

WELCOME

Area Health Education Centers Program

The Arkansas Area Health Education Centers (AHEC) Program was founded in 1973, through combined efforts of the Governor, the State Legislature, and the University of Arkansas for Medical Sciences (UAMS), as the primary educational outreach effort of UAMS and the principal means of decentralizing medical and other health professions education throughout the state.

In addition to the *Arkansas Health Career Guide*, the AHEC Program also sponsors summer programs for high school students who are interested in learning about health careers at the seven AHEC centers in El Dorado, Fayetteville, Fort Smith, Helena, Jonesboro, Pine Bluff, and Texarkana and in community hospitals around the state. These programs include the 2-week M*A*S*H program for high school students and CHAMPS, a 1-week program for junior high students. Medical student programs sponsored by AHEC include FATE (Fighting AIDS through Education) and RMSLA (Rural Medical Student Leadership Association) along with summer preceptorships, the junior family medicine clerkship, and required and elective rotations for senior medical students. The AHEC's also serve as a training site for nursing, pharmacy and allied health profession students.

To learn more about a particular health career or the scope of programs available through the AHEC's, contact an AHEC near your home:

AHEC Fort Smith: Lawrence Price, MD, Director; 479/785-2431

AHEC Pine Bluff: H. Marks Attwood, MD, Director; 870/541-7611

AHEC Northeast (Jonesboro): Tom Frank, PharmD, Director; 870/972-9603

AHEC Northwest (Fayetteville/Springdale): Robert Gullett, MD,
Director; 479/521-8269

AHEC South Arkansas (El Dorado): Mel Fratzke, PED, Director; 870/862-2489

AHEC Southwest (Texarkana): William McIntyre, PharmD, Director;
870/779-6000

Delta AHEC (Helena): Becky Hall, EdD, Director; 870/572-2727

Arkansas Health Careers

Arkansas needs more health care workers!

Along with the beautiful Boston and Ozark Mountains, the bountiful rice fields, and valleys of rich farm land, Arkansas has its share of health problems. These health-related problems include:

- Poor access to medical care for people who do not have health insurance
- Lack of transportation to physicians, dentists, and other health care providers
- Insufficient services for new mothers and children
- Limited medical services for the chronically ill and elderly, particularly those who are poor and uninsured
- Lack of health promotion and disease prevention education
- High teenage pregnancy rates
- Inappropriate use of hospital emergency rooms for regular primary care services

One look at the Arkansas map on this page and the point is clear—many Arkansans live in a Health Professional Shortage Area or HPSA.

What is a “HPSA”?

Generally speaking, a Health Professional Shortage Area (HPSA) is designated if there is a lack of health care professionals in the area to meet the population’s need for various health care services. Arkansas’s Health Professional Shortage Areas are determined by the Arkansas Division of Health. The following criteria are used to identify these areas: excessive population to provider ratios; isolation from resources due to distance, rugged terrain, over-utilization, or discrimination; infant mortality ratio; and the percentage of population earning income at or below the established poverty level. Communities in these areas desperately need primary care physicians (physicians trained in family medicine, general internal medicine, general pediatrics, general surgery, or obstetrics and gynecology), plus a variety of allied health professionals. This map shows the primary care HPSA’s in Arkansas.

To view maps of Arkansas HPSA’s, go to the website of the Office of Rural Health/Primary Care: http://www.healthyarkansas.com/rural_health/orhpc_web_page.htm.



What does the health care shortage mean to you?

It is an important opportunity! If you choose a health career, these areas can offer you employment and the satisfaction in knowing that you are having an effect on the lives of the citizens of these communities. When you choose a health career, the rewards are many—good pay, flexible hours, steady employment, and the good feelings that comes from helping others. These benefits, along with the fact that Arkansas needs health care professionals, provide you with a unique opportunity. Make a difference in Arkansas—choose a health career!

Considering a career in health care? What you need to know...

How can the Arkansas Health Careers Guide help me?

The manual is a comprehensive resource guide. It provides information on health-related careers, including work activities, educational requirements, and the locations of training programs in Arkansas.

Why should I consider a health care profession?

Many people choose health-related fields because they like to help others and because the work can be very exciting. However, other important factors are job availability, security, and compensation. Many health care workers earn more money and have better benefits than equally-trained people working in other fields. Like many states, Arkansas has a shortage of trained health care workers, which means that there are more jobs than there are health professionals to fill them.

I don't like the sight of blood; is there a health career for me?

Yes. As a matter of fact, about one-third of the people in health careers listed in this manual never come in contact with blood, and some don't have direct contact with patients.

Do all health-related careers require a college degree?

No. Educational requirements vary according to profession and an employer's needs. Some professions require a high school diploma and a few months of training, while others require a doctoral degree.

How much money do health care workers make?

Salaries vary greatly, depending on the education required, length of service, experience, and the location of your employer. For example, salaries in urban areas may be higher than in rural areas, but the cost of living in a city also is higher. Many practicing health professionals say that the reward from helping others is a greater compensation than any monetary benefit.

Is it possible to gain experience or "try out" a career, before I decide to pursue one?

Volunteering for health-related institutions or organizations is an excellent way to explore a range of health careers. Apprenticeships are available for certain careers; contact the Apprenticeship Program Manager, Vocational and Technical Education Division of the Arkansas Department of Education for more information.

How can I get more information on specific careers?

Review the job descriptions in this manual for addresses and phone numbers of individuals and organizations who have agreed to provide additional career information.

I can't afford to pay for education or training. Is financial aid available?

Detailed information on loans, scholarships, grants, loan forgiveness and other resources is available at www.arscholarships.com, <http://dwe.arkansas.gov/LoanForgiveness/atcslfp.htm>, www.arkansasnext.com, or call 1-800-54-STUDY or 501-371-2050. Because Arkansas is experiencing a shortage of health care workers, some hospitals may be willing to pay for your training if you agree to work for them for a set period of time.

Key to Abbreviations – Post-Secondary Institutions

FOUR-YEAR COLLEGES (Public)

ASUJ: Arkansas State University

ATU: Arkansas Tech University

HSU: Henderson State University

SAUM: Southern Arkansas
University at Magnolia

UAF: University of Arkansas at
Fayetteville

UAFS: University of Arkansas at
Fort Smith

UALR: University of Arkansas at
Little Rock

UAM: University of Arkansas at
Monticello

UAMS: University of Arkansas for
Medical Sciences

UAPB: University of Arkansas at
Pine Bluff

UCA: University of Central Arkansas

FOUR YEAR COLLEGES (Private)

ABC: Arkansas Baptist College

CBC: Central Baptist College

HU: Harding University

HC: Hendrix College

JBU: John Brown University

LC: Lyon College

OBU: Ouachita Baptist University

PSC: Philander Smith College

UO: University of the Ozarks

WBC: Williams Baptist College

TWO-YEAR COLLEGES (Public)

ANC: Arkansas Northeastern
College

ASUB: Arkansas State University at
Beebe

ASUM: Arkansas State University at
Mountain Home

ASUN: Arkansas State University at
Newport

ASUS: Arkansas State University at
Searcy

BRTC: Black River Technical
College

CCCUA: Cossatot Community
College of the U of A

EACC: East Arkansas Community
College

MSCC: Mid-South Community
College

NPCC: National Park Community
College

NAC: North Arkansas College

NWACC : North West Arkansas
Community College

OUTC: Ouachita Technical College

OZC: Ozarka College

PCCUA: Phillips Community
College of the U of A

PTC: Pulaski Technical College

RMCC: Rich Mountain Community
College

SACC – South Arkansas Community
College at El Dorado

SAUT: Southern Arkansas
University Tech at Camden

SEAC: Southeast Arkansas College

TC: Texarkana College

UACCB: University of Arkansas
Community College at Batesville

UACCH: University of Arkansas
Community College at Hope

UACCM: University of Arkansas
Community College at Morrilton

UAMCTC: University of Arkansas-
Monticello College of Technology
at Crossett

UAMCTM: University of Arkansas-
Monticello College of Technology
at McGehee

TWO-YEAR COLLEGES (Private)

CRC: Crowley's Ridge College

RC: Remington College

SC: Shorter College

TECHNICAL INSTITUTES AND VOCATIONAL TECHNICAL SCHOOLS (Public)

AVTI – Arkansas Valley Technical
Institute of ATU at Ozark

ASUTCMT – Arkansas State
University Technical College at
Marked Tree

CRTI: Crowley's Ridge Technical
Institute

ITT: ITT Technical Institute

NTI: Northwest Technical Institute

OTHER

BHS: Baptist Health School

SVI: St. Vincent Infirmary School

Key to Abbreviations – Types of Degrees

Abbreviation	Degree Program
C	Certificate (or diploma) of proficiency awarded for completing 15 semester credit hours or less; requires less than a year of school
Tech C	Technical Certificate or Diploma awarded for completing a program of at least one but, less than two, full academic years
A	Associate Degree awarded after at least two but, less than four, academic years of study
Adv C	Advanced Certificate awarded for finishing advanced technical courses in a technical specialty; requires an associate degree or higher and/or certification in the specialty
B	Baccalaureate (or Bachelor's) Degree awarded for completing four to five years of full-time college work
M	Master's Degree awarded for completing up to two years of study beyond a bachelor's degree
S	Specialist Degree or Certificate awarded for studies beyond the master's level; do not meet academic requirements for a doctorate
D	Doctoral Degree awarded upon completion of an educational program at the graduate level leading to a doctoral degree; law and medical degrees are included
ACM	Academic Common Market*

*If the public institutions in Arkansas do not offer degree programs in your desired field of study, it may be possible to arrange a waiver of out-of-state tuition to attend a cooperating public institution of higher education in another participating state. Arkansas is a member of the Southern Regional Education Board (SREB). Residents of a SREB state may participate in the SREB Academic Common Market (ACM), an agreement that enables students to pursue unique fields of study offered at public institutions in the other SREB states while paying in-state tuition. Savings to both states and students are significant. The state saves because the Common Market provides costly, specialized programs that otherwise would have to be duplicated. For more information about SREB, go to their website: www.sreb.org.

Visit the Arkansas Department of Education website to learn more about the Arkansas Health Education Grant Program: www.arkansashighered.com/arheg.html

Table of Contents

Welcome.....	1
Arkansas Health Careers	2
Considering a career in health care? What you need to know	3
Key to Abbreviations.....	4
Acknowledgements	7
I. Clinical Laboratory Sciences	8
A. Cytotechnologist	8
B. Histology Personnel	9
C. Medical Laboratory Personnel	10
D. Phlebotomist.....	11
II. Counseling and Mental Health	12
A. Counselor	13
B. Psychologist	15
C. Social Worker	16
III. Dentistry	17
A. Dental Assistant.....	18
B. Dental Hygienist	19
C. Dentist	20
IV. Radiology	21
A. Imaging Technician.....	22
B. Nuclear Medicine Technologist	23
C. Radiation Therapist	24
D. Radiologic Technologist	25
E. Medical Dosimetrist.....	26
V. Dietetics and Nutrition	27
A. Dietetic Technician	27
B. Dietitian	28
VI. Health Administration	30
A. Health Services Administrator	30
B. Nursing Home Administrator	32
VII. Health Information and Communication	33
A. Health Information Manager	33
B. Health Sciences Librarian.....	35
C. Medical Illustrator	36
D. Medical, Science, Technical Writer	37
VIII. Medicine.....	38
A. Chiropractor	38
B. Physician	39
C. Physician Assistant.....	41
D. Podiatrist	42
IX. Medical Office Personnel.....	44
A. Medical Assistant	44
B. Medical Secretary	45
C. Medical Office Manager.....	46
X. Nursing	47
A. Licensed Practical Nurse	47
B. Nurse Anesthetist.....	49
C. Nursing Assistant.....	50
D. Nurse Midwife.....	51
E. Nurse Practitioner	52
F. Registered Nurse.....	53

XI. Pharmacy	54
A. Pharmacist	55
B. Pharmacy Technician	56
XII. Public Health	57
A. Environmental Health Specialist	57
B. Epidemiologist.....	58
C. Health Educator	59
XIII. Science and Engineering	60
A. Biomedical Engineer	61
B. Biomedical Equipment Technician.....	62
C. Industrial Hygienist	63
D. Research Scientist	65
XIV. Therapy	66
A. Audiologist or Speech-Language Pathologist	67
B. Creative Arts Therapy Careers	67
C. Occupational Therapy Careers	69
D. Physical Therapy Careers.....	70
E. Respiratory Care Careers	72
F. Recreational Therapist	73
XV. Veterinary Medicine	74
A. Veterinarian.....	75
B. Veterinary Technician	76
XVI. Vision Care	77
A. Ophthalmic Medical Technologist	78
B. Optical Laboratory Mechanic	79
C. Optician	79
D. Optometric Assistant/Technician	80
E. Optometrist	81
XVII. Special Technologies and Services	83
A. Athletic Trainer	83
B. Emergency Medical Technicians (EMTs) and Paramedics	84
C. Gerontologist	88
D. Orthotist/Prosthetist.....	89
E. Perfusionist	91
F. Surgical Technologist	91

Acknowledgements:

Reprinting of this manual has been funded by:
University of Arkansas for Medical Sciences
Area Health Education Centers (AHEC) Program
Regional Programs
4301 W. Markham, Slot 599
Little Rock, AR 72205-9985
(501) 686-5260

October 1, 2006

Copyright permission was obtained from the Virginia Health Council, Inc. for portions of this text.

I. Clinical Laboratory Sciences

A. Cytotechnologist page 8

B. Histology Personnel page 9

C. Medical Laboratory Personnel..... page 10

D. Phlebotomist..... page 11

Diseases and disorders of the human body can be detected by laboratory examination of body fluids and tissues. Diagnosis of diseases, such as leukemia, diabetes, anemia, acquired immune deficiency syndrome (AIDS), and bacterial or parasitic infections, can be made by using sophisticated methods of analysis and evaluation. In addition, laboratory examinations can detect pregnancy, show the presence and amount of various drugs or alcohol in the body, and determine blood type. Microscopic examination of the tissues in the body is used in the diagnosis of diseases, tumors, and abnormalities of all the organs.

Clinical laboratory personnel conduct and evaluate these procedures in order to provide the physician with the information necessary to make an accurate diagnosis. Technologists and technicians provide a wide range of laboratory services depending upon their skill and education. Tests may be routine or highly complex analyses using the most advanced technology and equipment available.

Many careers and specialties are available in the clinical laboratory with educational requirements ranging from two years of training after high school to several years of postgraduate training.

A. Cytotechnologist

Cytotechnologists, who have specialized training, prepare slides of body cells and microscopically examine these cells for abnormalities which may signal the beginning of a cancerous growth. Examination of pap smears is a major role for cytotechnologists.

Work Activities

- Preparing slides of cell samples for examination by using special staining techniques that make the cells easier to differentiate
- Examining smears of cell samples on slides using a microscope
- Detecting abnormal hormone conditions
- Recognizing minute abnormalities in the color, size, and shape of cellular components and patterns

Work Settings

Most Cytotechnologists work in hospitals, clinics, or private laboratories under the supervision of a pathologist. Different kinds of diseased tissue specimens and unpleasant odors often are present, but few hazards exist because safety procedures generally are employed in laboratories. Some Cytotechnologists work in a university setting as professors or researchers.

Special Requirements

Persons interested in a clinical laboratory career should be careful about selecting an educational program. Prospective employers, such as hospitals and independent laboratories, may have preferences as to program accreditation. The program offered at the University of Arkansas for Medical Sciences is a fully accredited program. Educational programs should be able to provide

information about the kinds of jobs obtained by graduates, the length of time the program has been in operation, instructional facilities, and faculty qualifications.

Educational Institutions

UAMS(B)

For more information, contact:

Arkansas Association for Cytology

University of Arkansas for Medical Sciences
Department of Pathology
4301 W. Markham, Slot 517
Little Rock, AR 72205
(501) 686-6540

American Society of Clinical Pathologists Board of Registry

2100 West Harrison St.
Chicago, IL 60612-3798
(312) 738-1336
www.ascp.org

B. Histology Personnel

Histologic Technicians and **Histotechnologists** prepare human or animal tissue samples for microscopic and other types of examination for use in diagnosis, research, or instruction. This work enables pathologists to diagnose dysfunction, disease, and malignancy.

Histotechnologists, also called Histologists, perform complex procedures and often are supervisors or instructors. Histologic Technicians cut and stain tissue specimens for microscopic examination by pathologists and assist Histotechnologists.

Work Activities

- Preparing sections of body tissue for diagnostic, research, or teaching purposes
- Embedding pieces of tissue in wax, then slicing very thin sections using a microtome
- Mounting thinly-sliced tissue onto a glass slide for microscopic study
- Processing tissue sections by fixation, dehydration, decalcification, microincineration, and staining
- Identifying tissue structures and cell components
- Managing and supervising the histology laboratory

Work Settings

Most Histologic Technicians and Histotechnologists work in the pathology laboratory of a hospital or clinic. Some may work in medical or research laboratories. Specimens of diseased tissue and hazardous, odorous chemicals are encountered daily. However, strict precautionary procedures are used to assure safety and minimize risks.

Special Requirements

In Arkansas, histologic technicians may complete an accredited program in histotechnology. In addition, they are expected to pass an examination given by the American Society of Clinical Pathologists (ASCP). To be certified by the ASCP, Histotechnologists must have a bachelor's degree in an approved major. Then, either one year of experience in a histopathology laboratory or the completion of a formal histologic technology educational program is required.

Educational Institutions

BHS (C)

For more information, contact:
National Society for Histotechnology
4201 Northview Drive, Suite 502
Bowie, MD 20716-2604
(301) 262-6221
www.nsh.org

C. Medical Laboratory Personnel

Medical Laboratory Technicians and **Medical Technologists** perform essential laboratory testing that is critical to the detection, diagnosis, and treatment of diseases. Their work includes the use of microscopes, chemicals, computers, and complex laboratory equipment and instruments. They can perform tests in all sections of the laboratory including hematology, bacteriology, chemistry, urinalysis, serology, immunohematology, forensic pathology, immunology and toxicology. Medical Laboratory Technicians perform procedures that require less technical or theoretical knowledge than those performed by Medical Technologists.

Work Activities

Medical Laboratory Technicians' activities may include:

- Performing laboratory procedures used in the diagnosis and treatment of disease
- Collecting blood specimens
- Using laboratory equipment, such as microscopes and computerized instruments, for automated analyses
- Inoculating culture media to identify bacteria
- Monitoring the quality control of tests and procedures
- Reporting unusual or abnormal results to a Medical Technologist or pathologist

In addition to any testing that can be performed by Medical Laboratory Technicians, Medical Technologists' activities may include:

- Performing complex and sophisticated laboratory analyses
- Evaluating the effects that a patient's physiological condition may have on the results of the tests performed
- Confirming test results and providing the physician with the necessary data to determine the presence, extent, cause, and treatment of the disease
- Designing, establishing, and monitoring quality control programs to ensure the accuracy and reliability of test results
- Assuming the responsibility for accurate results

Career Specialties

Most **Medical Technologists** and **Medical Laboratory Technicians** are generalists who work in all areas of the laboratory. With additional education, they can become specialists in particular areas of laboratory work, including:

Clinical Chemistry: qualitative or quantitative analyses of the chemical constituents of body fluids, including toxic substances, cholesterol, drugs and alcohol, blood sugar, and enzymes.

Hematology: analysis of blood cells and plasma to detect diseases, such as leukemia and anemia.

Immunohematology: study of antigens and antibodies found on blood cells and in plasma in order to provide safe blood and blood products for transfusion.

Microbiology: identification and evaluation of the bacteria, viruses, fungi, and parasites associated with infectious diseases.

Immunology (Serology): analysis of serum and body fluids in order to study the body's immune response to infectious and autoimmune diseases.

Work Environment

Medical Laboratory Personnel work as part of a team. Medical Laboratory Technicians and Phlebotomists (persons who are trained to collect blood samples) are supervised by Medical Technologists. Medical Technologists are supervised by the Chief Medical Technologist or Laboratory Director and the pathologist.

Most Medical Laboratory Personnel work in hospital laboratories. Many are employed by private physicians, public health laboratories, medical research facilities, pharmaceutical companies, universities, industrial medical laboratories, and the armed forces. Hazards include working with diseased tissues, close contact with patients who have infectious diseases, exposure to toxic agents, and unpleasant odors. Risks are minimized by properly handling materials and using approved safety precautions.

Special Requirements

Medical Technologists are required to have a bachelor's degree plus clinical training or a bachelor's degree in medical technology. Medical Laboratory Technicians are required to have an associate degree in medical laboratory technology that includes clinical training. In addition, technician or technologist candidates must pass a national certification examination given by the Board of Registry of the American Society of Clinical Pathologists, the National Certification Agency for Medical Laboratory Personnel, or the American Medical Technologists. It is recommended that a counselor be consulted for advice on coordinating certification pursuits with career goals.

Educational Institutions

Medical Laboratory Technologists and Medical Laboratory Technicians: ASUJ, ASUB, BHS, NAC, NPCC, PCCUA, SACC, UAFS (All A); ATU, BHS, HSU, HU, NWACC, PCCUA, SAUM, UACCB, UACCH, UAMS (All B)

For more information, contact:

Arkansas Society for Medical Technology
University of Arkansas for Medical Sciences
College of Health Related Professions
4301 W. Markham, Slot 597
Little Rock, AR 72205

American Society for Clinical Laboratory Science (ASCLS)
7910 Woodmont Ave., Suite 530
Bethesda, MD 20814
(301) 657-2768
www.ascls.org

D. Phlebotomist

Also known as **Registered Phlebotomy Technicians (RPTs)**, phlebotomists are medical laboratory technicians whose primary role is to collect blood samples directly from the patient. Using safe and minimally painful techniques, the phlebotomist draws blood and keeps careful records of all procedures. Blood may be collected for work in a clinical laboratory or may be drawn for blood bank collection. Safety precautions are of utmost concern to phlebotomists due to the nature of their work.

Work Activities

Phlebotomists are usually employed by hospital laboratories, private laboratories, clinics, large medical offices, and blood banks. They are supervised by medical technologists and are trained to

apply tourniquets, locate veins and insert needles to draw blood. Some phlebotomists are also trained to conduct interviews, take vital signs and draw blood samples to screen blood donors.

Work Settings

Phlebotomists may be employed in hospital laboratories, blood banks, blood donation centers, doctors’ offices, clinics and nursing homes. In hospitals, phlebotomists may be needed around the clock, while other settings may be more conducive to typical business hours. Full-time as well as part-time employment is possible.

Special Requirements

In addition to a high school diploma, interested individuals should enroll in an approved phlebotomy training program or have one year of experience in a laboratory setting. There are one year programs at community colleges that offer associate degrees. American Medical Technologists (AMT) conducts the certification examination and awards the Registered Phlebotomy Technician title.

Educational Institutions

ASUMH, NAC, NPCC, PCCUA, UACCH (C)

For more information contact:

American Society for Clinical Laboratory Science (ASCLS)
7910 Woodmont Ave., Suite 1301
Bethesda, MD 20814
(301) 657-2768
www.ascls.org

American Society of Clinical Pathologists
2100 W. Harrison St.
Chicago, IL 60612-3798
www.ascp.org

II. Counseling and Mental Health

- A. Counselor..... page 13**
- B. Psychologist page 15**
- C. Social Worker page 16**

Health maintenance and restoration can be affected by social, economic, and environmental factors. Social workers, through direct counseling and referral services, deal with the emotional, cultural, social, and physical needs of the elderly, homeless, unemployed, disabled, seriously ill, and handicapped. Medical social workers frequently care for the mentally ill. Social workers help their clients to accept situations that cannot be changed or to rebuild their lives by making constructive and meaningful changes. Social workers must have at least a bachelor’s degree.

