistry, Greek *gnosis*.

Because of the ease of observation of cutaneous symptoms, dermatology had early become a separate branch of medicine. Its scientific basis, however, was not established until the mid-19th century by the Austrian physician Ferdinand von Hebra. Hebra emphasized an approach to skin diseases based on the microscopic examination of skin lesions. Following Hebra's work, dermatologists concentrated chiefly on the description and classification of skin diseases, but a new emphasis on the biochemistry and physiology of these diseases, begun by Stephen Rothman in the 1930s, led to the development of more sophisticated and effective treatments in the latter half of the 20th century. Dermatologists have gained the capacity to control fungal diseases of the skin, to recognize and treat skin cancers at an early stage, to control the life-threatening skin diseases pemphigus and lupus erythematosus, and to alleviate psoriasis.

Diagnosis, the process of determining the nature of a disease or disorder and distinguishing it from other possible conditions. The term comes from the Greek *gnosis*, meaning knowledge.

The diagnostic process is the method by which health professionals select one disease over another, identifying one as the most likely cause of a person's symptoms. Symptoms that appear early in the course of a disease are often more vague and undifferentiated than those that arise as the disease progresses, making this the most difficult time to make an accurate diagnosis. Reaching an accurate conclusion depends on the timing and the sequence of the symptoms, past medical history and risk factors for certain diseases, and a recent exposure to disease. The physician, in making a diagnosis, also relies on various other clues such as physical signs, nonverbal signals of distress, and the results of selected laboratory and radiological and other imaging tests. From the large number of facts obtained, a list of possible diagnoses can be determined, which are referred to as the differential diagnosis. The physician organizes the list with the most likely diagnosis given first. Additional information is identified, and appropriate tests are selected that will narrow the list or confirm one of the possible diseases.

Historical aspects

Traditionally, diagnosis has been defined as the art of identifying a disease from its signs and symptoms. Formerly, few diagnostic tests were available to assist the physician, who depended on medical history, observation, and examination. In the 20th century there occurred numerous technological advances in medicine, which resulted in the development of a wide variety of diagnostic tests and new techniques to image tissues. These developments significantly improved the ability of doctors to make accurate diagnoses.

In the 5th century BCE, at the time of the Greek physician Hippocrates, there arose significant interest in medicine and personal hygiene. The Greeks recognized

the salubrious effects of bathing, fresh air, a good diet, and exercise. The ancient Romans also recognized the influence of these factors on health and even made significant advances in supplying and purifying water and in improving sanitation. Today, a balanced diet, clean air and water, and exercise continue to be emphasized as important factors for maintaining health. The ancient Greeks also introduced the notion that illness resulted from an imbalance between the four humours of the body: blood, phlegm, yellow bile, and black bile. They emphasized the value of observation, including bodily signs and excretions. However, the focus was more on predicting the outcome of an illness (i.e., prognosis) and less on its diagnosis. A physician's reputation depended on accurate prognostic skills, predicting who would recover and who would die or how long an illness would last.

Hippocrates is credited with establishing the ethical basis of the physician's behaviour, and graduating physicians still recite the Hippocratic oath. His writings document the value of objectively evaluating all aspects of the patient's symptoms, diet, sleep patterns, and habits. No finding was considered insignificant, and physicians were encouraged to employ all their senses—sight, hearing, smell, taste, and touch—in making a diagnosis. These principles hold just as true today.

Galen of Pergamum (129 CE–c. 216) is considered the most influential physician after Hippocrates because of his extensive studies in anatomy and physiology. His voluminous writings rendered him the ultimate authority in these fields until the 16th century. As the first experimental neurologist, he described the cranial nerves and the sympathetic nervous system. He observed the structural differences between arteries and veins. One of his most important demonstrations was that the arteries carry blood, not air, as had been taught for 400 years. However, many of his views contained fallacies, which remained unchallenged for centuries. His description of the heart and its chambers and valves, in which he contended that blood passes from the right to the left ventricle by means of invisible pores in the interventricular septum,

delayed the discovery of blood circulation for 14 centuries. The true nature of the circulation of blood was not recognized until the early 17th century, when English physician William Harvey published his findings in *Exercitatio Anatomica de Motu Cordis et Sanguinis in Animalibus* (1628; *Anatomical Exercise on the Motion of the Heart and Blood in Animals*, or simply *De Motu Cordis*).

One of the greatest advances in diagnosis was the invention of the compound microscope toward the end of the 16th century by the Dutch optician Hans Jansen and his son Zacharias. In the early 17th century, Italian philosopher, astronomer, and mathematician Galileo constructed a microscope and a telescope. The utility of microscopes in the biological sciences and for diagnostic purposes was initially realized in the late 17th century, when Dutch microscopist Antonie van Leeuwenhoek became the first person to see protozoa and bacteria and the first to describe red blood cells (erythrocytes). He also demonstrated the capillary anastomosis (network) between arteries and veins that proved Harvey's studies of circulation to be correct.

