PUBLISHER'S NOTE

The latest volume in our *Careers in* series, *Careers in Medical Technology*, provides a thorough introduction to the wide range of career opportunities available to those interested in the many areas of this burgeoning field, from being an audiologist to a veterinary technician, and everything in between.

The types of careers related to medical technology are incredibly wide-ranging, from the obvious, like MRI technologist, to the not-so-obvious, like medical dosimetrist. *Careers in Medical Technology* offers insight into what it's like to work directly with medical equipment, as well as working in adjacent positions that create these devices, or rely on the information they convey in order to diagnose and treat patients. If you are interested in how to turn your passion for health, technology, and detail-oriented work into a fulfilling career, this book is for you.

At the heart of this volume, like the dozens of previous *Careers in* titles, are 26 occupation profiles that cover various careers involving medical technology in some way, from audiologists to nuclear medicine technologists and veterinary technologists & technicians. Each career profile offers details about its specific career:

Snapshots offer current data on:
- Median pay
- Job outlook
- Educational and other requirements
- Working conditions
- Recommended areas of interest

Career Overviews describe:
- Duties
- Work environment
- Work schedules

In addition, each profile provides important qualities for the job, specific and general job requirements, anticipated rates of growth, and why. Also included is a list of related occupations, both in the public and private sectors, and a list of resources for more information, with profession-specific associations and certifying bodies.

Merging scholarship with occupational development, this single comprehensive guide-book provides students who are interested in exploring a career involving medical technology with the necessary insight into the wide array of options available in this fascinating and vital field. The book offers guidance regarding what job-seekers can expect in terms of training, advancement, earnings, job prospects, working conditions, relevant associations, and more. *Careers in Medical Technology* is specifically designed for a high school and undergraduate audience and is edited to align with secondary or high school curriculum standards.

Additional Materials

Careers in Medical Technology is enhanced with statistical data, including projections from the U.S. Bureau of Labor Statistics, and median annual salaries or wages for those occupations profiled. Fast Facts, Famous Firsts, and dozens of photos add depth to the discussion.

A popular and valuable highlight of the *Careers in* series are "Conversations With..." —interviews with real-life professionals working in relevant jobs. Those interviewed offer their personal career paths, detail the potential for career advancement, and offer advice for students.

The back matter in this volume includes:

Appendix A: Guide to the Holland Code—John Holland's theory that people and work environments can be classified into six different groups: realistic, investigative, artistic, social, enterprising, and conventional. These interest codes are found at the beginning of each profile.

Appendix B: Further Readings—a list of suggested readings for those who wish to learn more about pursuing a career in medical equipment, broken down by general and major topics.

Appendix C: List of Organizations and Resources—a list of additional resources for education, certification, professional development, and networking.

Salem Press thanks the professionals whose honest responses and personal insight provide immeasurable value to *Careers in Medical Technology.*

INTRODUCTION

Advances in medical technology are growing exponentially, and with great benefit, as the world's population continues to expand and humanity is reminded time and again just how fragile health can be. Technologies such as telemedicine, gene editing, and artificial intelligence (AI), to name a few, are revolutionizing how doctors diagnose illness and how patients recieve care. Medical technology touches nearly every corner of healthcare, and the careers to be found working with this exciting technology are varied and fascinating. The list of careers that are related to medical technology is long, including everything from audiologists to nuclear medicine technologists and veterinary technologists & technicians. Our goal with this edition is not to be all-encompassing, but rather to get to the heart of some remarkable careers that utilize medical technology.

Being employed in fields related to medical technology does not necessarily mean operating an MRI machine or designing the next generation of biotechnology—although it certainly can. There are a vast number of career options that are either directly related to, or adjacent to, fields involving medical technology, all working to further human and animal health, and to make medical procedures safer and more accurate.

