



## **INDUSTRY OVERVIEW: DIAGNOSTIC MEDICINE**

### **Who are Diagnostic Medicine Professionals?**

They are medical practitioners, including physicians, dentists, chiropractors, osteopaths, optometrists, podiatrists, and veterinarians, involved in active practice and called upon to treat patients exhibiting symptoms of illness and distress. In doing so, they first need to make a diagnosis about the causes of the problem, which is carried out by means of a history, physical exam, and various tests. Once a reliable diagnosis has been made, the next phase is to design a treatment plan. This is the standard approach used in Western medicine today.

### **Career Tracks**

Chiropractors: are health care professionals trained to perform structural adjustments, especially to the vertebral column, as a means of treatment for back and spinal problems. This healing approach is based on the hypothesis that misalignment of the spine results in neurological dysfunction and consequently a disturbance in various parts of the body. By manual adjustment or use of other nonsurgical or non-medicinal methods (chiropractors do not go to medical school), they try to restore the body to a healthy state. Patients treated by chiropractors may either have acute or chronic problems including headaches, stiff neck, backaches, or fatigue. Chiropractors obtain medical histories, perform physical exams including spinal postural analysis, take and evaluate x-rays and measurements, and order lab tests. Once a diagnosis has been made, they seek to correct any structural problems found by reducing or immobilizing the abnormality through numerous methods.

Dentists: diagnose and treat problems with teeth and tissues in the mouth, along with providing preventive care. They remove tooth decay, fill cavities, examine x-rays, place protective plastic sealants on children's teeth, straighten teeth, and repair fractured teeth. They also perform corrective surgery on gums and supporting bones to treat gum diseases. Dentists extract teeth and make models and measurements for dentures to replace missing teeth. They also write prescriptions for antibiotics and other medications. Most dentists are general practitioners, handling a variety of dental needs. Dentists can also practice in any of following nine specialty areas:

*Orthodontists*, the largest group of specialists, straighten teeth by applying pressure to the teeth with braces or retainers. *Oral and maxillofacial surgeons*, are the next largest group, who operate on the mouth and jaws. The remainder may specialize as *pediatric dentists* (focusing on dentistry for children); *periodontists* (treating gums and bone supporting the teeth); *prosthodontists* (replacing missing teeth with permanent fixtures, such as crowns and bridges, or with removable fixtures such as dentures); *endodontists* (performing root canal therapy); *public health dentists* (promoting good dental health and preventing dental diseases within the community); *oral pathologists* (studying oral diseases); or *oral and maxillofacial radiologists* (diagnosing diseases through the use of imaging technologies).

Optometrists: also known as *doctors of optometry*, or *ODs*, are the main providers of basic vision care. They examine people's eyes to diagnose vision problems and test patients' depth and color perception and ability to focus and coordinate the eyes. Optometrists may prescribe eyeglasses or contact lenses, or they may prescribe

or provide other treatments, such as vision therapy or low-vision rehabilitation. Optometrists also test for glaucoma and other eye diseases and diagnose conditions caused by systemic diseases such as diabetes and high blood pressure. Most optometrists are in general practice. Some specialize in work with the elderly, children, or partially sighted persons who need specialized visual devices. Others develop and implement ways to protect workers' eyes from on-the-job strain or injury. Some specialize in contact lenses, sports vision, or vision therapy. A few teach optometry, perform research, or consult. Training to become an Optometrist involves 4 years of post-college training, but does not require medical school.

Ophthalmologists: are licensed physicians who specialize in eye care. Unlike optometrists, ophthalmologists are MDs who attend 4 years of medical school, 1 year of an internship, and a minimum of 3 years in residency. Whereas optometrists provide primary eye care services (as listed above), ophthalmologists offer the full spectrum of eye care, including conducting complex and delicate eye surgery. Ophthalmologists may also specialize in areas from specific eye diseases like cornea and external diseases to glaucoma, to ophthalmic plastic surgery, to pediatric ophthalmology, to vitreoretinal diseases.