Counselors aid people with social, educational, or personal problems. School and career counselors help students to evaluate their interests and abilities and to plan a career, as well as counsel them about social and personal problems. Employment counselors evaluate an individual’s education and skills and help the person locate and apply for a job. Rehabilitation counselors help those who are physically or mentally impaired to become more self-sufficient and productive. Mental health counselors deal with personal, family, or work problems, or with criminal behavior.

Psychologists provide counseling and therapy to groups and individuals who suffer emotional, learning, or behavioral problems. They may work in a variety of settings, including schools,

clinics, hospitals, or private practice. Psychologists and counselors are required to have a graduate degree.

A. Counselor

Counselors assist individuals and groups with mental health issues concerning self-understanding, self-esteem, life roles, and relationships. Counselors work with many issues, including mental health, school, college, career, employment, rehabilitation, aging, substance abuse, and marriage and family. Counselors help people to make decisions and accept responsibility for them, to accept responsibility for their behavior, and to adjust to or change life situations.

Work Activities

- Conducting intake interviews with an individual or a group to determine the problem area and the focus of the counseling (This procedure can include testing - personality, aptitude, achievement, and psychological - observation, and interviewing.)
- Formulating a treatment plan to accomplish the client's goals
- Counseling individuals, groups, marriage partners, or families
- Assisting others in understanding and overcoming social, emotional, and psychological problems
- Using appropriate therapies that improve the functioning of the client
- Referring clients to other professional or community resources
- Conducting workshops in special subjects, such as assertiveness, career development, job search skills, interpersonal relationships, relaxation and stress management, coping skills, and wellness
- Maintaining records of tests and counseling sessions.
- Teaching counselor education classes at universities and colleges
- Conducting research and reporting results in professional journals

Career Specialties

Counselors may specialize in the following areas:

Mental Health Counselors work with individuals and groups to promote optimum mental health. They work therapeutically with individuals to deal with such concerns as: addictions and substance abuse; family, parenting, and marital problems; suicide; stress management; self-esteem; issues associated with aging; job and career concerns; educational decisions; and issues of mental and emotional health. Mental Health Counselors work closely with other mental health specialists, including psychiatrists, psychologists, and social workers.

Genetic Counselors provide information and support to individuals who have birth defects or genetic (inherited) disorders, or who are at risk for such conditions. Genetic Counselors may conduct scientific research on factors that cause disorders and on possible treatments, or they may counsel families and individuals on coping with the disorders.

Marriage and Family Counselors work with individuals, partners, and families to promote the highest level of functioning within the family unit. While focusing mainly on family and marital problems, Marriage and Family Counselors may deal with the same issues as mental health counselors.

Rehabilitation Counselors help persons deal with the impact of their disabilities on their personal lives and their jobs. They evaluate the clients' disabilities and potential for employment by interviewing the clients and their families, reviewing school and medical reports, and conferring with physicians, psychologists, occupational therapists, employers, and others.

The goal of these counselors is to work toward increasing their clients' capacities to adjust and live independently.

School and College Counselors help students to understand and deal with social, behavioral, and personal problems. They provide students with life skills necessary to deal with problems before they occur and to enhance personal, social, and academic growth. Another goal for School and College Counselors is to help students understand their abilities, interests, talents, and personality traits so they can develop realistic academic and career options. These Counselors may also manage career information centers and educational programs. High School Counselors provide advice on college admission requirements, entrance exams, financial aid, and trade/technical school and apprenticeship programs. Elementary School Counselors confer with elementary teachers, administrators, and parents on developmental issues and special needs of children.

Career and Employment Counselors help individuals make wise career decisions. They help clients explore and evaluate personality traits, interests, skills and abilities, education, training, and work history through counseling sessions and testing. They also help people to develop job-seeking skills and assist them in locating and applying for jobs.

Work Settings

Counselors work in a variety of public and private settings, including mental health clinics, social agencies, health care facilities, job training and vocational rehabilitation centers, correctional institutions, residential care facilities, halfway houses, group homes, and elementary, secondary, and postsecondary schools. They also work in substance abuse facilities and federally- and state-funded agencies that engage in community life improvement. A growing number of counselors are employed in private practices, health maintenance organizations, and group practices.

Special Requirements

Employment as a Counselor usually requires a minimum of a master's degree. The most common requirements to enter a graduate program in counseling include completing a bachelor's degree with an acceptable grade-point average, taking the Graduate Record Examination, and having teaching or other professional experience. State certification is also required.

Educational Institutions

Counseling: ASUJ, SAUM, UAF, UALR (all M); ASUJ, UAF (S); UAF (D)

Rehabilitation Counseling: ASUJ, UAF, UALR (M); UAF (M & D)

Genetic Counseling: UAMS (M)

For more information, contact:

National Association of Alcoholism & Drug Abuse Counselors

1911 N. Fort Myer Dr., Suite 900
Arlington, VA 2209
(703) 741-7686
www.naadac.org

American Counseling Association

5999 Stevenson Avenue
Alexandria, VA 22304
(800) 347-6647
www.counseling.org

National Society of Genetic Counselors

233 Canterbury Drive
Wallingford, PA 19086-6617
(610) 872-7608
www.nsgc.org

Arkansas Board of Examiners in Counseling

P.O. Box 70
Magnolia, Arkansas 71754-0070
(870) 901-7055
www.state.ar.us/abec

B. *Psychologist*

Psychologists study the behavior of people and animals in order to understand, compare, and explain the way that they act and respond. They collect and apply knowledge related to the mental, emotional, and behavioral characteristics of individuals and groups.

Work Activities

- Diagnosing and treating psychological problems
- Collecting data through interviews, case histories, and observational techniques
- Developing, selecting, administering, and interpreting psychological tests, questionnaires, surveys, and experiments
- Counseling individuals and groups
- Conferring with parents, teachers, counselors, administrators, and others
- Determining the effectiveness of treatments through follow-up procedures
- Conducting research and developing and evaluating mental health programs
- Serving as a consultant to social, educational, medical, or other agencies
- Writing for professional and trade journals or other media
- Teaching in colleges and universities

Career Specialties

Clinical Psychologists evaluate, diagnose, and treat mentally and emotionally disturbed people. They also are concerned with the prevention of mental and emotional disorders.

Educational Psychologists design, develop, and evaluate techniques and materials to solve problems in training programs.

School Psychologists evaluate the needs of average, gifted, and physically or mentally challenged students. They make suggestions about placing disabled and/or emotionally impaired students within an educational system, and they recommend implementation of the appropriate programs.

Developmental Psychologists investigate the emotional, mental, physical, and social growth and development of humans.

Social Psychologists study human relationships to gain understanding of individual and group thought, feeling, and behavior.

Industrial and Organizational Psychologists develop and apply psychological techniques to personnel administration, management, and marketing problems.

Psychologists may specialize in teaching, research, therapy, or community service. Other specialties include: counseling, rehabilitation, community health, physiology, and psychopharmacology. They may specialize in working with specific age groups or persons with certain psychological problems.

Work Settings

Psychologists work alone, with other Psychologists, or with psychiatrists and other physicians. Employment settings include college classrooms and laboratories, hospitals, correctional institutions, clinics, private offices, industries, schools, businesses, and government agencies.

Special Requirements

A doctoral degree is generally required for employment as a Psychologist. Psychologists with doctorates (Ph.D. or Doctor of Psychology - Psy.D.) qualify for a wide range of responsibilities, such as research, clinical and counseling positions in universities, private industry, school settings, and government.

Persons with a master's degree can administer and interpret tests as Psychological Assistants. Under the supervision of psychologists, they can conduct research in laboratories, conduct psychological evaluations, counsel patients, or perform administrative duties. They may teach in 2-year colleges or work as school psychologists or counselors with appropriate state certification.

A bachelor's degree qualifies a person to assist psychologists and other professionals in community mental health centers, vocational rehabilitation offices, and correctional programs, or work as a research assistant.

Educational Institutions

School Psychologist: UCA (M &D)

Family Psychologist: WBC (B)

General Psychologist: ASUJ, ATU, HC, HSU, HU, JBU, LC, PSC, OBU, SAUM, UAF, UAFS, UAM, UALR, UAPB, UCA, UO, WBC (All B); UAF (M & D)

Applied Psychologist: UALR (M)

Counseling Psychologist: UCA (M)

For more information, contact:

Arkansas Psychological Association

1123 South University, Suite 235

Little Rock, AR 72204

(501) 614-6500

www.arpapsych.org

American Psychological Association

750 First Street, NE

Washington, DC 20002-4242

(202) 336-5500

www.apa.org

C. Social Worker

Social Workers assist individuals and groups with problems, such as poverty, illness, drug abuse, child and spousal abuse, financial management, and inadequate housing. Social Workers apply their knowledge and skills to form relationships that use an individual's capabilities as well as community resources.

Work Activities

- Interviewing and counseling individual clients and families regarding their physical, social, and psychological concerns
- Evaluating information to determine the nature and degree of the client's problems
- Compiling records of the client's activities, reactions, progress, and indications of accountability
- Assisting clients in improving personal and social functioning by helping them to secure services, education, and training
- Improving services through community and organizational changes
- Organizing job clubs and making referrals to job placement agencies
- Referring clients to other professional or community resources
- Coordinating or working with civic, religious, business, and union organizations to combat social problems through community programs

Career Specialties

Social Workers usually specialize in casework, group work, or community organizations, but some are involved with all three. They may specialize in addressing specific problems, such as substance abuse, or in working with special groups, such as the elderly.

Medical Social Workers and Psychiatric Social Workers help patients and their families with problems that accompany illness or inhibit recovery and rehabilitation. They collect patient information to help other health professionals understand social, emotional, and environmental factors underlying patients' illnesses.

Work Settings

Social Workers often work independently, but may work as part of a team that includes physicians, psychologists, lawyers, nurses, therapists, teachers, the clergy, and other professionals concerned with a client's welfare. They also consult and work with members of a client's family.

Working conditions vary with the nature of the work, the type of employer, and the location. Social Workers are employed in agency offices, hospitals, clinics, schools, prisons, reformatories, or courts of law. Some of their duties may require travel. Social Workers may visit homes of clients in neighborhoods where conditions are unpleasant or dangerous. They may try to help persons who do not feel that they need help.

Special Requirements

A bachelor's degree is the minimum requirement for most positions. Besides the bachelor's degree in social work (BSW), undergraduate majors in psychology, sociology, and related fields satisfy hiring requirements in some agencies. BSW programs prepare graduates for direct service positions such as caseworker or group worker. A master's degree in social work (MSW) is generally necessary for positions in health and mental health settings. An MSW degree prepares graduates to perform assessments, to manage cases, and to supervise other workers. Advancement to supervisor, program manager, assistant director, and finally to executive director of an agency or department generally requires an MSW plus work experience. Licensing, certification, or registration regarding social work practice may be required for use of professional titles.

Educational Institutions

ASUJ, HU, PSC, SAUM, UAF, UALR, UAM, UAPB (All B); ASU, UAF, UALR (M)

For more information, contact:

**National Association of Social Workers,
Arkansas Chapter**
1123 South University, 1010
Little Rock, AR 72204
(501) 663-0658
www.naswar.org

National Association of Social Workers
750 First Street, NE, Suite 700
Washington, DC 20002-4241
(800) 638-8799
www.socialworkers.org

III. Dentistry

- A. Dental Assistant page 18**
- B. Dental Hygienist..... page 19**
- C. Dentist..... page 20**

Dentistry is concerned with the diagnosis, treatment, and prevention of problems associated with the hard and soft tissues of the mouth. The dental care team is dedicated to promoting optimal oral health by educating the public about good oral hygiene and nutrition.

The dentist examines the teeth, mouth, and associated tissues; diagnoses and treats diseases; restores defective teeth and tissue; and replaces missing teeth. Dental hygienists, dental laboratory technicians, and dental assistants play a major supporting role in these functions. Today, the roles

of dental hygienists and dental assistants are expanding in order to increase the dentist's productive capacity.

In this field, many opportunities are available in community health, private industry, research, dental product sales, private practice, health maintenance organizations (HMOs), the Peace Corps, or the military. Career opportunities are available for individuals with one year of post-high school training to several years of post-college education.

A. Dental Assistant

Dental Assistants aid dentists at the chairside during examination and treatment of patients. They may perform laboratory procedures, such as assisting in the construction of dentures and models of the teeth and mouth, and clerical duties.

Work Activities

- Obtaining and recording a patient's medical history
- Sterilizing and disinfecting instruments and equipment
- Preparing patients for dental treatment
- Arranging dental instruments, materials, and medications on chairside trays
- Assisting the dentist during a dental examination
- Keeping a patient's mouth dry by using a suction system
- Mixing and preparing materials, such as fillings and cements
- Assisting during oral surgery
- Performing laboratory procedures, such as pouring, trimming, and polishing study casts
- Providing oral hygiene education, such as instructing patients on a plaque control program
- Maintaining patient treatment records, scheduling appointments, and collecting fees for services

Work Settings

Dental Assistants work under the supervision of a dentist. They may work with a dental hygienist or a dental laboratory technician. Employment may include working in private dental offices, public health clinics, dental schools, the armed forces, hospitals, or nursing homes. Almost one-third of Dental Assistants work on a part-time basis.

Special Requirements

Dental Assistants in Arkansas are not required to be licensed or certified, unless their job requires that they take, develop, and mount X-rays, which requires passing an X-ray certification examination. They may be trained on the job or in formal one- or two-year programs.

Educational Institutions

ANC, PTC (C)

For more information, contact:

American Dental Assistants Association

35 East Wacker Drive, Suite 1730

Chicago, IL 60601-2211

www.dentalassistant.org

B. Dental Hygienist

Dental Hygienists are preventive oral health professionals licensed in dental hygiene who provide educational, clinical, and therapeutic services supporting total health through the promotion of optimal oral health. As part of a dental team, Dental Hygienists are responsible for providing treatment that helps to prevent oral diseases, such as dental caries (cavities) and periodontal disease (gum disease), and for educating the patient. They are knowledgeable especially about the preventive aspects of dental disease. Both associate and bachelor's degree programs are offered. Graduate education at the master's and doctoral degree levels provides additional opportunities for career advancement and for work in research, teaching, or administration.

Work Activities

- Examining the teeth and oral structures, including the soft tissue
- Removing calculus, stain, and plaque (hard and soft deposits) from above and below the gum line
- Applying caries-preventive agents, such as fluorides and fissure sealants, to the teeth
- Teaching plaque control and developing individualized oral hygiene programs for home care
- Exposing, processing, and interpreting dental X-rays
- Placing temporary fillings and periodontal dressings, removing sutures, and polishing and recontouring amalgam fillings
- Educating individual patients, the general public, and special population groups (e.g., geriatric, or mentally or physically handicapped populations) about the importance of good oral hygiene habits
- Designing and implementing community dental health programs

Work Settings

Dental Hygienists may work in such practice settings as private dental offices and dental clinics; federal, state, and local health departments or associated institutions; or hospitals and nursing homes. They may work for school districts, departments of education, or educational programs that teach dentistry, dental hygiene, and dental assisting.

Special Requirements

A Dental Hygienist must be licensed and is eligible for licensure after graduation from an educational program accredited by the American Dental Association's Commission on Dental Accreditation, and after successfully completing both a written National Board of Dental Hygiene Examination and a clinical examination.

Educational Institutions

UAFS, UAMS (A); UAMS (B)

For more information, contact:

Arkansas State Dental Hygienists' Association

2518 Frederick Drive
Conway, AR 72034
(501) 327-1159
<http://users.conwaycorp.net/moore/ad/asdha.htm>

American Dental Hygienists' Association

444 N. Michigan Avenue, Suite 3400
Chicago, IL 60611
(312) 440-8900
www.adha.org

C. Dentist

Dentists—Doctors of Dental Surgery (DDS) or Doctors of Dental Medicine (DDM) examine and treat patients who have diseases, injuries, or malformations of the teeth, gums, and mouth. They instruct patients about good oral health practices so that the patients can prevent gum disease and tooth loss.

Work Activities

- Diagnosing oral conditions
- Planning treatment to restore and maintain optimal oral health
- Administering anesthetics
- Locating and filling cavities
- Treating diseased gums
- Removing teeth that cannot be treated
- Replacing missing teeth
- Administering and prescribing antibiotics to prevent infection during and after dental procedures
- Fitting and providing dentures
- Teaching preventive care of teeth and gums

Career Specialties

Some **Dentists** teach or perform research at schools of dentistry as well as practice in clinics there. Others specialize in specific areas of dentistry, including the following:

Orthodontists prevent, diagnose, and correct irregularities that occur in the position of the teeth and in the development of the jaws by using fixed or removable appliances.

Oral Surgeons perform surgical operations on the mouth and jaws to remove teeth and tumors or other abnormal growths, and to correct abnormalities in the jaw or other oral structures.

Periodontists treat diseased tissues that support the teeth. They clean and polish the teeth and eliminate irritating edges of fillings. They may perform surgery to remove part of an infected or diseased gum.

Prosthodontists specialize in making artificial teeth or dentures. They correct natural and acquired deformations of the mouth and jaws.

Public Health Dentists participate in planning, organizing, and maintaining the dental health programs of public health agencies. They may perform dentistry on selected patients of all ages and assist in the operation of dental clinics.

Work Settings

Dentists work alone or with a dental hygienist, nurse, dental assistant, or dental laboratory technician. They may establish their own practices, become part of dental or medical groups, or work in hospitals or teaching institutions. Dentists may perform some work in their own laboratories.

Dentists may experience physical strain because they must stand or sit for long periods of time, frequently bending in awkward positions. Their work may be performed under difficult circumstances if the patient is frightened, upset, or in pain. They may be exposed to patients with infectious diseases, but risks are minimized by following standard safety precautions, such as wearing masks and gloves.

Special Requirements

To be considered for acceptance into a school of dentistry, an applicant must complete a pre dental program or its equivalent with an acceptable grade-point average. Other requirements include applying through the American Association of Dental Schools Application Service (AADSAS), taking the dental admissions test, and submitting other required letters and forms. To become licensed in Arkansas as a Dentist, a candidate must graduate from an approved dental school that has been accredited by the Commission on Dental Accreditation of the American Dental Association. Candidates may fulfill the written part of the state licensing by passing the National Board Dental Examinations. Individual states or regional testing agencies give the practical examinations.

Educational Institutions

(ACM) Louisiana State University, Meharry Medical College, University of Louisville, Texas A&M University HSC, University of Alabama, University of Missouri-Kansas City, University of Oklahoma, University of Tennessee
Pre Dental Studies: ATU, JBU (B)

For more information, contact:

Arkansas State Dental Association
2501 Crestwood, Suite 205
Little Rock, AR 72116
501-771-7650
www.dental-asda.org

American Dental Association
211 East Chicago Ave.
Chicago, IL 60611-2678
312-440-2500
www.ada.org

IV. Radiology

- A. Imaging Technician page 22**
- B. Nuclear Medicine Technologist page 23**
- C. Radiation Therapist..... page 24**
- D. Radiologic Technologist page 25**
- E. Medical Dosimetrist..... page 26**

Technological advances in instrumentation have helped to improve the quality of medical care. The development of new machines and techniques has led to earlier diagnosis of disease, more effective treatment, and easier maintenance of body functions. Technologists and technicians operate and monitor life-saving and life-sustaining equipment. These specialists use such techniques as magnetic resonance imaging (MRI), mammography, positron emission tomography (PET), computerized axial tomography (CAT), ultrasound, and radiography (X-ray) to show the presence of disease or injury by obtaining visual information about internal structures. They also use radioactivity lasers, or linear accelerators in the diagnosis or treatment of disease.

Training in the field of diagnostic and technical instrumentation varies depending upon the degree of sophistication of the instrumentation being used. Some careers require one or two years of education after high school, while many require a college degree plus additional training. New developments in equipment technologies should provide more jobs and career advancements for men and women trained in diagnostic assessment.

A. Imaging Technician

Imaging Technologists operate equipment that measures and records heart action by monitoring and graphically tracing the electrical activity occurring during a heartbeat. Physicians use the graphs (electrocardiograms) in diagnosing heart ailments, monitoring heart functions, and recording a patient's progress.

Work Activities

- Obtaining information for EKG records, including patient identification, history, and medication use
- Connecting electrodes to leads from the electrocardiograph machine with small clamps or screw attachments
- Moving the chest electrode across specific chest areas to record the pulse from electrodes
- Directing patients to perform physical exercise as specified by the physician
- Recognizing emergencies and assisting the physician in responding to them
- Identifying abnormal heart rhythms
- Pasting and labeling tracings on mounting cards and sending them to the physician for interpretation

Imaging Technologists who work in a physician's office may perform office duties, such as scheduling appointments, maintaining patients' files, and sending bills.

Career Specialties

With additional on-the-job training and experience, Imaging Technicians may operate one or more types of cardiognostic equipment and may be designated accordingly. The following are examples of some specialists:

Cardiac Catheterization Technologists insert a tube into a blood vessel and ease the tube forward into the heart so that the condition of the vessels and the heart can be examined with the aid of a television monitor.

Cardiopulmonary Technologists use invasive and non-invasive procedures to test the lungs and heart.

Cardiovascular Technologists measure and analyze heart functions using invasive and non-invasive procedures. The test data is used to determine the presence and extent of heart disease.

Echocardiograph Technicians use ultrasound diagnostic equipment to produce two-dimensional, ultrasonic patterns and positive pictures of the heart chambers and valves to detect problems, such as congenital defects.

Holter Monitoring Technicians monitor special electrocardiograms that are recorded on cassettes attached to patients for a 12- to 24-hour period in order to record irregular heart action.

Stress-Testing Technicians use cardiognostic equipment to record heart activity during physical exercise.

Work Settings

Imaging Technicians often work under the direction of a cardiologist and may supervise the training of less experienced Imaging Technicians. Frequently, the work is done somewhat independently in patient care areas. Conscientious and accurate work is required. Imaging Technicians work in hospital laboratories, clinics, or doctors' offices. Because imaging equipment is movable, they may work at a patient's bedside if the patient's condition warrants it.

Special Requirements

The minimum educational requirement for Imaging Technicians is high school graduation or its equivalent. Often, three to six months of on-the-job training under the supervision of an experienced Imaging Technician or a cardiologist is required. Cardiovascular technologists require specialized instruction and must complete two to four years of study at an accredited community or junior college.

Educational Institutions

None in Arkansas

For more information, contact:

Alliance of Cardiovascular Professionals

Thalia Landing Offices, Bldg. 2
4356 Bonney Road, #103
Virginia Beach, VA 23452-1200
(757) 497-1225
www.acp-online.org

American Society of Echocardiography

1500 Sunday Drive, Suite 102
Raleigh, NC 27607
(919) 861-5574
www.asecho.org

B. Nuclear Medicine Technologist

Nuclear Medicine Technologists prepare, measure, and administer radiopharmaceuticals (radioactive materials) that are used to detect and treat disease.

Work Activities

- Reviewing physicians' orders and patients' records to determine when a procedure is required
- Preparing various radiopharmaceuticals, calculating the correct dosage, and administering the appropriate material to the patient
- Evaluating the patient's condition and explaining the procedure to the patient
- Positioning and adjusting the equipment over the body area to be studied; operating the imaging systems to perform the procedure
- Using radioactive substances to perform laboratory tests on specimens from the body
- Using quality control techniques to assure the quality of radiopharmaceuticals and to ensure the efficient and effective operation of equipment

Some Nuclear Medicine Technologists may have laboratory, research, and/or administrative duties.

Work Settings

Nuclear Medicine Technologists report to a supervisor or a nuclear medicine physician. Technologists usually work alone when operating equipment and conducting laboratory tests. Work usually is performed in a specialized laboratory or other hospital or clinical setting. A potential hazard of exposure to radiation exists while preparing doses and handling body products that contain radioactive isotopes. However, using protective lead shielding and constantly monitoring the laboratory with radiation detectors help to safeguard the work surroundings. Specially designed film badges are worn by all nuclear medicine personnel to measure radiation exposure. All workers wear disposable gloves and use special equipment when preparing radiopharmaceutical doses. Rigid adherence to established laboratory techniques and standards of the Nuclear Regulatory Commission minimize hazards.