Work with medical technology may involve those who directly create and operate these pieces of equipment, such as bioengineers, medical scientists, technologists and technicians, and surgeons, but it may also include those who rely on medical technology to yield diagnostic results in order to properly treat or consult with patients, such as audiologists, genetic counselors, and optometrists, as well as those who catalog health records and analyze clinical data, such as health information technologists, medical registrars, and medical assistants. The wide variety of uses of medical technology means virtually no career within the healthcare system remains untouched by it. Some careers involving medical technology, such as EMTs and paramedics, involve working with this equipment under often extreme conditions, dealing with life-or-death situations on a daily basis. These are just some of the many ways medical technology factors into a wide variety of often interconnected areas of employment.

Finding the path that's right for you means thinking about your own interests, skills, and talents. Important skills for working with medical technology include analytical, communication, compassion, critical-thinking, detail-oriented, dexterity, hand-eye coordination, interpersonal, mathematical, problem-solving, and technical skills, not to mention a desire to work towards better healthcare for all.

It's also worth considering how much money you want to make. A position that requires a four-year degree will earn you more money than one requiring a two-year degree, or one requiring no post-secondary education at all. The profiles in this volume include education requirements and typical earnings. Remember, however, that how much money you make is not the entire story. Benefits, job security, where you work, and self-fulfillment are important factors as well.

The "Conversations With..." spread throughout this volume show the variety of career paths available involving medical technology, how to achieve them, and what to expect

when you get there. They are interviews with real individuals working in the field at real jobs.

The list of jobs contained in this volume is not exhaustive, and should be viewed as an entry point into a world with numerous branches and related disciplines, many of which can intersect in novel ways. The aim is to provide readers—especially students embarking on their lifelong careers—with accurate and detailed examples of some the many possibilities available in these fields, which play such a vital role in maintaining human and animal health.

Here are details about how certain careers can relate to medical technology:

Bioengineers and biomedical engineers combine engineering principles with sciences to design and create equipment, devices, computer systems, and software.

Dental and ophthalmic laboratory technicians and medical appliance technicians make or repair dentures, eyeglasses, prosthetics, and related products.

Diagnostic medical sonographers and cardiovascular technologists and technicians operate special equipment to create images or conduct tests. They work closely with physicians and surgeons, who view the images and test results to assess and diagnose medical conditions.

Emergency medical technicians (EMTs) and paramedics assess injuries and illnesses, provide emergency medical care, and may transport patients to medical facilities. They work with a variety of medical equipment, such as defibrillators, advanced airway devices, and various medications, to stabilize and treat patients in critical situations.

Health information technologists and medical registrars advise organizations on computerized healthcare systems and analyze clinical data.

Medical dosimetrists calculate doses of radiation and design and oversee treatment plans for patients with cancer and other serious diseases.

Medical scientists conduct research aimed at improving overall human health. They may study methods of disease prevention, treatment, and outbreak control, or work on developing new vaccines, medications, or diagnostic testing techniques. Medical scientists perform and oversee medical, chemical, biological, hematological, immunologic, microscopic, and bacteriological tests during their research. They often use clinical trials and other investigative methods to reach their findings.

Nurse anesthetists, nurse midwives, and nurse practitioners, also referred to as advanced practice registered nurses (APRNs), coordinate patient care and may provide primary and specialty healthcare. The scope of practice varies from state to state.

Occupational health and safety specialists and technicians collect data on, analyze, and design improvements to many types of work environments and procedures. Specialists inspect workplaces and enforce adherence to regulations on safety, health, and the

environment. Technicians work with specialists to implement and evaluate programs aimed at mitigating risks to workers, property, the environment, and the public.

Orthotists and prosthetists measure, design, fit, and adapt musculoskeletal devices for patients who have disabling conditions. These devices include artificial limbs and orthopedic braces.

Physicians and surgeons diagnose and treat injuries or illnesses and address health maintenance. Physicians examine patients; take medical histories; prescribe medications; and order, perform, and interpret diagnostic tests. Surgeons operate on patients to treat injuries, such as broken bones; diseases, such as cancerous tumors; and deformities, such as cleft palates.

Radiologic technologists, also known as radiographers, perform x rays and other diagnostic imaging examinations on patients. MRI technologists operate magnetic resonance imaging (MRI) scanners to create diagnostic images.