Another advance in diagnostic medicine occurred when the mercury thermometer, invented in 1714 by German physicist Daniel Fahrenheit, came into general use as a clinical tool in the mid-19th century. It was initially 25.4 cm (10 inches) long and took five minutes to register a temperature. The modern clinical thermometer was introduced by English physician Sir Thomas Clifford Allbutt in 1866. The thermometer was popularized by German physician Karl August Wunderlich, who thought, incorrectly, that every disease had its own characteristic fever pattern.

Another significant medical advance, which greatly improved the ability to diagnose diseases of the chest and heart, was the invention of the stethoscope in 1816 by French physician René-Théophile-Hyacinthe Laënnec. Before this, the lungs and heart were examined by applying the ear to the chest wall. Laënnec's original stethoscope design

consisted of a wooden cylinder and was monoaural, transmitting sound to only one ear. This device allowed Laënnec to diagnose diseases such as tuberculosis at an earlier stage than was previously possible. His wooden stethoscope was replaced at the end of the 19th century by models using rubber tubing; later, binaural stethoscopes, which transmit sound to both ears, came into use. Rubber binaural devices are widely used today.

Another significant diagnostic aid that was developed in the 19th century was the ophthalmoscope, an instrument for inspecting the interior of the eye. The ophthalmoscope was developed in 1850 by German scientist and philosopher Hermann von Helmholtz, who was best known for his knowledge of physics and mathematics. The ophthalmoscope consists of a strong light that can be directed into the eye by a small mirror or prism. The light reflects off the retina and back through a small hole, through which the examiner sees a nonstereoscopic magnified image of the structures at the back of the eye. With this device the retina and its blood vessels can be readily examined. The inner eye can provide information not only about diseases of the eye but also about those pertaining to cardiovascular abnormalities and complications of diabetes mellitus.

Perhaps the greatest modern anatomic diagnostic tool is the X-ray, discovered in 1895 by the German physicist Wilhelm Conrad Röntgen. Röntgen found that opaque objects exposed to ionizing radiation could be visualized on a screen coated with fluorescent material, which he demonstrated by producing a photographic image of the bones of the human hand. Since then, knowledge about X-rays, sometimes called roentgen rays, and about various forms of radiation have been applied to the development of computerized axial tomography (CAT), magnetic resonance imaging (MRI), and other imaging techniques that are extremely useful modern diagnostic tools. The training of physicians also has undergone significant change since the time of the ancient Greek physicians. For many centuries, and particularly between the late

Middle Ages and the end of the 19th century, physicians were trained through lectures and rarely were taught at the patient's bedside. This practice was altered by Canadian physician Sir William Osler during his time as professor of medicine at Johns Hopkins University Medical School in Baltimore, Md., U.S. One of the most renowned physicians of the early 20th century, he introduced the practice of instructing students at the bedside of the patient. He emphasized the importance of taking an accurate medical history, providing a thorough examination, and closely observing the patient's behaviour to gather clues for a diagnosis before resorting to laboratory testing.

Medical history

The medical history of a patient is the most useful and important element in making an accurate diagnosis, much more valuable than either physical examinations or diagnostic tests. The medical interview is the process of gathering data that will lead to an understanding of the disease and the underlying physiological process. To be effective, an interviewer must possess good communication skills and be alert to nonverbal clues as well as to the verbal message. Often, more information is conveyed by nonverbal actions and tone of voice than by words. The objective is to obtain an accurate and comprehensive picture of the patient's situation, including the nature and timing of symptoms, emotional factors (including types of stress), and past medical conditions that may place the patient at greater risk for certain diseases.

The accuracy and usefulness of the medical interview depend on the physician's ability to elicit information pertinent to the problem at hand and on the patient's accurate recall and articulation of the sequence of symptoms. This may be difficult, because meaningful data may be forgotten if the patient is experiencing pain or emotional distress. The skilled interviewer knows when to use silence, open-ended questions, or specific closed-ended questions to explore avenues in which the most useful information may be found. The real reason for the patient's visit may not be apparent until a rapport has been established and the person feels comfortable describing what is

most bothersome. Problems that are emotionally threatening may not be voiced until adequate courage has been summoned—sometimes not until the end of the appointment when the patient's hand is on the doorknob.

A complete medical history consists of an account of: (1) the present illness; (2) past medical history; (3) family history; (4) occupational background; (5) psychosocial history; and (6) a review of body systems.

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