Special Requirements

Nuclear Medicine Technologists must be certified or be eligible for certification before employment in Arkansas. Two associations that offer certification for the Nuclear Medicine Technologist are the American Registry of Radiologic Technologists and the Nuclear Medicine Technologists Certification Board of the Society of Nuclear Medicine.

Educational Institutions

Nuclear Medicine Technologist/Technician: ASUJ, BHS, UAMS, UCA (B)

For more information, contact:

Nuclear Medicine Imaging Sciences Program

Department of Imaging and Radiation Sciences
University of Arkansas for Medical Sciences
4301 West Markham Street, # 714
Little Rock, Arkansas 72205
Phone: (501) 686-6848

Society of Nuclear Medicine

1850 Samuel Morse Drive
Reston, VA 20190-5316
(703) 708-9000
www.snm.org

C. Radiation Therapist

Radiation Therapists assist radiation oncologists (physicians who use radiation to treat cancer) in administering radiation treatment by exposing specific areas of the patient's body to ionizing radiation. They must exercise judgment in protecting themselves and the patient from unwanted radiation.

Work Activities

- Assisting the oncologist in planning treatment procedures, including tumor localization and dosimetry (dose determination)
- Helping the patient assume the correct position for treatment and monitoring the patient during the treatment
- Administering radiation therapy according to the prescription and instructions of the oncologist using a variety of therapeutic equipment
- Attending to the patient's needs and monitoring the patient's responses to therapy in order to note and report any unusual or adverse reactions
- Applying principles of radiation physics and safety to limit radiation exposure of the patient and self
- Recording patients' treatments accurately

Work Settings

Most Radiation Therapists work in hospitals. Qualified professional may work in private offices, public health and governmental facilities, or cancer treatment centers. Radiation hazards exist but are minimized by adhering to strict procedures and using protective equipment.

Educational Requirements

Formal training programs are the most popular means of entrance into this field. A training option for radiographers interested in pursuing a career in radiation therapy is the one-year certificate program. For others not already involved in the radiologic field, training options include a two-year hospital certificate program, a two-to three-year associate's degree, or a four-year bachelor's degree from a college or university. Licensure of radiation therapists was required by 26 states in 1995, and most employers prefer the therapist to be voluntarily certified. The American Registry

of Radiologic Technologists offers the ARRT certification for radiation therapy technologists as well as for radiographers. A biannual continuing education requirement must be completed.

Educational Institutions

ASUJ, UAMS (B)

For more information, contact:

Association of Freestanding Radiation Oncology Centers

1875 I Street NW, 12th Floor

Washington, DC 20006

888-334-4542

<http://afroc.org>

D. Radiologic Technologist

Radiologic Technologists, also called **Radiographers** or **X-Ray Technologists**, assist radiologists in the use of X-ray and fluoroscopic equipment for the diagnosis and treatment of disease or injury. X-rays act on photographic film to produce radiographs (X-ray pictures), which allow physicians to study internal organs and bone. Fluoroscopes use X-rays to allow physicians to observe internal parts of the body.

Work Activities

- Reviewing the physician's orders and patient's records to determine the procedure required
- Evaluating the patient's condition and explaining the X-ray procedure to the patient
- Adjusting the radiographic equipment to give the most comprehensive view of the portion of the patient's body to be X-rayed
- Determining the proper voltage, current, and exposure time for each X-ray
- Preparing and administering mixtures that are required for some procedures
- Assisting the radiologist in performing sophisticated or invasive procedures
- Using quality control techniques to assure efficient and effective operation of equipment

Career Specialties

Radiologic Technologists may specialize in the use of certain pieces of equipment or in the use of procedures that involve specific parts of the body.

Radiation Therapy Technologists prepare cancer patients for treatment and administer prescribed doses of ionizing radiation to specific body parts.

Sonographers, also known as ultrasound technologists, use non-ionizing, ultrasound equipment to transmit high frequency sound waves into areas of the patient's body to collect reflected echoes to form an image. Sonographers explain the procedure, record additional medical history, and then position the patient for testing. Viewing the screen as the scan takes place, sonographers look for subtle differences between healthy and diseased areas, check for factors such as position obstruction, or change of shape, and judge if the images are satisfactory for diagnostic purposes.

Work Settings

Radiographers usually work under the direction of radiologists or other physicians in hospitals, clinics, or physicians' offices. In hospitals, some Radiographers operate mobile X-ray equipment at the patient's bedside, in the emergency room, or in surgery. Others work in medical laboratories or for private industry.

Special Requirements

To be registered, Radiologic Technologists must complete formal training at an American Medical Association (AMA)-approved hospital or school. High school graduation or its equivalent is required for acceptance into a radiologic technology program. Most hospital and college programs are at least two years in length.

Educational Institutions

Radiologic Technologists: ASUJ, ASUMH, BHS, EACC, NAC, NPCC, SACC, SEAC, SVI, UAMS, UAFS (All A); ASUJ, UAFS, UAMS (All B)

Sonography: ASUJ, UAFS, UAMS (All B)

For more information, contact:**American Society of Radiologic Technologists (ASRT)**

15000 Central Ave., SE
Albuquerque, NM 87123-3917
800-444-2778, press 5
www.asrt.org

E. Medical Dosimetrist

Medical Dosimetrists work as part of radiation therapy teams in hospitals and radiation therapy centers, calculating the proper doses of radiation for their patients. Dosimetrists use computer programs and three-dimensional images to calculate the doses.

Work Activities

Dosimetrists work with an oncology team and are skilled in the calculation and planning of radiation doses. They use various tools to determine the correct dose, which is approved by the radiation oncologist before being administered to the patient. This career has emerged because of the need for precision in the treatment of cancer with the use of radiation. Dosimetrists also play an important role in patient care after treatment. They help to monitor the patient's surroundings, establish safe distances for visitors and staff, enlist the use of shields if necessary, and communicate with individuals about safe practices.

Work Settings

Dosimetrists can find work in hospitals, cancer treatment centers, and medical research laboratories. The work week should be a standard 40-hour week, though weekend and evening shifts may arise.

Special Requirements

Certification is available for current radiation therapy technologists or for individuals with a bachelor's degree in science and a medical background. Upon completion of an accredited program, the individual may take an exam offered by the Medical Dosimetrists Certification Board (MDCB) to become a certified medical dosimetrist (CMD). Continuing education hours are required in order to maintain certification.

Educational Institutions

UAMS (B) and (Adv C)

For more information, contact:
Medical Dosimetry Program
Department of Imaging and Radiation Sciences
University of Arkansas for Medical Sciences
4301 W. Markham, Slot 771
Little Rock, AR 72205
501-686-7100
<http://www.uams.edu/chrp/dosimetry/>

V. Dietetics and Nutrition

A. Dietetic Technician page 27

B. Dietician page 28

Nutrition is the science of food and its effects on the body. Food contains nutrients and other substances that become part of the body's chemistry and physiology. These components of food have a direct effect on the maintenance and restoration of health. Dietitians are food and nutrition experts who promote optimal health and the nutritional status of the public. They often counsel individuals and groups about nutrient deficiencies that can cause disorders and diseases, and about diet modifications that can correct health problems. Dietitians may analyze food for its nutritional content or study the way the body uses nutrients. They may be working in food service management, business, or private practice. Because the general public increasingly is becoming interested in nutrition, the roles of dietitians and dietetic technicians are expanding. Consumers want more information about foods and their nutritional values on product labels, so employment opportunities in marketing and food manufacturing have increased. More colleges are offering nutrition courses, so employment for dietitians as educators has risen. This expansion in the field of dietetics and nutrition will continue as long as the public continues to seek better health and longer life by developing and improving nutritional habits.

A. Dietetic Technician

Dietetic Technicians assist in the assessment, planning, implementation, and evaluation of either nutritional care services or food service management for organizations, such as hospitals, schools, and businesses.

Work Activities and Career Specialties

Dietetic Technicians may specialize in a particular area of competency, such as nutritional care or food service management. Activities of Nutritional Care Technicians may include:

- Interviewing patients to obtain and evaluate their diet histories
- Reporting patients' progress or dietary problems to the dietitian
- Assisting patients to plan meals that are within their food budgets and prescribed diets
- Translating the calculated diets into daily menus
- Assisting hospitalized patients in choosing menus that meet their diet requirements
- Counseling individuals or groups who are at high risk for poor nutrition

Dietetic Technicians who are competent in food service management may assist with the food service operation of geriatric, child care, or other programs. Their activities may include:

- Planning menus
- Developing and/or testing products
- Procuring and storing food, supplies, and equipment

- Supervising food production and service
- Maintaining quality control, sanitation, and safety standards
- Selecting, training, and scheduling employees
- Implementing new food service systems
- Providing diet counseling and education
- Using computer systems to calculate payroll, record laboratory data, and verify diet orders

Work Settings

Dietetic Technicians usually work as members of a health care team and may supervise food preparation workers, diet clerks, and dietetic assistants. Supervision of Dietetic Technicians may vary. Those in nutritional care are supervised by a dietician, while those in food service management are supervised by an administrator or a registered dietitian consultant. Dietetic Technicians may be employed by hospitals, public health nutrition programs, long-term care facilities, school lunch programs, nutritional programs for the elderly, or food service systems management firms. They may also be in private practice as consultants.

Special Requirements

Most employers prefer applicants who are graduates of a two-year associate degree program that is approved by the American Dietetic Association. Graduates must pass an examination given by the Commission on Dietetic Registration.

Educational Institutions

Dietetic Technician: BRTC (A)

Dietetic Assistant: BRTC, SEAC (C)

For more information, contact:

Arkansas Dietetic Association

P.O. Box 55234

Little Rock, AR 72215-5234

(501) 374-3300

www.arkansaseatright.org

American Dietetic Association

120 South Riverside Plaza, Suite 2000

Chicago, Illinois 60606-6995

(800) 877-1600

www.eatright.org

Arkansas Dietetics Licensing Board

PO Box 1016

North Little Rock, AR 72115

(501) 221-0566

www.ardieteticslicbrd.net

B. Dietitian

Dietitians apply the principles of food and nutrition to plan and supervise the preparation and serving of meals in hospitals, schools, restaurants, or other public and private institutions. They may teach basic nutrition and diet modifications related to various diseases. They apply the principles of food service, nutrition, biochemistry, and physiology to make recommendations for the nutritional management and support of patients.

Work Activities and Career Specialties

Dietitians can practice in many different settings. Some of their specialties include education, pediatrics, business, and sports dietetics. Others are listed below.

Management Dietitians organize, plan, and direct food service programs and nutritional care for establishments that require large-scale meal planning and preparation. Their activities may include:

- Supervising the planning, preparation, and service of meals
- Selecting, training, and directing food service supervisors and others who prepare and serve meals
- Coordinating diet counseling services
- Teaching current trends in diet therapy
- Directing purchasing, establishing sanitation and safety practices, and managing personnel
- Preparing records, reports, and budgets
- Coordinating dietary services with those of other departments to increase effectiveness
- Acting as a consultant to food service directors and other health care professionals on matters related to dietetics

Clinical Dietitians assess the nutritional status of inpatients and/or outpatients in hospitals, medical centers, nursing homes, outpatient clinics, and research facilities; formulate and implement their nutritional care plans; and communicate this information to other members of the health care team. Their activities may include:

- Assessing patient nutritional requirements and making nutritional support recommendations
- Developing guidelines for therapeutic diets with recommendations for appropriate patient management aimed at their specialized nutritional requirements
- Instructing patients and their families about nutritional guidelines, emphasizing the importance of good nutrition, and offering individualized suggestions for following a balanced diet
- Educating medical, nursing, and dietetic staff and students about nutritional aspects of disease

Research Dietitians conduct, evaluate, and interpret research in various fields, such as nutrition science and education, food management, and food service systems.

Community Dietitians plan, develop, administer, and coordinate nutritional programs as part of the health care plan for public health agencies, day care centers, and governmental nutrition programs.

Education Dietitians work in colleges, universities, and community or technical schools instructing students or other health professionals.

Consultant Dietitians advise food and pharmaceutical industries, prepare nutritional programs for groups, such as athletes or nursing home patients, speak at professional seminars, write books and articles on weight control and nutrition, and counsel individuals or groups in health and recreation clubs or in their own private practices.

Work Settings

Management Dietitians supervise others. Community Dietitians work as part of a health team. Clinical, Research, and Consultant Dietitians may work alone or as part of a team. Work settings of dietitians vary according to their specialty and the type and size of the organization that employs them. Some of their duties may be performed at office desks, patients' bedsides, small clinic rooms, or outpatient clinics. Other tasks may be performed in modern, well-equipped kitchens or research laboratories.

Special Requirements

Many employers prefer to hire dietitians who are members of the American Dietetic Association (ADA) and who are registered through the ADA's Commission on Dietetic Registration. A

bachelor's degree from an ADA-approved institution is required for membership. Also required is completion of an approved/accredited supervised practice experience, such as a pre-professional practice program or dietetic internship. Members become registered after passing the ADA examination. To maintain registration, dietitians must complete continuing education hours as specified by the ADA.

Educational Institutions

HU, OBU, UAF (B); UAMS (Adv C); UAMS (M & D)

For more information, contact:

Arkansas Dietetic Association

P.O. Box 55234
Little Rock, AR 72215-5234
(501) 374-3300
www.arkansaseatright.org

American Dietetic Association

120 South Riverside Plaza, Suite 2000
Chicago, Illinois 60606-6995
(800) 877-1600
www.eatright.org

Arkansas Dietetics Licensing Board

PO Box 1016
North Little Rock, AR 72115
(501) 221-0566
www.ardieteticslicbrd.net

VI. Health Administration

A. Health Services Administrator page 30

B. Nursing Home Administrator..... page 32

Health services administrators and nursing home administrators set the goals, develop the methods, and coordinate the programs necessary to achieve the smooth functioning of a health agency or institution. They determine policies and procedures, then ensure that these are understood and implemented with the collective cooperation of the medical staff and other personnel. The administrator's job includes financial planning and budget development, personnel administration, purchasing, public relations, departmental coordination and patient services administration. Changes in the health care delivery system are increasing the demand for competent people to direct and manage voluntary, private, governmental, and research facilities. Also, administrators can play a role in developing health care services by joining in the activities of community agencies and by discussing health concerns and issues with health associations and professional groups.

Many years of training are required to develop and administer health care systems. Most administrators hold graduate degrees. They must possess intellectual maturity, refined leadership skills, and a thorough knowledge of management principles in order to handle the complexities of managing a health care system.

A. Health Services Administrator

Health Services Administrators direct and coordinate the functions of a hospital or other health care institution and the activities of the staff. They are responsible for the efficient operation of a specific department or for the entire health care facility.

Work Activities

- Managing the total or partial operation of a hospital or other health care facility
- Directing the activities of medical, nursing, allied health, technical, volunteer, clerical, service, and/or maintenance staffs
- Maintaining and developing professional standards, policies, and procedures for various institutional activities
- Administering fiscal operations, such as planning the budget, accounting, and establishing rates for health services
- Planning and coordinating the marketing activities for hospital services
- Directing the hiring and training of personnel
- Developing or expanding programs or services for scientific research, preventive medicine, medical and vocational rehabilitation, and community health and welfare
- Attending meetings of the governing body of the institution
- Preparing official reports of hospital or other health care facility activities
- Representing the health care facility at community meetings and promoting programs through various news media

Career Specialties

Health Services Administrators may work in a particular type of establishment or organization, such as a Hospital Administrator does. In early career stages, persons trained as administrators can serve as staff-level assistants to the administrator, financial officer, operations officer and other administrators. There is an increasing demand for health services managers in non-hospital settings, such as clinics, medical practices, health maintenance organizations, voluntary health agencies, and other specialized medical facilities. Those who specialize in the administration of certain management functions may be designated as Policy Development Administrators or Health Program Analysts. Some Health Services Administrators specialize in nursing.

Nursing Supervisors coordinate and evaluate the activities of the nursing staff working in specific nursing services, such as obstetrics, orthopedics, pediatrics, or surgery. The Nursing Supervisor also supervises and evaluates the performance of head nurses, inspects unit areas to see that patient needs are being met, and suggests new methods and procedures when needed. Additional responsibilities include planning and organizing orientation and in-service training for unit staff members and supervising employee and nursing records.

Work Settings

In small hospitals, Health Services Administrators personally coordinate the programs and activities that make an organization function. In larger hospitals, they work through a staff of assistant administrators who direct daily operations. The Health Services Administrator remains informed through formal and informal meetings with assistants, medical staff, and other hospital workers. Usually, the Hospital Administrator is responsible to a policy-making body, such as a board of trustees. Health Services Administrators working in positions other than hospital administration have varied working conditions.

Special Requirements

For many chief administrative positions, a graduate degree in health services administration, nursing administration, or business administration is a decided asset. For all health specialist positions and some generalist positions, employers seek applicants who have had clinical experience (as nurses or therapists, for example) as well as academic preparation in business or health services administration.

Educational Institutions

Health Services Administrator: ASUJ, UALR, UCA, UAMS (M)

General Business Administration: ABC, ASUJ, CBC, JBU, HSU, LC, PSC, SAUM, UAFS, UAF, UALR, UAM, UAPB, UCA, UO, WBC (All B); ASUJ, HSU, HU, JBU, UAF, UALR, UCA (M); UAF (D)

For more information, contact:

Arkansas Health Care Association

1401 W. Capitol, Suite 180
Little Rock, AR 72201
Tel: (501) 374-4422
<http://arhealthcare.com>

American College of Healthcare Executives

One North Franklin St., Suite 1700
Chicago, IL 60606-4425
(312) 424-2800
www.ache.org

Arkansas Hospital Association

419 Natural Resources Drive
Little Rock, AR 72205
(501) 224-7878
<http://www.arkhospitals.com>

B. Nursing Home Administrator

Nursing Home Administrators plan, organize, direct, and control the operations of a nursing home or other long-term personal care facility using policies established by the owner of the facility or its governing board.

Work Activities

- Directing the activities of the medical, nursing, technical, clerical, volunteer, service, and maintenance staffs
- Maintaining and developing standards, policies, programs, and operating procedures that comply with the most current governmental regulations
- Administering fiscal operations, such as budget preparation, accounting, and establishing rates for health services
- Directing the hiring and training of employees
- Compiling, analyzing, and preparing official reports
- Speaking at community gatherings and conducting public relations and marketing activities
- Interviewing families of persons seeking admittance to the facility

In addition to their administrative duties, Nursing Home Administrators may have duties in patient care or service. They may be physicians, registered or licensed practical nurses or allied health professionals. Also, some are involved in teaching, research, or other professional activities.

Work Settings

Nursing Home Administrators work under the supervision of a proprietor or governing board. In small facilities, Administrators coordinate all aspects of the institution with the assistance of an administrative assistant. Administrators usually assign responsibility for routine tasks to assistant administrators.

Most Nursing Home Administrators work in offices located in the nursing homes. Others work in the business offices of large nursing home corporations that manage several facilities.

Special Requirements

All states require Nursing Home Administrators to pass a licensing examination, complete a state-approved training program, and pursue continuing education. Persons interested in nursing home administration should contact individual agencies in Arkansas for additional specific requirements.

Educational Institutions

No programs are available in Arkansas.

For more information, contact:

American Health Care Association (Nursing Homes)

1201 L Street, N.W.

Washington, DC 20005

(202) 842-4444

www.ahca.org

VII. Health Information and Communication

A. Health Information Manager page 33

B. Health Sciences Librarian..... page 35

C. Medical Illustrator..... page 36

D. Medical, Scientific, Technical Writer page 37

Although these individuals usually do not provide patient care, health information personnel maintain, analyze, and preserve medical information about patients so that it can be used in evaluation, diagnosis, and treatment. They organize the data and prepare statistical reports that are used in studying and planning health.

In the area of information and communication, these health care professionals are often overlooked when considering who contributes significantly to patient care. In reality, their work is extremely useful. The accuracy of their work is crucial and promotes medical advances. As we see increased use of computer technology and internet resources, health information and communication professionals will help health care providers stay ahead of the curve.

A. Health Information Manager

Health Information Managers plan, develop, and administer health record systems for hospitals, clinics, community health centers, or similar facilities. The health information management professional collects, analyzes, and manages the information that steers the health care industry. In dealing with patient records, the health information manager must respect individual patient privacy yet contribute to quality care by organizing the medical data. These information specialists are skilled in the following areas: health care database and database systems, medical classification systems, flow of clinical information, relationship of financial information to clinical data, uses and users of health care information, and medical legal issues and security systems.

There are four types of Health Information Managers: **Medical Records Administrators, Medical Coding Specialists, Medical Records Technicians, and Certified Coding Specialists.** The medical records administrator (RRA) is a health service manager who directs activities in the medical records department of a health facility. He or she may establish departmental policy, objectives and procedures, coordinate with other managers, and oversee the other workers in their

department. The medical records technician ensures that patient reports are complete and accurate for computer entry, and may confer with physicians to obtain missing information. The medical coding specialist, and certified coding specialist (CCS) utilize an established coding system to classify medical data. Insurance companies make use of these codes to monitor patients' health expenses and bill them as needed.

Work Activities

- Directing and controlling activities of personnel in the health information department
- Planning and developing information systems for the efficient receipt, recording, storage, and retrieval of health data
- Ensuring that confidentiality of records is safeguarded
- Developing in-service educational materials and conducting training of health care personnel
- Assisting the health care staff in evaluating the quality of health care
- Providing information for reimbursement by insurance companies or other third-party payers
- Transcribing and reviewing quality of medical reports for completeness, accuracy, and compliance
- Coding diseases, diagnosed, procedures, and treatments according to recognized coding systems such as ICD-9-CM, CPT, and HCPCS
- Abstracting data into registers and indices for research and specialized registries
- Compiling and analyzing data for health care statistical reports
- Supervising personnel within the department
- Releasing confidential information to persons and agencies according to regulations

Work Settings

In large hospitals, management of health data is usually directed by the Health Information Managers. In smaller facilities, experienced Health Information Managers often manage the department and supervise personnel. Other areas where the Health Information Manager may work includes: clinics, large group medical practices, HMOs, insurance companies, nursing homes, rehabilitation facilities, behavioral health institutions, private companies, and for attorneys. As computerized medical records are utilized, health information professionals will play a vital role in supporting the care of patients in all these settings.

Health Information Managers manage health care data to assure that the patient receives quality patient care while maintaining an efficient use of health services. The clinical background of the technician and administrator provides the knowledge to effectively perform these duties.

Special Requirements

Positions in these careers are usually awarded to applicants with at least a bachelor's degree in health information management. The American Health Information Management Association (AHIMA) conducts a certification exam and awards the credential of Registered Health Information Administrator. Medical records technicians generally have an associate's degree from a two-year community college or junior college program. After passing an exam, technicians receive the title Certified Coding Specialist (CCS) or Certified Coding Specialist-Physician Careers-based (CCS-P).

Educational Institutions

Health Information Management/Technology: OC, NPCC (A); ATU (B)

Medical Records Administration: ATU (B); ASUS (C); UAMS, UACCB (A)

Medical Coding: BHS, PCCUA, NAC, NPCC, OTC, SACC, UACCB (C)

For more information, contact:**American Health Information Management Association**

223 N. Michigan Avenue, Suite 2150

Chicago, IL 60601-5800

(312) 233-1100

www.ahima.org

B. Health Sciences Librarian

Health science librarians are specially trained information professionals who are responsible for the collection, compilation, and dissemination of essential biomedical information. Using knowledge of both library science and the health sciences, they assist health care providers, students, researchers, and administrators with retrieving information that will provide for better patient care, education, and research.

Work Activities

- Select and purchase books, journals, and other materials on health sciences
- Classify and catalog acquisitions for easy access
- Instruct health care students and professionals in the use of information resources
- Prepare guides to reference materials
- Compile bibliographies
- Answer mail, email, fax, and telephone request for information
- Help health care personnel track down elusive information
- Manage the operation of the medical library
- Stay current on the newest computer technology and Internet resources

Work Settings

Health science librarians work in schools of medicine, nursing, pharmacy, veterinary medicine, and allied health. They also work in hospitals, pharmaceutical companies, professional associations, federal and state agencies, research centers, and health maintenance organizations. They majority of health science librarians are located in hospitals.