Surgical assistants and technologists help with surgical operations. Surgical assistants, also called surgical first assistants, help surgeons with tasks such as making incisions, placing clamps, and closing surgical sites. Surgical technologists, also called operating room technicians, prepare operating rooms, arrange equipment, and help doctors and first assistants during surgeries.

Veterinary technologists and technicians, supervised by licensed veterinarians, do medical tests that help diagnose animals' injuries and illnesses. Most states require veterinary technologists and technicians to be credentialed.

Audiologist

Snapshot

Career Cluster(s): Health Science; Science, Technology, Engineering & Mathematics

Interests: Hearing; Health; Helping Others

Earnings (Yearly Average): $87,740

Employment & Outlook: Much Faster Than Average Growth Expected

OVERVIEW

Sphere of Work

Audiologists diagnose, manage, and treat patients who have hearing, balance, or related problems.

Work Environment

Audiologists may find work in different environments, including the offices of physical, occupational and speech therapists, and audiologists; offices of physicians; state, local, and private hospitals; or for various educational services.

Some audiologists, such as those contracted by a school system, travel between multiple facilities. Audiologists may work closely with other healthcare specialists, including audiology assistants (a type of medical assistant), physicians and surgeons, registered nurses, and speech-language pathologists.

iStock/D-Keine. [Used under license.]

Most audiologists work full time. Some work weekends and evenings to meet patients' needs.

Profile

Working Conditions: Inside
Education Needs: Bachelor's Degree; Doctoral Degree
Licensure/Certification: Required
Opportunities for Experience: Internship; Supervised Clinical Practice
Interest Score: ISC

Occupation Interest

Work as an audiologist requires a strong interest in science and medicine, as well as excellent communication and problem-solving skills. Audiologists must also be patient, compassionate, and detail-oriented, as they work closely with their patients to improve their quality of life. This person is dedicated to helping others and is passionate about using their expertise to improve the lives of those with auditory impairments.

A Day in the Life—Duties and Responsibilities

Audiologists diagnose conditions such as hearing loss and tinnitus (ringing in the ear). They use a variety of devices to identify the extent and underlying cause of hearing loss. For example, with audiometers they measure the volume and frequency at which a person hears.

Duties and Responsibilities

- Examining patients who have conditions related to the outer, middle, or inner ear
- Assessing the results of the examination and diagnose problems
- Creating treatment plans to meet patients' goals
- Providing care for routine procedures, such as testing
- Fitting and dispensing hearing aids and other assistive listening devices
- Counseling patients and their families on ways to listen and communicate, such as by lip reading or through technology
- Evaluating patients regularly to monitor their condition and modify treatment plans, as needed
- Recording patient progress
- Researching the causes and treatment of hearing and balance disorders
- Educating patients on ways to prevent hearing loss

Treatment depends on the type and severity of a patient's hearing loss and may range from cleaning wax out of ear canals to fitting and checking hearing aids. (Audiologists' ability to diagnose as well as treat patients distinguishes their work from that of hearing aid specialists.) Audiologists work with physicians and surgeons treating patients whose hearing may be improved with cochlear implants, small devices that are surgically embedded near the ear to deliver electrical impulses to the auditory nerve.

Audiologists also counsel patients and their families on adapting to hearing loss, such as through use of technology, and may refer them to resources and other support.

Dental/Ophthalmic Laboratory Technician/Medical Appliance Technician

Snapshot

Career Cluster(s): Health Science; Manufacturing

Interests: Science; Medical Technology; Making Things; Helping Others

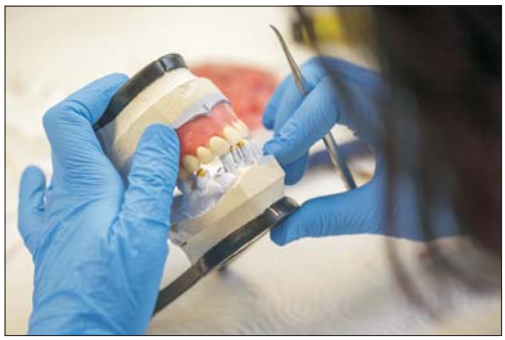
Earnings (Yearly Average): $44,640

Employment & Outlook: Decline Expected

OVERVIEW

Sphere of Work

Dental and ophthalmic laboratory technicians and medical appliance technicians make or repair dentures, eyeglasses, prosthetics, and related products.



iStock/Goxi. [Used under license.]