Podiatrists: also known as *doctors of podiatric medicine* (DPMs), diagnose and treat disorders, diseases, and injuries of the foot and lower leg. Podiatrists treat corns, calluses, ingrown toenails, bunions, heel spurs, and arch problems; ankle and foot injuries, deformities, and infections; and foot complaints associated with diabetes and other diseases. To treat these problems, podiatrists prescribe drugs and physical therapy, set fractures, and perform surgery. Podiatrists may specialize in areas such as surgery, orthopedics, primary care, public health, sports medicine, pediatrics, dermatology, radiology, geriatrics, or diabetic foot care.

Physicians and Surgeons: diagnose illnesses and prescribe and administer treatment for people suffering from injury or disease. Physicians examine patients, obtain medical histories, and order, perform, and interpret diagnostic tests. They counsel patients on diet, hygiene, and preventive health care. There are two types of physicians: M.D.—Doctor of Medicine—and D.O.—Doctor of Osteopathic Medicine. M.D.s also are known as Allopathic Physicians and D.O.s are known as Osteopathic Physicians.

Both MDs and DOs have usually completed a college degree focused on the sciences, completed 4 years of basic medical education (1 in a school of osteopathic medicine and 1 in medical school), and obtained internships and residencies after medical school with training typically lasting from 3-6 years. Both must pass comparable exams to obtain state licenses, practice in accredited and licensed health care facilities, and may use all acceptable methods of treatment including drugs and surgery. However, unlike traditional medical school training (M.D.s), osteopathic medical schools emphasize training that focuses on preventive health care and seeing the body as an integrated whole (a holistic approach); they also receive extra training on the musculoskeletal system and are taught how to provide osteopathic manipulative treatments. In the US, traditional medical schools are typically more competitive than schools of osteopathic medicine.

Physicians work in one or more of several specialties, including, but not limited to, anesthesiology, family and general medicine, general internal medicine, general pediatrics, obstetrics and gynecology, psychiatry, and surgery.

*Anesthesiologists* focus on the care of patients and pain relief during surgery. Through continual monitoring and assessment, these critical care specialists are responsible for maintenance of the patient's vital life functions—heart rate, body temperature, blood pressure, breathing—during surgery.

*Family and general practitioners* often provide the first point of contact for people seeking health care by acting as the traditional family doctor. They assess and treat a wide range of conditions, from sinus and respiratory infections to broken bones. They refer patients with more serious conditions to specialists or other health care facilities for more intensive care.

*General internists* diagnose and provide nonsurgical treatment for a wide range of problems that effect internal organ systems, such as the stomach, kidneys, liver, and digestive tract. They commonly act as

primary care specialists. They treat patients referred from other specialists, and, in turn they refer patients to other specialists when more complex care is required.

*General pediatricians* care for the health of infants, children, teenagers, and young adults. They specialize in the diagnosis and treatment of a variety of ailments specific to young people and track patients' growth to adulthood.

*Obstetricians and gynecologists* (OB/GYNs) specialize in women's health. They are responsible for women's general medical care, and they also provide care related to pregnancy and the reproductive system. They focus on ailments such as cancers of the breast or cervix, urinary tract and pelvic disorders, and hormonal disorders. OB/GYNs also specialize in childbirth, treating and counseling women throughout their pregnancy.

*Psychiatrists* are M.D.s who specialize in the area of mental health. They assess and treat mental illnesses through a combination of psychotherapy, hospitalization, and medication. They often collaborate with psychologists or other psychotherapists, who are not licensed to prescribe medications, and therefore seek assistance from psychiatrists if drug therapy is needed.

*Surgeons* specialize in the treatment of injury, disease, and deformity through operations. Although a large number perform general surgery, many surgeons choose to specialize in a specific area, such as orthopedic surgery, neurological, cardiovascular surgery, otolaryngology (treatment of the ear, nose, and throat), and plastic or reconstructive surgery.