Special Requirements

A master's degree in library science, preferably from a college or university accredited by the American Library Association (ALA) is the usual and preferred preparation for professional librarians. While not mandatory for employment, certification by the Medical Library Association (MLA) is a useful credential that can enhance job opportunities and salaries.

Educational Institutions

Library Science: SAUM, UCA (M)

For more information, contact:

Medical Library Association

65 Wacker Place, Suite 1900
Chicago, IL 60601-7246
(312) 419-9094
www.mlanet.org

C. Medical Illustrator

Medical Illustrators are artists who create graphic representations of medical or biological subjects for textbooks, pamphlets, exhibits, instructional films, civil/criminal legal proceedings, and teaching models.

Work Activities

- Drawing accurate renderings of anatomical parts, surgical procedures, or microorganisms
- Drawing diagrams or schematic concepts
- Using modeling skills to design and sculpt artificial body parts
- Creating graphic and audio-visual aids
- Preparing artwork for publications
- Drawing illustrations to assist with medical research
- Producing three-dimensional teaching models and exhibits

Career Specialties

Some Medical Illustrators specialize in producing artwork for medical advertising or illustrating specific subjects for medical specialties. However, the majority of medical illustrators remain general artists and are skilled to handle a variety of assignments.

Work Settings

Medical Illustrators may be employed by medical schools and large medical centers that have teaching and research programs. Many may accept free-lance assignments or work exclusively on a free-lance basis. They also may work for hospitals, pharmaceutical manufacturers, publishing companies, advertising agencies, or companies specializing in medical illustration.

Special Requirements

To become a Medical Illustrator, specialized training is necessary in art and the biological sciences. Educational programs involve six or seven years of college-level work beyond high school. There are five degree programs in the United States that accept a limited number of students. An excellent academic record and portfolio of your artwork are necessary.

Educational Institutions

Illustration: JBU (B)

Art: UACCM (A); ASUJ, ATU, HU, LC, OBU, SAUM, UAF, UALR, UAM, UAPB, UCA, UO, WBC (All B); ASUJ, UAF, UALR (All M)

For more information, contact:

Association of Medical Illustrators

245 1st Street, Suite 1800
Cambridge, MA 02142
(617) 395-8186
www.medical-illustrators.org

D. Medical, Science, Technical Writer

Medical, science, and technical writers are involved in a variety of activities, including presenting health information in an informative and interesting form for the public and offering information to health specialists. They may write for newspapers, magazines, radio, or television.

Technical writers deal with the same subject matter as do science writers, but while technical writers write for an audience of professionals in a field, **science writers** translate technical information into language that lay people can understand. **Medical writers** and editors are trained journalists who write or edit health-related books, articles, and brochures on a freelance basis or as part of a professional staff.

Work Activities

- Write articles for newsletters and journals
- Write scripts for television or radio advertisements
- Assist with writing medical textbooks and educational courses

Work Settings

Medical, science and technical writers may be employed by print or electronic media while other such writers may be employed by pharmaceutical companies, universities and medical colleges, federal agencies, professional societies, or industrial research companies. Voluntary health agencies (VHAs) often focus their efforts on publicizing the results of medical research and will hire medical, science, and technical writers specifically for this. Typically, medical, science and technical writers operate on a 35-40 hour work week.

Special Requirements

Medical science and technical writers must not only master journalistic and reporting skills, but also have a firm understanding of technical and scientific terminology. Often, these writers obtain a bachelor's degree in journalism or English from undergraduate institutions. Some employers may prefer a writer with a science degree, but generally will accept a liberal arts major who has completed science coursework. Institutions may offer specific courses in medical, science, or technical writing, but these courses are not always necessary for employment. Organizations like the American Medical Writers Association offer a curriculum that will offer continuing education so individuals are always receiving an up-to-date education.

Educational Institutions

Journalism: ASUJ, ATU, HU, JBU, UAF, UALR, UAPB, UAM (All B); ASUJ, UAF, UALR (All M)

General English: ASUJ, ATU, HC, HSU, HU, JBU, LC, PSC, OBU, SAUM, UAF, UAFS, UALR, UAM, UAPB, UCA, UO, WBC (All B); ASUJ, ATU, UAF, UCA (All M); UAF (D)

Technical Writing: UALR, UCA (B); UALR (M)

VIII. Medicine

- A. Chiropractor page 38
- B. Physician..... page 39
- C. Physician Assistant page 41
- D. Podiatrist page 42

Practitioners of medicine perform exams, diagnose illnesses, and treat patients with diseases or injuries. They also teach and advise people about how to maintain good health. Some perform research or teach in medical schools. Physicians may be general practitioners, or they may specialize. Specialists work with advanced technologies that require additional training and skills beyond what is learned in medical school.

Podiatrists are practitioners trained to diagnose, treat, and prevent foot problems using medicine or surgery. They attend schools of podiatric medicine for their education.

Chiropractors diagnose problems and then use manipulation of the spinal column and body parts as treatment. They also use water, light, heat, and exercise in their treatments.

Physician Assistants perform medical exams and may assume many of the responsibilities of physicians who supervise them. They may order laboratory tests, initiate treatment or therapy, and counsel patients.

Many years of education and training are required to practice medicine. A dedication to learning is essential because the medical practitioner continually must acquire knowledge in order to keep up with the advances in technology, equipment, techniques, and medications.

A. Chiropractor

Doctors of Chiropractic, also known as **Chiropractors** or **Chiropractic Physicians**, are health practitioners who treat patients by manual adjustment of parts of the body, giving special consideration to the spine and the central nervous system. The chiropractic system of health care is a drugless, non-surgical healing art based on the principle that the nervous system governs the state of health of the human body and that many abnormal functions and disorders are caused by interference with nerve transmission and expression.

Work Activities

- Analyzing a patient's condition by questioning the patient and using physical, X-ray, and laboratory tests
- Advising the patient of the course of treatment to be followed
- Performing spinal adjustments working from the base of the skull to the tip of the spine using hand and finger manipulation
- Treating patients using exercise, water, light, and heat therapy
- Recommending nutritionally sound diets along with good sleeping and resting habits
- Keeping accurate case history records of all patients
- Suggesting that patients requiring drugs or surgery contact other health care specialists

Work Settings

Most Chiropractors set up their own practices; however, several Chiropractors may form a group practice in a private clinic or a hospital setting. Some Chiropractors occasionally provide

treatment at patients' homes. Many employ a nurse, a chiropractic assistant, or a chiropractic technician to assist them in performing their work. Possible hazards of practice include the effects of radiation from X-ray equipment if it is used improperly and the risks of contagious diseases or infection.

Special Requirements

In general, state licensing boards require completion of a 4-year chiropractic college program. Chiropractic colleges require applicants to have at least 2 years of undergraduate study including courses in English, social sciences, organic and inorganic chemistry, biology, physics, and psychology. Most applicants have a bachelor's degree. For licensure, a chiropractor must pass a three-part test administered by the National Board of Chiropractic Examiners. To maintain licensure, a certain number of continuing education hours is required each year.

Educational Institutions

No programs are available in Arkansas

For more information, contact:

Arkansas Chiropractic Association
1301 Central Ave.
Hot Springs, AR 71901
(501) 318-6030
www.chiro.org/states/AR/acaark.htm

American Chiropractic Association
170 Clarendon Blvd.
Arlington, VA 22209
(800) 986-4636
www.amerchiro.org

B. Physician

Physicians, or **Medical Doctors**, diagnose and treat human diseases and injuries and practice preventive medicine. Some combine medical practice with research or teaching in medical schools. Physicians receiving M.D. degrees are Doctors of Allopathic Medicine or Doctors of Medicine. Those receiving D.O. degrees are Doctors of Osteopathic Medicine or Doctors of Osteopathy. Programs in medicine provide the education needed by physicians to meet the changing health care needs of society. Medical programs are designed to use the scientific disciplines so that the future practices of students will be as scientifically based as possible. Programs in medical school include clinical and laboratory work, observation, and hospital clerkships.

Work Activities

- Diagnosing patient's condition on the basis of examination, tests, and reports
- Ordering or performing various tests, analyses, and X-rays to provide information on the patient's condition
- Prescribing and administering drugs and treatments
- Vaccinating patients to immunize them against communicable diseases
- Providing prenatal and postnatal care to pregnant women and delivering babies
- Performing surgery and related procedures
- Conducting research to aid in the control and cure of diseases
- Developing and testing new medical techniques
- Reporting births, deaths, and the outbreak of contagious diseases to governmental authorities
- Supervising medical treatments of patients

Osteopathic Physicians diagnose, prescribe medications for, and treat diseases of the human body relying on accepted medical and surgical procedures and, when deemed beneficial, on

manipulative therapy. They are concerned particularly with symptoms that may be attributed to impairments of the musculoskeletal system.

Career Specialties

Primary Care Physicians practice in most areas of medicine. They may refer complex medical problems to other specialists. The areas of primary care are:

Family Medicine (healthcare for the entire family, from newborns to elderly)

General Internal Medicine (emphasis on adult health)

General Pediatrics (emphasis on children's health)

Other specialists diagnose and treat illnesses and/or injuries related to specific branches of medicine or parts of the human body. These include the following:

Anesthesiologists administer anesthesia (numbness or sleep) to patients undergoing surgery.

Cardiologists treat diseases of the heart.

Dermatologists specialize in treating conditions of the skin.

Gastroenterologists diagnose and treat ailments of the digestive system.

Gynecologists specialize in the prevention and treatment of disorders of the female reproductive system.

Neurologists specialize in disorders of the brain and central nervous system.

Obstetricians care for pregnant women and deliver babies.

Oncologists specialize in working with malignant, or cancerous, tumors.

Ophthalmologists diagnose and treat disorders associated with the eye.

Orthopedists specialize in correcting or preventing skeletal deformities or ailments.

Otolaryngologists treat ailments of the ears, nose, and throat.

Pathologists interpret and diagnose the changes in tissue caused by disease.

Physiatrists are specialists of physical medicine and rehabilitation.

Psychiatrists deal with the study, treatment, and prevention of mental illness.

Pulmonologists treat the lungs and respiratory system.

Radiologists use X-rays to diagnose and treat diseases.

Surgeons perform operations to correct deformities, repair injuries, treat diseases, and improve functions of patients.

Urologists treat ailments of the urinary tract.

Work Settings

Physicians may be supervised by a health administrator. They may work alone, with other physicians or with a nursing staff. They may supervise interns or residents as well as the nursing staff. The majority of physicians work in hospitals, clinics, nursing homes, or in private practice offices. Physicians may be exposed to infections from patients, to cuts and burns from equipment, and to radioactive materials used in diagnosis and treatment.

Special Requirements

Upon completion of medical school, the M.D. degree or the D.O. degree is granted. Most physicians then enter a period of post-graduate training called a residency during which time (one to four years) they receive their specialty training. To become licensed as a Doctor of Medicine or Osteopathy, an applicant must be at least 18 years of age, meet all the educational and training requirements of the Board of Medicine, and pass the licensing examinations. Also required is completion of satisfactory post-graduate training at a hospital in the United States or Canada approved by the Accreditation Council on Graduate Medical Education or another official accrediting body recognized by the American Medical Association or the American Osteopathic Association for internships or residency training.

The most common requirements for entering schools of medicine are completion of a premedical college or university program or its equivalent with an acceptable grade average; application through the centralized services of the American Medical College Application Service (AMCAS), managed by the Association of American Medical Colleges, or the American Association of Colleges of Osteopathic Medicine Application Service, managed by the American Association of Colleges of Osteopathic Medicine; and passing the association's Medical College Admissions Test (MCAT) with a competitive score. A personal interview, additional applications, and further testing may be required.

Educational Institutions

Doctor of medicine: UAMS (D)

Doctor of osteopathy: (ACM) Oklahoma State University; Des Moines University, Pikeville College, The University of Health Sciences-Kansas City

For more information, contact:

Arkansas Medical Society

10 Corporate Hill Drive
Little Rock, AR 72205
(501) 224-8967
www.arkmed.org

American Medical Association (AMA)

515 North State Street
Chicago, IL 60610
(800) 621-8335
www.ama-assn.org

Arkansas Osteopathic Medical Association

1400 West Markham,
412 Union Station
Little Rock, AR 72201
(501) 374-8900
www.arkosteomed.org

Arkansas Osteopathic Association (AOA)

142 East Ontario Street
Chicago, IL 60611
(800) 621-1773
www.osteopathic.org

C. Physician Assistant

Physician Assistants provide medical care services to patients while under the direct supervision and responsibility of a doctor of medicine or osteopathy. Physician Assistants may work alone or directly with the supervising physician, but they can do only what is permitted by the physician and the laws of the state in which they practice. Programs for Physician Assistants prepare individuals - some with past experiences as health care professionals—to assist licensed physicians in a variety of health care settings. One or more years of direct patient care is a common prerequisite. The curriculum consists of courses in the basic medical sciences with clinical clerkships.

Work Activities

- Taking detailed medical histories and performing physical examinations on patients of all ages
- Ordering laboratory tests, X-rays, EKGs, and other diagnostic studies
- Identifying normal and abnormal findings on histories, physical examinations, and common laboratory tests
- Making diagnoses and decisions regarding the management and treatment of patients
- Initiating therapy or treatment
- Suturing wounds, assisting in surgery, applying and removing casts, and performing other therapeutic procedures

- Making hospital rounds to observe and record the progress of patients, to update and summarize charts, and to order or carry out indicated therapy
- Assisting in providing services to patients who require continuing medical care at home, at a nursing home, or at another extended health care facility
- Coordinating and supervising the work of some health care professionals
- Counseling patients and their families on preventive care, medical problems, and prescribed treatments and drugs

Physician Assistants may have special training in a particular medical specialty, such as geriatrics, surgery, neonatology, pediatrics, or occupational medicine.

Work Settings

Physician Assistants work under the supervision and direction of a licensed physician. Some Physician Assistants work in satellite offices away from the direct supervision of the physician and communicate with the physician by telephone or radio. They may work alone or with other health personnel, such as registered nurses and licensed practical nurses. Physician Assistants usually work in physicians' offices, clinics, or hospitals. They may be exposed to infection, communicable diseases, and contaminated materials.

Special Requirements

Admission requirements vary, but many programs require 2 years of college and some work experience in the health care field. About half of all applicants hold a bachelor's or master's degree. Generally, training programs last 2 years. To become licensed as a Physician Assistant, an applicant must complete an accredited formal education program. Also, the applicant must pass an examination given by the National Commission for Certification of Physician Assistants.

Educational Institutions

HU (M)

For more information, contact:

American Academy of Physician Assistants

950 N. Washington Street
 Alexandria, VA 22314-1552
 (703) 836-2272
 www.aapa.org

D. Podiatrist

Podiatrists, or Doctors of Podiatric Medicine, are physicians and surgeons of the human foot. They examine, diagnose, and treat diseases, injuries, and deformities of the foot and ankle using medical, surgical, mechanical, or other means. Podiatrists also treat muscles and tendons governing foot functions and normal and abnormal growths on the feet.

Work Activities

- Diagnosing foot ailments, such as tumors, ulcers, fractures, skin or nail diseases, and congenital or acquired deformities
- Treating deformities, such as flat or weak feet and foot imbalance, using mechanical and electrical methods
- Treating conditions, such as corns, calluses, ingrown nails, tumors, shortened tendons, cysts, bone disorders, and abscesses, by surgical methods
- Correcting deformities by using plaster casts and strappings

- Prescribing and fitting corrective footwear and orthotics
- Advising patients concerning continued treatment of disorders and proper foot care to prevent recurrence
- Referring patients to other physicians when symptoms observed in the feet indicate disorders, such as diabetes, arthritis, heart disease, or kidney disease
- Teaching and consulting
- Lecturing to the public on health care for the foot and associated disorders

Career Specialties

Podiatrists may specialize in one or many areas of podiatric medicine; such as:

Orthopedics—treatment of bone, muscle, and joint disorders

Podopediatrics—treatment of foot ailments affecting adolescents, children, and newborns. (They work to prevent and treat congenital and acquired disorders or foot diseases)

Podiatric Surgery—treatment of foot problems by performing surgery

Podogeriatrics—treatment of foot problems of the elderly

Podiatrists also may be involved in the treatment and prevention of injuries relating to athletic activities.

Work Settings

Many newly licensed Podiatrists open their own offices or purchase established practices. Some work in hospitals or in industry. Some enter group practices or start as associates to Podiatrists with established practices in order to gain experience. Podiatrists usually employ one or more assistants depending on the size of the practice. Podiatrists usually work in offices, but they may spend time visiting patients or performing surgery at a hospital. They may also provide service in Health Maintenance Organizations, Preferred Provider Organizations, hospitals and extended care facilities, U.S. Public Health Service, municipal health departments, and faculties at health professional schools.

Special Requirements

All states require a license for the practice of podiatric medicine. The applicant must be a graduate of an accredited college of podiatric medicine and pass written and oral examinations. The six colleges of podiatric medicine are located in California, Florida, Illinois, Iowa, Pennsylvania, and Ohio. Prerequisites for admission include completion of at least 90 hours of undergraduate study (including pre-med science courses), an acceptable grade point average, and suitable scores on the Medical College Admissions Test (MCAT).

Educational Institutions

(ACM) Barry University, Ohio College of Podiatric Medicine, Finch University of Health Sciences-Chicago, Des Moines University

For more information, contact:

American Association of Colleges of Podiatric Medicine

15850 Crabbs Branch Way, Suite 320

Rockville, MD 20855

800-922-9266

www.aacpm.org

IX. Medical Office Personnel

A. Medical Assistant..... page 44

B. Medical Secretary page 45

C. Medical Office Manager page 46

No clinic or hospital department could function without the special skills of clerical staff.

If you are interested in office work with an extra measure of challenge, intellectual stimulation, excitement, and personal satisfaction, you can choose from among dozens of medically-related clerical positions.

You could be a department secretary in a special area of medicine that intrigues you, or a unit secretary in a fast-paced nursing station. You could work in the administrative office, the emergency room, the laboratory, or in research.

As a medical assistant or secretary in a healthcare setting, you must be exceptionally conscientious, mature, and responsible. You must have a keen understanding of how your work ultimately affects the operation of the hospital or clinic and the patients they serve.

A. Medical Assistant

Medical Assistants provide various types of medical care and related services. Medical Assistants may assist physicians in examining patients or may handle duties involving office management.

Work Activities

- Preparing treatment rooms for the examination of patients
- Checking and recording the patient's pulse, blood pressure, temperature, weight, height, and other medical history data
- Assisting in operating equipment, such as EKG (electrocardiograph) and X-ray machines
- Administering injections and medications and collecting blood samples and other specimens
- Assisting with some laboratory and surgical procedures
- Arranging for hospital admission and laboratory work as requested by the physician
- Instructing patients in the use of medications and other treatments
- Scheduling appointments, receiving payments for bills, maintaining medical and financial records, completing insurance forms, performing general secretarial tasks, and assisting with office management
- Preparing inventories of office, medical, and laboratory supplies to determine items that need to be ordered

Career Specialties

Medical Assistants' duties may be either clinical or administrative, but they usually involve both, depending on their training and the needs of their employer. Medical Assistants may be designated as Chiropractic Assistants or Podiatric Assistants.

Work Settings

Medical Assistants work under the supervision and direction of physicians. They may work alone, with other assistants, or with other health personnel, such as registered or licensed practical nurses. They may supervise medical secretaries and clerks. Medical Assistants work in offices, clinics, hospitals, industrial plants, schools, and research and medical laboratories, where working

conditions vary. Medical Assistants may be exposed to infection, communicable diseases, and contaminated material.

Special Requirements

Medical assisting is one of the few health occupations open to individuals with no formal training. Applicants usually need a high school diploma or the equivalent. Certification of Medical Assistants is not mandatory in Arkansas. However, physicians may require it for employment. There are two certifying organizations: the American Association of Medical Assistants (AAMA) and the American Medical Technologists (AMT). Both the AAMA and the AMT require applicants for certification to pass examinations. In order to qualify for the examinations, applicants must have completed an approved program of study or have sufficient training and work experience.

Educational Institutions

ATU, BRTC, CCCUA, OTC, OC, PCCUA, SACC, SAUT, SEAC, UACCB, UACCH (C)

For more information, contact:

The American Association of Medical Assistants

20 North Wacker Dr., Suite 1575

Chicago, IL 60606

(312) 899-1500

www.aama-ntl.org

B. Medical Secretary

Medical Secretaries, also called **Medical Transcriptionists** or **Medical Administrative Assistants**, perform a variety of clerical tasks and assume minor executive responsibilities in order to keep the office running smoothly. Their main purpose is to conserve the employer's time by organizing the office and being responsible for some administrative duties.

Work Activities

- Taking hand or machine dictation
- Transcribing medical notes for patient records or research reports
- Writing and typing letters and memoranda
- Opening and sorting the mail
- Greeting patients and other visitors
- Receiving and placing phone calls
- Scheduling appointments for patients
- Maintaining records and time cards
- Filing correspondence, reports, and records
- Bookkeeping and billing patients

Career Specialties

Some Medical Secretaries are trained in specific areas of medicine. Their familiarity with the terminology may allow them to concentrate in ophthalmology, dermatology, pathology, or another specialty.

Work Settings

Medical Secretaries work alone or with other employees in a large office. These secretaries are employed by physicians or other health care professionals, hospitals, clinics, local or state health departments, group medical practices, or medical research departments. They may supervise other clerical personnel and may be supervised by an office manager or nurse.

Special Requirements

Most employers require applicants to have a minimum typing speed of 50 to 60 words per minute and dictation skills of 80 words per minute. Knowledge of medical terminology is required. Other desired skills include competence in spelling, punctuation, and grammar.

Educational Institutions

Medical Administrative Assistant/Secretary: NPCC, PCCUA (C)

Medical Transcription: ASUMH, ATU, BHS, CCCUA, MSCC, NAC, NPCC, OTC, PTC, SACC, SEAC (C)

For more information, contact:

American Association for Medical Transcription

100 Sycamore Avenue
Modesto, CA 95354-0550
(800)982-2182
www.aamt.org

International Association of Administrative Professionals

10502 NW Ambassador Drive
PO Box 20404
Kansas City, MO 64195-0404
(816)891-6600
www.iaap-hq.org

C. Medical Office Manager

Medical Office Managers are persons with qualified training who are capable of managing the medical office. These individuals possess skills in office and personnel management and billing and coding.

Work Activities

- Managing the operations of a medical office
- Maintaining and developing office standards and policies and procedures
- Oversight of the fiscal operations such as accounting and billing
- Involvement in the hiring and training of office personnel
- Liaison with patients, hospitals, insurance companies and others

Work Settings

Medical Office Managers work in doctor's offices, clinics, group medical practices, health maintenance organizations and hospitals. They may supervise medical secretaries or clerks.

Special Requirements

The individual in this position would be required to have knowledge of business office practices, health care systems, payroll accounting, legal concepts in health care, and medical insurance coding and billing. An associate degree in medical office management may be required. A test for national certification is offered by the Professional Association of Healthcare Office Management for individuals with a minimum of 3 years experience in the field.

Educational Institutions

UACCB, UACCH (A)

For more information, contact:

Professional Association of Healthcare Office Management

461 East Ten Mile Road

Pensacola, FL 32534

(800) 451-9311

www.pahcom.com

X. Nursing

A. Licensed Practical Nurse	page 47
B. Nurse Anesthetist	page 49
C. Nursing Assistant.....	page 50
D. Nurse Midwife.....	page 51
E. Nurse Practitioner	page 52
F. Registered Nurse	page 53

Nurses provide health services to the individual, the family, and the community by promoting wellness, preventing illness, restoring health, and alleviating suffering. Nurses work as part of a health care team which, by a cooperative effort, contributes specific knowledge and skills to provide patients with the best possible health care.