Work Environment

Dental and ophthalmic laboratory technicians and medical appliance technicians can be found in multiple

sorts of work environments. A majority work in medical equipment and supplies manufacturing industry, but other environments can include the offices of dentists and optometrists, as well as and professional and commercial equipment and supplies wholesale companies. They may also work in health and personal care retail settings, providing necessary equipment and supplies to the public. These technicians are essential in ensuring that medical and healthcare facilities have the necessary equipment and devices to provide quality care to patients.

Profile

Working Conditions: Inside
Physical Strength: Light Work; Varies
Education Needs: High School; Certificate Program
Licensure/Certification: Strongly Recommended
Opportunities for Experience: On-the-Job Training
Interest Score: RCI

Technicians may be exposed to health and safety hazards when handling certain materials. Workers typically wear protective equipment, such as goggles, gloves, or masks, to protect themselves from injury. They may spend a great deal of time standing or bending.

Most dental and ophthalmic laboratory technicians and medical appliance technicians work full time, and schedules may vary.

Occupation Interest

Someone who becomes a dental and ophthalmic laboratory technician and medical appliance technician is likely to have a strong interest in science, attention to detail, and manual dexterity. They enjoy working with their hands and have a natural inclination towards problem-solving. As this occupation also requires precision and patience, individuals who are meticulous and organized tend to thrive in this role. A passion for helping others and improving their oral and visual health may also make this career appealing.

Duties and Responsibilities

- Reading and following detailed work orders and prescriptions
- Bending, forming, and shaping material for appliances or devices
- Polishing and shaping appliances and devices, using handtools or power tools
- Adjusting appliances or devices to allow for a natural look or to improve function
- Inspecting the final product for quality and accuracy
- Repairing damaged appliances and devices

A Day in the Life—Duties and Responsibilities

Technicians' duties vary, depending on their employer. In small offices and retail establishments, technicians may handle every phase of production. In large manufacturing and wholesale facilities,

Health Information Technologist/Medical Registrar

Snapshot

Career Cluster(s): Health Science

Interests: Health; Computers; Statistics; Information Technology

Earnings (Yearly Average): $62,990

Employment & Outlook: Much Faster Than Average Growth Expected

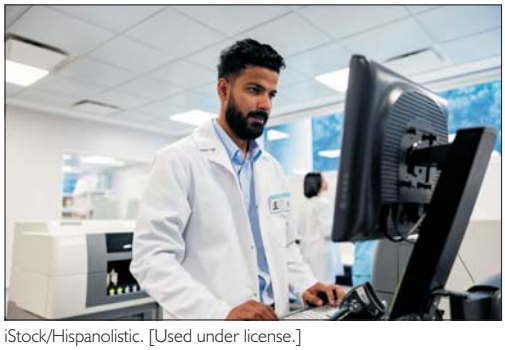
OVERVIEW

Sphere of Work

Health information technologists and medical registrars advise organizations on computerized healthcare systems and analyze clinical data.

Work Environment

Health information technologists and medical registrars play important roles in the healthcare industry and are employed by a variety of organizations. The majority are employed by hospitals, both state, local, and private. In addition to hospitals, they are also employed by offices of physicians, where they assist with



iStock/Hispanolistic. [Used under license.]

administrative and information management tasks. A smaller portion are employed in management of companies and enterprises, where they may oversee the implementation and maintenance of electronic health record systems. They can also be found in professional, scientific, and technical services, providing support and expertise in health informatics and information management. Finally, some work in administrative and support services, where they may handle information system training and support for healthcare organizations. Most health information technologists and medical registrars work full time.

