

# PRE-DIAGNOSTIC MEDICAL SONOGRAPHY

## ..... G U I D E .....



Diagnostic medical sonographers and cardiovascular technologists typically do the following:

- Prepare patients by explaining the procedure to them and answering their questions
- Prepare exam rooms and maintain diagnostic imaging equipment
- Properly situate patients for imaging
- Operate equipment to obtain diagnostic images or to conduct tests
- Review images or test results to check for quality and adequate coverage of the areas needed for diagnoses
- Analyze results for abnormalities and other diagnostic information and provide a summary of findings to physicians
- Record findings and keep track of patients' records

**Diagnostic medical sonographers** specialize in creating images, known as sonograms or ultrasounds, that depict the body's organs and tissues. Sonography is often the first imaging test performed when disease is suspected.

Sonography uses high-energy sound waves to produce images of the inside of the body. The sonographer uses an instrument called a transducer to scan parts of the patient's body that are being examined. The transducer emits pulses of sound that bounce back, causing echoes. The echoes form an image on a computer that physicians use for diagnosis.

The following are examples of types of medical sonographers:

- *Abdominal sonographers* specialize in imaging a patient's abdominal cavity and nearby organs, such as the kidney, liver, gallbladder, pancreas, and spleen. Abdominal sonographers may assist with biopsies or other examinations requiring ultrasound guidance.
- *Breast sonographers* specialize in imaging a patient's breast tissue. Sonography can confirm the presence of cysts and tumors that may have been detected by the patient, the physician, or a mammogram. Breast sonographers assist with procedures that track tumors and help to provide information that will aid physicians in making decisions about treatment options for breast cancer patients.
- *Cardiac sonographers (echocardiographers)* specialize in imaging a patient's heart. They use ultrasound equipment to examine the heart's chambers, valves, and vessels. An echocardiogram may be performed either while the patient is resting or after the patient has been physically active. Cardiac sonographers also may take echocardiograms of fetal hearts so that physicians can diagnose cardiac conditions during pregnancy.
- *Musculoskeletal sonographers* specialize in imaging muscles, ligaments, tendons, and joints. These sonographers may assist with ultrasound guidance for injections, or during surgical procedures, that deliver medication or treatment directly to affected tissues.
- *Pediatric sonographers* specialize in imaging of children and infants. Many of the medical conditions they image are associated with premature births or birth defects. Pediatric sonographers may work closely with pediatricians and other caregivers.
- *Obstetric and gynecologic sonographers* specialize in imaging the female reproductive system. For example, many pregnant women receive sonograms to track the baby's growth and health.
- *Vascular technologists (vascular sonographers)* create images of blood vessels and collect data that help physicians diagnose disorders affecting blood flow. Vascular technologists often evaluate blood flow and identify blocked arteries or blood clots. (*Occupational Outlook Handbook*)

The following **Pre-Diagnostic Medical Sonography Program** will satisfy the requirements for admission to the Department of Clinical, Diagnostic and Therapeutic Sciences at the University of Nebraska Medical Center (UNMC). A **minimum of 79 credit hours**, including the following pre-diagnostic medical sonography prerequisites, are required. Admission to the professional portion of the program is competitive and is not automatically assured by successful completion of pre-diagnostic medical sonography courses. The Diagnostic Medical Sonography Program is a 12 month program at UNMC. Students will receive a Bachelor's of Science in Medical Therapeutic Science from UNMC upon completion of the program.

#### A. Required Courses:

##### Take all of the following:

BIOL 225	Anatomy and Physiology	4
BIOL 226	Anatomy and Physiology	4
BIOL 325	Medical Terminology	1
MATH 102	College Algebra	3

##### Take one of the following courses:

ENG 101	Introduction to Academic Writing	3
SPCH 100	Fundamentals of Speech Communication	3

##### Take one of the following courses:

PHYS 205	General Physics	5
PHYS 203	Physics for Allied Health	4

Students should see their advisor for suggestions on electives to complete the 79-credit hour requirement. Due to the competitive nature of the application process, students are encouraged to complete UNK's general education requirements (LOPER courses) and use the electives to work towards the requirements of a UNK major to allow for the possibility of completing a Bachelor's Degree from UNK if not accepted. Students should check with other sonography programs to which they intend to apply to ensure that requirements are fulfilled.