The field of nursing offers a wide variety of career opportunities and personal rewards. Employment is available in every location and to fit every schedule. Training can be as general or as specialized as the individual prefers. There are careers open at every level of training. As part of their education, nurses learn to understand a patient's psychological and social needs, use and judge the effects of pharmaceuticals, operate complex medical equipment, and perform modern treatment and rehabilitation. Additional education is offered for persons interested in research, teaching, or administration within the field of nursing.

A. Licensed Practical Nurse

Licensed Practical Nurse (LPN) care for ill, convalescent, and handicapped persons in hospitals, clinics, doctors' offices, private homes, nursing homes, medical care facilities, and similar institutions. LPN's may work under the direction of a registered nurse, a licensed physician, or a dentist.

Work Activities

- Taking and recording the patient's temperature, blood pressure, pulse, respiration rate, weight, and height
- Dressing wounds
- Administering prescribed medication, when authorized
- Performing simple diagnostic tests
- Recording food and fluid intake and output
- Observing patients, and recording their reactions to treatments, then reporting those reactions to the registered nurse or physician in charge
- Assisting patients in activities of daily living, such as eating, exercising, bathing, performing oral hygiene, and making beds
- Caring for patients in traction and casts
- Turning patients in bed and assisting patients to walk
- Caring for mothers in labor and during the postpartum period

- Feeding infants and newborns
- Assisting with teaching patients good health habits
- Providing emotional support to patients and families
- Observing patient-monitoring equipment
- Providing post-mortem care for patients who have died

Career Specialties

After additional training, an LPN may work in specialized areas, such as post-operative recovery, obstetrics, pediatrics, psychiatry, surgery, or emergency care.

Work Settings

LPN's work under the direction of physicians, dentists, or registered nurses. Experienced LPN's may assist with the supervision of nursing assistants. Those who care for patients in homes and other locations may work under a variety of environmental conditions. Some of the work, such as lifting patients and turning them in bed, can be strenuous. LPN's are in close contact with patients who are experiencing illness, pain, discomfort, and death as well as healing and recovery.

Special Requirements

To become qualified as a Licensed Practical Nurse in Arkansas, the applicant must complete an accredited practical nursing program and pass a written examination. Any person who holds a license to practice as an LPN may use the designation "Licensed Practical Nurse."

Educational Institutions

ANC, ASUB, ASUMH, ASUN, ATU, BHS, BRTC, CCCUA, NAC, NPCC, NTI, OUTC, OZC, PCCUA, PTC, RMCC, SEAC, SACC, SAUT, SVI, UACCB, UACCH, UAFS, UAMCTC, UAMCTM (all C)

For more information, contact:

National Federation of Licensed Practical Nurses

605 Poole Drive
Garner, NC 27529
(919)779-0046
www.nflpn.org

B. Nurse Anesthetist

Nurse Anesthetists are registered nurses who administer intravenous, spinal, and other types of anesthetics to patients undergoing medical, dental, surgical, and obstetrical procedures. They work under the direction of the attending surgeon, dentist, or anesthesiologist to render patients insensitive to pain. Specialized training is required.

Work Activities

- Assembling supplies, equipment, and machines for administering anesthetics, and testing the machines to ensure proper functioning
- Studying the results of pre-surgical tests to determine how the anesthetic will affect the patient
- Assuring that a supply of the proper blood type is available for emergency use
- Explaining medical procedures to the patient to secure cooperation and bolster confidence
- Administering prescribed medications before surgery or childbirth

- Administering the prescribed anesthetic and maintaining the patient under anesthesia during surgery
- Preparing prescribed solutions and starting intravenous injections
- Watching the patient for warning signs, such as dilation of pupils or change in skin color
- Monitoring the patient's condition during anesthesia and assisting the attending physician with emergency procedures if necessary
- Inserting artificial airways, or administering oxygen, fluids, and blood to prevent airway obstruction or surgical shock
- Recording the patient's condition and the anesthetic and medication administered before, during, and after surgery

In addition to duties directly relating to surgical procedures, Nurse Anesthetists may prepare periodic reports of the activities of other workers, take inventories, order supplies, and request necessary equipment, repairs, or adjustments. Others may teach in nurse anesthetist programs, engage in research, or perform administrative duties related to anesthesiology.

Work Settings

Nurse Anesthetists combine professional nursing skills with the science of anesthesia. The Nurse Anesthetist works under the direction of a physician or dentist. Although anesthetics usually are administered in a hospital operating room, Nurse Anesthetists may work in the obstetric department, the psychiatric department, the inhalation therapy department, the emergency room, or in dental offices.

Special Requirements

Certified Registered Nurse Anesthetists (CRNAs) must be registered nurses and must obtain a nurse anesthetist practitioner's license. Documentation of current certification from the Council on Certification of Nurse Anesthetists is also required.

Educational Institutions

ASUJ (M)

For more information, contact:

American Association of Nurse Anesthetists
 222 S. Prospect Avenue
 Park Ridge, IL 60068
 (847) 692-7050
 www.aana.com

Arkansas Association of Nurse Anesthetists
 P.O. Box 20343
 Hot Springs, AR 71903-0343
 (501) 520-5204
 www.arcrnas.com

C. Nursing Assistant

Nursing Assistants, also known as **Nurse Aides and Orderlies**, assist in the care of patients under the direction of the nursing and medical staff. Those who work with elderly patients are called **Geriatric Aides**.

Work Activities

- Bathing, dressing, undressing, and assisting in the hygienic needs of patients
- Serving meals and feeding patients who are unable to feed themselves
- Measuring and recoding food and liquid intake and output
- Taking and recording a patient's temperature, blood pressure, pulse, and respiration rate

- Setting up equipment, portable X-ray machines, and overhead irrigation bottles
- Observing and reporting how patients respond to the care they receive
- Assisting patients in and out of bed
- Moving patients to and from treatment rooms by using wheelchairs or wheeled carriages, or by assisting them to walk.
- Draping patient for examinations and treatments, then remaining to assist the physician with the examination
- Making beds and doing other housekeeping activities to keep patients rooms clean

Career Specialties

Nurse Aides may be classified according to the specific tasks they perform.

Central Supply Nurse Aides clean, sterilize, store, prepare, and issue dressing packs, treatment trays, and other supplies.

Delivery Nurse Aides prepare patients for childbirth and clean the delivery rooms.

Nursery Nurse Aides bathe, weigh, dress, and feed newborn babies.

Surgery Nurse Aides clean, sterilize, and assemble supplies and instruments used in surgery and maintain cleanliness and order in the operating rooms.

Work Settings

Nursing Assistants usually work in hospitals or nursing homes as members of a nursing team under the direct supervision of a licensed health professional. Working conditions may include close contact with illness, pain, and death, and exposure to infection and communicable diseases. Also, Nursing Assistants may work in private homes and in psychiatric care settings where conditions may vary.

Special Requirements

Most employers in Arkansas prefer applicants with a high school diploma or equivalent and some training, either formal training at a postsecondary institution or on-the-job training at a hospital or nursing home.

Educational Institutions

ASUMH, BRTC, OTC, OC, SACC, SAUT, SEAC, SVI, UACCB, UACCH, UAMCTC, UAMCTM (All C)

For more information contact:

National League for Nursing

61 Broadway, 33rd Floor
New York, NY 10006
(212) 363-5555
www.nln.org

Arkansas Academy of Nursing Assistants

201 W. Broadway
Little Rock, AR 72114
(501) 375-7565

American Nurses Association

8515 Georgia Avenue, Suite 400
Silver Spring, MD 20910
(800) 274-4262
www.nursingworld.org

D. Nurse Midwife

Nurse Midwives are registered nurses with specialized training in the care of healthy pregnant women and newborns. Certified Nurse Midwives provide personal, family centered care while remaining affiliated with a physician who is available for consultation or referral if necessary.

Work Activities

- Advising women about reproductive health, conception, and personal care
- Providing gynecological services, including pelvic and breast exams and Pap smears
- Monitoring the health of the pregnant woman and fetus during pregnancy
- Educating women and their families about nutrition, exercise, childbirth methods, and infant care
- Evaluating the progress of labor and offering physical and emotional support
- Consulting a physician if labor is not normal
- Assisting with childbirth and examining the newborn
- Advising patients about breast- and bottle-feeding

Work Settings

Nurse Midwives work in hospitals, birthing centers, health maintenance organizations, public health departments, or clinics, or establish their own private practices. Some Midwives deliver babies in the mother's home if conditions are safe and suitable.

Special Requirements

To become certified as a Nurse Midwife in Arkansas, one must be a registered nurse, complete an accredited educational program to earn a certificate or a master's degree, and pass a written examination given by the American College of Nurse Midwives.

Educational Institutions

No programs are available in Arkansas.

For more information, contact:

American College of Nurse Midwives

8403 Colesville Rd, Suite 1550

Silver Spring MD 20910

240-485-1800

www.midwife.org

E. Nurse Practitioner

Nurse Practitioners are registered nurses with advanced, specialized education in health assessment who provide comprehensive health care to people of all ages in collaboration with physicians and/or other health professionals.

Work Activities

- Obtaining health histories
- Performing complete physical exams
- Diagnosing and treating common illnesses
- Initiating therapy or prescribing medications
- Managing stable, chronic conditions such as diabetes
- Providing education and counseling with an emphasis on the preventive aspects of health care

Work Settings

Nurse Practitioners work in private offices with physicians, medical clinics, schools, home health agencies, health maintenance organizations, health departments, and hospitals. Some Nurse Practitioners have their own private practices.

Career Specialties

Nurse Practitioners may specialize in adult, family, pediatric, women's, school, or geriatric health.

Special Requirements

To become a Nurse Practitioner, one must be a registered nurse and complete an accredited Nurse Practitioner program earning a certificate or a master's degree. To become certified in Arkansas, Nurse Practitioners also must pass an examination given by the American Nurses Association or other certifying organizations.

Educational Institutions

HU, UAMS, ASUJ, UCA (All M)

For more information, contact:

American Academy of Nurse Practitioners

P.O. Box 12846

Austin, TX 78711

Phone: 512-442-4262

www.aanp.org

F. Registered Nurse

Registered Nurses (RNs) provide care, treatment, counseling, and health education to the ill, injured, and infirm. They assist in the maintenance of health and the prevention or management of illness, injury, and disability.

Work Activities

- Determining the nursing and health needs of patients
- Carrying out prescribed medical and nursing treatments
- Teaching and counseling patients and their families
- Observing and reporting the patient's condition and reaction to drugs and treatments to physicians and modifying the plan of care if needed
- Directing and supervising less skilled nursing personnel

Career Specialties

Registered Nurses may specialize in some of the following areas:

Hospital Nurses or **Institutional Nurses**, also known as staff or general duty nurses, give general or specialized nursing care to patients in hospitals, long-term care facilities, or similar institutions. Their duties may include: administering drugs, injections, and treatments to patients, as prescribed by a physician; preparing equipment and aiding the physician during treatment and examination of the patient

Hospital RNs may specialize in one of the clinical and nursing services of the institution, such as obstetrics, surgery, psychiatry, cardiac care, or intensive care. They may work with special types

of patients, such as children, the elderly, the chronically ill, or the physically or mentally challenged.

Industrial Nurses (RNs who work in occupational health settings) usually treat ailments and injuries that occur on the company property. They may be involved in illness prevention and safety programs provided for employees. Also, they may refer some individuals to other health care providers.

Nurse Instructors or Nurse Educators teach nursing students in basic and vocational schools. Nurse Educators also may work with in-service or staff development programs in various health service settings.

Office Nurses care for and treat patients in offices as directed by physicians. They may have reception, clerical, and inventory duties in addition to regular nursing duties. They often perform simple laboratory tests and take X-rays when specialists for these tasks are not available.

Private Duty Nurses give constant bedside care to one patient, either in a hospital or at the patient's home.

Public Health Nurses, or Community Health Nurses, work in governmental or voluntary public health agencies to provide care, teaching, and counseling to individuals at home, at work, or in schools, clinics, or other settings. Emphasis is on preventing illness by providing people with instruction in health maintenance and disease prevention. They refer patients with special problems to appropriate community agencies.

School Nurses plan policies, standards, and objectives of school health programs in cooperation with medical and school administrative personnel.

RN's who have graduate education or extensive experience may become administrators, teachers, Public Health Nurses, or consultants. Specialists, such as Nurse Anesthetists or Nurse Practitioners, also are registered nurses who have completed specialized training.

Work Settings

Hospital or Institutional Registered Nurses may be supervised by the head nurse. They may supervise auxiliary nursing personnel and other health personnel, such as licensed practical nurses, nurse aides, or orderlies. Nurse Educators are supervised by the director of staff development or the school director. They instruct and supervise the training of auxiliary nursing personnel. Office Registered Nurses are supervised by the physician(s) who employ them. RN's work in hospitals, nursing homes, clinics, offices, or classrooms. Private Duty Nurses and Community Health Nurses may provide nursing services in private homes, industries, or clinics. All may be exposed to infection, communicable diseases, and contaminated materials.

Special Requirements

To qualify as a registered nurse in Arkansas, the applicant must complete an accredited professional nursing program (two-year degree, three-year diploma, or four-year degree) and pass a written examination. Any person who holds a license to practice professional nursing has the right to use the title "Registered Nurse."

Educational Institutions

ANEC, ASUMH, ASUJ, ASUN, BRTC, CCCUA, EACC, NAC, NPCC, NWACC, OC, PCCUA, SACC, SEAC, UACCB, UACCM, UAFS, UAM (All A); BHS (Diploma)

ANC, ASUJ, ASU, EACC, HU, MSCC, NAC, OUTC, SACC, UACCH, AF, UAFS, UAM, UAMS, UAPB, UCA (All B)

Post R.N.: AHEC-FS, ASUJ, ATU, PCCUA, SEAC, UCA, UAMS (All M), UAMS (D)

For more information, contact:

Arkansas Nurses Association

1401 West Capital Ave. Suite 155

Little Rock, AR 72201

(501) 244-2363

www.arna.org

XI. Pharmacy

A. Pharmacist..... page 55

B. Pharmacy Technician..... page 56

Pharmacology is the science of the interaction of chemical substances with living organisms or systems. The development of chemical agents to cure, prevent, or ease the symptoms of disease is the primary goal of pharmacology. Pharmacists interpret prescriptions and then prepare and dispense the appropriate medications with accuracy. They may provide the physician and patients with information about the uses and effects of pharmaceuticals. They also assist customers in choosing nonprescription medicines and health products and must have the necessary knowledge to counsel a customer.

The pharmacist must remain aware of the latest developments in drugs for the treatment of all diseases and disorders. Also, knowledge of pesticides, herbicides, and industrial chemicals is required. Pharmacy personnel are important members of a rapidly expanding science. The career options are very broad. Pharmacists and pharmacy technicians may work in community pharmacies, hospitals, industries, colleges or schools of pharmacy, or public health facilities. Training for a career in pharmacology varies from a few months after high school to several years of post-graduate study.

A. Pharmacist

Pharmacists dispense medications prescribed by physicians and other authorized medical practitioners. They counsel patients about the use of prescription drugs and over-the-counter medications.

Work Activities

- Verifying the validity of a prescription
- Determining the identity, purity, and strength of medications
- Weighing, measuring, and mixing drugs and other medicinal compounds
- Ensuring that patients understand prescribed instructions
- Providing information to prescribers, institutional clients, and others
- Taking responsibility for the pharmaceutical care of patients
- Providing consultation to patients
- Keeping comprehensive records of all medications dispensed in order to satisfy the provisions of the law
- Storing and preserving biologicals, vaccines, serums, and other drugs that may lose their potency
- Ordering and maintaining a supply of drugs, chemicals, and other pharmaceutical stock
- Advising civic groups and other health professionals about rational drug use and precautions, and about the availability of medications
- Teaching in a college of pharmacy

Career Specialties

Pharmacists may perform other duties depending on their place of employment.

Community Pharmacists, or **Retail Pharmacists**, perform a combination of professional, managerial, and administrative functions. In addition to dispensing medications and medical supplies and consulting with consumers and other health professionals, these pharmacists hire and supervise employees, keep business records, and oversee the general operation of the pharmacy.

Consultant Pharmacists review the drug therapy programs of nursing home patients on a regular basis.

Hospital Pharmacists working in hospitals, clinics, or nursing homes may advise the medical staff on the selection and effects of drugs, perform administrative duties, teach in schools of allied health, and work in patient care areas as members of a medical team. They may be engaged in the therapeutic monitoring of drug levels and in the filling and compounding of orders for medications. They also may gather information for use in hospital research projects.

Radiopharmacists receive special training to work with radiopharmaceuticals (drugs that contain radioactive materials).

Pharmacists employed in **Industry** may find positions in the research and development of new drugs or in the supervision of personnel, quality control, packaging, or medical sales.

Work Settings

Depending on their place of employment, a Pharmacist may work alone, with other Pharmacists, or as a member of a team of health care professionals. Pharmacists may supervise pharmacy assistants, pharmacy technicians, and other employees and/or be supervised by a pharmacy owner, project director, or by a more experienced Pharmacist.

Hazards may include skin disorders from contact with chemicals and burns from acids. The work does not require much physical effort; however, in many jobs, Pharmacists are required to stand most of the day.

Special Requirements

To become licensed as a Pharmacist in Arkansas, an applicant must have a professional degree from an approved school of pharmacy, pass a state board examination, and have a specified amount of practical experience in a pharmacy or serve an internship under a licensed pharmacist in a community or a hospital pharmacy.

Educational Institutions

Prepharmacy: ATU, UAF (B)
UAMS (M&D)

For more information, contact:

Arkansas Pharmacists Association
417 South Victory Street
Little Rock, Arkansas 72201
(501) 372-5250
www.arpharmacists.org

**American Association of Colleges of
Pharmacy**
1426 Prince St.
Alexandria, VA 22314-2841
(703) 739-2330
www.aacp.org

B. Pharmacy Technician

Pharmacy Technicians assist pharmacists by mixing and filling prescriptions and maintaining the pharmacy's stock levels.

Work Activities

- Mixing pharmaceutical preparations under the direction and supervision of the pharmacist
- Preparing inventory; ordering and stocking supplies
- Packaging and labeling drugs, chemicals, and other pharmaceutical preparations
- Filling prescriptions with prepared drugs and compounding sterile intravenous solutions under the supervision of a pharmacist
- Cleaning equipment and work areas in the pharmacy
- Sterilizing bottles, beakers, and other glassware according to prescribed methods
- Computing charges for drugs
- Delivering prepared medications and running errands

Work Settings

Pharmacy Technicians work under the direction and close supervision of a pharmacist. They may work with other Technicians in large hospitals or in retail settings where they also may greet and assist customers.

Special Requirements

Nearly all employers require applicants to have a physical exam. Because Pharmacy Technicians deal with controlled substances, they must undergo a background check. Applicants without prior experience or training may be required to pass a test to determine if they have the necessary aptitude to learn the job. Some typing may be required for this job.

Educational Institutions

ASUB, UACCH (C)

For more information, contact:

American Association of Pharmacy Technicians

P.O. Box 1447
Greensboro, NC 27402
(877) 368-4771
www.pharmacytechnician.com

XII. Public Health

- A. Environmental Health Specialist..... page 57**
- B. Epidemiologist.....page 58**
- C. Health Educator.....page 59**

Public health is concerned with assuring the public’s health through health promotion, disease prevention, quality control, and disease control. Public health career fields include research, biostatistics, health education, environmental health and safety, consumer health, school health, communicable disease control, and occupational health.

A. Environmental Health Specialist

Environmental Health Specialists are responsible for education, consultation, and enforcement relating to local, state, and federal laws, regulations, and standards governing the sanitation of food, milk, water, solids, hazardous and infectious wastes, sewage, housing and institutional environments, and other health hazards. They work to improve the water and sanitation facilities at recreational areas, nursing homes, schools, restaurants, and other locations. They are involved actively in the overall environmental quality of a community.

Work Activities

- Evaluating the handling, processing, and serving of food and milk in order to identify hazards and to ensure compliance with federal, state, and local laws, rules, and regulations
- Evaluating the standards of procedures, personnel, and equipment in dairies and food processing plants
- Collecting and analyzing environmental samples of a chemical, physical, and biological nature in order to determine if a hazard to the public health exists
- Overseeing the safe and adequate treatment and disposal of sewage and solid, hazardous, and infectious waste
- Designing wastewater disposal systems and well installations and monitoring their construction to ensure that regulations are met
- Determining the nature and cause of a myriad of pollution problems and initiating stop action orders
- Developing and managing program to prevent toxic waste contamination, control insects and rodents, dispose of waste, and ensure clean water supplies
- Consulting with and advising physicians and other medical personnel about community environmental health hazards
- Recommending measures to ensure maximum community health protection
- Serving as a community health educator or environmental health issues
- Conducting and analyzing epidemiologic data regarding disease outbreaks within a community

Career Specialties

In rural areas and small cities, Environmental Health Specialists are responsible for a wide range of activities and environmental programs. In large cities or in agencies, they may specialize in one area of environmental health. These areas of specialization include milk and dairy production, food protection, sewage disposal, pesticide management, air pollution, institutional sanitation, and occupational health.

Work Settings

Environmental Health Specialists work closely with the public as educators, interpreters, consultants, and enforcement agents in a variety of environments. They may draft laws and regulations and testify in court. More experienced Environmental Health Specialists may manage and supervise large staffs. Some areas of work require considerable travel and may include encountering unsanitary conditions and health hazards. However, precautions are implemented to prevent exposure of the Environmental Health Specialist and the community to any hazards. Environmental Health Specialist working in enforcement agencies may prepare documents used in determining “acceptable standards” and in legal proceedings.

Special Requirements

Most Environmental Health Specialists earn the required bachelor’s degree in environmental health. In some instance, education in a related field, such a environmental engineering, is acceptable. Master’s and doctoral degrees may be earned in environmental health or a related science. National certification is available through the National Environmental Health Association.

Educational Institutions

Environmental Health: UALR (B); UAF, UAMS (M)

Environmental Science: JBU, LC, UAF, UCA, UO (All B); ASUJ, UAF, UAMS (M & D)

For more information, contact:
National Environmental Health Association
720 S. Colorado Blvd., Suite 970-S
Suite 970 South Tower
Denver, CO 80246-1925
(303) 756-9090
www.neha.org

B. Epidemiologist

Epidemiologists analyze the occurrence and distribution of diseases within a population by determining the possible vector or mode of disease transmission, and examining the efficiency of intervention programs.

Career Specialties

Epidemiologists may specialize in the following fields: Infectious disease, chronic disease, environmental/occupational epidemiology, psycho/social epidemiology, health care evaluation, or human genetics.

Work Activities

- Investigates and describes the causes and distribution of disease, disability, injury, and other health conditions
- Develops programs and strategies for their prevention and control

Work Settings

Epidemiologists work in a wide variety of settings including state and federal government (health, human service agencies, corrections and jail facilities, private organizations (hospitals, clinics, managed care organizations, businesses), voluntary organizations (non-profit, foundation, religious), schools and university health settings, and academic and research institutions. Many epidemiologists are employed by the CDC (Centers for Disease Control) where they attempt to analyze and eradicate disease from the population.

Special Requirements

Epidemiologists should have either a master's or doctoral degree. Some individuals choose to enter medical school and have a MD degree in addition to another graduate degree.

Educational Institutions

UAMS (M & D)

For more information contact:
American College of Epidemiology
1500 Sunday Drive, Suite 102
Raleigh, NC 27607
919-861-5573
www.acepidemiology.org

C. Health Educator

Health Educators communicate information on health issues and concerns to the public and targeted population groups. They assess individual and community needs and plan effective health education programs, while functioning as a resource and consultant. Some topics they

address are: nutrition, exercise, smoking, high blood pressure, drug and alcohol abuse, infant mortality, teenage pregnancy, sexually transmitted diseases, and AIDS.