Profile

Working Conditions: Inside
Education Needs: Associate's Degree; Bachelor's or Master's Degree
Licensure/Certification: Preferred; Often Required
Opportunities for Experience: On-the-Job Training; Internship
Interest Score: CIS

Occupation Interest

Individuals interested in becoming a health information technologist or medical registrar are likely detail-oriented, organized, and able to work well under pressure. They must also have a strong interest in healthcare and a passion for accurate and efficient record-keeping. These professionals must be comfortable working with technology and possess strong critical thinking and problem-solving skills.

A Day in the Life—Duties and Responsibilities

Health information technologists and medical registrars help to design and develop electronic healthcare systems. They abstract, collect, and analyze clinical data related to medical treatment, follow-up, and results. Their work supports the delivery and improvement of patient care.

Duties and Responsibilities

- Helping to determine requirements for computerized healthcare systems
- Evaluating and supporting implementation of health information systems
- Organizing and updating information in clinical databases or registries
- Compiling data and generating reports, such as for disease registry or treatment
- Tracking patient outcomes for quality assessment
- Validating the integrity of patient data
- Ensuring privacy, security, and confidentiality of patients' health information

Health information technologists apply their knowledge of information technology (IT) and healthcare concepts in a variety of ways. Some specialize in the electronic health records systems used for storing and retrieving patient data, which may include implementing the systems and educating staff on their use. Others analyze

healthcare data for a range of purposes, such as for research or to evaluate programs and services.

Medical registrars create and maintain databases of information, such as those used to track a particular disease or condition. For example, cancer registrars collect and analyze information for facility, regional, and national databases of cancer patients. They review patients' records and pathology reports to verify completeness and accuracy; assign classification codes to represent the diagnosis and treatment of cancers and benign tumors; and track treatment, survival, and recovery.

WORK ENVIRONMENT

Immediate Physical Environment

The immediate physical environment for health information technologists and medical registrars is typically an office or hospital setting. These professionals work in clean and well-organized spaces that are equipped with computers and other necessary equipment. The environment is often fast-paced and can be high-pressure, as these individuals are responsible for managing and maintaining important medical information.

Human Environment

Health information technologists and medical registrars must collaborate with doctors, nurses, and other healthcare professionals to ensure accurate and timely recording of medical data. They also work closely with patients, gathering their medical history and ensuring the confidentiality and privacy of their information. As such, good interpersonal and communication skills are essential for these professionals.

Technological Environment

Health information technologists and medical registrars use a variety of technology and software to manage and analyze medical data, including electronic health record systems, coding and billing software, and data analytics programs. As technology continues to play a crucial role in the healthcare industry, these individuals must stay updated and proficient in using new and emerging technologies.

Orthotist/Prosthetist

Snapshot

Career Cluster(s): Health Science

Interests: Health, Helping Others, Science

Earnings (Yearly Average): $78,100

Employment & Outlook: Much Faster Than Average Growth Expected

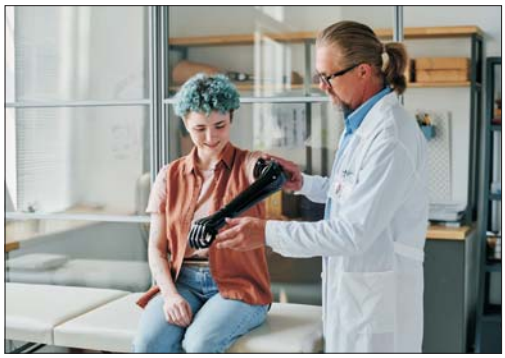
OVERVIEW

Sphere of Work

Orthotists and prosthetists measure, design, fit, and adapt musculoskeletal devices for patients who have disabling conditions. These devices include artificial limbs and orthopedic braces.