Veterinarians: care for the health of pets, livestock, and animals in zoos, racetracks, private practice, and laboratories. Some veterinarians use their skills to protect humans against diseases carried by animals and conduct clinical research on human and animal health problems. Others work in basic research, broadening our knowledge of animals and medical science, and in applied research, developing new ways to use knowledge. Most veterinarians diagnose animal health problems; vaccinate against diseases; medicate animals; treat and dress wounds; set fractures; perform surgery; and advise owners about animal feeding, behavior, and breeding.

## **Requirements/Skills:**

Becoming a diagnostic and treating health care professional is a formidable challenge which requires solid science skills including, biology, chemistry, physics, and calculus, as well as the behavioral sciences of psychology and sociology. These courses provide the framework for understanding the human body's form and function and how people behave. It requires intellectual curiosity, personal growth, and maturity, as well as physical stamina, motivation, and determination (due to the length of schooling). The educational requirements and licensing necessary to practice in these careers vary, but all require a 4-year college degree followed by graduate school anywhere from 4-8 years (including internship and residency), and more may be required for various specializations. Generally though, chiropractic medicine, dentistry, optometry, and veterinary science are 4-year programs; podiatry is a 4-year program (with most graduates completing 2-4 years of hospital residency program after); while osteopaths and physicians are 4 years plus 1 year internship and 2-6 years of residency (depending on one's specialty).

**Related Occupations:** (See Industry overview on "Allied Health" for several related occupations.)

Additional medical specialties include, but are not limited to:

Allergists	Gastroenterologists
Cardiologists	Oncologists
Dermatologists	Pathologists
Emergency Physicians	Radiologists

## **Salaries:**

While salaries vary based on geographic location and setting (private practice, group practice, research, teaching), the following information (median salaries) was obtained from the AMA website, mdsalaries.com, alliedphysicians.com, and payscale.com:

Chiropractor: \$50,000-\$105,000  
Dentist: \$114,000-\$314,000  
Optometrist: \$70,000-\$126,000  
Osteopaths: \$102,000-\$245,000

Podiatry: \$150,000  
Physician: \$186,044 (family practice)-\$339,739 (surgery)  
Veterinarian: \$50,000-\$143,000

## **Directories:**

Health Care careers for the 20<sup>th</sup> Century (available in Beren Campus CDC Library)  
Health Professions Career and Education Directory (available in Beren Campus CDC Library)  
[www.ama-assn.org](http://www.ama-assn.org)  
[www.avma.org](http://www.avma.org) [veterinary]  
[www.apma.org](http://www.apma.org) [podiatry]  
<http://www.scpod.org/#> [podiatry]  
[www.aoa.org](http://www.aoa.org) [optometry]  
[www.acatoday.org](http://www.acatoday.org) [chiropracty]  
[www.ada.org](http://www.ada.org) [dentistry]  
[www.naturalhealers.com](http://www.naturalhealers.com)  
[www.aamc.org](http://www.aamc.org) [Assn. of American Medical Colleges]

## **Associations**

American Chiropractic Association  
American Dental Association  
American Optometric Association  
American Osteopathic Association  
American Podiatric Medical Association  
American Medical Association  
American Veterinary Association

## **Websites**

[www.aamc.org](http://www.aamc.org)  
[www.studentdoc.com](http://www.studentdoc.com)  
[www.allhealthjobs.com](http://www.allhealthjobs.com)  
[www.healthcareers.com](http://www.healthcareers.com)  
[www.healthcarerecruitment.com](http://www.healthcarerecruitment.com)  
[www.hospitaljobsonline.com](http://www.hospitaljobsonline.com)  
[www.medzilla.com](http://www.medzilla.com)  
[www.healthcareerweb.com](http://www.healthcareerweb.com)  
[www.topresearchjobs.com](http://www.topresearchjobs.com)  
[www.explorehealthcareers.org](http://www.explorehealthcareers.org)

Many associations have websites and links to job boards, openings, and notices. Also log on to websites of specific hospitals, medical centers, rehab centers, and clinics for research and internship opportunities.