Work Activities

- Diagnosing educational needs of clients to increase their knowledge, modify their attitudes, and change their unhealthy behaviors
- Researching, designing, and presenting quality health education programs.
- Writing educational materials, public information reports, grant proposals, and newsletters
- Using instructional equipment and medial effectively
- Organizing community coalitions to address health concerns and issues
- Coordinating resources and identifying ways to achieve school or community health goals

Career Specialties

Health Educators may specialize according to a health concern, such as nutrition or a particular illness, or they may specialize by work setting, such as a school or hospital.

Community Health Educators focus on public health issues, with an emphasis on community involvement and diagnosis of related health concerns.

School and College Health Educators teach comprehensive school health education courses and often counsel students.

Patient and Family Health Educators work primarily in conjunction with other health care professionals, such as physicians, nurses, and dietitians who work in hospitals, outpatient clinics, and public health departments.

Worksite Health Educators plan and manage health promotion programs in a variety of public and private work settings.

Work Settings

Health Educators work alone or with other health and human service professionals. Employment is available in many settings, including health departments, community organizations, schools, corporations, hospitals, and governmental agencies.

Special Requirements

National certification is available for Health Educators who pass a written examination as a Certified Health Education Specialists (CHES). Special licensing is required for Health Educators who become classroom teachers. Academic preparation is available at the undergraduate and graduate levels.

Educational Institutions

Health Education: ASUJ, UAF, UALR, UCA, UAM (All B); ASUJ, UAF, UCA (All M)

Community Service, Health Promotion: ASUJ, JBU, SAUM (B)

Public Health: UAMS (M, S, & D)

Health Science: ASU, ATU, SAUM, UAF, UALR, UAM, UAPB, UCA (B); ASU, UAF, UALR, UAM, UAPB, UCA (M); UAF (D)

For more information, contact:

Arkansas Society of Public Health

Educators

P.O. Box 251169

Little Rock, AR 72225

www.arsophe.org

American Association for Health Education

1900 Association Drive

Reston, VA 20191-1598

(800) 213-7193

www.aahperd.org

XIII. Science and Engineering

A. Biomedical Engineer	page 61
B. Biomedical Equipment Technician	page 62
C. Industrial Hygienist.....	page 63
D. Research Scientist.....	page 65

In many aspects, the fields of science and engineering are related closely to medicine. Many scientists work in the health field to detect, control, or prevent disease. Environmental health specialists use their knowledge of biology and environmental science to improve and manage air, water, and other environmental resources. Industrial hygienists protect the work environment by detecting and controlling disease-producing agents. Other scientists apply engineering skills to make significant advances in medical research and in methods to treat injury and disease. Biomedical engineers use scientific theory, technology, and computer science to design medical and surgical instruments, and to create or improve devices that repair, assist, or replace damaged or diseased body parts.

Scientific research has revolutionized modern medicine. New drugs, methods, equipment, and technology contribute to the effectiveness of diagnosis and medical treatment and to the elimination of the causes of disease and illness. Careers in this field require specialized training after high school. Many of these professions require a college degree, and research and development work requires a master's or a doctoral degree.

A. Biomedical Engineer

Biomedical Engineers research the biology of humans and animals to develop theories and facts, or to test, prove, or modify known theories of life systems. Based on the results of this research, they design and develop life-support apparatus using principles of engineering and bio-behavioral science.

Work Activities

- Studying engineering aspects of human bio-behavioral systems using a knowledge of human anatomy and physiology
- Planning and conducting research concerning behavioral, biological, psychological, or other life systems
- Developing mathematical models and computer simulations of human bio-behavioral systems in order to obtain data for measuring or controlling life processes
- Designing and developing instruments and devices, such as artificial organs, limbs, pacemakers, or ultrasound imaging equipment—to assist health care personnel in observing, diagnosing, repairing, or treating physical ailments or deformities
- Evaluating the effectiveness of drugs and other medications
- Developing new applications for energy sources, such as using nuclear power for biomedical implants
- Teaching, writing, consulting, and managing laboratories
- Biomedical Engineers may work in sales or as field engineers and install, adjust, maintain, or repair equipment for biomedical equipment manufacturers.

Career Specialties

Biomedical Engineers may specialize according to their place of employment and the scope of their work.

Clinical Engineers work to improve and maintain health care delivery systems in hospitals, clinics, governmental units, universities, and industry. They supervise the maintenance of biomedical equipment, advise hospital personnel on the purchase and installation of new equipment, investigate accidents of equipment failure, and train and supervise biomedical equipment technicians and others. They may work as part of hospital operating teams ensuring that critical life-support and analysis equipment is working properly.

Medical Engineers develop instruments, materials, diagnostic and therapeutic devices, artificial organs, and other equipment.

Bio-Environmental Engineers use engineering concepts and technology to maintain and protect the quality of the environment in order to protect human, animal, marine, and plant life from toxins and pollutants.

Work Settings

Biomedical Engineers work alone or with medical and administrative personnel; life, social, and physical scientists; and other specialists. They may direct, train, or supervise technicians and medical personnel.

Most Biomedical Engineers work in medical, academic, industrial, and governmental research laboratories and hospitals. Those who work in undersea and space programs are exposed to a variety of environmental conditions. However, hazards are minimized by following safety procedures and wearing protective clothing.

Special Requirements

Many Biomedical Engineers complete undergraduate programs in electrical, chemical, mechanical or general engineering before entering a master's or doctoral program. Hospitals often require certification for employment. Clinical Engineers may obtain optional certification from either the Association for the Advancement of Medical Instrumentation or the American Board of Clinical Engineers.

Educational Institutions

UAF (M&D)

For more information, contact:

Biomedical Engineering Society (BMES)

8401 Corporate Drive, Suite 140
Landover, MD 20785-2224
(301) 459-1999
www.bmes.org

The American Society for Healthcare Engineering (ASHE)

One North Franklin, 28th Floor
Chicago, IL 60606
(312) 422-3800
www.ashe.org

B. Biomedical Equipment Technician

Biomedical Equipment Technicians are knowledgeable in the theory of operation; the underlying physiological principles; and the practical, safe, clinical application of biomedical equipment. Technicians may be involved in the operation, supervision, and control of equipment.

Work Activities

- Installing, inspecting, and testing equipment and instruments using blueprints, written specifications, and standard specialized test equipment
- Disassembling equipment to locate the cause of malfunctioning
- Repairing or replacing defective parts

- Reassembling equipment and adjusting precision components according to blueprints and written and verbal instructions
- Performing safety checks on electrical and radiation equipment
- Adding to or changing original components to meet specific therapeutic or diagnostic requirements
- Training equipment users to operate equipment safely
- Maintaining inventories of supplies and parts and reordering items as needed

Career Specialties

Biomedical Equipment Technicians may specialize in the repair and maintenance of specific types of biomedical equipment used in radiology, nuclear medicine, and patient monitoring operations. They may also specialize in airborne biomedical instrumentation.

Biomedical Equipment Technicians may be designated according to their place of employment or their work activities. Biomedical Engineering Technicians support biomedical or clinical engineers in hospitals, large clinics, and many other work settings. Their work may involve design, construction, development, installation, and service of biomedical and related technical equipment. Engineering Technicians, depending on their background in engineering, electronics, physiology, or medicine, may be expected to substitute for engineers in less technical activities.

Electromedical Equipment Repairers work primarily in hospitals. They test, repair, and provide preventive maintenance for electromedical equipment, such as electrocardiographs, electroencephalographs, operating room lamps and tables, and diathermy machines.

Dental Equipment Installers and Servicers install and maintain electric or pneumatic drill units, dental X-ray machines, plumbing equipment, and related dental office equipment.

Work Settings

Most Biomedical Equipment Technicians work in hospitals and large clinics. They work with other technicians and hospital or clinic personnel under the direction of a more experienced supervisor. Other Biomedical Technicians work for employers on teams with biomedical or clinical engineers, medical personnel, and scientists. Technicians who work for manufacturers may work with engineering, sales, and service personnel.

Working conditions usually are pleasant, but there are physical hazards in this occupation. Injuries may be caused by lifting or transporting heavy equipment. Also, Biomedical Equipment Technicians may be exposed to electric shock, radiation, noxious fumes, and communicable diseases. Hazards are minimized by following safety procedures and wearing protective gear, such as goggles, safety shoes, and rubber aprons.

Special Requirements

Biomedical Equipment Technicians are not required to be certified. Employers may hire individuals who have a background in electronics and train them on the job. However, some prefer graduates of formal biomedical equipment technology programs. Satisfactory completion of professional coursework in Biomedical Instrumentation Technology satisfies the academic requirements to apply for national certification by the International Certification Commission. Two years of professional experience are also required. Successful completion of the program does not itself ensure certification. Each student is responsible for familiarizing himself/herself with the applicable certification requirements.

Educational Institutions

NAC (A)

For more information, contact:

Association for the Advancement of Medical Instrumentation (AAMI)

1110 N. Glebe Road, Suite 220

Arlington, VA 22201- 4795

(703) 525-4890

www.aami.org

C. Industrial Hygienist

Industrial Hygienists conduct health hazard evaluations, perform health effects/risk assessment research, and manage health programs in industries or governmental organizations. They anticipate, recognize, evaluate, control, and eliminate health hazards in industry, the community, or the environment.

Work Activities

- Collecting samples of potentially toxic chemical, physical, and biological agents for analysis
- Preparing and calibrating equipment used in collecting and analyzing samples
- Performing laboratory analyses of samples
- Investigating the adequacy of ventilation, exhaust, lighting, and other conditions that may affect employee health, comfort, or efficiency
- Conducting evaluations of exposure to ionizing and non-ionizing radiation and to noise and vibration
- Reviewing physicians' and accident reports and conducting studies to determine if diseases or illnesses are work-related
- Recommending measures to ensure maximum employee protection
- Collaborating with other health professionals to remove or control hazardous and potentially hazardous materials
- Preparing reports of observations and analyses, and making recommendations about industrial health problems
- Using cost-benefit analysis to justify the money required to make engineering changes or to purchase protective equipment
- Conducting or participating in epidemiological research
- Participating in educational training meetings to instruct employees about occupational health and the prevention of accidents

Industrial Hygienists who work for enforcement agencies may help prepare documents to be used in legal proceedings.

Career Specialties

Industrial Hygienists may specialize in a particular area, such as the collection and analysis of samples or the control of acoustical, chemical, radiational, or toxicological hazards. Some Hygienists work in administration, teaching, research, or consultation. Persons with specialized training in engineering may work as Industrial Health Engineers.

Work Settings

Industrial Hygienists may work alone or with industrial engineers, physicians, or other members of an industrial team. Some may work with governmental officials, environmental groups, organized labor groups, or industrial managers when designing and developing systems for a healthy work environment. They may work in industrial plants or in governmental agencies. Physical surroundings and working conditions of Industrial Hygienists vary. Some duties, such as collecting samples of pollutants for environmental impact evaluation, require working outdoors.

Such duties as collecting samples from a workplace or testing the samples are conducted indoors. The hazards encountered may include those that the Hygienist is working to control, including excessive noise levels, chemicals, air pollution, or radioactivity.

Special Requirements

An individual who wants to become an Industrial Hygienist should have a minimum of a bachelor's degree in occupational safety and health, or environmental health engineering, physical science, or natural science.

Educational Institutions

Environmental Health: SACC (C); UALR (B)

Environmental Engineering: UAF (M & D)

Environmental and Occupational Health: UAMS (M & D)

General Physical Sciences: ATU, UAM, UCA (All B)

Environmental Science/Studies: JBU, LC, UAF, UCA, UO (All B); SAUT (A); ASUJ (M&D)

Toxicology: UAMS (M & D)

For more information, contact:

American Industrial Hygiene Association

2700 Prosperity Avenue, Suite 250

Fairfax, VA 22031

(703) 849-8888

www.aiha.org

D. Research Scientist

Research Scientists attempt to learn everything possible about a particular field of interest and training. They improve and prolong life by helping to prevent and cure illnesses.

Work Activities

- Performing research to determine the action of foods, drugs, sera, hormones, nutrients, and other substances on the tissues and processes of living things
- Studying disease processes in order to find the causes of illnesses, such as cancer, arthritis, genetic diseases, and heart disease
- Isolating and identifying bacteria, viruses, and parasites
- Studying how the immune system works to prevent illness
- Discovering the ways in which humans lived, worked, and died in ancient times
- Developing better ways to process, store, and use foods, drugs, and chemical compounds
- Conducting research to find methods of transferring characteristics of one type of organism to another, such as in the development of disease-resistant strains of field crops
- Performing diagnostic tests and developing new tests used in the detection of diseases, genetic disorders, or other abnormalities
- Developing and testing new ways to treat illness
- Designing and building special laboratory instruments, space vehicles, and underwater equipment
- Writing reports and scientific papers based on research
- Analyzing mathematical and scientific theories in order to apply them in ways that will make life better

Career Specialties

Research Scientists may specialize in many different areas of laboratory work and research.

Biochemists study the chemical processes of living organisms and the changes that take place during the development of the organisms. They explain biological functions in chemical terms and contribute to the understanding of the structure and function of all organisms, tissues, and cells.

Geneticists study the biology of heredity. They especially are interested in how traits are transmitted and why they vary from one individual to another.

Immunologists study the ways in which humans and other organisms resist illnesses, such as cancer, heart disease, and communicable diseases.

Microbiologists study bacteria and other organisms in order to prevent and cure the diseases they cause. They also learn to use these organisms in positive ways, such as in cleaning up oil spills or producing lifesaving medicines.

Molecular Biologists study the structure and function of living organisms at the most basic level. They study the chemistry and physics of the smallest units that make up life.

Pathologists study the causes and characteristics of diseases in order to prevent illness, ease suffering, and increase the productive life span.

Physicists study the interactions of matter and energy in theory and in application to our daily lives.

Work Settings

Research Scientists may work alone or as a member of a team. Research Scientists with advanced degrees usually are assisted by laboratory workers who perform routine work. Research Scientists may work under a research director or may supervise a research team. Some Research Scientists combine research with teaching in colleges and universities. Most Research Scientists work in laboratories. Those who teach also spend time in classrooms. Although Research Scientists work with plants, animals, chemicals, radiation, and microorganisms that may cause illness or disease, usually the work is not dangerous if proper safety procedures are followed.

Special Requirements

The minimum educational requirement is a master's degree. However, advanced degrees are required for many beginning jobs. A doctoral degree is required to conduct advanced research and to advance to many management and administrative positions.

Educational Institutions

Biochemistry: HU, JBU (B); UAMS (M & D)

Health Systems Research: UAMS (M&D)

Microbiology: UAF (B, M & D), UAMS (M & D)

Molecular Biology: UAF, UAMS (M & D); ASUJ (D)

Pathology: UAMS (M & D)

Physics: UAF (B, M & D)

Physiology: UAMS (M & D)

For more information, contact:

National Academy of Sciences National Research Council

500 Fifth Street, NW

Washington, DC 20001

www.nas.edu

XIV. Therapy

- A. Audiology/Speech Pathology page 67**
- B. Creative Arts Therapy Personnel..... page 67**
- C. Occupational Therapy Careers page 69**
- D. Physical Therapy Personnel page 70**
- E. Respiratory Care Careers page 72**
- F. Recreational Therapist page 73**

Therapists use their skills, talents, and specialized knowledge to help ill or disabled persons to regain the ability to function independently. They work with individuals who have physical, mental, emotional or social handicaps. To help patients with recovery and adjustment may require many and varied techniques and modalities of treatment; therefore, persons interested in the field of therapy have numerous career choices. They may choose from a variety of therapies, including art, dance, music, sports and exercise, speech and hearing, physical, horticultural, and occupational. Therapists combine the highly skilled services of their specialties with their abilities to teach. The field of therapy is open to individuals with diverse interests and talents. Some careers require a high school education plus two years of training. Most require a bachelor's degree or graduate education.

A. Audiologist or Speech-Language Pathologist

Speech-Language Pathologists or **Audiologists** are professionals concerned with the research, evaluation, and treatment of human communication problems. They work with people of all ages and types of symptoms, including stuttering, harsh voice, inappropriate pitch, and eating or swallowing difficulties. Their patients may also have problems producing and understanding language. Causes of such speech problems can date back to birth and include mental retardation, cerebral palsy, and cleft palate. Other causes striking later in life may be hearing loss, brain injury, or stroke. For all patients, the speech-language pathologist determines the exact nature of the disability and decides upon an adequate treatment regimen.

Work Settings

Many different opportunities are available for an Audiologist or Speech-Language Pathologist. An **Audiologist** or **Speech-Language Pathologist** may work independently or with a team of other professionals who may include physicians, occupational therapists, physical therapists, hearing aid specialists, and/or special education teachers. They may work in private practice, public schools, industry, private and public hospitals, clinics, rehabilitation centers, physicians' offices, schools for the handicapped, nursing homes, colleges and universities, research laboratories, and governmental agencies.

Special Requirements

A master's degree in audiology or speech-language pathology is the standard credential in this field. In schools, people with bachelor's degrees in speech-language pathology may work with children who have communication problems. They may have to be certified by their state educational agency, and may be classified as special education teachers rather than audiologists or speech-language pathologists. Federal legislation requires speech-language pathologists in school systems to have a minimum of a master's degree or equivalent. All states require audiologists to hold a master's degree or equivalent.

Educational Institutions

Audiology/Speech Pathology: UALR/UAMS, UCA (B); UALR/UAMS (M & D)

Communication Disorders: HU, OBU, ASUJ (B); UAF (B & M); UCA, UALR/UAMS (M & D)

Education of Deaf/Hearing Impaired: HSU, UALR (B); ASUMH (A)

Sign Language Interpreter: UALR (A & B)

For more information contact:

American Speech-Language-Hearing-Association

10801 Rockville Pike

Rockville, MD 20852

800-498-2071

www.asha.org

Arkansas Speech-Language-Hearing-Association

P.O. Box 250261

Little Rock, AR 72225

(877) 427-5742

www.arksha.org

B. Creative Arts Therapy Careers

Creative Arts Therapists help individuals, families, and groups to achieve optimal physical, psychological, and psychosocial functioning. Creative arts therapy is focused on communication and expression and concentrates more on emotional processes than the verbal therapies do.

Work Activities

- Assessing psychotherapeutic needs of clients and determining appropriate goals and objectives
- Developing, evaluating, and directing creative arts therapy treatment plans
- Charting a client's progress
- Teaching students and other professionals

Career Specialties

Art Therapists focus on the psychotherapeutic use of the visual arts, such as drawing, painting, and clay modeling, and offer clients an opportunity to express symbolically and resolve inner conflicts and painful or confusing experiences in order to encourage personal growth and development. Art Therapists may specialize in working with certain age groups or persons with specific emotional problems, such as post-traumatic stress.

Dance/Movement Therapists help individuals use movement to strengthen body image, alter feelings, increase coping skills, and improve orientation to reality. They work with people of every age and level of progress.

Drama Therapists use creative drama, theater, and role playing to promote the goals of emotional and physical rehabilitation, symptom relief, and personal growth.

Music Therapists, through the use of creative and structured sounds, assist clients with improving and maintaining skills in communication, socialization, motor development and functioning, and sensory awareness.

Poetry Therapists help individuals to achieve therapeutic goals and personal growth through poetry and other evocative literature.

Work Settings

Creative Arts Therapists may work as members of a treatment team or as individual practitioners. They serve individuals, couples, families, and groups. Employment settings include hospitals, clinics, private offices, schools, universities, training institutes, psychiatric centers, businesses, government agencies, law enforcement agencies, and prisons.

Special Requirements

Art Therapists are required to have a master's degree from an accredited art therapy program. To become a Registered Art Therapist (ATR) with the American Art Therapy Association, an applicant also must complete a specific number of hours of supervised clinical service. Dance Therapists also must obtain a master's degree from an accredited university in either dance therapy or a related field. There are two levels of national registration: Registered Dance Therapists (DTR's) are qualified to work in a professional treatment system, and Registered Academy of Dance Therapists (ADTR's) are qualified to teach, provide supervision, and engage in private practice. Upon completion of either a bachelor's or master's degree in music therapy from an accredited program, Music Therapists are required to complete a clinical internship at an approved facility. The National Association for Music Therapy provides certification as a Registered Music Therapist (RMT), and the American Association for Music Therapy provides certification as a Certified Music Therapist (CMT). Psychodramatists must have a minimum of a master's degree in a mental health-related field from an accredited school. The applicant also must obtain additional training and one year of supervised experience and pass a written examination.

Educational Institutions

Art Therapy: HU (B)

For more information, contact:

American Dance Therapy Association

2000 Century Plaza, Suite 108
Columbia, MD 21044
(410) 997-4040
www.adta.org

American Music Therapy Association (AMTA)

8455 Colesville Rd., Suite 1000
Silver Spring, MD 20910
(301) 589-3300
www.musictherapy.org

National Association for Drama Therapy (ADTA)

15 Post Side Lane
Pittsford, NY 14534
(585) 381-5618
www.nadt.org

American Art Therapy Association

1202 Allanson Road
Mundelein, IL 60060-3808
(888)290-0878
www.arttherapy.org

C. Occupational Therapy Careers

Occupational Therapists conduct and direct specialized therapeutic programs to help people with physical, psychological, or developmental problems regain their abilities or adjust to their handicaps. The scope and objective of each treatment program vary according to the individual patient's needs and capabilities. Several types of workers with different skill and educational levels are employed in this field.

Programs in occupational therapy offer the education needed to provide services to individuals whose abilities to cope with the tasks of daily life are threatened or impaired. Developmental handicaps, physical injuries or illnesses, psychological and social problems, age, and economic and cultural barriers are some of the factors affecting individuals who require the services of Occupational Therapists.

Work Activities

- Planning individual therapy programs using selected activities
- Consulting with other members of the treatment team to coordinate the most appropriate program
- Selecting activities and programs according to the needs and capabilities of individual patients
- Teaching patients the skills and techniques that are required for participation in activities
- Evaluating patients' progress, attitudes, and behaviors
- Designing special equipment to aid disabled patients
- Teaching patients how to adjust to home and work activities and to social environments
- Testing and evaluating patients' physical and mental abilities
- Preparing patients' progress charts
- Lecturing to various professionals, students, and community groups about occupational therapy

Occupational Therapy Assistants aid **Occupational Therapists** in administering programs for patients in need of rehabilitation services. They assist in the evaluation of the patient's daily living skills and capacities. They also instruct patients in such activities as self-care, homemaking, social skills, and crafts. They order supplies and help maintain tools, equipment, and records.

Occupational Therapy Aides work under the direction of Occupational Therapists and **Occupational Therapy Assistants**. They perform support services, such as transporting patients, assembling equipment, and preparing and maintaining work areas for patient use.

Career Specialties

Occupational Therapists usually work with certain types of disabilities and age groups. Often they start their careers in general patient care, but eventually choose a treatment specialty, such as pediatrics, gerontology, or psychiatry. They may work as staff therapists, senior therapists, supervisors, clinical directors, activity coordinators, administrators, consultants, researchers, or educators.

Vocational Rehabilitation Therapists arrange paid employment for patients in an actual work environment. They also determine the work activities that will provide the greatest therapeutic value for a patient.

Work Settings

Occupational Therapists usually work as part of a team. In most cases they work with physicians, physical and speech therapists, nurses, social workers, psychologists, vocational counselors, teachers, and other specialists. They may supervise certified and non-certified Assistants, Aides, and volunteers. Most work is performed indoors; however, some Occupational Therapists occasionally supervise outdoor recreational and rehabilitation activities, such as games, gardening, and exercises. Often they are required to make visits to a patient's home and school to determine the patient's rate of progress and adjustment to the treatments.

Special Requirements

A college degree and a certificate in occupational therapy from an accredited program are required to become an Occupational Therapist. After students complete the six- to nine-month clinical practice portion of the program and graduate, they are eligible to take the examination to become a Registered Occupational Therapist. Also, training in occupational therapy is available at the master's degree level. Assistants in this occupation may become certified after completing a two-year approved training program and passing an examination.