Work Environment

Orthotists and prosthetists work both in healthcare settings and in laboratories. In healthcare offices, they interact with patients during assessment and fitting of a device. In the lab, they may work with tools, such as drills and sanders, to construct or adjust devices. Orthotists and prosthetists collaborate with other healthcare workers, including physicians and surgeons, occupational therapists, and physical therapists.



iStock/SeventyFour. [Used under license.]

Orthotists and prosthetists may be exposed to safety hazards when working with certain tools or materials. To minimize risks, they take

Veterinarian

Snapshot

Career Cluster(s): Agriculture, Food & Natural Resources; Health Science

Interests: Medicine; Biology; Science; Animal Husbandry; Animal Care

Earnings (Yearly Average): $119,100

Employment & Outlook: Much Faster Than Average Growth Expected

OVERVIEW

Sphere of Work

A veterinarian is a licensed doctor of veterinary medicine (DVM) who evaluates, diagnoses, and treats various kinds of animals. A veterinarian also works to prevent animal diseases and injuries. Although the majority of veterinarians work with household pets, some treat wild animals, livestock, and animals living in zoos, on farms, in rescue shelters, or in laboratories. A few veterinarians specialize in preventing the diseases spread by animals and others conduct research related to the medical science of animals.

Work Environment

Most veterinarians operate out of a private medical practice or clinic and specialize in one or two animal species. Veterinarians who work primarily with pets (such as cats, dogs, birds, ferrets, and reptiles) typically work more than 40 hours per week. Their work environment, while indoors and private, is busy and noisy due to the constant animal traffic in

iStock/FatCamera. [Used under license.]

LIST OF ORGANIZATIONS AND RESOURCES

Academy of Doctors of Audiology (ADA)
1024 Capital Center Drive, Suite 205
Frankfort, KY 40601
866.493.5544
info@audiologist.org
www.audiologist.org

Academy of Forensic Nursing (AFN)
P.O. Box 42
Holbrook, MA 02343
afn@afnmail.org
www.goafn.org

Academy of General Dentistry (AGD)
560 West Lake Street, Sixth Floor
Chicago, IL 60661-6600
888.243.3368
membership@agd.org
www.agd.org

Accreditation Council for Genetic Counseling (ACGC)
7918 Jones Branch Drive, Suite 300
McLean, VA 22102
703.506.7667
info@gceducation.org
www.gceducation.org

Accreditation Council for Pharmacy Education (ACPE)
190 S. LaSalle Street, Suite 3000
Chicago, IL 60603
312.664.3575
info@acpe-accredit.org
www.acpe-accredit.org

Accreditation Review Commission on Education for the Physician Assistant, Inc. (ARC-PA)
3325 Paddocks Parkway, Suite 345
Suwanee, GA 30024
770.476.1224
www.arc-pa.org

Alliance of Cardiovascular Professionals (ACP)
P.O. Box 2007
Midlothian, VA, 23113
804.639.9213
www.acp-online.org

American Academy of Audiology (AAA)
11480 Commerce Park Drive, Suite 220
Reston, VA 20191
703.790.8466
www.audiology.org

American Academy of Family Physicians (AAFP)
11400 Tomahawk Creek Parkway
Leawood, KS 66211
800.274.2237
aafp@aafp.org
www.aafp.org

American Academy of Oral and Maxillofacial Pathology (AAOMP)
P.O. Box 539
Winfield, IL 60190
630.510.4552
info@aaomp.org
www.aaomp.org

American Academy of Orthotists & Prosthetists (AAOP)
8116 Arlington Boulevard, PMB214
Falls Church, VA 22042
202.380.3663
info@oandp.org
www.oandp.org

American Academy of PAs (AAPA)
2318 Mill Road, Suite 1300
Alexandria, VA 22314
703.836.2272
customercare@aapa.org
www.aapa.org

American Academy of Pediatric Dentistry (AAPD)
211 East Chicago Avenue, Suite 1600
Chicago, IL 60611-2637
312.337.2196
www.aapd.org

American Academy of Periodontology (AAP)
737 North Michigan Avenue, Suite 800
Chicago, IL 60611-6660
313.787.5518
www.perio.org