#### Academic Guidelines

A minimum cumulative GPA of 2.75 (on a 4.0 scale) is required at the time of application submission to UNMC. However, a higher GPA is preferred and will result in the student being a more competitive applicant. Each required course must be passed with a letter grade of "C-" or better. Students should be aware of prerequisites on all courses and plan accordingly.

#### Non-Academic Guidelines

Admission is based on GPA, shadowing, direct patient care experience, community involvement and volunteerism, leadership qualities, the interview, and an essay. All diagnostic medical sonography students are strongly encouraged to shadow. **UNMC requires a minimum of 500 hours of direct patient care experience prior to application.** Direct patient care is defined as interactions that involve face-to-face contact with patients such as physical examinations, administering treatments, and performing medical procedures. Examples meeting this criterion include, but are not limited to, imaging professionals, nurses and certified nursing assistants, physical therapy assistants, paramedics, or phlebotomists.

Health Sciences offers opportunities to meet these non-academic guidelines through the Shadowing Program, Internships, connections to employment opportunities, the Health Science Club, and volunteer experiences. Students should plan to be involved in these types of activities and experiences throughout their undergraduate career. Other important non-academic factors include good moral character, excellent interpersonal skills, a deep commitment to healthcare, evidence of leadership potential and service to others.

#### The Application Process

Students applying to UNMC's Diagnostic Medical Sonograph Program will use UniCAS, a centralized online application service. The application opens in October and is due January 15<sup>th</sup>. Students applying to other sonography programs will need to check their websites for instructions and application materials.

### Letters of Evaluation/Recommendation

Letters of evaluation are not required by UNMC. If letters are required by other programs, letters from a faculty member, health care practitioner, academic advisor, or employer would be appropriate.

### Interviews

Most programs screen applicants with some form of personal interview. The format of the interview may vary depending on the programs to which the student is applying.

### Criminal Background Checks

Prerequisite for enrollment into any health science professional program or professional training is consent for an external background check. This check includes, but is not limited to, past criminal offenses and registry information. If there is evidence of arrest for a crime(s), conviction for a crime(s), presence on an abuse registry, or other information which reasonably suggests that patient safety might be compromised, the student will be asked to provide additional information.

### Citizenship/International Students

Professional schools in the health sciences vary as to whether they accept non-U.S. citizens. Some programs that do accept non-citizens require a substantial financial commitment up front. Since not all programs accept non-citizens and since the financial commitment of those that do may be substantial, students should thoroughly research and carefully consider such a decision and discuss it with their pre-health advisors early in their undergraduate years.

### Suggested Sequence of Key Courses

	Fall	Spring
Year 1	CHEM 148 or BIOL 103 (LOPER 8) MATH 102 (LOPER 4) ENG 101 (LOPER 2) LOPER 1	STAT 241 SPCH 100 (LOPER 3) PSY 203 (LOPER 7) Elective
Year 2	BIOL 225 BIOL 325 Elective LOPER 5 LOPER 6	BIOL 226 Elective LOPER 9 LOPER 6
Year 3	LOPER 10 Elective Elective Elective Elective	PHYS 203 or PHYS 205 Elective Elective Elective
Year 4	Diagnostic Medical Sonography Program at UNMC	Diagnostic Medical Sonography Program at UNMC

- Students must be aware of prerequisites for courses and plan accordingly.
- A MATH ACT score of 20 is a pre-requisite for College Algebra (MATH 102).
- A MATH ACT score of 20 or prior completion of College Algebra (MATH 101 or 102) or higher is a pre-requisite for CHEM 148.
- A minimum MATH ACT score of 20 or prior completion of College Algebra (MATH 102) (Grade of B+ or better) or higher is required for entry into PHYS 205.