Educational Institutions

Occupational Therapy Assistant/Aide: BHS, PTC, SACC (A)

Occupational Therapy: UCA (B & M)

For more information, contact:

American Occupational Therapy Association

4720 Montgomery Lane

P O Box 31220

Bethesda, MD 20824-1220

(301) 652-2682

www.aota.org

D. Physical Therapy Careers

Physical Therapists plan, administer, and conduct physical therapy treatment for patients referred to them by other health care practitioners in order to restore functioning, relieve pain, and prevent disability following disease, injury, or loss of a body part.

Work Activities

- Evaluating the physician's referral and the patient's medical records to determine what type of physical therapy is required
- Performing patient tests, measurements, and evaluations, including range-of-motion and manual-muscle tests, gait and functional analyses, and body-parts measurements
- Administering manual therapeutic exercises to improve or maintain muscle function
- Instructing and motivating patients in non-manual exercises (i.e., isometrics) and in functional activities (i.e., ambulation)
- Administering treatments involving the application of light, heat, water, and electricity
- Evaluating the effects of treatments and of their duration, then adjusting treatments to achieve maximum benefits
- Performing deep and surface massage techniques
- Administering traction to relieve neck and back pain
- Instructing patients and their families in physical therapy procedures to be continued at home
- Training patients in the use of prosthetic and orthotic devices and recommending modifications
- Conferring with physicians, social workers, nurses, psychologists, and other therapists regarding patient cases

Physical Therapy Assistants are skilled technical workers who help administer tests and treatment programs under the direction of the Physical Therapist.

Physical Therapy Aides perform routine tasks related to physical therapy service. They may assist patients in preparing for treatment sessions. They transport patients to and from treatment areas, arrange treatment supplies and equipment, clean work areas and equipment after sessions, and perform other duties assigned by the Physical Therapist.

Career Specialties

The physical therapy profession has developed certified clinical specialties in the areas of sports medicine, orthopedics, pediatrics, clinical electrophysiological testing, geriatrics, neurology, and cardiopulmonary. Physical Therapists may be engaged actively in research, teaching, consultation, administration, or community health.

Work Settings

Physical Therapists often work as part of a team under the supervision of higher level personnel, such as a Chief Physical Therapist or a department head. Physical Therapists may supervise Physical Therapist Assistants and Physical Therapy Aides. Physical Therapists work with physicians, nurses, social workers, occupational therapists, speech therapists, and other specialists. Some Physical Therapists are in private practice. Physical Therapists may work in private and public hospitals, clinics, rehabilitation centers, physicians' offices, schools for the handicapped, nursing homes, colleges and universities, research laboratories, and governmental agencies. Usually they work indoors; however, those who treat patients at home or who are consultants for agencies perform their duties under a variety of working conditions.

Special Requirements

To become licensed in Arkansas as a Physical Therapist, an applicant must be at least 18 years of age, graduate from a school of physical therapy approved by the Commission on Accreditation of Physical Therapy Education, and pass an examination.

To become licensed in Arkansas as a Physical Therapy Assistant, an applicant must be at least 18 years of age, graduate from a two-year college program for Physical Therapy Assistants that has been approved by the certifying board, and pass an examination.

Educational Institutions

Physical Therapy Assistant/Aide: ASUJ, NWACC, OZC, SACC, UCA (All A)

Physical Therapist: ASUJ, UCA (B & M); UCA (D)

For more information, contact:

American Physical Therapy Association (APTA)

1111 N. Fairfax Street
Alexandria, VA 22314-1488
(703) 684-2782
www.apta.org

Arkansas Physical Therapy Association

PO Box 180
State University, AR 72476-1800
(870) 974-2998
www.arpta.org

E. Respiratory Therapy Careers

Respiratory Therapists and **Respiratory Technicians** treat patients who have difficulty breathing because of cardiopulmonary (heart-lung) problems. The heart and lungs are interrelated, so problems in one area usually affect the other. Treatments may include temporary or long-term therapy for patients with lung disorders, such as asthma, emphysema, bronchitis, or pneumonia, and emergency care for victims of heart failure, chest injuries, stroke, shock, premature birth, or post-surgical complications.

Work Activities

- Reviewing prescriptions, planning treatment procedures, and explaining them to patients
- Setting up and operating equipment, including oxygen, gas, and mist inhalation equipment, iron lungs, tents, masks, catheters, and incubators used in administering prescribed doses of medicinal gases and drugs (aerosols)
- Monitoring patients undergoing treatment and notifying other personnel of any harmful reactions
- Showing patients and their families how to use the equipment at home
- Teaching patients special breathing exercises designed to clear the lungs of fluid

- Conducting diagnostic tests of patients' cardiopulmonary functions
- Preparing and maintaining a treatment chart for each patient
- Inspecting and testing equipment to ensure proper functioning

Respiratory Therapists and Respiratory Technicians perform essentially the same duties. However, Therapists are expected to have a higher level of expertise and may be involved in diagnostic studies under the direct supervision of a physician. Therapists may be expected to assume some teaching, consulting, and supervisory duties.

Career Specialties

Although Respiratory Therapists are involved primarily in the treatment of cardiopulmonary problems, some specialize in diagnostic testing. **Pulmonary Technicians** and **Pulmonary Technologists** perform a wide range of diagnostic tests of the pulmonary (lung) system. Many make preliminary analyses of test data and present their findings to a physician. The test results help physicians evaluate how well a patient's lungs are functioning. This is necessary in order to determine if the prescribed therapy is resulting in improvement and to detect the presence and extent of disease. Some Respiratory Therapists work primarily in adult, pediatric, or neonatal (newborn) critical care units.

Work Settings

Respiratory Therapists supervise and are assisted by Respiratory Technicians and Respiratory Assistants. In the absence of registered therapists, certified Respiratory Technicians may supervise other respiratory personnel. The work setting for these personnel is usually a hospital. Often they work under emergency conditions to maintain or to start a patient's breathing. They also have responsibility in the care of critically ill patients and must exercise careful judgment. They assume the responsibility of working with and maintaining expensive equipment. Hazards include working with pressurized gas sources and with electrical equipment.

Special Requirements

Although certification and registration are not necessary to practice respiratory therapy in some states, many employers prefer workers with these credentials. There are two credential levels for respiratory care practitioners: the Certified Respiratory Therapy Technician (C.R.T.T.) and the Registered Respiratory Therapist (R.T.T.).

C.R.T.T.'s are typically graduates of a one-year certificate program. They administer general respiratory care and may assume clinical responsibilities for specified respiratory care modalities involving the application of well-defined therapeutic techniques under the supervision of a respiratory therapist and/or physician. R.R.T.'s are typically graduates of degree programs at least two years in length. They apply scientific knowledge and theory to practical clinical problems of respiratory care and are qualified to assume primary responsibilities for all respiratory care modalities, including the supervision of C.R.T.T.'s. Under the supervision of a physician, the R.R.T. is often required to exercise considerable independent clinical judgment in the respiratory care of patients.

Educational Institutions

Respiratory Therapy Technician (CRTT): BRTC, NWACC, PTC, UAMS (All C);
Respiratory Therapist (RTT): ASUMH, BRTC, AHEC-Delta & SA, NWACC, PCCUA, PTC, SAC, UACCH, UAMS(All A); UAMS, UCA (B)

For more information, contact:
American Association for Respiratory Care
9425 N. MacArthur Blvd., Suite 100
Irving, TX 75063-4706
(972) 243-2272
www.aarc.org

Arkansas Society for Respiratory Care
PO Box 2255
Pine Bluff, AR 71613-2255
www.arksrc.org

F. Recreational Therapist

Recreational Therapists design and implement education about leisure activities to improve the functional skills of their clients. Recreation participation programs focus on providing clients with opportunities to make independent choices for their enjoyment or self-expression. Recreational Therapists assist people of all ages who are challenged by disabling conditions that interfere with independence in play, recreation, and leisure. They help their clients to overcome social, emotional, attitudinal, or environmental barriers so they can develop and maintain a personally meaningful leisure lifestyle.

Work Activities

- Assessing the client's needs and functional abilities
- Planning and implementing goal-oriented programs
- Documenting the client's progress
- Monitoring and performing quality assurance activities
- Leading activities that help the client to focus on leisure awareness, skill development, resource identification, and community integration

Career Specialties

Recreational Therapists may specialize in various areas of interest, including aquatics and arts and crafts. It is helpful to be creative, innovative, and have good organizational skills.

Work Settings

Recreational Therapists work in public, private, federal, and state agencies. Employment opportunities are numerous in clinical and community settings where Recreational Therapists may act as therapists, educators, counselors, facilitators, and advocates.

Special Requirements

A bachelor's degree in therapeutic recreation (or in recreation with an option in therapeutic recreation) is the usual requirement for hospital and other clinical positions. An associate's degree or qualifying work experience may be sufficient for activity director positions in nursing homes.

Educational Institutions

Rehabilitation: ATU, UAPB (B); UALR (Adv C); UAF, UALR (M); UAF (D)

For additional information, contact:
American Therapeutic Recreation Association
1414 Prince Street, Suite 204
Alexandria, VA 22314
(703) 683-9420
www.atra-tr.org

XV. Veterinary Medicine

A. Veterinarian page 75

B. Veterinary Technician page 76

Veterinarians, assisted by veterinary technicians, treat and prevent the illnesses of pets, livestock, marine animals, and sporting animals. It also is their job to prevent diseases that can be transmitted from animals to humans and to protect the public from residues of herbicides, pesticides, and antibiotics used in food production. They may be involved in wildlife preservation and conservation. Also, veterinarians play an important role in agriculture. They use their knowledge to increase food production through genetics, animal feed production, and preventive medicine. The profession has assumed a major role in the advance of research in the medical uses of atomic energy, in the development of tranquilizers, corticosteroids and other pharmaceuticals, and in the study of space medicine. Veterinary medicine involves the study of the immunological relationship of viruses in humans and animals, and protects and advances human health by studying diseases, such as cancer, arthritis, anemia, and heart disease, that are common to man and animals. Also of benefit to humans is research that is performed relative to aging, organ transplantation, and ulcers.

The realization of the importance of animal care is creating new opportunities for veterinarians and veterinary technicians. More specialties mean more jobs and greater choice for individuals who possess an affinity and love for animals combined with the calm competence and fearlessness necessary to handle and manage them.

A. Veterinarian

Veterinarians, also known as Doctors of Veterinary Medicine (DVM), diagnose, treat, and control diseases in animals and are concerned with preventing the transmission of animal diseases to humans. Also, they treat injured animals and develop programs to prevent disease and injury.

Work Activities

- Performing surgery, dressing wounds, and setting broken bones of animals
- Diagnosing animal diseases
- Vaccinating animals against disease
- Advising animal owners about the care and breeding of animals
- Performing autopsies on animal carcasses
- Inspecting animals intended for consumption, both before and after they are slaughtered
- Teaching or conducting research on animal and human diseases

Career Specialties

Veterinarians may specialize in many fields, including the following:

Public Health Veterinarians safeguard the public health by controlling and preventing diseases that are transmitted from animals to humans. They inspect and regulate food- and drug-processing plants, inspect and test livestock, and provide public information.

Meat Inspection Veterinarians inspect establishments that slaughter livestock and process meat for domestic or foreign shipment. They examine the animal and the carcass to detect evidence of disease or other abnormal conditions. They also enforce municipal, state, and federal regulations to ensure a safe and wholesome food supply.

Avian Medicine Veterinarians work primarily with either ornamental (pet) birds or poultry. Diagnosis, treatment, control, and prevention of diseases are the major concerns. A pet bird practice can involve large aviaries, but most pet bird work is performed for individuals who own

one bird or a small collection of ornamental birds. Poultry practice is concerned primarily with large commercial flocks and involves interactions with poultry nutritionists, geneticists, medicinal suppliers, researchers, flock owners and caretakers, and processors so that optimum efficiency in the production of meat and eggs is achieved. Avian Veterinarians also are involved in research and product development, teaching, health in wildlife, zoo medicine, sales, and other fields.

Laboratory Animal Veterinarians conduct or provide support for research on infectious diseases, nutritional problems, and other health-related issues of laboratory animals, such as hamsters, rabbits, monkeys, and mice. They are responsible for the implementation of animal welfare guidelines and regulations and advise researchers on the proper care and use of laboratory animals.

Private Practice Veterinarians may choose to limit the species of animals they normally treat to dogs, cats, and other domesticated pets or horses or farm animals. Veterinarians may specialize in such areas as animal surgery, cardiology, dentistry, dermatology, internal medicine, neurology, ophthalmology, or radiology.

Research and Development Veterinarians with special training in toxicology, pathology, microbiology, pharmacology, or management play active roles in the development and safety testing of pharmaceuticals, vaccines, and medical devices.

Work Settings

Veterinarians may work independently or as a part of a team. They may supervise veterinary assistants, veterinary technicians, or others. Work settings vary with the type of practice. In rural areas, Veterinarians spend time working outdoors and going to and from farms. In urban areas, they are usually indoors in hospitals or clinics. Veterinarians in research and teaching usually work in laboratories and classrooms. In meat- and food-processing plants, Veterinarians may spend time in refrigerated cold storage rooms. Hazards associated with being a Veterinarian include exposure to diseases and infections that may be transmitted to humans and exposure to injuries, such as bites, scratches, and kicks. They may be exposed to radiation in certain kinds of research.

Special Requirements

Common requirements for entering programs in veterinary medicine are completion of a pre-veterinary medicine program or its equivalent and achievement of an acceptable cumulative and pre-veterinary science course grade-point average. Also, it is necessary to complete the veterinary aptitude test, to develop personal activities that indicate a continuing interest in the field and in community service, and to demonstrate in an interview the ability for successful completion of a program in veterinary medicine.

To become a licensed Veterinarian, an applicant must have earned a degree in veterinary medicine from a school or college of veterinary medicine accredited by the American Veterinary Medical Association. The candidate must submit a transcript of all coursework, an acceptable national certification board examination score, and an acceptable clinical competency test score. When these requirements are met, the applicant will be eligible to take the appropriate state examination for licensure.

Educational Institutions

Pre-veterinary medicine: ATU (B)

(ACM) Louisiana State University, Mississippi State University (D)

For more information, contact:

Arkansas Veterinary Medical Association

9 Shackelford Plaza, Suite 1
Little Rock, AR 72211
(501) 221-1477
www.arkvetmed.org

American Veterinary Medical Association

1931 N. Meacham Road, Suite 100
Schaumburg, IL 60173-4360
(847) 925-8070
www.avma.org

B. Veterinary Technician

Veterinary Technicians are employed by veterinarians to feed, maintain, clean, comfort, and provide services to animals. Veterinary Technicians work in a variety of areas, such as research, X-ray technology, surgical nursing, animal anesthesiology, animal care, veterinary hospital reception, meat inspection, and public health.

Work Activities

- Taking animals into treatment rooms
- Securing restraints or holding animals during treatment
- Sterilizing surgical instruments and other equipment
- Shaving animals before surgery
- Administering medications and monitoring anesthesia
- Taking and developing X-rays
- Performing laboratory tests on blood, urine, and feces
- Maintaining records of animals' reactions to treatment

Work Settings

Veterinary Technicians work under the supervision of a veterinarian or an experienced Technician. While performing routine duties, little supervision may be needed. There are some procedures that Veterinary Technicians are prohibited by law from performing. They may not diagnose ailments, prescribe medications, or perform surgery. Veterinary Technicians work indoors most of the time. Outdoor work may be required of those who are responsible for exercising animals or who work with a veterinarian practicing large animal medicine. The work involved in the basic care of animals may be dirty, repetitious, routine, and demanding. Hazards might include bites, scratches, and/or exposure to infection. Veterinary Technicians may supervise Veterinary Assistants. Veterinary Assistants perform routine animal care, such as feeding, watering, bathing, and exercising animals. They may greet and make appointments for clients, answer telephone calls, and accept payments. Most Veterinary Technicians work in veterinary offices, veterinary hospitals, kennels, research institutes, or zoos.

Special Requirements

Veterinary technicians with formal training should be certified through the Arkansas Veterinary Medical Examining Board. Only upon certification does one have the right to use the title "Certified Veterinary Technician." However, certification and formal training are not required in Arkansas. Applicants with a strong science background may be trained on the job as a Veterinary Assistant.

Educational Institutions

ASUB (A)

For more information, contact:

Arkansas Veterinary Medical Association
9 Shackelford Plaza, Suite 1
Little Rock, AR 72211
(501) 221-1477
www.arkvetmed.org

American Veterinary Medical Association
1931 N. Meacham Road, Suite 100
Schaumburg, IL 60173-4360
(847) 925-8070
www.avma.org

XVI. Vision Care

- A. Ophthalmic Medical Technologist page 78**
- B. Optical Laboratory Mechanic page 79**
- C. Optician page 79**
- D. Optometric Assistant/Technician.....page 80**
- E. Optometristpage 81**

Optometry is the art and science of vision care. Optometrists, with the aid of optometric assistants and optometric technicians, examine the eye for defects and faults of refraction, and prescribe corrective lenses or therapy. Opticians and Optical Laboratory Mechanics work together to fill the prescriptions of the optometrist or ophthalmologist (a physician who specializes in the treatment of eye diseases and injuries) for the corrective lenses, and ensure that they fit the patient correctly. Ophthalmic technologists assist ophthalmologists in the diagnosis and treatment of visual problems.

Vision is extremely important in education, work, and play because more than 80 percent of learning is visual. Studies have shown that good vision improves the production and morale of workers and that athletic performance is enhanced when vision problems are corrected. Vision care personnel are vital to industry, public health, recreation, highway safety, education, and the community. They work to promote the prevention of eye injury and disease and the maintenance of good health and vision.

A. Ophthalmic Medical Technologist

Ophthalmic Medical Technologists are specialists in the eye health care team. They assist ophthalmologists by collecting data and testing measurements to ensure the accurate diagnosis and treatment of a diseased eye.

Work Activities

- Using sophisticated equipment and techniques to gather information about a patient’s condition during eye examinations
- Assisting with eye surgery, using microscopic and intricate technical instruments
- Making sure the patient understands his or her diagnosis and treatment procedures
- Interacting with other eye health care professionals to ensure optimum patient care

Career Specialties

Ophthalmic medical technology lends itself to various avenues of specialization, including ophthalmic photography, ophthalmic ultrasonography, contact lenses, ophthalmic surgical technology, electrophysiology, and low-vision optics. Within the clinical setting, Ophthalmic Medical Technologists may specialize in pediatric, general, or geriatric ophthalmology. Other opportunities are available within the fields of teaching, business, or sales.

Work Settings

Ophthalmic Medical Technologists generally are employed by ophthalmologists' private practices, clinics, or hospitals. They often develop a one-to-one relationship with the patient, and they may be required to examine diseased eyes and participate in surgical procedures.

Special Requirements

Students who complete two years of college (60 college credits) are eligible to apply to a two-year ophthalmic technology clinical program. Upon graduation, students take a written examination for certification, offered by the Joint Commission of Allied Health Personnel in Ophthalmology, and a national oral practical examination. If both tests are passed, the candidate will be recognized as a Certified Ophthalmic Medical Technologist.

Educational Institutions

UAMS (B)

For more information, contact:**Joint Commission on Allied Health Personnel in Ophthalmology**

2025 Woodland Dr.

St. Paul, MN 55125-2998

(800) 284-3937

www.jcahpo.org

B. Optical Laboratory Mechanic

Optical Laboratory Mechanics set up and operate machines to cut, grind, and polish lenses according to prescriptions.

Work Activities

- Reading the lens and frame specifications from prescriptions
- Selecting proper lens blanks
- Marking lens blanks according to specifications using lens-measuring equipment
- Mounting lenses in metal, plastic, or rimless frames
- Inspecting mounted lenses for conformance to specifications
- Making necessary modifications to lenses
- Examining broken lenses to identify original prescriptions

Career Specialties

Optical Laboratory Mechanics may specialize, with the scope of their duties varying according to the size and type of establishment where they work. In large laboratories, technicians may specialize in one phase or operation. In small labs, they may work in all or most of the specialty areas.

Work Settings

Most Optical Laboratory Mechanics work in optical laboratories under the direction of lab supervisors. Others work for dispensing opticians, ophthalmologists, or optometrists. Although they may work with others, Technicians perform much of their work independently. Modern optical processing techniques have eliminated unpleasant odors and dust from optical labs. However, noise from power grinding machines and other equipment is to be expected. Sometimes goggles are worn to protect the eyes.

Special Requirements

Nearly all Optical Laboratory Mechanics learn their skills on the job. Employers filling entry level trainee jobs prefer applicants who are high school graduates. Courses in science and mathematics are valuable, while manual dexterity and the ability to do precision work is essential.

Educational Institutions

No programs are available in Arkansas.

For more information, contact:

American Optometric Association

243 N. Lindbergh Blvd., Stop 1
St. Louis, MO 63141-7881
(314) 991-4100
www.aoa.org

Association of Schools and Colleges of Optometry

6110 Executive Blvd., Suite 510
Rockville, MD 20852
(301) 231-5944
www.opted.org

C. Optician

Opticians design, order, and adjust eyeglasses and contact lenses for patients whose eyesight has been tested by a physician (ophthalmologist) or an optometrist.

Work Activities

- Analyzing and interpreting a written optical prescription (from the examining doctor) to determine the lens specifications required
- Measuring the customer's facial features
- Assisting the customer in selecting the style and color of eyeglass frames and lenses by advising them of the size and shape best suited to both their facial features and their optical prescription
- Preparing a work order that gives an optical laboratory the information needed to fabricate lenses and to mount lenses in frames
- Verifying that the finished lenses are exact by checking the power and surface quality with special optical instruments
- Adjusting finished eyeglasses to fit the customer by heating and shaping plastic frames, or by bending metal frames using pliers
- Instructing customers in the care of eyeglasses and contact lenses
- Performing follow-up services, such as fixing broken frames, replacing temple screws, and adjusting and refitting glasses

In some shops, Opticians may mount lenses in frames. They may sell optical goods, such as binoculars, cameras, sunglasses, magnifying glasses, and low-vision aids.

Career Specialties

Contact Lens Opticians, or **Contact Lens Technicians**, order and fit contact lenses. They prepare a work order similar to that for eyeglasses, except that measurements for the corneas of the customer's eyes are included. They instruct customers on inserting, removing, and caring for the lenses. They may make minor adjustments to finished lenses for a more comfortable fit.

Work Settings

Opticians may operate their own businesses. Also, they may work for owners or managers of retail optical outlets, for ophthalmologists or optometrists who sell glasses directly to patients, or

for supervisors in eye clinics and hospitals. Opticians usually perform their work independently and spend most of their time dealing directly with the public.

Educational Institutions

ASUMH (A)

For more information, contact:

Opticians Association of America
441 Carlisle Dr.
Herndon Virginia 20170
703-437-8780
www.oaa.org

D. Optometric Assistant/Technician

Optometric Assistants and **Optometric Technicians**, sometimes called Paraoptometric, perform a combination of tasks to assist the optometrist in eye examinations and corrective procedures.

Work Activities

- Obtaining and recording the patient's preliminary case history
- Maintaining records, schedules, and announcements
- Preparing the patient for the vision examination
- Assisting with various eye tests
- Instructing the patient in the care and use of glasses or contact lenses
- Working with the patient in vision therapy
- Assisting the patient in frame selection
- Adjusting and repairing glasses or contact lenses
- Maintaining an inventory of materials and cleaning the instruments
- Helping to make eyeglasses or contact lenses
- Performing general and ocular test procedures

Work Settings

Optometric Assistants and Optometric Technicians are supervised by an optometrist. They work in optometrists' offices with other optometric professionals, and few hazards are associated with the job.

Educational Institutions

No programs are available in Arkansas.

For more information, contact:

Arkansas Optometric Association
411 S. Victory St., Suite 202
Little Rock, AR 72201
(501) 661-7675
<http://www.arkansasoptometric.org>

American Optometric Association
243 N. Lindbergh Blvd., 1st Floor
St. Louis, MO 63141-7881
(800) 365-2219
www.aoanet.org

Association of Schools and Colleges of Optometry

6110 Executive Blvd., Suite 510

Rockville, MD 20852

(301) 231-5944

www.opted.org

E. Optometrist

Optometrists, or **Doctors of Optometry**, help people preserve and improve their vision by examining, diagnosing, and treating conditions of the vision system.

Work Activities

- Examining, diagnosing, and treating conditions of eyes and related structures of the human vision system to enhance visual performance and efficiency and to diagnose and treat eye diseases and other abnormalities
- Diagnosing and treating patients with visual pathology or ocular-related diseases, and referring patients in need of surgery to other medical practitioners
- Diagnosing and treating the cause of defects in the human vision system
- Examining the vision system for proper depth and color perception
- Analyzing the patient's ability to focus and coordinate eye movement
- Measuring peripheral (side) vision
- Prescribing corrective procedures, such as the use of lenses, prisms, and exercises, or other forms of vision therapy
- Administering diagnostic pharmaceutical agents to examine the human vision system for pathology or other abnormalities
- Administering and prescribing ocular-related therapeutic pharmaceutical agents to treat diseases of the eye and related structures
- Prescribing and dispensing eyeglasses and contact lenses
- Providing examination and treatment services related to occupational and sports vision, low-vision (partially sighted) services, vision-related learning disabilities, and pediatric and geriatric vision care

Career Specialties

Optometrists may specialize in treating the elderly or in treating children with visually related learning problems. Others work to rehabilitate the partially sighted who can be helped with microscopic or telescopic lenses. Some specialize in the visual safety of industrial workers or in environmental vision care. Optometrists may perform vision training or vision therapy. Also, they may specialize in prescribing and fitting contact lenses. Some Optometrists become specialists by earning a master's or doctoral degree in such programs as physiological optics, neurophysiology, public health administration, health information and communication, or health education. They also may conduct research, teach at a college or university, act as a consultant, or work in the public health field.

Work Settings

Optometrists may be employed by universities, optical manufacturers, governmental health agencies, or hospitals. Most Optometrists are self-employed and practice alone. Others are in partnerships or in group practices with other Optometrists or health professionals as part of a health care team. Optometrists may direct the work of optometric technicians, optometric assistants and/or receptionists. Most optometric care is provided in a professional office atmosphere. The work is relatively hazard-free.

Special Requirements

The most common requirements for entering an optometry program are completing preprofessional courses at an accredited college or university, taking the Optometry College Admission Test (OCAT), and completing application forms. Student selection is based on high school, college, and pre-professional course grades, academic aptitude, OCAT results, recommendations, and personal interviews.

Educational Institutions

(ACM) Northeastern State University-Tahlequah, OK, Southern College of Optometry-Memphis, TN, University of Missouri-St. Louis

For more information, contact:

Arkansas Optometric Association
411 S. Victory St., Suite 202
Little Rock, AR 72201
(501) 661-7675
<http://www.arkansasoptometric.org>

Association of Schools and Colleges of Optometry
6110 Executive Blvd., Suite 510
Rockville, MD 20852
(301) 231-5944
www.opted.org

American Optometric Association
243 N. Lindbergh Blvd., 1st Floor
St. Louis, MO 63141-7881
(800) 365-2219
www.aoanet.org

XVII. Special Technologies and Services

- A. Athletic Trainer page 83**
- B. Emergency Medical Services page 84**
- C. Gerontologist..... page 88**
- D. Orthotist/Prosthetist..... page 89**
- E. Perfusionist..... page 91**
- F. Surgical Technologist..... page 91**

Many people are employed in hospitals, health maintenance organizations, nursing homes, emergency care centers, and other health or science settings. Opportunities are available for individuals who are interested in teaching, working with athletes, providing emergency treatment, being part of an operating room team, or designing and fitting artificial limbs and braces.

Health care facilities also offer opportunities for computer operators and programmers, accountants, receptionists, technical writers, insurance reviewers, librarians, housekeepers, and stock clerks. These and many other professionals are vital to the daily operation of health and science facilities.

Jobs exist at every educational level in these diverse and interesting occupations. Some require on-the-job training, while others require college or post-graduate work

A. Athletic Trainer

Athletic Trainers are professionals who, as part of a complete athletic program team, provide efficient medical management, prevention, and treatment of athletic injuries. Their work ensures that athletic competition is safe, morale is high, and performance is at its best.

Work Activities

- Structuring training programs designed to prevent injuries
- Treating and rehabilitating athletic injuries as directed by the team’s physicians
- Maintaining a good working relationship with coaches, physicians, other health care workers, athletes, and administrators
- Caring for student athletes’ physical needs during team sports, recreation, intramurals, and physical education classes
- Using a knowledge of nutrition, hygiene, psychology, conditioning, and protective equipment to help the athlete perform well and to prevent injury

Work Settings

Athletic Trainers work in an athletic and teaching environment. They may be employed by public or private secondary schools, colleges or universities, professional sports teams, or sports medicine clinics in health clubs or corporate health programs. They work with athletes, coaches, physicians, and other health care specialists, often combining training, therapy, and teaching.

Special Requirements

An undergraduate athletic training program should include a specific number of working hours of clinical experience, with two or more years of experience under the direct supervision of a Certified Athletic Trainer.

Educational Institutions

Exercise Science/Physiology and Movement Studies: ASUJ, HC, HSU, JBU, SAUM (All B); ASUJ (M)

Kinesiology: HC, HSU, HU, OBU, PSC, SAUM, UAF, UCA, UO, WBC (B) SAUM, UAF, UCA (All M); UAF (D)

Athletic Training: ASUJ, HSU, UAM, UCA (B)

For more information, contact:

National Athletic Trainers Association

2952 Stemmons Fwy., Suite 200
Dallas, TX 75247-6103
(214) 637-6282
www.nata.org

B. Emergency Medical Services Professionals

- 1. Emergency Medical Technician Basicspage 84**
- 2. Emergency Medical Technician Intermediatespage 86**
- 3. Paramedicspage 87**

Emergency Medical Service (EMS) professionals work as members of emergency care medical teams providing immediate patient care to the critically ill and injured. In Arkansas, career (paid) and volunteer opportunities are available with rescue squads, fire departments, commercial ambulances and the industrial setting. The above levels are recognized by the Arkansas Department of Health and the United States Department of Transportation. Arkansas certified EMS Professionals can go through a process of reciprocity with surrounding, and other states so that their education and certification can provide them with job opportunities in other areas of the country, the military, and internationally.

1. Emergency Medical Technician Basics (EMT-Bs)

EMT-Bs serve as the entry level of the EMS work force. They must complete the Department of Transportation National Standard Curriculum through an Arkansas accredited training site. Most EMT-B courses are between 120 to 180 contact hours in length. The curriculum includes didactic, clinical, and field internship. EMT-Bs provide noninvasive treatments that include oxygen delivery, splinting, controlling hemorrhaging, automatic defibrillation, hemorrhage control, spinal immobilization, and packaging patients.

Work Activities

- Outdoor environment with significant autonomy
- Assessing patients for the nature and extent of illness or injury
- Gathering patient histories through interpersonal communications
- Establishing treatment and transport priorities
- Initiating treatment interventions based on the patient's history and the assessment
- Inventory management of the responding unit
- Packaging patients for emergency department reception
- Reassuring patients, families, and bystanders during the event
- Communicating findings via patient care report, radio or cellular technology to the receiving facility
- Develop and maintain working relationships with other emergency services including police, fire and first responders
- Transferring care of the patient to the emergency department staff
- Triage multiple patients and selecting treatment and transport priorities
- Cleaning, disinfecting and maintaining the responding unit

Work Settings

Most EMT-Bs work on hospital, fire, or private ambulance services as a member of the pre-hospital team. They work as in-charge members of Basic EMS units or as partners on advanced level ambulances. EMT-Bs can also work as members of emergency response teams in the industrial settings. Working shifts of 12 hour and 24 hours are common, and night and holiday work may be required. The work environment has many potential hazards. The likelihood of injuries from scenes and infectious diseases does exist; however with proper training the risk can be minimized.

Special Requirements

Arkansas Department of Health requires the student who is taking the EMT-B Certification Exam to be at least 18 years of age and have a high school diploma or GED equivalent. Entry levels vary between career and volunteer agencies. The student must have a valid driver's license, good driving record, and minimal to no criminal record.

High School Preparation

These subjects are helpful in preparing for this occupation: •English • Drivers' Training • First Aid • Health Occupations/Medical Professions Education • Computer Skills • Biology • Chemistry • Psychology • Physical Education •Algebra

Emergency Medical Technician Basic Training sites:

ASU- Beebe, Beebe 72012	Phillips County College, Dewitt 72042
ASUMH, Mountain Home 72653	South Arkansas Community College, El Dorado 71730
Cossatot Community College, De Queen 71832	South East Arkansas Community College, Pine Bluff 71603
Crowley's Ridge Technical Institute, Forrest City 72335	Southern Arkansas University Tech, Camden 71701
Henderson State University, Arkadelphia 71923	UA Community College- Batesville 72503
Little Rock Fire Department, Little Rock 72201	UA Community College- Hope 71802
Mid-South Community College, West Memphis	UA Community College- Morrilton 72110
National Park Community College, Hot Springs 71913	UAMS, Little Rock 72205
North Arkansas College, Harrison 72601	UA Monticello, Crossett 71635
Northwest Arkansas Community College, Bentonville 72712	UA Monticello, McGehee 71654
Ozarka College, Melbourne 72556	

For more information contact:**National Association of Emergency Medical Technicians**

P.O. Box 1400
 Clinton, MS 39060-1400
 (800) 346-2368
 www.naemt.org

Arkansas Emergency Medical Technician Association

Arkansas Paramedic Society
EMT Industrial Society
 1211 W. Markham, #14-394
 Little Rock, AR 72211
 www.aemta.org

Arkansas Department of Health

Office of EMS and Trauma Systems
 (800) 482-5400 ext 2262

2. Emergency Medical Technician Intermediates (EMT-Is)

EMT-Is begin the first level of advanced EMS professional. EMT-Is must be a certified EMT-B and complete the Department of Transportation National Standard EMT-I Curriculum through an Arkansas accredited training site. Most EMT-I courses include between 120 to 150 contact hours of education. EMT-I training includes didactic, clinical, and field internship. EMT-Is provide all of the EMT-B skills plus invasive treatments which include IV therapy, limited medication administration, and limited advanced airway procedures.

Work Activities

- Outdoor environment with significant autonomy
- Assessing patients for the nature and extent of illness or injury
- Gathering patient histories through interpersonal communications
- Establishing treatment and transport priorities
- Initiating treatment interventions based on the patient's history and the assessment
- Inventory management of the responding unit
- Packaging patients for emergency department reception
- Reassuring patients, families, and bystanders during the event
- Communicating findings via patient care report, radio or cellular technology to the receiving facility
- Develop and maintain working relationships with other emergency services including police, fire and first responders.

- Transferring care of the patient to the emergency department staff
- Triage multiple patients and selecting treatment and transport priorities
- Cleaning, disinfecting and maintaining the responding unit

Work Settings

Most EMT-Is work on hospital, fire, or private ambulance services as a member of the pre-hospital team. EMT-Is function as team leaders for intermediate level ambulance services or serve as team members on paramedic ambulances. Working shifts of 12 hour and 24 hours are common, and night and holiday work may be required. The work environment has many potential hazards. The likelihood of injuries from scenes and infectious diseases does exist; however with proper training the risk can be minimized.

Special Requirements

The student must be currently certified as an EMT-B in order to begin EMT-I training. Entry levels vary between career and volunteer agencies. The student must have a valid driver's license, good driving record, and minimal to no criminal record.

High School Preparation

These subjects are helpful in preparing for this occupation: •English • Drivers Training • First Aid • Health Occupations/Medical Professions Education • Computer Skills • Biology • Chemistry • Psychology • Physical Education •Algebra

Emergency Medical Technician Intermediate training sites include:

Southern Arkansas University Tech, Camden 71701
 UA Community College- Batesville 72503
 UA Monticello, McGehee 71654

For more information contact:

Arkansas Emergency Medical Technician Association
Arkansas Paramedic Society
EMT Industrial Society
 1211 W. Markham, #14-394
 Little Rock, AR 72211
www.aemta.org

National Association of Emergency Medical Technicians
 P.O. Box 1400
 Clinton, MS 39060-1400
 (800) 346-2368
www.naemt.org

Arkansas Department of Health

Office of EMS and Trauma Systems
 (800) 482-5400 ext 2262

3. Paramedic

The Paramedic is the highest trained EMS professional. Paramedics must complete EMT-B certification and complete the Department of Transportation National Standard Paramedic Curriculum through an Arkansas accredited training site. Paramedic courses provide at least 1500 contact hours of education including didactic, clinical, and field internship. Paramedics are capable of delivering all of the skill sets of EMT-Bs and EMT-Is with the addition of three and twelve lead electrocardiogram interpretation, manual defibrillation, cardiac pacing, a comprehensive list of medications to administer, and more advanced airway procedures.

Work Activities

- Outdoor environment with significant autonomy
- Assessing patients for the nature and extent of illness or injury
- Gathering patient histories through interpersonal communications
- Establishing treatment and transport priorities
- Initiating treatment interventions based on the patient's history and the assessment
- Inventory management of the responding unit
- Packaging patients for emergency department reception
- Reassuring patients, families, and bystanders during the event
- Communicating findings via patient care report, radio or cellular technology to the receiving facility
- Develop and maintain working relationships with other emergency services including police, fire and first responders.
- Transferring care of the patient to the emergency department staff
- Triage multiple patients and selecting treatment and transport priorities
- Cleaning, disinfecting and maintaining the responding unit

Paramedics also may work as crew members on helicopter or fixed wing medical transport units.

Work Settings

Most Paramedics work on hospital, fire, or private ambulance services as the in-charge member of the pre-hospital team. Medics function on the special rescue units or the paramedic ambulance. Working shifts of 12 hours and 24 hours are common; and night and holiday work may be required. The work environment is filled with dangers. Possibility of injuries from scenes and infectious diseases do exist; however with proper training these can be minimized.

Special Requirements

The student must be currently certified as a Basic EMT to enter the training. Entry levels vary between career and volunteer agencies. The student must have a valid driver's license, clear driving record, and clean criminal record.

High School Preparation

These subjects are helpful in preparing for this occupation: •English • Drivers Training • First Aid • Health Occupations/Medical Professions Education • Computer Skills • Biology • Chemistry • Psychology • Physical Education •Algebra

College Preparation

These subjects are helpful in preparing for this occupation but not all necessary as a prerequisite for every educational program: •English Composition I & II • Anatomy & Physiology • Medical Terminology •College Algebra • Computer Skills • Psychology • Speech •American National Government

Paramedic training sites:

Arkansas State University, Beebe 72012
 Arkansas State University, Newport 72112
 Black River Technical College, Pocahontas
 72455
 Cossatot Community College, 71832
 East Arkansas Community College, Forrest City
 72335
 Henderson State University, Arkadelphia 71923
 National Park Community College, Hot Springs
 71913
 North Arkansas College, Harrison 72601

Northwest Arkansas Community College,
 Bentonville 72712
 South Arkansas Community College, El Dorado
 71730
 South East Arkansas Community College, Pine
 Bluff 71603
 Texarkana College, Texarkana 75501
 UA Community College- Batesville 72503
 UA Community College- Hope 71802
 UAMS, Little Rock 72205
 UA Monticello, McGehee 71654

For more information contact:

**Arkansas Emergency Medical Technician
 Association**
Arkansas Paramedic Society
EMT Industrial Society
 1211 W. Markham, #14-394
 Little Rock, AR 72211
 www.aemta.org

**National Association of Emergency
 Medical Technicians**
 P.O. Box 1400
 Clinton, MS 39060-1400
 (800) 346-2368
 www.naemt.org

Arkansas Department of Health

Office of EMS and Trauma Systems
 (800) 482-5400 ext 2262

C. Gerontologist

Gerontologists are professionals who specialize in working with elderly persons. They may have a degree in gerontology, or they may be trained in nursing, sociology, psychology, or other human service-related professions. The job roles of gerontologists fall under four broad categories: Direct Service, Education and Training, Program Planning and Evaluation, and Administration and Policy.

Work Activities

- Providing services to persons in nursing homes and similar facilities, at senior citizen centers, and in the community
- Conducting research on the aging process and the living environments of older persons
- Teaching at colleges and universities
- Educating older persons by giving oral presentations, publishing books and articles on subjects of interest, or producing relevant television programs and films
- Counseling the elderly and their families
- Advising business, industry, and labor about older workers and consumers

Work Settings

Gerontologists work in a wide variety of settings. They may work in nursing homes, senior citizen centers, hospitals, clinics, for government agencies such as Area Agency on Aging, advocacy organizations, rehabilitation agencies, mental health facilities, social service, or public health offices. They may visit individuals' homes, or teach in schools and colleges. Often they work with other professionals, such as physicians, occupational therapists, physical therapists, dietitians, or lawyers, who also are interested in improving the quality of life of elderly persons.

Special Requirements

Many colleges and universities offer various levels of programs in gerontology. Some schools offer research programs at doctoral and post-doctoral levels. Currently no accreditation or registration is required beyond completion of an accredited program.

Educational Institutions

Nursing Assistant in Gerontology: BRTC ©

Gerontology: UAPB (C & B); UAF, UALR (S); UALR (M)

Aging Studies: ASUJ (S)

For more information, contact:

Gerontological Society of America

1030 15th St. NW, Suite 250

Washington, DC 20005

(202) 842-1275

www.geron.org

D. Orthotist/Prosthetist

Orthotist and **Prosthetists** design, write specifications for, and fit artificial appliances for body deformities and disorders following the prescription of a physician. These appliances include artificial arms and legs; neck, and back braces; and surgical supports. An individual may be both an Orthotist and a Prosthetist. Orthotists specialize in planning, making, and fitting orthopedic braces, and similar devices, such as surgical supports and corrective shoes. These are used to support weakened body parts or to correct physical defects. Prosthetists specialize in planning, making, and fitting artificial limbs.

Work Activities

Orthotists and Prosthetists follow similar procedures in their work although they deal with different abnormalities, designs, and patients. Their duties may include:

- Reviewing prescriptions that specify the types of appliances or limbs to be made
- Examining the patient's affected areas for factors that could influence the fitting or artificial limbs and appliances
- Measuring and making a plaster cast of the limb or deformity to determine the type of brace or artificial limb needed
- Correcting irregularities and deficiencies in the plaster cast
- Designing the appliance that will function best in meeting the patient's needs
- Selecting appropriate materials and components and giving the specifications of the limb or brace to the technician
- Making a limb or brace that requires special attention
- Fitting the appliance to the patient and noting any adjustments for comfort, alignment, or appearance
- Counseling the patient on the use of the device
- Providing routine maintenance and repair of devices

Orthotists and **Prosthetists** may be assisted by the following professionals:

Orthotics Assistants provide care to patients with disabling conditions of the limbs and spine by fabricating and fitting supportive or corrective devices known as orthoses. Orthotics Assistants may supervise **Orthotics Technicians**. Orthotics Technicians make and repair braces and other orthotic devices, such as surgical corsets and corrective shoes, according to the specifications of

the Orthotist. **Prosthetics Assistants** provide care to patients with partial or total absence of a limb by fabricating and fitting artificial limbs or devices known as prostheses. Prosthetics Assistants may supervise **Prosthetics Technicians**.

Work Settings

Orthotists and Prosthetists work with a minimum of supervision. They meet with physicians, therapists, and other on the rehabilitation team to evaluate the appropriateness of the appliance or limb. They work with patients to fit artificial limbs, braces, and other appliances. Depending on the facility, Orthotists and Prosthetists may supervise Orthotics Technicians and Prosthetics Technicians. Orthotics and prosthetics businesses may be very small and employ only one or two workers. Work areas in private offices and medical facilities may have formal offices, fitting rooms similar to examination rooms, and workrooms. Workrooms may be noisy and dusty because of the machines and materials used. There may be fumes from solvents, lacquers, and heat treatment processes present. In addition, the possibility of injury from moving machinery exists.

Special Requirements

Some employers may require that Orthotists, Prosthetists, Assistants, and Technicians be certified by the American Board for Certification in Orthotics and Prosthetics. To become a Certified Orthotist (CO), a Certified Prosthetist (CP), or a Certified Prosthetist-Orthotist (CPO), the applicant must have bachelor's degree in prosthetics and orthotics.

Educational Institutions

No programs are available in Arkansas.

For more information, contact:

National Commission on Orthotic and Prosthetic Education (NCOPE)

330 John Carlyle St., Suite 200

Alexandria, VA 22314

(703) 836-7114

www.ncope.org

E. Perfusionist

Perfusionists are members of an open-heart surgical team. They select, set up, and operate the heart-lung machine, which functions as the patient's heart and lungs during surgery.

Work Activities

- Operating the heart-lung machine, which circulates blood outside of the body during surgery
- Monitoring the patient's circulation while he or she is being perfused
- Anticipating abnormal situations and taking corrective action
- Informing the surgeon and the anesthesiologist about the patient's condition
- Providing long-term support of the patient's circulation after the operation

Work Settings

Perfusionists usually are employed by hospitals. About 50% may be hired by individual surgeons or companies that supply hospitals with perfusion services or that manufacture perfusion supplies and equipment. They may also work in research and development or in marketing or sales.

Special Requirements

To become a certified Perfusionist, an individual must complete a one-, two-, or four-year perfusion educational program that has been accredited by the Committee on Allied Health Education and Accreditation (CAHEA) and must pass oral and written examinations given by the American Board of Cardiovascular Perfusion (ABCP). Many programs prefer students who have a bachelor's degree in biology, chemistry, respiratory therapy, or nursing.

Educational Institutions

No programs are available in Arkansas.

For more information, contact:

American Academy of Cardiovascular Perfusion

P O Box 3596

Allentown, PA 18106-0596

(610) 395-4853

<http://users.aol.com/officeAACV/home.html>

F. Surgical Technologist

Surgical Technologists, also called **Operating Room Technicians**, perform a variety of duties in an operating room to assist the surgical team before, during, and after surgery.

Work Activities

- Helping the surgical team scrub and put on gloves and masks
- Arranging the sterile setup for surgery
- Washing, shaving, and disinfecting the area of the patient's body to be operated on
- Assisting in positioning the patient for the surgical procedures
- Anticipating the needs of the surgeon
- Passing instruments, sponges, sutures, and needles to surgeons or their assistants
- Holding retractors and cutting sutures
- Operating lights, sterilizers, suction machines, and diagnostic equipment
- Preparing operative specimens for laboratory analysis
- Completing an inventory of sponges, needles, and instruments used during an operation
- Cleaning the operating room following surgery and washing and sterilizing used equipment

Career Specialties

Surgical Technologists may specialize in a particular area of operating room surgery.

Work Settings

Surgical Technologists are supervised by registered nurses and physicians. They work in hospitals as part of a surgical team of surgeons, nurses, assistants, and anesthesiologists. Technicians may also be employed in other institutions that have operating room, delivery room, or emergency room facilities.

Special Requirements

Surgical Technologists receive their training in programs lasting 9 months to 2 years and graduate with a certificate or associate degree. A high school diploma is usually required for admission. Hospital-based programs last 6 months to 1 year and are for licensed practical nurses or other health professionals. Technologists certified after 1993 must have graduated from a program. Certification is not required by all hospitals or states.

Educational Institutions

NAC, NTI, SACC, SEAC, UACC, UAFS, UAMS (C); BHS, NAC, SACC, SEAC, UAFS, UAMS (A)

For more information, contact:

Association of Surgical Technologists, Inc.

6 West Dry Creek Circle

Littleton, CO 80120

(800) 637-7433

www.ast.org